Designing and legalization of a test to measure the explosive strength of performance (physical - skill) of the muscles of the lower limbs OF THE FENCING PLAYERS

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ABSTRACT

The study aimed to design and standardize a test to measure the explosive power of the performance (physical - skill) of the muscles of the lower limbs of the fencing players; Moreover, creating standard scores and levels for players. Where the researchers used the descriptive approach, and the research community consisted of (114) players, the category of applicants, and after the results of the exploratory experiments confirmed the validity of the test, the main experiment was initiated to apply it. Through statistical treatments, the researchers concluded that the explosive test that was designed and codified proved its validity to measure the power of the performance (physical - skill) of the muscles of the lower extremities of the members of the research sample; The grades and standard levels obtained from the test represent the actual level of the research sample members.

Keywords: test to measure, explosive power, limb muscles, fencing players

I.   INTRODUCTION

Recently, research and scientific studies have tended to study the obstacles of tests and measurement in various sports activities to develop appropriate solutions to them. By adopting previously codified tests and making modifications to them or designing new tests in the type of sports activity practiced to obtain accurate results for the level of physical and skill performance of athletes, the aim of which is to advance the training units in an orderly manner In order to achieve economy of effort and time and attainment to achievement, where physical abilities tests differ And kinetics depending on the type of effectiveness and skill to be measured, so the explosive force of the muscles of the lower extremities is one of the important physical abilities to implement offensive movements and achieve a legal touch when fencers. From the foregoing, the importance of research was evident in the design and legalization of a test to measure the explosive force of the performance of the working muscles of the lower extremities, where the test is similar to the skillful performance, which reflects the real level of the fencing category of applicants. To the knowledge of the two researchers, which prompted us to conduct this research?

Research problem: despite the availability of physical tests to measure the explosive force of the lower extremities approved in various sports activities, they do not simulate the reality and privacy of the actual performance of the specialized sports activity in itself to reflect the true level of it , and from this standpoint focused and emerged the problem that the researchers wanted to seek to find appropriate solutions to it By designing and codifying a special test for mixing the two sides (physical - skill) combined to measure the explosive force of the performance of the working and opposite muscles of the lower extremities, where it is inspired by the duty of the motor act of fencing and to provide the most accurate information that can be used to achieve the optimum achievement.

Research objectives: Design and standardization of a test to measure the explosive power of performance (physical - skill) of the muscles of the lower extremities of advanced fencing players, Finding standard degrees and levels for testing the explosive power of performance (physical - skill) for the muscles of the lower extremities of the individual research sample.

II.   METHODOLOGY

Research Methodology: According to the nature of the research problem, the researchers adopted the descriptive survey method as the best and easiest method to achieve the research objective.

Research community and sample: The researcher identified the research community, which are the players of the Iraqi governorates' clubs in fencing, the category of applicants and registered with the statements of the Iraqi Central Fencing Federation for the 2019-2020 season, amounting to (38) clubs, and the total number of their players is (114) and their percentage was (100%), where they were excluded. The exploratory experiment sample numbered (12) players, and thus the number of the research sample became (102) players, with a percentage representing (89.47%) of the original community, as shown in Table (1).

Table (1) shows the distribution of the research community members in fencing, the category of applicants

T	provinces	Number of clubs	Number of Players	exploratory experience	Construction sample and rationing
1	Baghdad	11	33	-	33
2	Basra	5	1 5	-	15th
3	Najaf	3	9	-	9
4	Diyala	4	12	-	12
5	Kirkuk	3	9	-	9
6	Samawa	3	9	-	9
7	Karbala	5	15th	-	15th
8	Maysan	4	12	12	-
total summation		38	114	12	102

Tools and methods used in the research:

Personal interviews with experts and specialists. (see Appendix (1))

- A questionnaire.
- Arabic references and sources.

Test design steps: After reviewing the literature on tests and measurements, the researchers reached to formulate the test in its initial form and presented it with a questionnaire to experts and specialists (see Appendix (2)) to express their opinions and observations about the designed test. After collecting the questionnaires, the test was modified and formulated in the final form, according to their opinions.

The exploratory experiment: The two researchers conducted the exploratory experiment on Sunday, 6/12/2020 in the fencing hall of the Faculty of Physical Education and Sports Sciences - University of Maysan on a sample representing part of the research community and they are the players of Maysan Governorate clubs, which amounted to (12) players, and the purpose of which was to identify on the obstacles that the researchers may face in the main experiment, finding scientific transactions as well as the validity of the test.

Scientific parameters of the test:

Validity coefficient: The validity of the test or experimental test was verified by applying the proposed new test to a sample of individuals and applying another test that already exists as charity to the same sample of individuals. The correlation coefficients calculate the scores of the new test, the scores of the actually existing test, and the correlation coefficient, provided that the tests measure the same trait, Or the measured characteristic so that the validity of the new test can be ascertained and it is a simplified alternative to the original test. (Laila, 2007) where this was achieved by finding the numerator correlation coefficient (Pearson) between the performance test (physical - skill) for jumping over the designed barrier with another test to prove its sincerity, which is the "long jump test of stability" ". (Adel, 2011), the correlation value was (0.93), which indicates the validity of the designed test.

Stability coefficient: The stability of "the test means stability, that is, if the same test is re-applied to one individual, it gives some stability in the results," (Mohammed, 1995), where the two researchers seek to find the reliability

coefficient by applying the test on Sunday, 6/12/2020, with a "one week time difference". (Mohammed, 2006) The test was repeated on the same group and under the same conditions on Sunday 12/13/2020, as the numerator correlation coefficient (Pearson) was calculated between the first and second tests, where the results showed that the correlation coefficient value was (0.92), which confirms the stability of designed test.

Objectivity coefficient: Objectivity means the extent to which it is possible to obtain a correct score when two or more arbitrators apply the test to the same sample in two different situations. The same score is given, which is "if two or more arbitrators use the same devices and procedures and similar results can be obtained." (Marwan, 1999) where the researchers used arbitrators (see Appendix (3)), who are professors with experience and scientific competence, as the numerator correlation coefficient (Pearson) was calculated between the first and second judgments, where the results showed that the correlation value was (0.89), which indicates that the Objectivity of the designed test.

The discriminatory power of the test validity: In order to obtain the discriminatory ability of the test, honesty was used to distinguish between the group with a high level and a low level to determine the efficiency of the test, which is "the ability to show the differences between the trait measured by the test in opposing or divergent groups." (Tayseer, 2005), where the researchers arranged the raw scores in descending order, using the (extreme groups), as 27% of the scores were adopted for the upper and lower groups, which amounted to (22) players for each group, and the arithmetic mean of the upper group was (89,818).) with a standard deviation of (0.732), while the arithmetic mean of the lower group reached (85.363) and with a standard deviation of (0.726), and therefore the (t) law was used for two independent samples to test the differences between the means of the two groups. It reached (40.996) below the significance level (0.000), which is greater than the significance level (0.05).

Description of the proposed test in its final form:

Test name: Performance test (physical - skill) for jumping over the barrier.

The purpose of the test: To measure the explosive force of the working and opposite muscles of the lower extremities from the position of readiness (oncard).

Tools used: a fencing field or flat ground - tape measure - adhesive tape - fencing weapons of all kinds - glove - registration form - barrier (20) cm high, 150 cm wide and (5) cm thick.

How to perform: The player stands in the ready position (oncard) on the starting line, which is (5) cm wide, so that the phalanx of the front foot touches the edge of the outer line, which is (65) cm away from the jumping barrier placed on the ground, which is (20) cm high. The above situation is given the start signal by the laboratory, where the player performs the extension of the legs along the torso and pushes the ground with the feet with maximum force to help jump over the barrier and to the farthest horizontal distance possible, then lower the feet together on the ground.

Performance conditions: The player must do the following.

- The player stands in a standby position facing the barrier.
- The player must pass the barrier. In the event of failure to pass, the attempt is considered a failure.
- After passing the barrier, the player must remain in the standby position to measure the distance.
- Maintaining balance as well as the distance between the feet.

Scoring: The distance is measured from the outside edge of the starting line to the heel of the player's back foot and to the nearest (cm).

Number of Attempts: The player is given three attempts and the best attempt is taken.
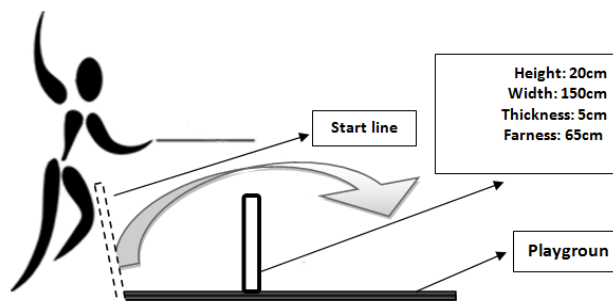
Figure (1) shows the performance test (physical - skill) for jumping over the barrier

The main experiment: After the results of the exploratory experiment confirmed the safety and validity of the implemented procedures, as they were included in the conditions, scientific transactions and the validity of the test, as well as the suitability of the research sample, the main The experiment was started by applying the test to the aforementioned legalization sample, which amounted to (102) players, in the hall of the National Center for the Gifted On Thursday, December 20, 2020.

Statistical treatments: (arithmetic mean, standard deviation, skews coefficient, median, Pearson correlation coefficient, law (t) for uncorrelated samples, standard degree z)

III.   RESULTS

1.   *Presentation and analysis of the results of the performance test (physical - skill) for jumping over the barrier*:

It is clear from the results of the statistical analysis of the performance test (physical - skill) to jump over the barrier that the members of the research sample had obtained an arithmetic mean (87.637) and a standard deviation (1.815), while the median value was (88), while the results showed that the value of the torsion coefficient It reached (0.065), which is less than (+3), which indicates that the results of the designed test are within the normal distribution.

2.   *The results of determining the standard scores of the performance test (physical - skill) for jumping over the barrier*:

After the test, the raw scores were obtained, as these scores are considered meaningless, which requires converting them into standard scores .Therefore, "the raw scores obtained by the person applying the tests have no meaning or significance unless we return to a standard that defines the meaning of these scores and through them You can know the position of the player or the person in relation to the group to which he belongs, whether he is average, above average or below average, and what is his position in relation to his peers in the legalization sample) .Ali, 2004) On this basis, the raw grades, the standard grade, and the modified standard grade were transferred to the degrees of the rationing sample after they were arranged in descending order, and they were presented in tables known as the standards tables , which are "tables showing the raw grades and derived grades in the form of parallel columns) ."Mohammed, 2006) and as shown in Table (2)

Table (2) shows the raw scores, the standard score, and the modified standard score arranged in descending order for the performance test (physical - skill) to jump over the barrier

T	Raw grade	Standard score	Modified norm	T	Raw grade	Standard score	Modified norm
100	91	1.85	68.53	59	88	0.20	52
99	91	1.85	68.53	58	88	0.20	52
98	91	1.85	68.53	57	87	0.35 -	46.49
97	91	1.85	68.53	56	87	0.35 -	46.49
96	90	1.30	63.02	55	87	0.35 -	46.49
95	90	1.30	63.02	54	87	0.35 -	46.49
94	90	1.30	63.02	53	87	0.35 -	46.49
93	90	1.30	63.02	52	87	0.35 -	46.49
92	90	1.30	63.02	51	87	0.35 -	46.49
91	90	1.30	63.02	50	87	0.35 -	46.49
90	90	1.30	63.02	49	87	0.35 -	46.49

89	90	1.30	63.02	48	87	0.35 -	46.49
88	90	1.30	63.02	47	87	0.35 -	46.49
87	90	1.30	63.02	46	87	0.35 -	46.49
86	89	0.75	57.51	45	87	0.35 -	46.49
85	89	0.75	57.51	44	87	0.35 -	46.49
84	89	0.75	57.51	43	86	0.90 -	40.98
83	89	0.75	57.51	42	86	0.90 -	40.98
82	89	0.75	57.51	41	86	0.90 -	40.98
81	89	0.75	57.51	40	86	0.90 -	40.98
80	89	0.75	57.51	39	86	0.90 -	40.98
79	89	0.75	57.51	38	86	0.90 -	40.98
78	89	0.75	57.51	37	86	0.90 -	40.98
77	89	0.75	57.51	36	86	0.90 -	40.98
76	89	0.75	57.51	35	86	0.90 -	40.98
75	89	0.75	57.51	34	86	0.90 -	40.98
74	89	0.75	57.51	33	86	0.90 -	40.98
73	88	0.20	52	32	86	0.90 -	40.98
72	88	0.20	52	31	85	1.45 -	35.47
71	88	0.20	52	30	85	1.45 -	35.47
70	88	0.20	52	29	85	1.45 -	35.47
69	88	0.20	52	28	85	1.45 -	35.47
68	88	0.20	52	27	85	1.45 -	35.47
67	88	0.20	52	26	85	1.45 -	35.47
66	88	0.20	52	25	85	1.45 -	35.47
65	88	0.20	52	24	85	1.45 -	35.47
64	88	0.20	52	23	84	2.00 -	29.96
63	88	0.20	52	22	84	2.00 -	29.96
62	88	0.20	52	21	84	2.00 -	29.96
61	88	0.20	52	20	84	2.00 -	29.96
60	88	0.20	52				

It is clear to us from Table (2) that the arithmetic mean of the standard scores was (0) and the standard deviation (1) and that their values are confined between (+3), which means that the standard test scores fall within the (normal) level, as these values were extracted from during the player's obtaining the raw score and its equivalent in the last field of the table that represents the test score extracted after adjusting the standard scores according to the formula "Modified Standard Score (Z score x 10 + 50)" (Mohammed, 2011), and for the purpose of identifying the standard levels of the performance test (Physical - skill) to jump over the barrier, as the data in Table (2) have been tabulated and the standard levels and repetitions have been set based on the values of the z-standard grades and as shown in Table (3)

Table (3) shows the standard levels of performance test (physical - skill) for jumping over the barrier

Standard score	Modified Standard Score	Standard level	Number of Players	
(Iterations)	percentage			
(-2) and below	29 and under	Very weak	0	0%
(-1.99) - (-1)	30 – 39	Weak	12	15th %
(-0.99) - (0)	40 – 49	Acceptable	26	32.5%
(0.01) - (1)	50 - 59	Average	29	36.25%
(0.01) - (2)	60 – 69	good	14	17.5%

(n = 102) (x = 0) (+h = 1)

It is clear to us from Table (3) regarding the performance test (physical - skill) for jumping over the barrier, where the number of players within the level was very weak and also very good (0) with a percentage (0%) , while the number of players within the weak level (12) by a percentage (15%), while the number of players within an acceptable level was (26) by a percentage (32.5%), while the number of players within an average level was (29)

by a percentage (36.25%), and the number of players within the level reached Good (14) with a percentage (17.5%), as shown in Figure (2).
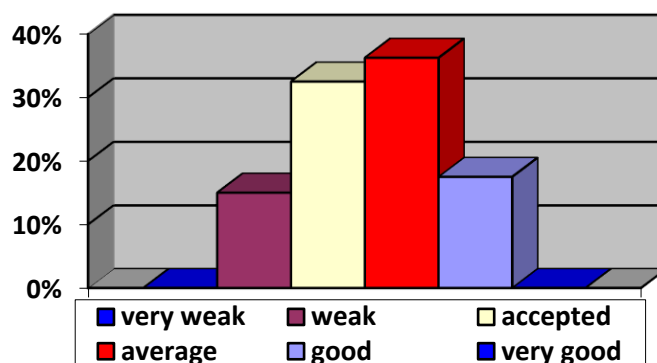

Figure (2) shows the percentages of standard levels achieved by the sample in the test

Through the foregoing results of the explosive force test performance (physical - skill) for jumping over the barrier, where the researchers see the inevitability of the results came from one vision based on the background of the proposed test design, which was similar in design and motor performance to the technical performance of jumping, which is "hitting the ground with the feet in a row". (Abbas, 1993) in terms of congruence and symmetry in the implementation of the duty of the motor action of the motor paths of the muscles (working and opposite), which confirmed this explosive ability in the muscle groups of the two legs undoubtedly, which was positively reflected in the achievement of the desired goal. This is consistent statement with what (Abd Ali's) indicated, "The fencer must have strength in the legs and arms to achieve good performance." (Statement, 2009) and also agrees with what was indicated by (Fatima Abdel Maleh) "It is the ability of the fencing player to show maximum strength in the least time while maintaining the correct performance of the skill for only one time at the maximum speed." (Fatima, 2015(

IV.   CONCLUSIONS

1. The test that was designed and standardized proved its validity to measure the explosive force of the performance (physical-skill) of the muscles of the lower extremities of the research sample members.
2. The standard degrees and levels obtained from the explosive power test of the (physical - skill) performance of the muscles of the lower extremities represent the actual level of the research sample members.

Recommendations

1. Adoption of the designed and coded test to measure the performance (physical - skill) of the muscles of the lower limbs of the fencing players.
2. Legalizing the test designed for other age groups and for different sexes in the sport of fencing.
3. Designing and legalizing other similar tests to measure the performance test (physical - skill) in the sport of fencing.

REFERENCES

1.   Abbas Abdel-Fattah Al-Ramli: Fencing is a fencing weapon, Cairo, Dar Al-Fikr Al-Arabi, 1993.
2.   Adel Turki Hassan Al-Dalouli :Principles of Athletic Training and Strength Training, Iraq, Dar Al Diaa for Printing and Design, 2011.
3.   Ali Salloum Jawad Al-Hakim: Tests, Measurement and Statistics in Physical Education, 2004.
4.   Bastawisi Ahmed: Foundations and Theories of Sports Training, Cairo, Arab Thought House, 1999.
5.   Bayan Abd Ali (and others): Foundations of the sport of fencing, Baghdad, Dar Al-Arqam for printing, 2009.
6.   Fatima Abdel Maleh and Zafer Namous Khalaf: The Basics of Training Fencing, 1st Edition, Baghdad, Dar Al-Arqam, 2015.
7.   Ibrahim Ahmed Salama: Tests and Measurements in Physical Education, Alexandria, Manar Al-Alam, 1979.
8.   Laila El-Sayed Farhat: Measurement and Testing in Physical Education, 4th Edition, Cairo, Al-Kitab Publishing Center, 2007.
9.   Marwan Abdul Majeed Ibrahim: Scientific foundations and statistical methods for tests and measurements in physical education, 1st edition, Amman, Dar Al-Fikr, 1999.
10. Muhammad Jassim Al-Yasiri: Theoretical foundations of physical education tests, Najaf Al-Ashraf, Dar Al-Diaa for Printing and Design, 2010.
11. Muhammad Nasr El-Din Radwan: Introduction to Measurement in Physical Education and Sports, 1st Edition, Cairo, Al-Kitab Center for Publishing, 2006.
12. Muhammad Sobhi Hassanein: Measurement and Evaluation in Physical Education and Sports, 3rd Edition, Cairo, Dar al-Fikr al-Arabi, 1995.
13. Tayseer Mufleh Kawafha: Measurement, Evaluation, Methods of Measurement and Diagnosis in Special Education, 2nd Edition, Amman, Dar Al Masirah for Publishing, Distribution and Printing, 2005.

Annex (1) table showing the experts and specialists who were interviewed

T	The name	Specialization	Workplace
1	Prof. Muhammad Jassim Al-Yasiri	Tests and Measurement	\ College of Physical Education and Sports Sciences / University of Babylon
2	Prof. Dr. Rahim Attia Jannati	Tests and Measurement	College of physical education and sports sciences/ University of Maysan
3	Prof. Dr. Abdel Hadi Hamid Mahdi	training/duel	College of Physical Education and Sports Science/University of Baghdad
4	Prof. Mai Ali Aziz	Tests and Measurement	College of Physical Education and Sports Sciences/University of Al-Qadisiyah
5	Prof. Dr. Mustafa Abdel Rahman Mohamed	Tests and Measurement	College of Physical Education and Sports Sciences/ University of Basra
6	Prof. Dr. Rahim Helou Ali	Psychology / Duel	College of physical education and sports sciences/ University of Maysan

Annex (2) table showing the experts and specialists to whom the questionnaire was presented

T	The name	Specialization	Workplace
1	Prof. Dr. Hashem Ahmed Suleiman	Tests and Measurement	College of Physical Education and Sports Science/University of Mosul
2	Prof. Dr. Fatima Abdel Maleh	Training / Duel	College of Physical Education and Sports Sciences / University of Baghdad - Al - Waziriyah
3	Prof. Mithaq Ghazi Muhammad	Tests and Measurement	College of physical education and sports sciences/ University of Dhi Qar
4	Prof. Emad Kazem Yasser	Tests and Measurement	College of physical education and sports sciences/ University of Dhi Qar
5	Prof. Dr. Salam Jaber Abdullah	Physiology / Duel	College of Physical Education and Sports Sciences/ University of Basra
6	Prof. Dr. Mohamed Abdel Rahim Neama	Tests and Measurement	College of Physical Education and Sports Sciences/ University of Basra

Annex (3) table showing the arbitrators

T	The name	Specialization	Workplace
1	Prof. Dr. . Muhammed Majid Muhammed	Tests and Measurement	College of Physical Education and Sports Sciences for Girls/ University of Maysan
2	A.M.D. Mustafa Abdel-Zahra, father and d	Tests and Measurement	College of Physical Education and Sports Science for Girls/University of Maysan