



The use of training tools to develop the kinetic velocity and its impact on the time of maximum power and the performance of basketball defender under the age of (18) years old

A research submitted by
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Abstract:

The study included five chapters as follow:

In chapter one, the study refers to the developments in the field of sports training science, through the use of assistive training means that enhance the players performance. The research stressed the need for using the said assistive means to develop the kinetic velocity and achieve best time of maximum power and enhance basketball defender performance.

The problem of the research treated some defects that hit the sport community, for the time being, especially basketball, one of these obstacles is: the physical preparation doesn't take its real role and size in the training process that should suit with any competition conditions of basketball. The study implies research goals and hypothesis in addition to the fields of the research.

In chapter two the researcher mentioned several theoretical topics related to the main research subject, therefore he referred to training ways of kinetic velocity and measure the skill of basketball defender player movement.

In chapter three, the researcher applied the experimental methods on sample of players of national center for nurturing sport talent in



basketball, Baghdad, for sports season (2019-2020) under (18) years old, and the number of participants was (8) players, it is called group experimental (1).

In fourth chapter, the results of the study have been presented and discussed by using statistical program called (spss), the researcher has reached to a conclusion there is an advance made in the kinetic velocity and indicator of maximum power and the movement of basketball defender.

In chapter fifth the study concluded the training, which was conducted by using assistive training tools in this study, had been of great effective in improving physical performance, the study referred also to a positive impact of physical exercises that raise the level of physical ability of basketball players (participants in the research) and how (physical training) affect greatly the functional side.

The researcher recommended to allocate enough time from training courses to improve the basketball defender skills, the researcher asked coaches and trainers to show constant interest in the training of physical capabilities, because those things must considered to strengthen physical capacities and maintain fitness of players throughout the year.

1- Definition of the research

1-1 Introduction and importance of the research

The hypotheses of sport training have big influence in the course of the game, in general, it is principal factor of building skill performance, Nowadays the sport theories dealing with most tiny details and accurate information to obtain desirable and best results, therefore the sport theories interfered with other science to get ultimate purpose of the training process and perform sport acts with high skill movements.

Undoubtedly the biomechanical sport considered as cornerstone for any training course, the science of biomechanics is, in common, an excellent way for probation and measurement, it also depict facts, and give realistic numbers on the ground of basketball court, and it could be the major motive to ascertain right game strategies based on hypotheses and numbers of the study. More precisely, sport biomechanical science is real indicator of training level evolution and it's reflected in the general level in the same time.

One of the most important indicators of sport activities is velocity. Velocity has many different forms and ways, but the best explanation to the velocity it is the general power that represent two elements (skills and

time), in another word the (power) is not only indicator of training level, but it can be depicted also as real accomplishment to the sport act.

Basketball like any other games received big attention from many people, it requires durability, good physical shape and well trained players, therefore, basketball relays mostly on the body power of the players during the entire game, the manner of playing basketball can be done as individual or collective form, and in order to be the winner, the player or the whole team should play what they learned during the training courses and should follow certain techniques based on the right scientific training. Too many negative and positive signs can be diagnosed whether in the individual performance of the player or in team technique during the game, then the coach will fix mistakes and eliminate gaps between team member, but the most important factor that need to be treated and handled right away is skill factor because it is the ground of the play and all performances lean on skills.

From this point, the study focused on using assistive means that help to ameliorate the element of kinetic velocity and its influence on the behavior of defender and how to build the skill performance to any player, then comes the collective act of the team which leave a distinct imprint on the match with lowest number of errors.

2-1 The problem of study:

The (ability) or the power is defined as the average of work done, and it is equivalent to the amount of consumed energy during the unit of time.

The components of performance, represented by (physical and skill performance), is essential and it is so vital during the training courses, and when the player trained well (physically) it will reflect positively on the result of the game in favor of his team. The velocity and accurate performance and body strength will confuse the opponent and decrease his opportunity of scoring, in other word, well trained team can make most scores shot in the offensive mode and the team can paralyzed his opponents when they form good defensive mode, so that the opponent has no chance to score

Through the expertise of the researcher he diagnosed negative conditions, that need to be addressed and cope with the troubles the hinder the team to be the winner, the choices of coach are many and diverse to detect negative issues in the team and he is able to create or find best solutions that maybe useful to improve and reform low performance of the team and control the course of the match during four periods.

Low performance means declining in physical capabilities and deficiency in skills, so without skills and endurance and good strategies the players are helpless to change everything to their favor and handle the game masterly.

3-1 Goals of the research

- *Create special exercises by using assistive training tools for basketball players under 18 years old.*
- *Knowing the impact of exercises by using special training tools that help to develop the kinetic velocity for players under 18 years old.*
- *Knowing the impact of kinetic velocity in the time of maximum power and performance of basketball defender under 18 years old.*

4-1 Theories of research

- *There are differences in statistical significance between the results of pre and post- test for experimental group about the test of kinetic velocity to the basketball defenders under 18 years old.*
- *There are differences in statistical significance between the results of pre and post- test for experimental group about the time of maximum power and performance of basketball defenders under 18 years old.*

5-1 Research fields:

1-5-1 People field: *the research sample was group of players of national center for nurturing sport talent in basketball, Baghdad, for sports season (2019-2020), their ages below 18 year old.*

2-5-1 Spatial area: *the chosen place to apply the study is:*

- *Indoor court of basketball of national center for nurturing sport talent.*
- *Sport physiology lab.*

3-5-1 Time field: *the period of applying this study started from 5/1/2019 to 8/3/2019.*

2- Research methodology and field procedures

1-2 research methodology

The two researchers adopted an experimental approach to suit the course of the research.

2-2 Sample of research

The sample of research included (8) players were selected from special school of national center for nurturing sport talent in Baghdad, they were selected intentionally as one group, the researcher created a homogenized team based on length, weight, and age.

Table (1)

It shows a homogeneity of players according to length, weight, age, and training age

variables	Arithmetic mean	Median	standard deviation	twisting
length	1.8463	1.8300	.07881	.946
weight	72.0625	70.5000	10.15525	.748
age	17.5625	18.000	.51235	-.279
training age	2.28750	2.30	3.18067	0.45

3-2 field procedures of research

1-3-2 selectivity of physical test:

Running test in a specific place for (10) seconds ⁽¹⁾

- *The purpose of the test: measuring the kinetic velocity of legs muscles.*
- *Required tools: electronic stopwatch, rubber cord (1 meter length), whistler to give beginning and ending signals.*
- *Performance description:*
The player stands before the rubber rope which fastened on both rope ends in one leg of the player, the knee would be at the same level of rubber rope (one of the thighs is parallel to the ground) it means the height of rubber rope from the ground is equivalent to the height of the tester's knee. Once start signal is launched, the player will run, as fast as he could, starting firstly by his right leg so that the rubber rope touches the knee (alternately) throughout the run in a specific place, the player repeats this exercise as many as possible for ten seconds, each tapping of the ground by his only right leg will be counted as onetime, the number of player's hitting of the ground by his right leg will be counted and recorded for only ten seconds.

▪ **Functional test**

Wenket test ⁽²⁾

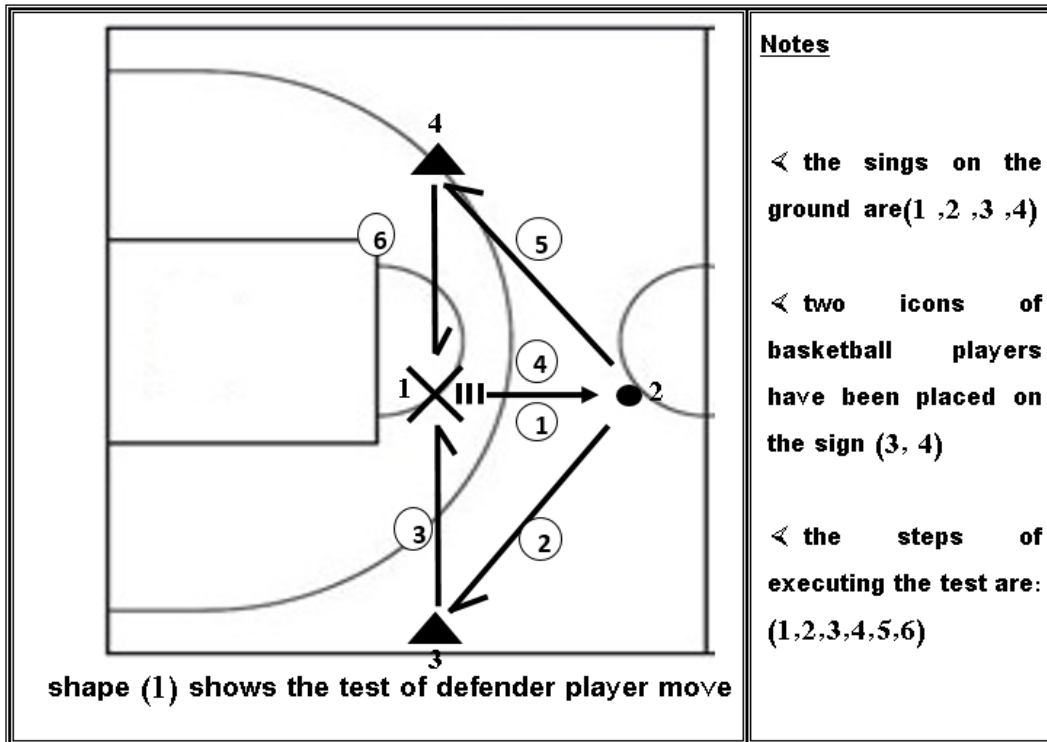
- *The purpose of test: Measuring the maximum anaerobic capacity using a stationary bike to measure stress for 30 seconds.*
- *The tester player rides the stationary bike and the seat will be adjusted to fit the player's height, so that the player's back has slight curve as much as possible as much as possible.*

⁽¹⁾ Faris Sami Yousef Sheba, determining the standard level for some physical capability and defensive skill in basketball in Iraq (master thesis, college of physical education, Baghdad university), page 81.

⁽²⁾ Hazza Bin Mohammed Al-Hazza, physiology - physical efforts, part 1, (king Saud university, 2009), page 39.

- *The perfect stance to buckle foot would be when the level of knee joint is at 10 degrees.*
 - *The tester must keep moving pedal by feet when riding bike as fast as he could for nonstop 30 seconds.*
 - *In this test the maximum power and rate power will be calculated within 5 , 10 , 20 , and 30 seconds, the test also measures the fatigue rate or the level of power reduction.*
 - **Skill test**
 - **Title of test:** *movement of defender⁽³⁾*
 - **The purpose of the test:** *measuring the movement speed of defender player.*
 - **Required tools:** *adhesive tape, leather tape measure (20 meters), signs (2 still figures), electronic stopwatch, whistle, papers and pens for writing down information.*
 - **Test procedures (figure 1)**
*There are four signs distributed as follow:
First sign located in the middle of central circle for remote shooting, which is (6,75) meters away from the point of ring center on the ground, while the two signs (3, 4) situated equally on both sides of the court (right and left), the distance between the signs (3,4) and side line of both courts sides is 90 cm, and the first sign lies on the same line between the two signs (3 and 4) while the second sign located on the center of midline of the court , as shown in the figure.*
- Description of the performance**

(³) Ali Kemal Hssain: tests design to measure some defensive skills [junior](#) basketball clubs- Baghdad (master thesis, Baghdad university, [College of Physical Education](#), 2012), page 91.



The defender stands on the first sign, once the player hears the whistle sound as starting sign he runs so fast towards the second sign then he stops, then the defender performs certain move towards the third sign (there is an icon of still basketball player has been put on the third sign, this icon called icon 1), then the player must touch (icon 1) by his right hand meanwhile he spins (around himself) for about quarter of rotational motion inward, then the defender moves towards the first sign, making the same rotation but to the left, as it shown in the figure below with six explanatory steps, the defender has only one try to do that. The player is awarded a score according to the time recorded when these six steps performed correctly in the test.

4-2 pre- test

The two researchers applied the pre- tests on research sample (players) in (5-6/1/2019), the pre test was carried out in the right time place, so the test of skill is executed in the indoor basketball court of the National Center for Nurturing Sport Talent, Baghdad.

5-2 Major experiment

- The training course has been applied for (6) weeks, in (2) training units (Saturday, Wednesday) per week, the total number of training units is (12) units, the main class period of training with regard to the kinetic velocity is (40) minutes, the allocated break time is (3:1) from

performance time and rest time between the groups is (2-3) minutes, and the wavy technique was used for velocity exercises in the test and the wave rate is (3-1) and the intensity used in velocity training is (90-96%), on the other hand, the training course was carried out using " high intensity Interventional training method".

6-2 post- tests

Post tests have been performed in (5/3/2019), and were carried out in the same way , time , tools and place of pre-tests. the reason of choosing all the same elements of pre-test is to avoid impact of conditions variables on the post- tests.

7-2 statistical means:

The researcher used software statistical program called (spss)

3- Viewing and discussing results:

1-3 view and discuss results of pre, post-tests of experimental groups in research variables.

1-1-3 view the Arithmetic means and pre, post- standard deviation and (T) calculated value and its significance for tests in the study

Table (2)

This table shows Arithmetic means and standard deviation, and median, and deviations, and (T) calculated value, significance level in pre-post tests for research sample in the study

Note:

C= correlation coefficient

() = Arithmetic Mean of post-test

(S±) = standard deviation

test	pre- test			post- test		difference of arithmetic mean	difference of standard deviation	calculated (T) value	real significance	significance
	measurement unit	Arithmetic mean of post-test	standard deviation S±	Arithmetic mean of post-test	standard deviation S±					
kinetic velocity	repetition	13.000	1.414	16.500	0.755	3.500	.56695	6.173	0.000	significant
maximum power time	second	6.291	0.528	3.214	0.655	3.076	0.259	11.844	0.000	significant
defender move	repetition	12.862	0.572	10.477	0.677	2.38500	0.380	6.274	0.000	significant

(T) value significant $0.05 \geq$ at degree of freedom (7).

In variable of (kinetic velocity) the Arithmetic Mean of experimental group in pre-test is (13.000) and the standard deviation is (1.414). in post-test the arithmetic mean is(16.500) and standard deviation is (0.755). The calculated (T) value is (6.173), and the real significant is (0.000) which is smaller than (0.05) at degree of freedom (7). It means the difference is (significant) in favor of (post-test).

As for the variable of (time of maximum power), the arithmetic mean of experimental group in pre-test is (6.2910) and the standard deviation is (0.528). In the post-test the arithmetic mean is (3.214) and the standard deviation is (0.655). The calculated (T) value is (11.844), and the real significant is (0.000) which is smaller than (0.05) at degree of freedom (7). It means the difference is (significant) in favor of (post-test).

On the other hand the variable of (defender movement), the arithmetic mean of experimental group in pre-test is (12.862) and the standard deviation is (0.572). In the post-test the arithmetic mean is (10.477) and the standard deviation is (0.677). The calculated (T) value is (6.274), and the real significant is (0.000) which is smaller than (0.05) at degree of freedom (7). It means the difference is (significant) in favor of (post-test).

Result discussion

One of the power definitions (is the mechanical done work during certain period), the power represents the work divided by the change in time, the table (2) shows the differences were significant between pre and post-tests, this is normal result for right practice to the exercises used in scientific and correct way.

This indicates a noticeable progress during the tests, when the results of research sample (tester players) have shown an improving level in terms of arithmetic mean and standard deviation for the performance of kinetic velocity tests and functional power indicator, as for defense test it enhanced the testers performance, on the other hand the assistive training means contributed to optimize the physical exercises and make them much deeper and harder, and helped the players to choose appropriate repetitions and rest periods. Besides the researcher matched between the nature of exercise and the capability of player and required time for completion.

These exercises have great impact on developing the variables of the research, therefore the goals and hypothesis have been accomplished perfectly.

4- Conclusions and recommendations

1-4 conclusions:

- 1. The results that have shown the training with special assistive training tools, recommended by researcher, were so effective in developing the physical performance of the players.*
- 2. The results that have shown the training with assistive training tools were efficient for raising the skill performance of the players.*
- 3. Using special physical exercises to deepen the physical abilities have big influential in improving the functional side.*

2-4 Recommendation

- 1. Allocating more time to train physical abilities of players because it is the basis on which the skills depend.*
- 2. Give serious attention by the coaches and persons concerned to the functional side throughout the preparation period.*
- 3. Adopt right and scientific manners to train players the special physical and skills exercises, and create special training courses tailored to the level of young basketball players.*

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Appendix of training program to the experimental sample of research
Training days : Saturday – Wednesday
Date: 10/3/2016

Unit (1)	No/ Exercise	Exercise code	Intensity %	Number of repetitions	Number of groups	Break between repetitions	Break between groups
kinetic velocity	1	31	90%	8	4	1:3	3-4 minutes
	1	32	90%	8	4	1:3	3-4 minutes
	3	33	90%	8	4	1:3	3-4 minutes
	4	34	90%	8	4	1:3	3-4 minutes

Unit (2)	No/ Exercise	Exercise Number	Intensity %	Number of repetitions	Number of groups	Break between repetitions	Break between groups
kinetic velocity	2	31	90%	8	4	1:3	3-4 minutes
	3	32	90%	8	4	1:3	3-4 minutes
	4	33	90%	8	4	1:3	3-4 minutes
	5	34	90%	8	4	1:3	3-4 minutes

Unit (3)	No/ Exercise	Exercise Number	Intensity %	Number of repetitions	Number of groups	Break between repetitions	Break between groups
kinetic velocity	3	31	92%	10	4	1:3	3-4 minutes
	4	32	92%	10	4	1:3	3-4 minutes
	5	33	92%	10	4	1:3	3-4 minutes
	6	35	92%	10	4	1:3	3-4 minutes

Unit (4)	No/ Exercise	Exercise Number	Intensity %	Number of repetitions	Number of groups	Break between repetitions	Break between groups
kinetic velocity	4	31	92%	10	4	1:3	3-4 minutes
	5	32	92%	10	4	1:3	3-4 minutes
	6	33	92%	10	4	1:3	3-4 minutes
	7	35	92%	10	4	1:3	3-4 minutes

Unit (5)	No/ Exercise	Exercise Number	Intensity %	Number of repetitions	Number of groups	Break between repetitions	Break between groups
kinetic velocity	5		94%	12	4	1:3	3-4 minutes
	6		94%	12	4	1:3	3-4 minutes
	7		94%	12	4	1:3	3-4 minutes
	8		94%	12	4	1:3	3-4 minutes

Unit (6)	No/ Exercise	Exercise Number	Intensity %	Number of repetitions	Number of groups	Break between repetitions	Break between groups
kinetic velocity	8	31	94%	12	4	1:3	3-4 minutes
	1	32	94%	12	4	1:3	3-4 minutes
	2	35	94%	12	4	1:3	3-4 minutes
	3	36	94%	12	4	1:3	3-4 minutes

Unit (7)	No/ Exercise	Exercise Number	Intensity %	Number of repetitions	Number of groups	Break between repetitions	Break between groups
kinetic velocity	1	31	92%	10	4	1:3	3-4 minutes
	2	35	92%	10	4	1:3	3-4 minutes
	3	36	92%	10	4	1:3	3-4 minutes
	4	37	92%	10	4	1:3	3-4 minutes

Unit (8)	No/ Exercise	Exercise Number	Intensity %	Number of repetitions	Number of groups	Break between repetitions	Break between groups
kinetic velocity	2	35	92%	10	4	1:3	3-4 minutes
	3	36	92%	10	4	1:3	3-4 minutes
	4	37	92%	10	4	1:3	3-4 minutes
	5	38	92%	10	4	1:3	3-4 minutes

Unit (9)	No/ Exercise	Exercise Number	Intensity %	Number of repetitions	Number of groups	Break between repetitions	Break between groups
kinetic velocity	3	35	94%	12	4	1:3	3-4 minutes
	4	36	94%	12	4	1:3	3-4 minutes
	5	37	94%	12	4	1:3	3-4 minutes
	6	38	94%	12	4	1:3	3-4 minutes

Unit (10)	No/ Exercise	Exercise Number	Intensity %	Number of repetitions	Number of groups	Break between repetitions	Break between groups
kinetic velocity	4	36	94%	12	4	1:3	3-4 minutes
	5	37	94%	12	4	1:3	3-4 minutes
	6	38	94%	12	4	1:3	3-4 minutes
	6	38	94%	12	4	1:3	3-4 minutes

Unit (11)	No/ Exercise	Exercise Number	Intensity %	Number of repetitions	Number of groups	Break between repetitions	Break between groups
kinetic velocity	5	36	96%	14	4	1:3	3-4 minutes
	6	37	96%	14	4	1:3	3-4 minutes
	7	38	96%	14	4	1:3	3-4 minutes
	8	39	96%	14	4	1:3	3-4 minutes

Unit (12)	No/ Exercise	Exercise Number	Intensity %	Number of repetitions	Number of groups	Break between repetitions	Break between groups
kinetic velocity	6	36	96%	14	4	1:3	3-4 minutes
	7	37	96%	14	4	1:3	3-4 minutes
	8	38	96%	14	4	1:3	3-4 minutes
	1	39	96%	14	4	1:3	3-4 minutes