THE CONTRIBUTION OF SOME KINETIC AND PHYSICAL VARIABLES TO THE TESTS OF THE WIDE AND VERTICAL JUMPING OF FEMALES

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ABSTRACT: *The aim of the research is to identify any kinetic and physical measurements variables in question are to contribute to achieving the broad and vertical jump of stability for a sample of students of the College of Physical Education and Sports Sciences, University of Baghdad / Jadriya, the academic year (2017-2018) , for the four stages , amounting to (75) students Of the total of (282) students, as an overall total and after the exclusion of those who have failed and players of the teams the total became (250) students and thus the proportion of the sample was (30%), and the researchers have used the statistical bag (SPSS) to extract the search results as fllows: the arithmetic mean, the standard deviation, the median. ,, torsion coefficient,, contribution ratio, and the study proved linkage to some of the variables completion tests , and the researchers concluded contribution of the bio-kinematic and physical variables to the broad jump test from stability by performing it, and did not contribute to the achievement of vertical jump test from stability and recommended the need to use a broad jump test from Stability for novice students and not to use the vertical jumping test from stability.*

INTRODUCTION OF THE RESEARCH AND ITS SIGNIFICANCE:

The jump test of both types the vertical and broad jumps are counted of the tests that take a wide range of most sports, and at the same time, the similarity to a great many movements and performance of different games, that the aim basis of both tests is to measure the explosive power of the two legs from the steady state, and this test is used for all athletes without regard to their levels or categories, as well as for non-specialized athletes in certain games, i.e. School students or university students or students of the competent colleges in physical education of both sexes as it can be used as one of the standards for tests of fitness. From that we note the importance of these two tests and their widespread use in sports, e.g. regarding the vertical jump test mentions:

"Numerous methodologies exist for estimating vertical jump height. The most common field test is a jump and reaches test"

Also, the case of difference of opinion from the standpoint of researchers between the performances of both tests in that the vertical jump performance is used in many games [1].

Vertical Jump Height, (Journal of Applied Biomechanics, Human Kinetics

"Vertical jumping is considered as an important and attractive element 2 of many sports such as basketball and volleyball" [1]

It is the individual's ability to raise the center of the weight of his body to the highest possible point towards the vertical direction, by using the

Maximum power possible of constriction of his legs, where muscles are used to the best kinetic possible art, and be in terms of the hand, touching to the highest point to reach to determine the height achieved.

As for the broad jump, it is the ability of the athlete to move the center of the weight of his body to the farthest point possible in the horizontal direction, using the maximum possible contraction strength of the muscles of the two legs with the use of the best possible movement art possible, being the horizontal point that is determined by touching the foot of the ground to determine the distance taken.

"While similar are not the same from a kinematic and kinetic perspective at the hip, knee and ankle" [2]

Every physical test has a major goal of its own, and certainly involved in his performance the rest of the body parts, that have a significant impact on the level of testing and improving its accomplishment e.g. parts of the arms and torso and the movement of the joints of the legs, speed and angles and the landing way is certain to have an impact On the results. The researchers have found that the best approach to study them is the kinematic analysis using a fast camera and special analysis programs to study the results of the analysis of these variables.

Research problem:

The study of the two tests at the same time came from the idea and as a result of some of the scientific opinions and discussions in that both tests measure the same capacity and are similar in some properties in the form of performance, and differ in others and this is consistent with the study of: others [3].

"There was a statistically significant correlation between the results in the vertical jump, the standing five steps, and long jump and muscle strength [4].

But the most important question is what may be faster-angled corner in parts such as trunk, arms and legs in addition to the timing of movements and the effects of height and mass. etc., and here appears the importance of studying kinetic variables in improving performance or the study of weaknesses and strength as well as the current research may give us answers about that, in addition, following the style of contributing to the statistical treatment shows us any variables will contribute more in the achievement. The researchers believe that the test in which the largest contribution rates appear will be is the most suitable in use for sample in the future.

As for the reason for the choice of the female sample, it is because of lack of research in this type in the local area of Iraq for these samples, because most tests go towards testing males. From all the foregoing the researchers chose this study that may give us part of the scientific

interest which would help us to explain some of the facts through the research results.

Research Purpose:

To determine the percentage of contribution of (kinetic variables) under study, total mass, the mass of arms and length of labs) in achieving the broad and vertical jump of stability for students of the College of Physical Education and Sports Sciences / University of Baghdad / Jadriya, the academic year (2017/2018)

Research Area:

Spatial area: Indoor Hall (Volleyball) in the Faculty of Physical Education and Sports Sciences / University of Baghdad

Temporal field:

The period (28/11/201 7), and up to (5/5/201 8).

Research methodology and field procedures:

Research Methodology:

The descriptive approach was adopted by researchers.

Sample Search:

The students of the four stages of the Faculty of Physical Education and Sports Sciences for the academic year (201 7 - 210 8) numbering (75) students, out of the total of (282) students, as a total and after the exclusion of those who have failed and team players the total became (250) hence the sample ratio was (30%). Table (1) shows the sample description in the values of the tests and the variables affecting them:

Means of gathering information and devices and tools used in the research:

Means of collecting information:

References, Arab and foreign sources, the Internet, international, interview, observation, tests and measurement.

Devices and tools used in research:

Fast Cameras numbering (2) speed range (30-1000) (CASIO type), kinetic analysis
program (Kenova .0.8.15), metric drawing scale, scale to measure the Mass, skin measurement tape (5 m), colored measurement tapes to determine the test field.

Field Actions:

Exploration Experience:

Took place on Wednesday (20/12/2017) at (11:00) a.m. in the inner hall of the volleyball court, on five students from different stages, and after several attempts, measurements were chosen that fit the two tests, in addition to the appropriate camera speed commensurate with the lighting, the entry of researchers quickly (240) r / s, and the result was a lack of clarity of the picture due to the lack of light, and thus put cameras on the speed of 120 r/s, which led to the clarity of the image and the possibility of analyzing it well[3,4].

Main experiment:

It began on Sunday (24/12/2017), at (10 o'clock) in the morning and
s the work of the researchers is the management of the experiment randomly according to the lessons in which stages are, divided between the volleyball hall, handball, basketball, in various times that continued until Thursday to (25/1/201 8) at (11:30) a.m., cameras have been installed by the following dimensions:

❖**ertical jump from stability:**

The distance of the camera from the examinee was (3.55) m, height (1.30) m, and the focus is fully open.

❖**-Broad Jump from Stability:**

1. The first camera: directly on the tested with a distance of (2.30 m), height (1.30 m), and the focus is fully open.
2. The second camera: its distance (2.70 m) and height (1.30 m), dedicated to the stage of flight from the moment of leaving the ground to the end of the jump, and the focus is fully open.

Used Tests [5]:

Vertical test from stability:

- Test Objective: Measure the explosive force of the two legs.
- **Method of Measurement:** The distance from the mark indicated by arm height is calculated from the position of standing to the specified point from the top of a possible vertical jump, (3) attempts given to the examinee and the best is calculated.

Test of the broad jump from stability:

- Test Objective: Measure the explosive force of the legs' muscles.
- **Method of Measurement:** The distance from the specific mark on which the examinee stands to the point touched by the feet, is calculated by jumping horizontally for the farthest distance and calculating the best distance for the three attempts.

Statistical methods:

The researchers have used the statistical pouch (SPSS) to extract the research results as follows:

Mean. Std . Deviation. Median , Skewness , Regression Liner.

The third Part (Presentation, analysis and discussion of results):

Statistical values for testing the broad jump of stability:

Statistical Description and simple correlation of kinematic and physical variables in broad jump test from stability.

- significance < (0.01) ** (0.05) *
- Table (2) shows:

There are significant correlations of kinematic and physical variables by completion of broad jumping for students, a (performance time to the moment of leaving the ground), a continued correlation indicating that the increase in this time give preference in the achievement and the researchers see that this time has something to do with pushing and the increase in table 2.

This time comes during bending the largest parts of the body, especially in the knees and this results to flight time increase of the examinee which appeared in the nature of the relationship of the variable, in addition to relationships of proportional variables (the time of the flight to the mid-distance) and (the time of the total flight from Leaving the ground to the moment of touching it) The first direct relation is which leads to improvement of achievement in terms of its being an initial indicator of the period of good flight in addition to the second direct relation which is the final indicator of the final achievement , and of course there are other variables such as the position of the two legs and the body during the landing to indicate the best distance, but was not studied in this research [6].

It is noted that there is an adverse correlation (to the angle of the knee in the maximum fold), which indicates that greater bend, gives preference in the movement technique, which gives a faster acceleration of the knee or angular range, and this variable is compatible with the variable (performance time to the moment of leaving the ground).

The direct relation (angle of the trunk in the maximum bend) is calculated with the horizontal line of the body from the hip point and indicates that the bending of the trunk at a level more than required may cause a type of disability for the flow of the body in the jump and therefore the relationship is proportional to the achievement when the angular extent is larger for trunk during the movement. The arm angle has become proportional in the same manner by the angle of the trunk of a direct relation. It's bigger range gives it an advantage in large, as it likely helps to better performance. As for the direct relation (for the speed of the angle of the knee to the moment of leaving the ground) is an intuitive relationship because the increase in speed of the knee leads to greater starting distance.

It became directly proportional (the speed of the angle of the arm to the

moment of leaving the ground) with the achievement because the speed of arm sway is of the important variables to increase the distance as body parts when working towards the movement give a better accomplishment, "Arms sway participated in a ratio of (20%) of the jump distance or Rise " [7].

The increased angle speed of the arm allows to generate more energy, which is transferred to the different body points to improve performance and jump speed of the arm is one of the most important factors affecting length and height of the jump, and this is in line with others [7], " free arm motion improves jump distance by anterior displacement [8].

In (the starting speed of the body) there was an inverse relationship with the achievement. This relationship may not be fit with the theories of distance and cruising speed, the scientific concepts of ejecta states that the increase of the speed of the starting gives a better distance output, but the researchers explain that there is always an inverse relationship between the speed and the starting angle of departure. It is true that researchers have not studied the value of a variable angle of flight, but according to their interpretation they see the greater the angle the lesser becomes the cruising speed. The study of others [9], provides:

The flight distance was firmly affected by a decrease in the jumper's take-off speed with increasing take-off angle [10].

The direct relationship (for length), the length of parts of the body first gives an intuitive of larger distance adding to that it leads to increased peripheral velocities of the body parts, especially the upper which affect the cruising speed, and the researchers see that this matter is one of the disadvantages of broad jump test, in not taking the length of the examinee into consideration, opposite to what happens in vertical jump, which takes the vertical distance of the examinee without taking the highest point she reaches. We note through the mentioned in all variables, including the speed of parts of the body, are found in a case of proportional increase to fit the best achievement. In most researches there are cases indicating that moving with a focus on speed leads to positive results in many elements of the movement, it gives a better pattern of movement and more consistent and increase in the accuracy of timing.

- Table (3) shows:

The kinematic and physical variables that relate to factor (8, 12) have contributed to the completion of the broad jump test for students by (.659).

Table (4) shows:

Through analysis of variance values that kinematic and physical variables have proven their contribution to the completion of a significant test for the broad jump students through the percentage of error (. 000). The value of (F) calculated (8.435).

Table (5) shows:

The variables that have had the effect of the completion of the broad jump test.

For students according to their importance is the (arm angle in the far bend) and (length) and (the speed of the angle the knee to the moment of leaving the ground)

, and finally (performance time to the moment of leaving the ground), and from the table of effect, it is noted that there are four relationships that corresponded to the results of simple correlation (Pearson) and six relationships did not match, and researchers believe that the most important variables are whose results show in the effect because it gives the real impact of the variables in the achievement, and the variables that appear in the relationship and not shown in the impact are considered of second priority .

What we note through these results is that there are variables belonging to the upper part of the body and the other part of the bottom of it, we conclude that these types of movements require coordination between these two parts and this is consistent with (Ashby and Heegaard, 2002)

"long jump is a basic movement of human which requires complex coordination of lower and upper extremities, and requires efficient control between the whole body and all body segments [1].

Statistical values to test the vertical jump stability:

Significance (0.01) (0.05)

Table (6) shows:

There are two abstract direct relationships and they are (the time of the flight to the highest rise) and (the total flight time of leaving the ground to the moment of touching it) and indicate that the greatest time to fly mean better achievement or bigger highest, for the rise in the jump whose output is longer time in the air. It is important to provide sufficient time to reach the highest point and position.

The two variables above and their correlation can be said to be intuitive to the output of the jump, but the most important in this output is the performance before jumping from the process of flexing the knee and the speed of its angle. Hence, if we consider that the longer time gives a better jump result due to improved push [9].

"An increase in the period over which a muscle generates force can lead to the generation of greater force and, therefore, for example in jumping, to greater jump height " [10].

The researchers found from the analysis of the two tests that the difference in the flight phase for the vertical jumping from the wide jumping is that the requirements of the rest of the body and the landing position do not take much effect in the vertical jump but are more important in achieving the better distance for wide jump.

When observing the results of the correlation in Table 2 of the broad jump, there was a correlation between the variables rather than the correlation in the vertical jump, and researchers conclude that the broad jump test is more appropriate for the students than the vertical jumping test. Most experts in motion science and training agree, however, that the wide jump test is more suitable for beginners or young adults because the movement technique

and requirements are easier than vertical jump requirements and since the sample of students is not of the highest level or sport proficient at a large level. In addition, to exclusion of female students in all sports from the test sample. All this led to the emergence of these results[11].

- Table (7) shows:

Table (1): Descriptive Statistics Length and mass.

no.	variables	Units	Mean	Median	Std.	Skewness
1	Length	Cm	16.842	161.000	4.769	-.363
2	mass	KG	55.211	55.000	6.903	.472

Table (2): the statistical description and simple link Table in execution and physical health to test broad jump of fortitude.

No.	variables	Units	Mean	Std. Deviation	Pearson Correlation	(Sig)
1	performance	Cm	165.947	21.347		
2	A performance to a second leave Earth	Sec	.340	.037	.199*	.042
3	Time of flight to Midway	Sec.	.169	.020	.457**	.000
4	total flight time leaving the ground to the moment to touch	Sec	.338	.040	.461**	.000
5	the high at maximum bend	Meter	.711	.068	-.121	.150
6	knee angle at maximum bend	Degree	103.763	11.699	-.256*	.013
7	the angle of the trunk at maximum bend	Degree	24.158	8.559	.366**	.001
8	angle of the arm at maximum bend	Degree	29.474	2.303	.254*	.013
9	speed the moment left the ground	Degree /sec	219.313	47.672	.329**	.002
10	speed of angle to the trunk to the moment left the ground	Degree /sec	135.072	28.853	-.073	.266
11	speed of the arm angle to a second Leaving ground	Degree /sec	482.313	111.053	.236*	.020
12	body starting speed	Meter/ Sec	3.010	.393	-.221*	.028
13	length	Cm	16.842	4.769	.395**	.000
14	mass	KG	55.211	6.903	-.102	.191
15	Arms mass	KG	5.385	.686	-.034	.386

Table (3): Model Summary the broad jump test delivery and physical execution.

Variables	R	R Square	Adjusted R Square	Std. Error of the Estimate
Execution and physical measurements of physical	**0.517**	**0.267**	**0.099**	**5.836**

Table (4) ANOVAb accomplish broad jump test and physical execution.

No.	Model	Sum of Squares	Df	Mean Square	F	Sig.
1	**Regression**	**22534.804**		**1609.629**	**8.435**	**.000**
2	**Residual**	**1164.986**	**61**	**19.836**		
3	**Total**	**34175.789**	**75**			

Table (5) Coefficients a to execution and broad jump test of physical completion.

No.	variables	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-272.173	88.455		-3.077	.003
2	Time of flight to Midway	137.676	49.684	.240	2.771	.007
3	total flight time leaving the ground to the moment to touch	-1168.860	2409.220	-1.102	-.485	.629
4	the high at maximum bend	788.548	1202.549	1.491	.656	.514
5	knee angle at maximum bend	-77.855	52.840	-.248	-1.473	.146
6	angle of the trunk at maximum bend	.476	.315	.261	1.509	.136
7	angle of the arm at maximum bend	.190	.273	.076	.695	.490
8	speed the moment left the ground	.297	.089	.283	3.344	.001
9	speed of angle to the trunk to the moment left the ground	.155	.049	.346	3.138	.003
10	speed of the arm angle to a second Leaving ground	-.105	.069	-.142	-1.513	.135
11	body starting speed	.023	.016	.122	1.461	.149
12	length	-7.246	5.182	-.133	-1.398	.167
13	mass	2.000	.612	.447	3.271	.002
14	Arms mass	-.105	.258	-.034	-.406	.686
15	Time of flight to Midway	-1.971	4.746	-.063	-.415	.679

Table (6): the statistical description and simple link Table in somatic and execution to test the vertical jump of fortitude.

No	variables	units	Mean	Std	Pearson Correlation	(Sig)
1	Performance	Cm	22.455	6.148		
2	A performance to a second leave Earth	Sec	.241	.053	-.010	.467
3	Time of flight to Midway	Sec.	.213	.016	.203*	.039
4	total flight time leaving the ground to the moment to touch	Sec	.423	.047	.336**	.001
5	the high at maximum bend	meter	.671	.055	-.122	.147
6	knee angle at maximum bend	degree	97.079	9.876	-.063	.294
7	angle of the trunk at maximum bend	degree	49.224	14.697	-.005	.483
8	angle of the arm at maximum bend	degree	29.895	13.808	.052	.327
9	speed the moment left the ground	Degree sec	218.817	32.518	-.040	.366
10	speed of angle to the trunk to the moment left the ground	Degree /sec	115.611	27.705	-.131	.129
11	speed of the arm angle to a second Leaving ground	Degree /sec	597.624	182.036	.106	.181
12	body starting speed	Meter/ sec	2.237	.607	-.022	.424
13	length	cm	16.842	4.769	.177	.064
14	mass	KG	55.211	6.903	.134	.125
15	Arms mass	KG	5.385	.686	.126	.139

Table (7): The vertical jump test delivery and etecution

Variable	R	R Square	Adjusted R Square	Std. Error of the Estimate
Execution and physical measurements	**0.812**	**.659**	**.581**	**13.814**

Table (8): vertical jump test delivery ANOVAb and physical execution.

No.	Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	756.554	14	54.040	1.586	.109
2	Residual	2077.944	61	34.065		
3	Total	2834.498	75			

Table (9): Coefficients for execution and the vertical jump test of physical completion.

NO	variables	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-28.426	33.372		-.852	.398
2	Time of flight to Midway	32.111	27.750	.278	1.157	.252
3	total flight time leaving the ground to the moment to touch	-3.339	62.039	-.009	-.054	.957
4	the high at maximum bend	46.044	24.333	.349	1.892	.063
5	knee angle at maximum bend	-13.943	23.294	-.126	-.599	.552
6	angle of the trunk at maximum bend	-.003	.147	-.005	-.021	.983
7	angle of the arm at maximum bend	.048	.083	.115	.582	.563
8	speed the moment left the ground	.054	.066	.121	.816	.417
9	speed of angle to the trunk to the moment left the ground	-.015	.028	-.078	-.523	.603
10	speed of the arm angle to a second Leaving ground	-.052	.033	-.234	-1.597	.115
11	body starting speed	.009	.006	.253	1.546	.127
12	length	-2.294	1.857	-.227	-1.235	.221
13	mass	.132	.184	.102	.717	.476
14	Arms mass	.290	.122	.326	2.380	.020
15	Time of flight to Midway	.388	1.264	.043	.307	.760

Kinetic and physical variables whose correlation coefficient (517.) have contributed to the completion of the vertical jumping test for students (267.).

Table (8) represents through analysis of variance values that kinematic and physical variables have proven not to have contributed significantly to the completion of the vertical jumping test of students through error rate (109.) and the value of (F) that is low calculated (1.586), compared to the value of (F) In the broad jump test[8].

Table (9) shows the variance that has the effect on the completion of the vertical jump test for the students (Mass/Block), as shown in the table by the direct value, means that the mass increase has a positive effect on the increase of achievement, namely the increase of the mass associated with the force of the tested body, for mass not accompanied by force will be an obstacle to the achievement. Ordinary people always their mass increase is compared to having increased fat, while people practicing sport are most often associated with increasing the bloc by force and lack of fat and that is what researchers deem in the sample of the present study. This study may be consistent with the study.

Conducted for the players in the volleyball, soccer and handball.

• " The comparison among groups with different BMI in these studies has revealed that the groups with lower or normal BMI perform better in physical fitness tests than overweight/obese (ie, higher BMI). fat mass, we would not expect the same magnitude of the association between BMI and physical fitness in the case of sports populations, in which there is an increased fat-free mass "[7]

It is noted also that the moral variables which are in the simple correlation do not conform to the variables in the impact table .

CONCLUSIONS:

• Biokinematic and physical variables have contributed to the wide jump test from stability and have not contributed to the vertical jump test from stability.

• The most important variables that contributed to the achievement of the wide jump test from stability, according to sequence (arm angle at the maximum bend), length (angle of the knee to the moment of leaving the ground) and finally (performance time to the moment of leaving the ground). In vertical jump, the mass has the greatest effect of achievement.

• The distance of achievement in the broad jump test is bigger by (7.39) times than the distance achievement of the vertical jump test at the research sample.

Recommendations:

• Confirmation on this type of tests for students because they reflect the reality of the extent of their motor development.

• The need to use a broad jump test for students who are beginners and not to use vertical jump test.

• To study the other kinematic and physical aspects that have not been studied in this research to find better and more accurate results.

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