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Modification and Implementation of Kick Force Test on the Football Game

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Abstract:

The purpose of this study is to find a new test for measuring the kick force applied on the ball of football game, as well as to identify the differences between the old and new test, and knowing the new test's ability to distinguish between the samples under test. The researchers presume that there is a disparity between the new test and old test, and the new test can discriminate between individuals. Theoretical framework included a vocabulary for most of terms used in this study. Research methodology and field procedures included the methodology used, community, research sample, tools and devices used, establishing a specific test levels for each new and old test , how to conduct the tests, the scientific basis of the new test and transacted the discriminatory ability and the degree of difficulty. Then collecting data and conducting the statistical processes using (SPSS) application, and then presented the results in tables and then analyzed and discussed scientifically, then the conclusions.

Keyword: Modification, Implementation, Kick Force Test, Football

1- Introduction:

Football game is a famous and popular game that received the attention of sports experts in all specialty. Due to the science and knowledge development in many fields today, especially in sports fields, this game draw the attention of researchers, that was reflected on the playing methods evolution, plans and laws that have contributed to give an aesthetic to players performance and increase the enthusiasm of audience.

Accomplishment of high achievements process is no longer depends only on training, but also on the selection process, which provides greater opportunities for a football player to achieve optimal athletic achievement.

That the selection of football players is not just about personal experience and mere observation or by chance, but it needs to follow sound scientific methods rely on tests and measurements in order to achieve the desired levels with less time and effort. For that, football game player needs a special physical and skill properties, so trainers and workers in this field must choose players according to specific standards that qualify them for skillful and physical performance according to coach desire.

Hence, the importance of the study is to find a special codified test according to scientific basis to help coaches to get players to achieve a high level of skillful and

physical performance to achieve best results. Where it reflected the research importance in finding a test for measuring the football kick force and put that test in the hands of coaches and football sport unions to benefit from in order to put players in positions and achieve the purpose of their presence in these positions, which assists in scoring in best possible level.

The aim of the tests, whether physical or psychological, or skill ... is to know the level of the players in these aspects positively or negatively for the purpose of the development level in both cases. Through researchers have reviewed many sources and scientific references dealing with football game, they found only one test for measuring football kick force by measuring the maximum distance traveled by the ball. According to biomechanics laws, the best angle of throwing projectiles for maximum distance is 45 degrees. The question is: is it possible that all the players can perform such a kick within this angle?. It may be some of them can by continuous training and high skills, but not all of them, some deviate from this angle more or less and thus may increase or decrease the distance. Hence, the researchers are to design a new test for measuring football kick force, and then comparing this test with the old one to know which is better. So researchers felt going into this study to know the differences between them, and whichever is better and put it in the hands of coaches and specialists in this game to help coaches in planning and specifying players' positions and to take advantage of their presence within these positions.

2- Research Methodology:

Researcher used the descriptive survey method because it fits the nature of the study justifications.

2.1 Community and the research sample:

Research community consisted of (672) students from the College of Physical Education and Sports Science - Al-Qadisiyah University, for year 2014-2015. Where researcher chose (179) students only from 4th grade as research sample randomly (simple random), which represented (26.636%) of total community. The students who have been conducted the test were (105) students only, because some students did not attend the test for many reasons like illness and other, where represent the (58.659%) of whole student number of 4th grade, and (15.625%) of the whole community.

2-2 Equipment, tools and methods used in the study:

- Arab sources and references.
- Data collection form.
- A questionnaire for collecting ideas of specialists and experts[1].
- The new test device.
- Measuring tape, football stadium + five footballs, and assistant team.

2-3 Steps to implement study:

2.3.1 The new test of measuring football kick force:

- **Purpose of the test:** measuring the football kick force.
- **Tools used:** a football stadium + footballs.
- **Test description:** the examined student stands in any convenient of a wide space (prefers football legal stadium), then we put the ball in the device that measures the speed of football kicking, then the student kick the ball that travels for a distance measured by the measuring tape, the device measures the speed of the ball. Note the laboratory performance of this test in any way

[1] Refer to supplement (1)

possible in order to be similar to the performance during the match depending on the direction guide the ball and place of the other fellow.

- **Recording:** The examined student performs (3) attempts, where the best speed considered and recorded on the form.
- then The researchers calculate the kick force for each examined student using the equation:

F=speed X g (where g=9.8 N/kg)

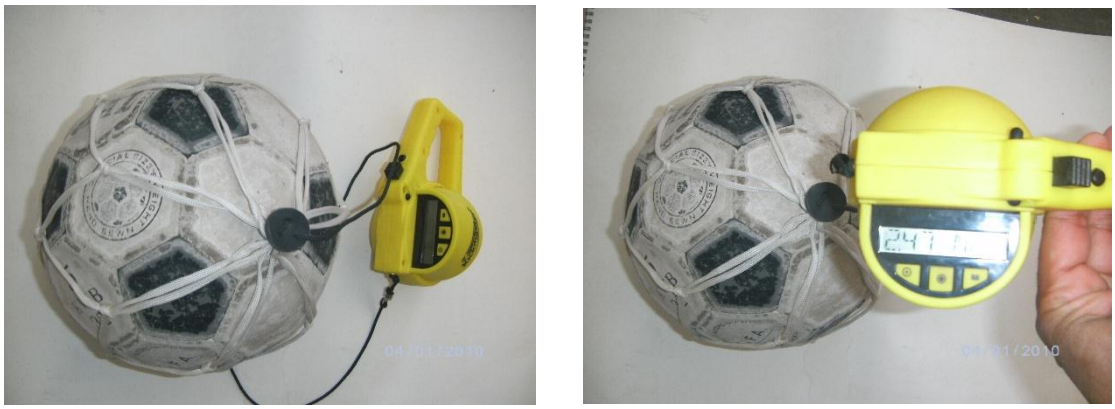

Fig (1): The new football kick force test

Table (1): Records of the test and record of the examined student in football kick force test.

Ser.	Group and Crude time	Standard record
1	0 N/m^2- less than 147 N/m^2	0
2	147 N/m^2- less than 184.3 N/m^2	1
3	184.3 N/m^2- less than 221.6 N/m^2	2
4	221.6 N/m^2- less than 258.9 N/m^2	3
5	258.9 N/m^2- less than 296.2 N/m^2	4
6	296.2 N/m^2- less than 333.5 N/m^2	5
7	333.5 N/m^2- less than 370.8 N/m^2	6
8	370.8 N/m^2- less than 409.1 N/m^2	7
9	409.1 N/m^2- less than 446.4 N/m^2	8
10	446.4N/m^2- less than 483.7 N/m^2	9
11	483.7 N/m^2- less than 520 N/m^2	10

2-3-2 The exploratory experiment:

Researchers conducted the exploratory experiment on a sample of (5) students from research community did not take part in the main experiment, the purpose of the exploratory experiment are:

- Know the pros and cons of the new test, and what are the obstacles that may occur?
- The time required to conduct the test and the time to repeat it with comparison with old test.
- Checking the readiness of assistant and organizing of forms for registration of the records.
- Checking the validity of tools used in the new test, the potential of these tools to damage, and the time required for repairing.

2-3-3 The scientific basis of the new test:

2-3.3-1 Test validity:

Validity is studying of the test content and examining its various elements to check whether it is representing the subject content (property or ability) that measured[1]. In order to check the new test validity, researchers presented the test to the measurement and validation experts[2] with full explanations for the test and validity of the materials used, and take their practical ideas about the test into account, as well as the measuring accuracy of test. Test validity adopted through the answers of experts by the proportion of their agreement, then researchers determine (calculated Chai square) value for (5) experts as (5), and (tabulated Chai square) as (3.84) at the level of significance (0.05) and degree of freedom (1).

2-3-3-2 Test Reliability:

Researchers determine the Reliability coefficient (retest), where the test was conducted on (10) students from the community, and re-conducted a week later to see how much the test is reliable. Then researchers analyzed the data statistically, and determined correlation coefficient value between records of two tests as (0.985), which is greater than tabulated value (0632) when the degree of freedom (8) and level of significance (0.05). This indicates the presence of significant correlation between two tests and indicates that the new test is reliable and effective.

2-3-3-3 Test objectivity:

There are several meanings for objectivity, for instance, it means the clarity of test conducting instructions and calculation of records or its results, or it could mean the objective of the test. The test is not affected by self-factors of arbitrators of the test, then the test is objective if there is no divergence between the views of arbitrators, if there are more than one arbitrator[1]. Researchers determine the test objectivity of the new test using (10) students outside from the research sample, and evaluated by two arbitrators[2], then researchers analyzed data and calculate correlation coefficient value between the grades of the two referees, as (0.912) which is greater than tabulated value (0.632) at level of significance (0.05) and degree of freedom (8). This indicates a presence of a complete correlation significant between the arbitrator's provisions, and indicates that the test is objective and not subject to the factors of self-judgments.

2-3-4 Tests used in the study:

Football kick force test:

- **The purpose of the test:** Measurement of the football kick force.
- **Tools:** legal football stadium, measuring tape (in meter), legal footballs.
- **Performance Description:** the examined student stands in any area that allows him to kick ball towards an open space, where the examined kick the ball as far as possible, taking into account that throwing angle is 45 degrees.
- **Recording**: The examined student perform (3) attempts, where the best speed considered and recorded on the form.

[1] Abu Hatab and Others, **Psychological Calendar**, 3rd ed., Cairo, Egyptian Anglo library, 1987, p: 134.

[2] Refer to supplement (1).

[1] Mohammed Jassim al-Yasiri, **The Scientific Basis of the Tests of Physical Education**, Dar Al Diaa Printing / Najaf, 1st ed., 2010, p: 77.

[2] -MD Laith Jabbar Nie'ma, Physical Education and Sports Science College - University of Qadisiyah.
-MD Mohammed Hatem Abdul-Zahra, hysical Education and Sports Science College - University of Qadisiyah.

Fig (2): The old football kick force test.

The following table shows the time of the performance standards:

Table (1) records of the test and examined student in football kick force test

Ser.	Group and Crude time	Standard record
1	0 m- 15 m or less	0
2	15 m- 18.8 m or less	1
3	18.8 m- 22.6 m or less	2
4	22..6 m- 26.4 m or less	3
5	26.4 m- 30.2 m or less	4
6	30.2 m- 34 m or less	5
7	34 m- 37.8 m or less	6
8	37.8 m- 41.6 m or less	7
9	41.6 m- 45.4 m or less	8
10	45.4 m- 49.2 m or less	9
11	49.2 m- 53 m	10

2-4 Discriminative ability:

Researchers arranged the results of (105) students obtained in ascending order, and then they select the values of two groups which constitute ratio of (27%) of the upper and lower. The number of students per group are (29) students, then they were calculated (t) value between the values of upper and lower of independent and non-correlated samples which is (43.767). When that value compared with the tabulated (t) value (1.671) when degree of freedom (56) and level of significance (0.05), they found that this test has an ability to distinguish between examined students significantly.

2-5 Degree of difficulty of the test:

Difficulty coefficient permanent necessity in all achievement tests that rely on the optimum performance being gives us an indication of how extent which the test accomplished and the level of research sample performance by the ratio after data canalization processes. Researchers determined difficulty coefficient of the two tests as shown in the results and canalization part.

2-6 The main test:

Through researchers have reviewed many sources and scientific references dealing with football game and tests of kick force, researchers conducted the main test on the research sample (105 students from 4th grade of Physical Education and Sports Science College - Al-Qadisiyah University) in date 2015/4/19-23 according to their own schedule and with help of teaching staff. Data collected during lectures, so that it does not effect on studying. Then they conducted the new test immediately after old test has been end-taking advantage of the exploratory test from where knowing the obstacles of the test during conducting the test.

2-7 Statistical methods:

Researchers used the computer statistical package (SPSS), were they used the following statistical laws:

- Arithmetic mean.
- Standard deviation.
- Percentage.
- (t) Coefficient for independent samples.
- The simple correlation (Pearson).
- Range of categories.
- Chai Square.

3- Results, analyzing and discussion:

Table (3) presents the comparison of discrimination ability between the new and old test of the sample and the comparison of the difficulty coefficient between the new and old test, and the comparison of (t) value between the two tests. It also presents the correlation results for sample between the two tests to determine the stability of test results. The details of results shown below:

Table (3) results of discrimination ability for both old and new test and analyzing**.**

Ser.	Variables	Lower group		Upper group		Calculated (t)* value	Significance of differences
		Mean	S.D.	Mean	S.D.		
1	Old test	2.517	1.271	9.655	0.483	28.263	Significant
2	New test	1.827	0.889	9.793	0.412	43.767	Significant

∗ Tabulated (t) Value at level of significance (0.05) and degree of freedom (56) = (1.671).

Table (3) shows the discrimination ability through means, standard deviations, and calculated and tabulated (t) values for both lower and upper groups of the old and new tests, the results of old and new tests are:

For both upper and lower groups, Means are (9.655, 1.827) respectively, Standard deviations (1.271-0.889) respectively. Results of upper group are (9.655-9.793) respectively, and a standard deviation of (0.483-0.412) respectively. values of calculated (t) for both old and new tests are (28.263-43.767) respectively, and when it compared with the tabulated (t) value, which is (1.671), at level of significance (0.05) and degree of freedom (0.05), we find that calculated (t) value is greater than tabulated value. That shows a significance differences for both tests between lower and upper groups in favor of upper group, which shows the validity of new test and its ability to distinguish between students, this proved the first hypothesis and thus achieved the first purpose of the study.

Table (4): View and analyze results of the difficulty coefficient at sample level between the old and new tests.

The variable	The test	Research sample	Total Degree of test evaluation	Achievement degree of ideal sample	Total achievement degree of sample	Difficulty coefficient	Coefficient* Significance
Degree of difficulty	Old test	105	10	1050	638	60.761	Medium difficulty
	New test	105	10	1050	669	63.714	Medium difficulty

*** Accepted difficulty coefficient value between (more than 20 - and less than 80)**

Table (4) presents the values of difficulty coefficient for both old and new test and their significant, we can see that difficulty coefficient of the old test is (63.714) which is a medium difficulty, because it is within the accepted value that make the community of a moderated distribution with respect to phenomenon under test. This indicates that the test is meeting all the scientific theoretical fundamentals in the definition. While the new test has a coefficient of the difficulty of (60.761) which is a medium difficulty, because the value in between two rejection values (less than 20 - and more than 80). This indicates that the test is meeting all the scientific theoretical fundamentals in the definition and here the second hypothesis is approved and has achieved the first purpose of the study.

3-3 View and analyze the sample level results between the old and new tests:

Table (5): Calculated (t) value for the two groups of old and new tests.

Ser.	variables	Old test		New test		Calculated (t)* value	Correlation Significance
		Mean	S.D.	Mean	S.D.		
1	Football kick force	6.076	3.233	6.371	2.926	0.694	Non-Significant

*** Tabulated (t) Value at level of significance (0.05) and degree of freedom (208) = (1.645).**

Table (5) presents calculated (t) value which equal to (0.694) that calculated through means of old and new tests (6.076-6.371) respectively and standard deviations (3.233-2.926) respectively. Comparing calculated (t) value with tabulated (t) value (1.645) at level of significance (0.05) and degree of freedom (208) shows that calculated (t) value less than tabulated (t) value, i.e. there is Non-Significant differences in sample level of both tests. If we check means of the sample in each test, we find that assessment of first test is greater than the new test assessment; this reflects the ease of performance in the old test. researchers also attribute this decline to that new test may be taken into account most of football kick force aspects through putting the right basis to measure this force in terms of the nature of kicking the ball which was similar to the natural kicking, as has been proved in coefficient of difficulty in table (4). Here the third hypothesis is proven and has achieved the second purpose of the study.

3-4 Results of correlation coefficients between the old and new test and analyzing:

Table (6): values of the calculated correlation coefficients (r) for the old test and new test.

Ser.	variables	test	calculated correlation coefficients (r)	tabulated correlation coefficients (r)∗	Correlation Significance
1	football kick force	Old test New test	0.227	0.138	Strong Significance

∗ Tabulated (r) Value at level of significance (0.05) and degree of freedom (208).

Table (6) presents value of correlation coefficient of the sample between the old and new test results, where the calculated value is (0.121), which is less than tabulated value (0.138) at level of significance (0.05) and degree of freedom (208), i.e. there is a Strong Significance. Researchers attribute this result to the differentiation between the two tests, and this significantly affected in proving of individual's ability to obtain the same result in both tests. As well as the new test, which includes more than one variable to reflect the measuring of kick force, can get differentiation in Individuals under test more than the old test, which includes only one variable to measure the kick force. That shows a strong correlation between these tests. Thus third hypothesis is proven and has the second goal of the research is achieved.

3-5 Overall Discussion of the old and new test results:

Through data presented in tables (3, 4.5, and 6), we can see that the new test has preference on the old test for many reasons:

- Measuring of kick force according to modern scientific basis.
- Using more variables.
- The new test took into account several aspects in how to measure kick force accurately.
- Using a new tool (measuring of the ball velocity), where the old test tainted by lack of precise measurement of the football kick force when ball kicking angle (less or more than force 45 degrees).
- The new test can differentiate better between sample individuals than the old test at the level of assessment of the differences, that resulting from the diversity and continuous changing in test conducting which impacts positively on the results, thus fulfilling the justice, equality, excitement and thrill principles.
- Sample results that emerged through the correlation coefficient in table (6) shows a strong correlation between the two tests. that is the significant correlation indicates that both tests (old and new) have no difference between them in measuring of the football kick force and that in the new test being taken into account most of the force components in ball kicking. Scientific sources confirm that the "Synergy of the mechanical laws and systems of the nervous system and musculature to guide, organize and determine the shape of the kinetic activity."[1]. As well as what confirmed by (grosser, 1995) who said," The co-working between nervous system and musculature in accordance with the voluntary movements involved various parts of the central and

[1] Abdullah Huwail Farhan, **Impact of Different Training Curricula sizes on the Physical, Physiological and Performance Skills Variables of junior football players**, Unpublished Master Thesis, Physical Education and Sports Science College - University of Qadisiyah, 2008, P: 82.

peripheral neuropathy and development of psychological and mental qualities which both considered as one of the requirements for mastering the art of kinetic performance."[12].

Therefore, we can use both tests, As the old test is similar to the performance, but the measurement is not correct when compared with the new method of testing but the new test is better because it uses the scientific basis in measuring the football kick force.

4- Conclusions:

Through data presentation, analysis and discussion, the researchers reached the following conclusions:

1. The new test discrimination from the old in measuring the strength to hit the ball because of it Significant impact on the distinction between testers.
2. New test relish a difficulty coefficient more than old test and match with the great development in the physical preparation today.
3. The technology used in the tool of new test prominent in the registry
4. Objective data has a significant role in recording data accurately.

References:

Abu Hatab and Others, Psychological Calendar, 3rd ed., Cairo, Egyptian Anglo library, 1987.

Ahmed Bastawisi, Basis and Theories of Sports Training, Cairo, Dar Al- fikr Al-Arabi, 1999.

Zaid Huwaidi, the Basics of Educational Evaluation, University Book House, Al-Ein, 2004.

Salam Jabbar Sahib, Predictive Value of Skillful Performance in terms of Physical, Skills, Physical, Kinetic and Physiological Measurements for Selecting Junior Football Players, PhD thesis, University of Babylon, Physical Education and Sports Science College, 2006.

Abdullah Huwail Farhan, Impact of Different Training Curricula sizes on the Physical, Physiological and Performance Skills Variables of junior football players, Unpublished Master Thesis, Physical Education and Sports Science College - University of Qadisiyah, 2008.

Qeis Naji Abdul-Jabbar and Shamil Kamil, Principles of Statistics in Physical Education, Higher Education Press, Baghdad, 1988.

Qassim Hassan Hussein and Ahmed Bastawisi, Isometric Muscular Training, Cairo, Alrejewi Press, 1978.

Mouafaq Asaad, Learning Basic Skills in Football, 1st ed., Dijla House, Ammn, 2009.

Mohammed Jassim al-Yasiri, The Scientific Basis of the Tests of Physical Education, Dar Al Diaa Printing / Najaf, 1st ed., 2010

Crosser, m; Diezweekgy mn astik 1.a, schorndorf ,1999.

Supplement (1): sport experts and specialists names

Ser.	Name	Specialization	Place of work
1	Prof. Alaa Jabbar Abboud	Testing and Measurement	Physical Education and Sports Science College-Al-Qadisiyah University.
2	Assistant prof Dr. Raafat Abdel-	Tests –	Physical Education and Sports

[2] Crosser, m; Diezweekgy mn astik 1.a, schorndorf . 1995, p120 .

	Hadi	Football	Science College-Al-Qadisiyah University.
3	Assistant Dr. Ahmed Fahim Nghesh	Tests – Football	Physical Education and Sports Science College-Al-Qadisiyah University.
4	Assistant Dr. Haider Kareem Saied	Psychology -Football	Physical Education and Sports Science College-Al-Qadisiyah University.
5	Assistant lecturer: Mohamed Radi athab	Testing and Measurement	Physical Education and Sports Science College-Al-Qadisiyah University.