

# Effect of compound exercises on Some Kinetic Abilities in Some Bio *kinematics* Variables and the Characteristics of the Curve (Force - Speed) for hit/spike of High Volleyball for Youth Volleyball

Ali Naeem sultan<sup>1</sup>, Ahmed Adnan Abd<sup>1</sup>, Asaad Flayyih Hasan <sup>2</sup>

<sup>1</sup> Assist. Lecturer; <sup>2</sup>Ph.D., Ministry of Education – General Directorate for Education / Dhi Qar

## Abstract

The importance of the research is important to study the impact of compound exercises using light stimuli and sound stimuli as well as the use of rubber ropes and some training aids and to develop some of the kinetic abilities that help the athlete to integrate several kinetic skills in an orderly and sequential as well as perform movements under changing conditions, to be able to face different Conditions and situations experienced during the game and well, as well as the development of indicators and function (force - speed), to reach the best mechanical conditions, and with the least decrease in speed and momentum, the researcher used the experimental method design one group The research sample was determined in a deliberate manner and they are players of Al-Shatra Club of the volleyball youth in the district of Shatra and the number of (6) players. The results were analyzed by the analysis software using (SPSS, Logger Pro 3.10.1, Sigview v.2.8.0, Kinovea 0.8.25) to obtain the values of the BioKinmatk variables of the study. Technique of the skill of high hit/spike as a result of the development of internal strength using a The most important recommendations were to emphasize the conduct of compound exercises, especially for muscles working on the joints of the hips, knees and ankles, as well as on the muscles working on the joints of the shoulders, elbows and wrists, as applied in the research for their importance in the development of some kinetic abilities and characteristics of the curve. Power - speed.

**Key words:** *Kinetic Abilities, Bio kinematics, Compound exercises, Curve (Force- Speed)*

## Introduction

The advance of technical level performance of the skill of hit/spike witnessed recently was the result of the progress of the training process and upgrade the level of methods and equipment and the preparation <sup>1</sup> of trainers technically and practically, which must keep pace with the advantages of this game that requires different positions fast and high physical ability as well as mastering the technical aspects and mechanical conditions that are characterized By this effectiveness. Combined training and effective means are important in the development of kinetic skills necessary for volleyball players, which depends on the ability of the athlete and efficiency in the production of muscle strength related to rapid performance <sup>2</sup> so as to reflect positively on the art of performance of the skill of hit/spike not to mention

the correct and appropriate, as this skill is distinguished It has its own neuromuscular system, which is the compatibility of the movement of the various joints of the different parts of the body that perform, as it requires the player to be able to link the kinetic coordination of partial movements with each other in place and time in order to obtain greater The speed is possible for all parts of the body at the moment of approaching and pushing and this depends on the ability of players to install and guide muscle groups to serve skill performance, as well as these exercises put a relatively large muscle effort which leads to stimulate muscle groups to mobilize the largest possible number of muscle fibers and possess the property of torque Rapid result of effort to shed these exercises, which increases the strength and speed of muscle contraction <sup>3</sup> and stimulation to work with great

ability, in turn contribute to the achievement of effective dynamic and effective work during the skill sections and record time, serves the goal of performance is to achieve the farthest distance both Horizontal during the contact or absorption or vertical distance during the final pushing stage, to accomplish the technical performance with the highest possible efficiency and with the least effort. Hence the importance of the research to study the impact of compound exercises using light stimuli and sound stimuli as well as the use of rubber ropes and some training aids and to develop some of the kinetic abilities that help the athlete to integrate several kinetic skills in an orderly and sequential as well as perform movements under changing conditions, to be able to face the player The various conditions and situations experienced during the game and well, as well as the development of the characteristics of the function of force - speed, to reach the best mechanical conditions <sup>5</sup>, and with less decrease in speed and linear momentum,

the researcher hopes to add new information in the field of application BioKinmatk science to hit/spike skill in volleyball and cope with the great progress made the results of volleyball in general and hit/spike skill in particular .

## Methodology

### Research Methodology

The researcher used the experimental method using the one-group experimental design appropriate to the nature of the research.

### The research sample

Six young players were selected from Shatrah Sports Club volleyball and deliberately in order to carry out the study and achieve its objectives. Table (1) shows the characteristics of the research sample.

**Table (1). Homogeneity of the sample in the variables of height, age of training and apparent weight**

No.	Characteristics	Arithmetic mean	Standard deviation	Coefficient of variation
1	Length (cm)	186	2.71	2.99
2	Age (years)	3.5	0.23	11.14
3	apparent weight (kg)	77	2.16	5.11

### Exploratory experience

The researcher conducted the exploratory experiment on Sunday 02/01/2018 on (3) players other than the research sample were photographed to identify the location of the power measurement platform and the location and dimensions of cameras and height and clarity of the image and time required for each shooting and the time to conduct the shooting as well as to identify the following:

- ü High cameras.
- ü Identify the difficulties and obstacles that will

appear during the implementation of the tests and their progress.

- ü Identify the time to take the tests and how long it takes.
- ü The possibility of shooting and analyzing the results of mechanical variables.
- ü The ability of the sample to carry out the tests and their suitability.
- ü Identify the devices and tools necessary to carry out the experiment and tests.

- ü The possibility of measuring the strength of the device used.
- ü For the total time required by the experiment.
- ü Introduce the team to the nature of the experiment and its requirements.

**Main experience**

The researcher has prepared compound exercises according to some kinetic abilities (kinetic speed and agility and balance) after reviewing a set of sources for sports training related to the subject of research and after presentation to the gentlemen experts have been the application of the exercises on 5/1/2019 until (6/3/2018) (8) weeks and includes (24) training units (3) units per week (Sunday - Tuesday - Thursday) commensurate with the different conditions of the sample and the appropriate period for the implementation of exercises is the stage of special preparation, which takes (8) weeks and an average of (3) units Training per week The time of one training unit (35 - 45 minutes) and prepare This is a new training trend because it focuses on the use of new kinetic exercises during the education process in order to ensure the increase of the kinetic balance. Changes and differences in the corners of muscle work during the performance of muscle exercises using devices and auxiliary tools according to some stimuli and sound stimuli that have a significant role

in increasing the speed during training and therefore lead to the organization and adapt speed The reflex reflexes, coordination of movement, rhythm and neural stimulation have a significant impact on the smoothness of performance and the slightest decrease in the amount of movement, whether angular or linear. The researcher used the method of repetitive training. The duration of the training was within the duration of the special preparation and 8 weeks, and by three training units per week, and a summary of how to use the intensity of the different exercises:

- Rubber cords exercises, Total cord elongation is measured as maximal limits and then training the training intensity of the ropes accordingly.

- For the additional weights used, the maximum weight that the player overcomes is determined and the intensity is determined accordingly.

1.4 Statistical means

The researcher used the statistical program (SPSS) to process the results.

2. View, discuss and analyze results

**3.1 Presentation and discussion of the results of differences in the values of some abilities of the pre- and post-test of the research group**

**Table (2) : It shows the values of the arithmetic media, the standard deviations and the calculated (T) value of the values of some kinetic capabilities of the pre- and post-tests of the research group.**

No.	Processors  Measurements	Measuring unit	Pre-test		Post-test		T value calculated	Significance level	Result
			from	±	from	±			
1	Kinetic balance	Degree	56.21	3.08	66.70	4.78	8.156	0.040	moral
2	Kinetic compatibility	sec	12.89	0.36	11.64	1.18	4.756	0.040	moral
3	Agility	sec	7.54	0.14	6.62	0.62	6.8443	0.045	moral

\* At the significance level ≤ 0.05

The researcher attributes the reason for this development to the nature of the compound exercises according to some special kinetic abilities applied by the research group using additional weights and rubber cords according to some light stimuli and acoustic stimuli on the momentary foot on one or two feet. Ideal approach corners positively reflected on kinetic balance (anxiety) according to skill performance and thus contributed effectively and easily to the gradient and the ability to link kinetic actions with each other, and this referred to the mechanism “For- Edunrt I. & Mathews” : “The balance is the ability to maintain the body in the state of stability or maintain its state during and after kinetic actions or restore it to its normal state”, and this reflects the harmony of mental processes and neuropsychiatric instructions with what is required to perform fast kinetic action and high amounts of strength when working with these Exercises and the use of added weights to the body and rubber ropes and light stimuli and the performance of exercises with great strength and speed of movement have affected the development of muscle groups of the two men and increase the activity of muscle contraction through repetitions in the performance of the exercises that used, As a result, the development of muscle contraction of the working muscle groups is accompanied by the development of neuromuscular compatibility, which led to ease of performance, and this is consistent with the “Mufti of Abraham 2001”, as the greater compatibility between the muscles involved in kinetic performance ... The increased production of muscle capacity (123: 5) . As for the compatibility ability, the researcher attributes the reason for these moral differences to the nature of complex exercises using complex exercises and aids dominated by the character of bilateral kinetic compatibility of the upper and lower limbs that helped the research group to regulate

the internal force with the external force in a way that reflects the ability of players to perform movements of various degrees Difficulty and high speed and accuracy according to the specificity of skill mechanical objectives associated and integrated and several repetitions in order to deepen the kinetic path in the nervous system, but in the ability of agility where the researcher attributes these differences to the nature of the complex exercises Using (light signals - acoustic acoustic stimuli - crossing barriers and crawling underneath - zigzag in different directions and speed - direction change exercises - balancing exercises - small toys ... etc) increased the efficiency of the internal strength of the strength of the muscles and ligaments and joints of the body and causing change Significant in the amount of movement of the body at the performance, where the ability of players to develop speed of movement and change of direction and evidenced during the implementation of the test developed muscular momentum and ideal approach corners helped to distribute force and pressure on the surface of the foot and thus increased the strength of vertical friction and say From the time of communication until the player does not slip in the direction of the original movement and thus the player can change the direction easily by the reaction generated large that suits the requirements of kinetic performance required to implement and direction, as the greater the amount of change in the direction required a greater lateral push and thus a greater reaction any friction force Significant as a result of increased speed of movement, the force causes acceleration, evolved efficiency of the strength of the internal players cause a backlash Prevent imbalance due to increased friction force during the face of unexpected kinetic events and rapid adaptation as well as increase the capacity of the kinetic reserve not to mention the development The ability of the sample to balance and conform.

**Table (2). shows the values of the arithmetic media, the standard deviations and the calculated (T) value of the values of some BioKinmatk variables of the pre- and post-tests of the research group.**

No.	Processors Measurements	Measuring unit	Pre-test		Post-test		T value calculated	Significance level 0.05	Result
			from	±	from	±			
1	Approaching speed	m/sec	3.60	0.20	3.88	0.07	3.699	0.002	moral
2	Corner of advancement	min	77.87	3.79	87	0.53	6.732	0.003	moral
3	Flight speed	m/sec	2.76	0.01	3.16	0.06	16.323	0.004	moral
4	Maximum height	m	1.34	0.01	1.48	0.01	31.485	0.002	moral

**\* At the significance level  $\leq 0.05$**

The researcher attributes the reason for this development to the nature of the compound exercises according to some special kinetic abilities applied by the research group using additional weights and rubber ropes according to some stimuli and various means associated with kinetic abilities learned to increase the efficiency of muscle momentum exerted during moments of back and front and ideal approach corners reflected positively The efficiency of these muscles and achieved by the speed of the player (a very short time) on the change of direction with balance and high compatibility, which contributed to the increase of decentralized force (as a prohibition), helped the player to increase the speed of movement

of the body parts Dust or better starting speed is much better than the speed in the pre-test “The greater the speed of approaching the greater the speed of departure and thus increase the momentum of the body and move to the ball,” which leads to increase the instantaneous speed of the ball as a result of increasing the values of the vertical speed of the body at the moment of departure and an ideal push corner The development of pure muscle strength, which is one of the most important variables in determining the height of body mass at the moment of hitting the ball unless any external forces overlap, “The development of the efficiency of muscular acceleration contributed effectively to the success of the main section by ensuring access to the goal to be achieved with high efficiency and with minimal muscle effort. “

**Table (3). shows the values of the arithmetic media, the standard deviations and the calculated value (T) of the values of some variables .**

No.	Variables	Processors	measuring unit	Pre-test		Post-test		T value calculated	Significance level 0.05	Result
				from	±	from	±			
1	Seam	Force function	nt		124.54	1815.59	48.14	6.643	0.030	moral
		Speed function	sec		0.002	3.09	0.001	24.751	0.027	moral
2	Absorption	Force function	nt		50.89	1297.59	71.68	6.525	0.001	moral
		Speed function	sec		0.001	3.05	0.001	9.113	0.010	moral
3	Pushing	Force function	nt		132.82	2943.86	60.81	14.134	0.030	moral
		Speed function	sec		0.001	4.24	0.001	16.776	0.020	moral

**Curve (force-speed) pre- and post-tests of the research group**

The researcher attributes the reason for this development as a result of the impact of interactive compound exercises on some kinetic capabilities using rubber resistors and additional weights and light stimuli and acoustic stimuli according to the scientific bases associated with BioKinmatks, contributed to the development of mechanical power capacity and this is due to the development of the efficiency of the internal strength of the production of torque and the strength of ligaments and joints Working during the kinetic performance affected the increase in angular velocity of the body parts increased the linear velocity values of

the center of gravity of the body and thus achieved high values of force during the moments of performance, either in approach or thrust, as well In addition, the exercises used have achieved the goal of developing muscle strength against resistance in the course of the exercise. This has increased the distance achieved (height or horizontal distance) associated with the time component. We will get the possibility of the muscle to exert high strength and a high level of speed. Represents the muscular power expressed as the result of both strength and speed.

The researcher believes that the variable speed is one of the mechanical variables that play a big role in achieving a high level of muscle capacity, as the amount of muscle power exerted is great to overcome the force of gravity of the moment of propulsion and the associated linear velocity of the center of gravity of the body and the reaction force, which resulted in The maximum possible ability of the player to obtain the distance (horizontal, vertical) required, as well as the exercises of agility and speed used to assist in the development of muscle capacity of the men as there is a direct correlation between the increase in the strength of the muscles of the legs with the results of explosive power and strength characteristic secret The exercises used in the training curriculum have facilitated the muscular work according to the appropriate BioKinmatk conditions in terms of the correct application, “the corners of the body to achieve the best value of the torque of these corners at the required time which reflects a good compatibility within the muscle itself” (145). : 1) as well as between the muscles engaged in performance.

### Conclusions

1. Evolution of the technical performance level of the skill of high hit/spike as a result of the development of internal strength using the exercises combined according to some of the kinetic capabilities.

2. The speed of approach and the speed of departure have evolved as a result of the development of mechanical conditions, which resulted from the use of compound exercises according to some kinetic capabilities.

3. compound exercises worked in accordance with the kinetic abilities to develop the corner of thrust as a result of the development of the strength of the strength of the muscles fixed in accordance with the absolute performance corners, especially when prompted to rise.

4. compound exercises using rubber ropes, extra weights and some different stimuli have developed mechanical strength during phases, contact, absorption and propulsion. As a result of the increase in the speed change during the three stages as well as the ability of the body to overcome the body weight and additional weights and other resistance sequentially to reach this stage in the best start.

5. A decrease in the pivot area of the foot support as a result of the application of compound exercises according to some of the kinetic capabilities applied using rubber ropes and additional weights and some different stimuli.

6. The exercises used to make the research sample achieve a high level of strength and in a very short time in the post-test.

7. All the exercises used to develop the kinetic abilities of the muscles of the legs, torso or arms, increased the efficiency of the internal force represented by the muscle contraction force, and the strength of the ligaments in the production of torque force.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Ministry of Education and all experiments were carried out in accordance with approved guidelines.

### References

1. Sarih A, Wahbi A. Encyclopedia of Kinetic Analysis Anatomical Analysis and its Kinetic and Mechanical Applications, Baghdad, Uday Al-Akili Press. 2007.
2. Sarih Abdul Karim and Wahbi Alwan: Anatomical Analysis and its Mechanical Applications, Dar Al-Okaili, Baghdad, 2007
3. Talha HH. BioKinmatks Theory and Practice (Cairo, Dar Al-Fikr Al-Arabi. 1993.
4. Kurt M. Kinetic Learning, (Translated) Abdul Ali Nasif, Mosul, Dar Al Kutub for Printing and Publishing, 1987.
5. Mufti I. Modern Sports Training - Planning, Implementation and Leadership, Dar Al Fikr Al Arabi, Cairo, 2001.
6. Najah MS. kinetic learning, (Mosul, House of Books for printing, 2000).