

## The effect of Vertimax device training on jump shooting in Basketball

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### **An introduction and problem of the research :**

The great technological advancement that the human achieved recently in the Twentieth century is one of the most important reasons that made the scientific research is an inevitable necessity in all different life aspects , particularly in the field of physical education because it is a fertile field of education and one of the most fields that requires further of the scientific researches that deal with several issues and it's different dimensions .

Hence the sport training is based upon the scientific research to achieve the highest achievement levels based upon theories and cognitions drawn from the findings of the scientific researches for the sciences related with the sport field . The success of the training process , achieving it's goals representing in the athlete arrive for the highest level and achievement in the practiced activity depends upon the trainer usage for modern cognitions and theories in training and his ability on understanding different abilities and potentials of the athlete whether skilful or physical ones and how to make use of them in competition . Although the experts agreement in the sport training field on the importance of determining the basic contents of the training programs in general , but there is still a great variance in the used methods and approaches for achieving the primary goals of these contents that contributes in increasing the skilful performance efficiency in general ( ٤: ٦ ) , ( ١١: ٢ ) , ( ٢: ٣٩٩ )

Ahmed Farouk Khalef (٢٠١٣) , Scott Lucett (٢٠١٣) , Mahmoud Houssain ( ٢٠١٣) , Krause et.al (٢٠٠٨) see that basketball sport is different than the rest of other team sports in being a sport of dynamic nature that acquires from the athlete to be perfect in maneuvers of direction change and speed with high competency with speed and control ability of the body to overcome the competitors in small spaces of the court and under several stress ( time , accuracy , physical load , balance , competition ) .It's motor skills are diverse and of special structure requiring special physical and motor abilities making him in a state of always ready for the tactical behave , performing the appropriate movements and skills in time , for continuous and quick change in playing situations , so those who concerned with and specialized in the field of developing the level of physical , movement and technical level , exert much efforts continuously for discovering and devising new methods , approaches and tools for developing the performance level of the athletes ( ٢: ٧ ) , ( ١٨:٦٠ ) , ( ١٥:١٠ ) , ( ١٢: ١٤ ) .

-Assistant apparatus and tools an efficient part in training process , since learning movement skills require not boring to mind , as well as adding the element of excitement . This part of the used apparatus and tools and contributing in acquiring physical characteristics , movement agility and some psychological traits that are necessary for performance , it is preferred that the method of training for developing the physical traits are suitable for the muscular work , as well as the prevalence in movements performed on the apparatus it's assistant tools has a positive effect on rising the level of the physical and skilful performance . ( ٧: ٥ ) .

Roport and Kerre ( ٢٠٠٠ ) indicate that the traditional strength training ( non ballistic ) in which the athlete not reached the maximum muscular ability not after a full second passing from the beginning of the training frequency , conversely the ballistic training imposes the athlete to reach the maximum muscular strength quickly in a time of ( ٠.٢ ) seconds . Vertimax is considered one of the developed experimental systems and designed to increase the athletes performance and their ability on all sport activities and all age stages .

The apparatus was designed allowing for performing several of different trainings simultaneously and in the place of practicing sport activity to save time and effort instead of performing physical and technical exercises independently .The importance of Vertimax went beyond the field of sport training where it allows the routines and gives the athletes the big opportunity to increase vertical jump and it is the only apparatus that is able in loading on legs and arms simultaneously and with

the same intensity during training on vertical jump , as well as the potential of controlling the resistances gradually from light to high . (١٤: ٩٦) .

The authors see that Vertimax is considered one of the best equipments of basketball training for developing some physical abilities and it is very important matter for all basketball athletes and it is considered a big advantage in the playground in both attack and offense cases .

Moanta et al (٢٠١٣) indicates that for developing basketball sport , this development must have ordered goals and methodology according to the principals of teaching and sport training , because the tactical performance in this sport is characterized with complication and complexity , through this tactical performance in which basketball sport is characterized than the rest of team sports , the athlete can lean much of the important tactical principals such as leadership and taking the suitable decisions in the appropriate times in the situations in which the athlete exists ,

We can develop the level of the physical and skilful performance for the basic attack skills ( passing , dribble , shooting ) , as well as the basic offense skills to defeat the attackers and possess the ball . He also adds that the situational trainings don't develop the tactical performance only , but they also develop the technical performance for the athletes and have a big role in winning matches . But this type of exercises , as for the performance complexity in the game must undergo two entangled and sequence stages that are the theoretical training ( the tactical learning ) and the practical training ( the tactical performance ) . So the trainer must treat the training aspects of the tactical learning on the new situations for improving these skills that were learned actually and for best planning of skills and providing new methods of playing (١٦: ٢١٧٣) .

Basketball shooting is considered the most important individual skills in basketball if the athlete has some weakness in their individual skills that can be substituted with a high level of shooting accuracy , distributing the free throw making the winners to losers in the matches , the greatest interest focuses on the athlete who has the highest numbers of shots is a part of training ( ١٩: ١٠٥) .

Rose ( ٢٠١٣ ) indicates that triple jump shot is the suitable or the sound base : perception , self confidence and good balance of the physic – shoulder width apart – shoulders facing the basket – arm and wrist near the front of the head – hand and fingers work collaboratively to free the ball in a smooth movement .

**Problem of the research :**

Vertimax is considered one of the best equipments of basketball training for developing some physical abilities and it is very important matter for all basketball athletes and it is considered a great advantage in the court in both attack and offense cases .

Through the authors follow up for basketball matches of some teams matches that used vertimax apparatus observing the difference in the teams level before and after using exercises of Vertimax of development in the physical and skilful performance of basketball athletes and low use of it in training inside Egyptian clubs in general and in Minia clubs in particular , under use of the assistant apparatus and tools in the physical training and not using similar physical exercises of attack and offense skills in basketball that leads the authors for the importance of using some Vertimax exercises on the skill of jump shooting in basketball .

**Aims of the research :**

The present research aims at recognizing the effect of using some Vertimax exercises on the skill of jump shooting in basketball .

**Hypotheses of the research :**

In the light of the research goal , the authors hypothesized the following

- ١- There are statistically significant differences between means of the pre – post measurements and the variance percent for the experimental group in the physical variables and jump shooting skill on behalf of the post measurements .
- ٢- There are statistically significant differences between means of the pre – post measurements and the variance percent for the control group in the physical variables and jump shooting skill on behalf of the post measurements .
- ٣ - There are statistically significant differences between means of the post measurements and the variance percent for the experimental and control Groups in the physical variables and jump shooting skill on behalf of the post measurements .

**Terms used in the research :**

**Vertimax apparatus :**

Vertimax is a developed apparatus for increasing the muscles ability and intensity on work and helps in improving legs and arms speed , as well as increasing the ability of weight , increasing the flexors muscles in legs and arms ,resistances of the apparatus , especially tying legs and arms with rubber rope and bands simultaneously that helps in developing the training competency of the athletes ( ٢٠ ) .

**Shooting :**

Shooting is one of the most important skilful aspects in basketball , without distinctive shooters in the team who poses brilliant passers , magnificent followers and a rest of strong athletes in different positions , it is difficult to win continuously . ( ٢٢ : ٨ ) .

**Plan and procedures of the research :****Method of the research :**

The authors used the experimental method for it's appropriateness of the present research nature by using the experimental design for two groups , one is the experimental group , the other is a control one by following the pre – post measurements for both groups .

**Community and sample of the research :**

The research community research included basketball female athletes in Moslem youth club at Minia , where the authors selected the research sample from the research community purposively of ( ٣٢ ) athletes . ( ٤ ) athletes were excluded because of their disagreement and irregularity in training . They became ( ٢٠ ) athletes divided into two equal , equivalent and homogenous groups of ( ١٠ ) athletes . ( ٨ ) other athletes were used as a pilot sample .

**:Moderation of distribution of individuals in the research sample**

Measurements were made for the research sample by finding the skewness coefficients before starting to implement the proposed training program, in order to ensure moderation in the research variables that may affect the research results in all research variables, and the following table .(١) shows this

Table (١)

**The arithmetic mean, standard deviation, and skewness coefficient of the research sample In the variables under investigation (n = ٢٠)**

Test		Arithmet ic Mean	Median	Standard Deviation	Skewness Coefficient
Physical structure	Alino	١٧.٤٥	١٧.٣١	٠.٦٣	٠.٧٠
	Modified wall sit and arms extension	٦.٢٨	٦.١٧	١.٩٠	٠.١٨
	Side jump	٢٤.٦٨	٢٤.٢٥	١.٨٠	٠.٧١
Three-point shot from the jump	Right corner	٥.٢٥	٥.٠٠	٠.٧٩	٠.٩٥
	The corner is in the middle	٥.١٥	٥.٠٠	٠.٥٩	٠.٧٧
	Left corner	٤.٩٠	٥.٠٠	٠.٧٢	٠.٤٢-

**:It is clear from Table (١) that**

The values of the skewness coefficients in the variables under research ranged between (-٠.٤٢, ٠.٩٥), that is, they were limited to ( $\pm ٣$ ).

This indicates that the distributions are close to moderation in all the research variables, which indicates the moderation of the distribution of the .individuals in the research sample

**:Equivalence of the two search groups**

The researchers made sure that the members of the two groups were equal in light of the physical and skill variables under investigation. Below is a presentation of the results that resulted from the results of the equality .of the two groups

(Table (٢)

**The significance of the differences between the average ranks of the two pre-measurements for the control and experimental groups In the physical and skill variables under investigation (n = ٢٠)**

Test		Experimental			control			Value ((Z)
		Arithmetic mean	average ranks	total ranks	Arithmetic mean	average ranks	total ranks	
Physical structure	Alino	١٧.٥١	١١.٩٠	١١٩.٠٠	١٧.٤٠	٩.١٠	٩١.٠٠	١.٠٦
	Modified wall sit and arms extension	٦.٣٣	١٢.٦٥	١٢٦.٥٠	٦.٢٣	٨.٣٥	٨٣.٥٠	١.٦٣
	Side jump	٢٤.٧٥	١٢.٣٥	١٢٣.٥٠	٢٤.٦٠	٨.٦٥	٨٦.٥٠	١.٤١
Three-point shot from the jump	Right corner	٥.٢٠	١٠.١٠	١٠١.٠٠	٥.٣٠	١٠.٩٠	١٠٩.٠٠	٠.٣٣
	The corner is in the middle	٥.٣٠	١١.٧٠	١١٧.٠٠	٥.٠٠	٩.٣٠	٩٣.٠٠	١.٠٨
	Left corner	٥.٠٠	١١.٢٠	١١٢.٠٠	٤.٨٠	٩.٨٠	٩٨.٠٠	٠.٥٨

**Tabular Z value at (٠.٠٥) = ١.٩٦ (٠.٠١) = ٢.٥٨**

**It is clear from Table (٢);**

There are statistically non-significant differences between the average ranks of the two pre-measurements for the control and experimental groups in the physical and skill variables under investigation, .and this indicates the equality of the two research groups

### **:Data collection methods**

#### **:First: Arabic and foreign references**

The researchers reviewed specialized scientific references related to .the field of research to benefit from them when conducting this research

#### **:Second: Scientific devices and tools**

- .Restameter Pe ٣٠٠٠ device for measuring height and weight –
- .Foam mattresses, canes, collars, ropes –
- .Swedish chairs, boxes and barriers of different heights –



**:Third: The tests under investigation****:Physical and skill tests under investigation**

The researchers enumerated many physical tests that measure the physical abilities associated with basketball, in addition to enumerating the skill tests that measure the skill variables under research, through a reference survey of many scientific references in measurement, evaluation, and basketball, and then they were placed in a form to be presented to (١٠) Ten professors specializing in basketball, sports training, measurement and evaluation. The researchers stipulated an agreement rate of no less than ٨٠%. Through this procedure, the physical and skill tests under study were reached.

**:Scientific transactions for the skill tests under research****:A- Honesty**

To calculate the validity of the tests, the researchers used discriminant validity. The researchers applied these tests to the exploratory sample, which numbered (٨) players. They were divided into two groups, one of which was distinguished with a high level of basketball and the other with a lower level. Then the researchers calculated the significance of the differences between the two groups, and it is explained That is Table (٣)

**Table (٣)**

**The significance of the differences between the distinguished and the less distinguished in the basketball category In the skill variables under investigation (n = ٨)**

Test		The least distinguished			the distinguished			Value (Z)
		Arithmetic mean	average ranks	total ranks	Arithmetic mean	average ranks	total ranks	
Three-point shot from the jump	Right corner	٤.٦٠	٣.٠٠	١٥.٠٠	٦.٢٠	٨.٠٠	٤٠.٠٠	**٢.٧٤
	The corner is in the middle	٤.٦٠	٣.٠٠	١٥.٠٠	٦.٢٠	٨.٠٠	٤٠.٠٠	**٢.٧٤
	Left corner	٤.٤٠	٣.٠٠	١٥.٠٠	٦.٢٠	٨.٠٠	٤٠.٠٠	**٢.٧٤

Tabular Z value at (٠.٠٥) = ١.٩٦ (٠.٠١) = ٢.٥٨

Significant at the level of (٠.٠٥) \*\* Significant at the level of (٠.٠١) \*



**:It is clear from Table (٣) that**

There are statistically significant differences between the distinguished and less distinguished players in basketball in tests of skill variables and in favor of the distinguished players, which indicates the validity of the tests under study and their ability to distinguish between the two different groups

### **:-Stability**

To calculate reliability, the researchers used the method of applying and re-applying the test, where they conducted the first application of the tests on the exploratory sample of (٨) players, then re-administered the tests for the second time on the same sample, with a difference of three days between the first application and the second application, and then calculated the correlation coefficient. Between the two applications, this is shown in Table (٤)

**Table (٤)**

**The correlation coefficient between the first application and the second application of the sample under study In tests of skill variables (n = ٨)**

Test		The first application		The second application		Value R
		Arithmetic mean	standard deviation	Arithmetic mean	standard deviation	
Three-point shot from the jump	Right corner	٥.٤٠	٠.٩٧	٥.٥٠	١.٠٨	**٠.٩٦
	The corner is in the middle	٥.٤٠	٠.٩٧	٥.٥٠	٠.٨٥	**٠.٩٥
	Left corner	٥.٣٠	١.٠٦	٥.٢٠	٠.٩٢	**٠.٩٦

**Tabular R value at (٠.٠٥) = ٠.٧٠٧ (٠.٠١) = ٠.٨٣٤**

Significant at the level of (٠.٠٥) \*\* Significant at the level of (٠.٠١) \*

**:It is clear from Table (٤) that**

The values of the correlation coefficients between the first application and the second application for the sample under study in the tests of skill variables ranged between (٠.٩٥: ٠.٩٦), which indicates that the selected ..tests have high reliability coefficients

#### **Fourth: Vertimax exercises. Currently under investigation (attachment ٥)**

To design a set of exercises on the Vertimax device to develop interactive agility and improve the level of performance of the physical variables of the sample under research, the researchers reviewed many specialized scientific references as well as previous studies and personal interviews (specialized professors and trainers) to identify the suitability of these exercises in terms of the duration of the proposed program and its distribution. The total duration of the program, the number of units per .week, and the time of the daily unit

#### **:The general goal of the training**

The Vertimax training exercises aim to develop interactive agility and improve the level of performance of the physical variables of the .sample under study

#### **:Purpose of the exercises**

:Vertimax exercises seek to achieve the following purposes

- A- The entity under study acquires some physical variables and improves .the level of performance of the physical variables
- B- That the sample members are able to apply the correct performance to .the physical variables under study
- C- The sample gains the ability to interact with the content of interactive .agility training
- .E-The player is helped to control his level of performance
- And - that the player's understanding of the movement he is making is .developed
- G- That the sample already researched be given the opportunity to .innovate
- H- The sample under study should be helped to pay attention and focus

### **The principles that were taken into account when preparing and :designing the exercises**

The researchers designed the exercises based on the following  
:scientific foundations

Taking into account the principle of diversity in performing exercises •  
.within the unit

Follow the principles of progression from easy to difficult and from •  
.simple to complex

Be guided by the results of previous studies when developing the •  
.program

Taking into account the goal of the proposed interactive agility exercises •  
.under research

.The content is appropriate for the technical capabilities and abilities •

.Providing technical capabilities and designing various tools and devices •

Flexibility of implementation and application in proportion to the current •  
.situation of the research sample

The presence of an element of suspense and seriousness for the proposed •  
.exercises under research

Taking into account the principle of individual differences and diversity •  
.in exercises within the training unit

The availability of an element of suspense and seriousness and arousing •  
.players' enthusiasm for the proposed exercises

Taking into account the similarity of the form of performing the proposed •  
.exercises with the nature of the specialized performance

The rest period between exercises within the training dose should be •  
.sufficient for the research sample members to reach appropriate rest

The warm-up and cool-down time ranged from (١٠ to ١٥ minutes), •  
.outside the training unit time

.The loads placed are appropriate for the players' abilities and age •

Taking into account the continuity of the gradual increase in the training •  
.load

Taking into account the appropriate formation in terms of size and •  
intensity and avoiding the phenomenon of overload

### :Survey studies

From February ١٩, ٢٠٢٢ to February ٢٥, ٢٠٢٢, researchers conducted

:exploratory studies with the aim of the following

- ☐ Calculating scientific coefficients (validity - reliability) for the tests used .in the study
- ☐ Preparing the tools and devices used in the tests and ensuring their suitability to conduct the tests
- ☐ Training assistants on how to implement tests to ensure (objectivity and .accuracy of measurement) and validity of data
- ☐ Distributing, arranging, organizing and coordinating work with assistants to ensure proper workflow during tests
- ☐ Knowing the time each player takes for each test separately to determine .the time he takes in all tests
- ☐ Ensure the appropriateness of the training program and the extent to .which the players understand the content of the training unit
- ☐ Identifying the difficulties that researchers may face when applying it to the basic sample and the extent to which these difficulties can be .overcome

The exploratory study was conducted on a sample of (١٠) female players who were chosen from outside the research sample but were similar to .them, and all tests and measurements were carried out on them

### :Its results resulted in the following

- ☐ The validity of the devices and tools used, as well as the places where .tests and measurements are carried out
- ☐ Helping hands understand how to perform tests and how to write data
- ☐ The validity of the selected tests and measurements for application to the .research sample by calculating the scientific coefficients for these tests
- ☐ Determine the chronological order for performing the tests and .measurements used

### :Pre-measurement

The researchers conducted a pre-measurement of growth rates and tests of the physical and skill variables under investigation for the experimental and control groups in the period from ٢/٢٨/٢٠٢٢ AD to ٢/٣٠/٢٠٢٢ AD with the aim of achieving parity between the two groups

**:Implementation and application of the training program**

The researchers applied the proposed training program to the experimental group at the same time that the traditional program was applied to the control group, noting that the total time of the program and the number of its units and weeks for the control group were equal to the time of the program for the experimental group. The research experiment was carried out for both groups in the period from ١/٣/ ٢٠٢٢ AD to

٥/٢٤/٢٠٢٢ AD. The five training days per week have been determined (Saturday, Sunday, Tuesday, Wednesday, Thursday), and the time of the .training unit ranges between (٩٠ and ١٢٠ minutes

**:Dimensional measurement**

After both the experimental and control groups finished implementing their respective training program, the researchers conducted the post-measurement in tests of the physical and skill variables under investigation in the period from ٥/٢٦/٢٠٢٢ AD to ٥/٢٨/٢٠٢٢ AD, and the .post-measurement was done in the same way as the pre-measurement

**:The statistical method used**

- . SMA –
- . Mediator –
- . standard deviation –
- .Torsion coefficient –
- .Mann-Whitney nonbarometric test –
- .Correlation coefficient –
- .Wilcoxon nonbarometric test –
- .Percentage improvement –

The researchers accepted a significance level of (٠.٠٥, ٠.٠١). The researchers also used the Spss program to calculate some statistical .coefficients

**:Presentation and discussion of results****:Results of the first hypothesis: which states**

- There are statistically significant differences between the average ranks of the pre- and post-measurements for the control group under study in physical structure and jumping shooting skill in favor of the post-measurement.

Table (٥)

**The statistical significance of the differences between the average ranks of the pre- and post-measurements for the control group Under investigation into the variables of physical structure )and jump shooting skill (n = ١٠**

Test		The pre			post			(Value (Z
		Arithmetic mean	average ranks	total ranks	Arithmetic mean	average ranks	total ranks	
Physical structure	Alino	١٧,٥١	٥,٥٠	٥٥,٠٠	١٦,٥٧	٠,٠٠	٠,٠٠	**٢,٨١
	Modified wall sit and arms extension	٦,٣٣	٠,٠٠	٠,٠٠	٧,٣٨	٥,٠٠	٤٥,٠٠	**٢,٦٨
	Side jump	٢٤,٧٥	٠,٠٠	٠,٠٠	٢٧,١٥	٥,٥٠	٥٥,٠٠	**٢,٨١
Three-point shot from the jump	Right corner	٥,٢٠	٠,٠٠	٠,٠٠	٧,٠٠	٥,٥٠	٥٥,٠٠	**٢,٩٧
	The corner is in the middle	٥,٣٠	٠,٠٠	٠,٠٠	٦,٩٠	٥,٥٠	٥٥,٠٠	**٢,٨٩
	Left corner	٥,٠٠	٠,٠٠	٠,٠٠	٦,٩٠	٥,٥٠	٥٥,٠٠	**٢,٩١

The tabular z value at the level of  $(٠.٠٥) = ١.٩٦$   $(٠.٠١) = ٢.٥٨$  \*

)Significant at the level of  $(٠.٠٥)$  \*\* Significant at the level of  $(٠.٠١)$  \*

**:It is clear from Table (٥) that**

There are statistically significant differences between the average ranks of the pre- and post-measurements for the control group under study in the variables of physical structure and the skill of shooting from the .jump in favor of the post-measurement

The researchers attribute the emergence of these results to the fact that the training process followed had a positive impact on the control group, improving those physical abilities, as well as the level of skill performance for the three basketball skills under study (the slam shot - the chest pass - the dribble), which indicates that the method used in the training process has Efficiency in the improvement process that appeared on the post-measurement of the control group. In this regard, Karpenly (٢٠٠٨) (١٣) mentions that any form of training or education positively

.affects most of the physical abilities and thus will affect the skill aspect

The researchers also attribute this result to the regularity of the members of the control group in training without interruption, with motivation and enthusiasm for performance, as the regularity and continuity in practice, in addition to the continuous competition among the group members to provide the best physical and skill performance, had the greatest impact in raising the level of physical variables, the impact of which was reflected in Developing the skill aspects of the players. The

researchers also attribute this result to the implementation of the training program followed in training the control group and presenting it to a set of exercises of gradual difficulty in proportion to the characteristics of the age group of the research sample. In this regard, Essam Abdel Khaleq (٢٠٠٥) mentions that the change In motor performance, it occurs as a result of training and practice as a result of repeated physical and skill exercises, which had a prominent role in raising the level of some of the motor .abilities and skill variables under research (٩:٢٢)

Thus, the first hypothesis has been fulfilled, which states that “there are statistically significant differences between the average ranks of the pre- and post-measurements for the control group under investigation in physical structure and the skill of shooting from the jump in favor of the ”.post-measurement

### **:Results of the second hypothesis: which states**

- There are statistically significant differences between the average ranks of the pre- and post-measurements for the experimental group under study in physical structure and jumping shooting skill in favor of the post-measurement.

**Table (٦)**

**The significance of the statistical differences between the average ranks of the pre- and post-measurements for the experimental group under study in the variables of physical structure and the skill of shooting from the jump (n = ١٠)**

Test		The pre			post			Value (Z)
		Arithmetic mean	average ranks	total ranks	Arithmetic mean	average ranks	total ranks	
Physical structure	Alino	١٧,٤٠	٥,٥٠	٥٥,٠٠	١٥,٦٨	٠,٠٠	٠,٠٠	**٢,٨٠
	Modified wall sit and arms extension	٦,٢٣	٧,٠٠	٧,٠٠	٨,٦١	٥,٣٣	٤٨,٠٠	**٢,٠٩
	Side jump	٢٤,٦٠	٠,٠٠	٠,٠٠	٢٩,٥٥	٥,٥٠	٥٥,٠٠	**٢,٨١
Three-point shot from the jump	Right corner	٥,٣٠	٠,٠٠	٠,٠٠	٨,٨٠	٥,٥٠	٥٥,٠٠	**٢,٨٤
	The corner is in the middle	٥,٠٠	٠,٠٠	٠,٠٠	٧,٩٠	٥,٥٠	٥٥,٠٠	**٢,٨٢
	Left corner	٤,٨٠	٠,٠٠	٠,٠٠	٨,٠٠	٥,٥٠	٥٥,٠٠	**٢,٨٤

\*The tabular z value at the level of  $(٠.٠٥) = ١.٩٦$   $(٠.٠١) = ٢.٥٨$

\*Significant at the level of  $(٠.٠٥)$  \*\* Significant at the level of  $(٠.٠١)$



**It is clear from Table (٦) that:**

There are statistically significant differences between the average ranks of the pre- and post-measurements for the experimental group under study in the variables of physical structure and the skill of shooting from the jump in favor of the post-measurement.

The researchers attribute the emergence of this result to the effect of using the Vertimax device exercises on improving these physical abilities, as we find that the Vertimax device exercises are considered one of the modern tools that have been used recently in the training process, and developed countries have preceded us in doing so, so the researchers have included this tool in the sport of football. Basketball (his field of specialization) and its use within the training units. They found that this tool was very useful during special training for the players and led to tremendous developments in their performance, especially when the training of this tool focused on improving the physical capabilities under study, “muscular ability of the legs and arms, coordination, Reaction speed, agility, transitional speed.

The researchers attribute this improvement in the aiming variables to the effect of the Vertimax device, which is compatible with the characteristics of the age group under study and the repetition of performance many times and with high efficiency as the pregnancy progresses. This is in addition to the diversity and multiplicity of these exercises, which the researcher took into account when designing the special principles for implementing the Vertimax device exercises, which was reflected in Its effect on improving the aiming variables under investigation.

The researchers also attribute this result to the effect of using the proposed training program using Vertimax exercises led to an improvement in the level of jump shooting skill among basketball players, as we find that the Vertimax device is one of the tools that works to improve and develop the level of skill performance because it helps the player. To move quickly in different directions, it also helps to react quickly in the face of sudden situations that he is exposed to while playing, and it also helps to perform faster while playing. It is also considered one of the interesting, unconventional exercises that helps the player to train in a better psychological atmosphere than usual and adds The spirit of joy, enjoyment, and ability to train, and this is consistent with what was stated by

Muhammad Hassanein and Hamdi Abdel Moneim (١٩٩٧ AD) that non-traditional means allow for more effective utilization of the functional potential of the athlete, such as using various activities and sports to develop and improve the level of physical abilities (١٠: ٣٥).

Thus, the second hypothesis has been fulfilled, which states: "There are statistically significant differences between the average ranks of the pre- and post-measurements for the experimental group under study in physical structure and the skill of shooting from the jump in favor of the post-measurement".

### Results of the third hypothesis: which states:

There are statistically significant differences between the average ranks of the two post-measurements for the control and experimental groups in physical structure and jump shooting skill in favor of the experimental group.

Table (٧)

The statistical significance of the differences between the average ranks of the two post-measurements for the control and experimental groups

In physical variables and jump shooting skill (n = ٢٠)

Test		Experimental			control			Value (Z)
		Arithmetic mean	average ranks	total ranks	Arithmetic mean	average ranks	total ranks	
Physical structure	Alino	١٦,٥٧	١٤,٠٥	١٤٠,٥٠	١٥,٦٨	٦,٩٥	٦٩,٥٠	**٧,٦٩
	Modified wall sit and arms extension	٧,٣٨	٥,٥٠	٥٥,٠٠	٨,٦١	١٥,٥٠	١٥٥,٥٧	**٣,٨٠
	Side jump	٢٧,١٥	٧,٦٥	٧٦,٥٠	٢٩,٥٥	١٣,٣٥	١٣٣,٥٠	*٢,١٩
Three-point shot from the jump	Right corner	٧,٠٠	٦,٣٠	٦٣,٠٠	٨,٨٠	١٤,٧٠	١٤٧,٠٠	**٣,٢٨
	The corner is in the middle	٦,٩٠	٧,٩٠	٧٩,٠٠	٧,٩٠	١٣,١٠	١٣١,٠٠	*٢,١١
	Left corner	٦,٩٠	٧,٥٥	٧٥,٥٠	٨,٠٠	١٣,٤٥	١٣٤,٥٠	*٢,٣٢

\*The tabular z value at the level of (٠.٠٥) = ١.٩٦ (٠.٠١) = ٢.٥٨

\*Significant at the level of (٠.٠٥) \*\* Significant at the level of (٠.٠١)

**It is clear from Table (٧) that:**

There are statistically significant differences between the average ranks of the two post-measurements for the control and experimental groups in physical structure and jump shooting skill in favor of the experimental group.

The researchers attribute this result and the improvement in the level of specific physical fitness elements to the use of Vertimax exercises, which had a positive impact, which led to the emergence of progress in the physical aspects and an improvement in the skill of shooting from jumps. The program also included various exercises using Vertimax exercises that work to develop physical qualities. Under research, which led to an improvement in interactive agility, as the players were attracted to the work through its training and the distinguished motor performance it includes, and it performs in a good and new way, and works to entertain and excite them, as they had never trained in such a way, and also their positive interaction led to the rapid establishment of an attractive training climate. Which helped to invest time and save a lot of effort during performance and the freedom to move in all directions and spaces in the playing place. This type is considered one of the innovations in training and its application, which contributes to creating a major breakthrough in the level of performance for the players. It also stimulated their interest and urged them to compare their performances with each other. The training was also characterized by Vertimax includes comprehensiveness, balance, and integration in developing physical abilities, taking into account individual differences and the principle of gradualness in increasing the load, which has an impact on the skill performance of the players.

This is consistent with what was indicated by “Ahmed Farouk” (٢٠٠٦)(١) and Muhammad Gad Al-Haqq (٢٠٠٨)(٦), that developing and developing physical qualities is necessary and vital for developing skill performance, and thus improving the level of skill performance, as well as the economy. In the effort expended by distributing the player’s effort in implementing the skill and tactical aspect in competitions effectively.

The researchers also attribute the improvement in the level of performance of the basic skills under study to Vertimax exercises, as mastery of motor skills will only be achieved through comprehensive development of physical and skill abilities, and this is what was achieved through Vertimax exercises, which include physical training, which led to an improvement in skill performance. The control group did not implement it.

The emergence of these results is due to the fact that the use of Vertimax exercises in the training process has had a highly effective and positive impact on the training method followed, in favor of the post-measurement of the group that used Vertimax exercises. This is what the results of the previous tables indicate, that there are statistically significant differences between the post-measurements of the control and experimental groups in favor of Post-measurement of the experimental group that used Vertimax exercises in the training process.

The researchers attribute this improvement to accuracy, comprehensiveness, and taking into account the correct scientific foundations in planning, implementing, and evaluating the proposed training program in a way that is commensurate with the circumstances, capabilities, and training requirements of the research sample, the research sample's tendency toward change, innovation, and creativity in training, and their high motivation toward achieving better heroic achievements.

These results are consistent with the results of studies by Al-Hassan Abdel Majeed Hassan (٢٠٢٠)(٣), Louay Sami Refaat (٢٠١٧)(٥), and Kersey RD (١٤), the results of which concluded that there is agreement on the effectiveness of Vertimax training exercises. The physical and skill aspects are being researched.

With these results, the third hypothesis is fulfilled, which states: "There are statistically significant differences between the average ranks of the two post-measurements of the control and experimental groups in physical structure and the skill of shooting from the jump in favor of the experimental group".

### **Conclusions:**

In light of the research results, the researchers reached the following conclusions:

- Vertimax exercises had a clear positive impact on the experimental group and contributed positively to improving the physical variables and jump shooting skill of the sample under study.
- The traditional exercises followed had a positive impact on the control group in improving the physical variables and the skill of shooting from the jump for the sample under study.
- The use of Vertimax exercises for the experimental group was more effective than the program used with the control group.

### **Recommendations:**

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

- Using Vertimax exercises as an effective training method in developing physical qualities and basic skills in basketball.
- The necessity of using Vertimax training programs to improve physical and skill variables.

**List of references****First, the Arabic references:**

١. .Ahmed Farouk Khalaf (٢٠٠٦): The effectiveness of using constructivist and differentiated learning methods on learning some cognitive outcomes in basketball, published research, the Tenth International Conference, Modern Trends in Physical Education, Faculty of Physical Education, University of Jordan.
٢. .Ahmed Farouk Khalaf, Mahmoud Hussein Mahmoud (٢٠٠٩): The effect of a proposed training program for combinatorial abilities on the level of performance of some basic skills for young people in basketball, Journal of Sports Sciences, January, Faculty of Physical Education, Minya University.
٣. .Al-Hassan Abdel-Majid Hassan (٢٠٢٠): The effectiveness of a short-term training program using the Vertimax device and weights on developing ability rates after the period of stopping Covid-١٩, Scientific Journal of Physical Education and Sports Sciences, Issue ٩٠, Part ٤, College of Physical Education for Boys, University Helwan
٤. .Souad Abdullah Ezzat Muhammad (٢٠١٠): The effect of specific training on offensive and defensive foot movements in basketball, unpublished master's thesis, College of Physical Education for Girls, Zagazig University.
٥. .Louay Sami Refaat (٢٠١٧): The effect of special physical exercises using the Vertimax device to develop strength characterized by speed and some physiological indicators and offensive skills for emerging basketball players, Journal of Physical Education, Volume ٢٩, Issue ٤.
٦. .Muhammad Ibrahim Gad Al-Haq (٢٠٠٨): The effect of single and combined movement exercises in improving the level of offensive skill performance of basketball players, Ph.D., Tanta.
٧. .Mahmoud Mohy El-Din Muhammad (٢٠١٩) The effect of icing exercises on the development of some physical and skill variables among basketball players, published research, Journal of Sports Sciences, Faculty of Physical Education, Minya University
٨. .Mustafa Muhammad Zidan, Gamal Ramadan Musa (٢٠٠٨ AD): Teaching basketball youth, Dar Al-Fikr Al-Arabi, Cairo.

٩. .Essam Abdel Khaleq Mostafa (٢٠٠٥): Sports Training (Foundations - Theories - Applications)", ٦th edition, Dar Al Maaref, Cairo.
١٠. .Muhammad Sobhi Hassanein and Hamdi Abdel Moneim (١٩٩٧ AD): Scientific foundations of volleyball and methods of measurement and evaluation (physical - skill - cognitive - psychological), Al-Kitab Center for Publishing, Cairo.
١١. .Moataz Abdel Fattah Maghazi (٢٠١٤): The effectiveness of an exercise program with tools in maintaining the level of some physical abilities of basketball youth, unpublished master's thesis.

### Secondly, foreign references

١٢. Jerry v. Krause, Done Meyer; Jerry Meyer (٢٠٠٨): Basketball skills and drills, ٣rd Ed., Human Kinetics.
١٣. Karpenly R-NI(٢٠٠٨) stringh training single , individual training opposite to multiple group, medicine physica .
١٤. Kersey RD.:The effectof short-term VertiMax vs. depth jump training on vertical jump performance. J Strength Cond Res٢٢(٢):٣٢١-٥. doi:/JSC.٠b٠١٣e٣١٨١٦٣٩f٨f.
١٥. Mahmoud Houssain (٢٠١٣): Impact of Plyometric Training and Coordination Ladder Training on some Physical and Skill Variables for Basketball player, Journal of Sport Sciences, December, Assiut University.
١٦. Moanță Alina Daniela, Tudor Virgil, Ghițescu Iulian Gabriel (٢٠١٣): The methodological overview for the technical-tactical training in basketball, Procedia - Social and Behavioral Sciences ٩٣, ٣rd World Conference on Learning, Teaching and Educational Leadership (WCLTA-٢٠١٢), pp ٢١٧٣ – ٢١٧٩.
١٧. Rose, L. (٢٠١٣). Winning basketball fundamentals. (١st ed.). USA: Human Kinetics. ISBN ١٠: ١-٤٥٠٤-٣١٦٢-٣.
١٨. Scott Lucett, (٢٠١٣): Speed and Agility Training for Basketball, Strength Cond Res, ١٢ (٢): ٢١٢-٦.
١٩. Zambová, D. - Tománek, L. (٢٠١٢). Efficiency shooting program for youth basketball players. Sportologia: ISSN ١٩٨٦-٦٠٨٩. Vol. ٨, Issue ١.

### Third: References from the International Information Network (the Internet)

٢٠. <https://www.vertimax.com/basketball-training>