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Design and Legalization of a Test to Measure the Muscular Ability of the Arm Carrying a Fencing Weapon

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Abstract
Given the importance of the movement of the arm carrying the fencing sword weapon and its basic role in performing the offensive and defensive skills, so it requires a muscular ability of the fencer to implement it during the fighting period, and it is known that the test of this ability based on its measurement on the muscle groups of the armed and unarmed arms (both arms) and if we know that the non-arm An armed arm whose primary duty is limited to the balance of the body during the fight, which is Negatively reflected on the results of the muscular ability test, and the armed arm is also not available a test to guarantee it, and from this point of view crystallized and emerged the research problem, which the researchers wanted to seek to find appropriate solutions for it through the design and legalization of the test To measure the muscular ability to perform the armed arm and to provide the most accurate information that can be used to achieve the optimum achievement in the sport o fencing. The study aimed to design and standardize a test to measure the muscular ability to extend and bend the arm carrying the fencing sword, as well as to find standard degrees and levels for the test among the research sample members. Where the descriptive approach was used, and the research community consisted of (118) advanced players, and after the results of the exploratory experiments confirmed the validity of the test, the main experiment was started to apply it. The researchers concluded that the designed and standardized test proved its validity in measuring the muscular ability to extend and flex the arm carrying the fencing weapon, and the standard scores and levels obtained from the test represent the actual level of the sample.

Keywords: *test to measure, muscular ability, arm, fencing weapon*

Introduction

Recently, research and scientific studies have tended to study the obstacles of testing and measurement of various sports activities, for which it is necessary to develop appropriate solutions. By adopting previously standardized tests and making modifications to them or designing new tests for the type of sports activity that is practiced and intended to obtain accurate results to know the individual differences in the level of physical performance among athletes, and then promote the training process in athletes an orderly manner in order to achieve economy of effort and time and reach the real goal, which achievement, where physical and kinetic abilities tests vary depending on the type of effectiveness and skill to be measured, so the muscular ability (strength distinguished by speed) Of the arm carrying the fencing sword weapon is one of the important physical abilities by implementing offensive movements to achieve a legal touch as well as defensive movements to avoid the opponent's touch in fencing. From the foregoing, the importance of research is evident in the design and codification of a test to measure the performance of muscle ability, Article II of the armed arm, where the test is similar to the skill performance, which reflects the true level of the ability of advanced fencers, studies and scientific research that I have dealt with, to the knowledge of the researchers which prompted us to conduct this research.

Research problem : Given the importance of the movement of the arm carrying the fencing sword weapon and its basic role in performing offensive and defensive skills, so the fencer requires a muscular ability (strength distinguished by speed) to implement it during the time of the fight , and it is known that the test of this ability depends in its measurement on the muscle groups of the armed and unarmed arms (both arms), and if we know that the unarmed arm is limited to its primary duty on the balance of the body During the fight, which is negatively reflected on the results of the muscular ability test, and just as the arm carrying the weapon is also not available a test that guarantees it, and from this vision crystallized the research problem that the researchers wanted Seeking to find appropriate solutions to it by designing and codifying a test to measure the muscular ability to perform the armed arm and providing the most accurate information that can be used to achieve optimal achievement in the sport of fencing.

Research objectives: Design and legalization of a test to measure the muscular ability to extend and bend the arm carrying the fencing sword. Finding standard degrees and levels for testing the muscular ability to extend and bend the arm carrying the fencing sword among the members of the research sample.

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 objectives.

Research community and sample: The researchers identified the research community, which are the players of clubs in the governorates of the central and southern regions in fencing, the category of applicants over the age of (20) years, with (24) clubs and registered with the statements of the Central Federation of fencing for the season 2019-2020, as the number of players reached (118) players and their percentage was (100%), where the exploratory experiment sample consisting of (20) players was excluded, which made the number of the sample (98) players, representing (83%) of the research community, as shown in Table (1).

Table (1) shows the distribution of research community members

T	The names of the provinces	Number of Players	exploratory experience	Construction sample and rationing
1	Baghdad	36	-	36
2	Maysan	20	20	-
3	Basra	16	-	16
4	Samawa	16	-	16
5	Karbala	18	-	18
6	Najaf	12	-	12
total summation		118	20	98

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 came up with the formulation of the test in its initial form, and it was presented to experts and specialists (see Appendix (2)) to express their opinions and observations about the designed test, after which the test was modified and formulated according to their opinions.

The exploratory experiment: The researchers conducted the exploratory experiment on Wednesday, 9/30/2020 in the fencing hall of the College of Physical Education and Sports Sciences on a sample that represents part of the research community. They are the players of Maysan Governorate clubs, which amounted to (20) players. The purpose was to identify the obstacles that can to confront the researchers in the main experiment, and find scientific transactions as well as the validity of the test.

Scientific transactions for the test

Validity coefficient: The validity of the test or experimental test was verified through the application of the proposed new test to a sample of individuals and the application of 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 on the The tests measure the same trait or trait so that the validity of the new test can be ascertained and it is a simplified alternative to the original test. (Laila, 2007) This was achieved by finding the numerator correlation coefficient (Pearson) between the test of muscular ability to extend and flex the arm of the designed fencing weapon with another test that will prove its validity, which is the "flexion and extension test of the arms from the front support position within 10 seconds". (Bastawisi, 1999), the correlation value was (0.96), which indicates the validity of the designed test.

Stability coefficient: The stability of "the test means stability, meaning that if the same test is repeated on one individual, it gives some stability in the results." (Mohammed, 1995), where the researchers sought to find the reliability coefficient by applying the test on Wednesday, 30/9/2020, and after seven days, the test was re-applied on Tuesday, 7/10/2020 with all the variables and conditions set for the first test, The numerator correlation coefficient (Pearson) was calculated between the first and second tests, where the results showed that the correlation value was (0.92), which confirms the stability of the 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 equipment and procedures and it is possible to obtain similar results. ". (Marwan, 1999), where the researchers used arbitrators (see Appendix (3)), who are professors with experience and scientific competence, as the numerator (Pearson) correlation coefficient was calculated between the first and second judgments, where the results showed that the correlation value was (0.93), which indicates that the Objectivity of the designed test.

The discriminatory ability of the test validity: In order to obtain the discriminatory ability of the test, the researchers used this type of validity 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 that the test measures in opposing or divergent groups." (Tayseer, 2005), where the researchers arranged the raw scores in descending order, using (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 reached (18.82).) with a standard deviation of (0.73), while the arithmetic mean of the lower group was (14 , 36) and with a standard deviation (073) and therefore the (t) law was used for independent samples, which showed that the test is distinct because the calculated (t) value amounted to (20.25). It is greater than its tabulated value of (2.00.(

Description of the proposed test in its final form:

Testing the muscular ability to extend and bend the arm of the fencing weapon during (10 seconds).

The purpose of the test: To measure the muscular ability to perform the working and opposite muscles of the armed arm.

Tools used: Belgian fencing weapon - fencing sign representing the legal target - glove - registration form - stopwatch.

Performing method: The player stands in a standby position (uncard) in front of the person, where the player is given an attempt to adjust the appropriate distance to perform the movement of extending and bending the arm carrying the fencing sword weapon on the person after the first tester places his palm on the player's torso to confirm the return of the armed arm to him, the second tester gives a signal Starting for the player to perform the test and at the same time pressing the play button of the electronic clock for the purpose of timing, where the player extends the armed arm towards the person to achieve touching with the fly of the weapon and then bends the arm to the standby mode (uncared) within a time of (10 seconds), and after the specified time is exhausted, it gives The laboratory stop signal.

Performance conditions: The player must do the following.

- Extending the armed arm to achieve touching the person with the fly of the weapon, provided that the arm is at shoulder level parallel to the ground, and the attempt is not counted if the person is not touched.

• After performing each extension of the armed arm on the person, it is followed by the process of bending the arm to the standby position so that the elbow of the armed arm touches the palm of the first tester placed on the player's torso. The attempt is not considered successful if the elbow does not touch the palm.

Recording: The number of repetitions (extension and flexion) of the armed arm is counted during a time (10 sec).

Number of Attempts: The player is given three attempts and the best transfer is taken.

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 (98) players, in the hall of the National Center for the Gifted, In Baghdad Governorate on Monday, October 19, 2020.

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

Results

1. Presentation and analysis of the results of the muscular ability test for extending and flexing the arm carrying the fencing weapon:

It is clear from the results of the statistical analysis to test the muscular ability to extend and bend the arm carrying the fencing sword that the research sample members obtained an arithmetic mean (16.63) and a standard deviation (1.82), while the median value reached (17.00), while the results showed that the value of the torsion coefficient reached (0.44) 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 for testing the muscular ability to extend and flex the arm carrying the fencing weapon:

After taking 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 status 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 grades of the rationing sample after they were arranged in ascending 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 ascending modified standard score to test the muscular ability to extend and bend the arm carrying the fencing sword.

T	Raw grade	Standard score	Modified Standard Score	T	Raw grade	Standard score	Modified Standard Score
1	13.00	-1.995	30.55	41	17.00	0.203	52.033
2	13.00	-1.995	30.55	42	17.00	0.203	52.033
3	13.00	-1.995	30.55	43	17.00	0.203	52.033
4	14.00	-1.44 5	35,549	44	17.00	0.203	52.033
5	14.00	-1.445	35,549	45	17.00	0.203	52.033
6	14.00	-1.445	35,549	46	17.00	0.203	52.033
7	14.00	-1.445	35,549	47	17.00	0.203	52.033
8	14.00	-1.445	35,549	48	17.00	0.203	52.033
9	14.00	-1.445	35,549	49	17.00	0.203	52.033
10	14.00	-1.445	35,549	50	17.00	0.203	52.033

11	14.00	-1.445	35,549	51	17.00	0.203	52.033
12	15.00	-0.896	41.044	52	17.00	0.203	52.033
13	15.00	-0.896	41.044	53	17.00	0.203	52.033
14	15.00	-0.896	41.044	54	18.00	0.753	57.527
15th	15.00	-0.896	41.044	55	18.00	0.753	57.527
16	15.00	-0.896	41.044	56	18.00	0.753	57.527
17	15.00	-0.896	41.044	57	18.00	0.753	57.527
18	15.00	-0.896	41.044	58	18.00	0.753	57.527
19	15.00	-0.896	41.044	59	18.00	0.753	57.527
20	15.00	-0.896	41.044	60	18.00	0.753	57.527
21	15.00	-0.896	41.044	61	18.00	0.753	57.527
22	15.00	-0.896	41.044	62	18.00	0.753	57.527
23	15.00	-0.896	41.044	63	18.00	0.753	57.527
24	16.00	-0.346	46.538	64	18.00	0.753	57.527
25	16.00	-0.346	46.538	65	18.00	0.753	57.527
26	16.00	-0.346	46.538	66	18.00	0.753	57.527
27	16.00	-0.346	46.538	67	19.00	1.302	63.022
28	16.00	-0.346	46.538	68	19.00	1.302	63.022
29	16.00	-0.346	46.538	69	19.00	1.302	63.022
30	16.00	-0.346	46.538	70	19.00	1.302	63.022
31	16.00	-0.346	46.538	71	19.00	1.302	63.022
32	16.00	-0.346	46.538	72	19.00	1.302	63.022
33	16.00	-0.346	46.538	73	19.00	1.302	63.022
34	16.00	-0.346	46.538	74	19.00	1.302	63.022
35	16.00	-0.346	46.538	75	19.00	1.302	63.022
36	16.00	-0.346	46.538	76	19.00	1.302	63.022
37	16.00	-0.346	46.538	77	20.00	1.852	68.516
38	16.00	-0.346	46.538	78	20.00	1.852	68.516
39	17.00	0.203	52.033	79	20.00	1.852	68.516
40	17.00	0.203	52.033	80	20.00	1.852	68.516

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 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 equation (Z -score x 10 + 50), and for the purpose of identifying the standard levels of testing the muscular ability to extend and bend the arm carrying the fencing sword weapon, as The data in Table (2) has been tabulated and standard levels and frequencies have been set based on the values of the z-standard grades, as shown in Table (3).

Table (3) shows the standard levels for testing the muscular ability to extend and bend the arm carrying the fencing sword

Standard score	Modified Standard Score	Standard level	Number of Players	Standard score
(-2) and below	29 and under	Very weak	0	0 %
(- 1.99) - (-1)	30 – 39	Weak	11	13. 75 %
(- 0.99) - (0)	40 – 49	Acceptable	27	33.75 %

(0.01) - (1)	50 - 59	Average	28	35 %
(0.01) - (2)	60 – 69	good	14	17.50 %
(2.01) and above	70 and above	very good	0	0 %

(n = 98) (x = 0) (+ h = 1)

It is clear to us from Table (3) regarding the test of the muscular ability to extend and bend the arm carrying the fencing sword weapon, where the number of players within the level was very weak and also very good (0) by a percentage (0%), while the number of players within a weak level (11) by a percentage (13.75%), while the number of players within an acceptable level was (27) by a percentage (33.75%), while the number of players within an average level was (28) by a percentage (35%), and the number of players was within a good level (14) by a percentage (17.50%), as shown in figure (1).

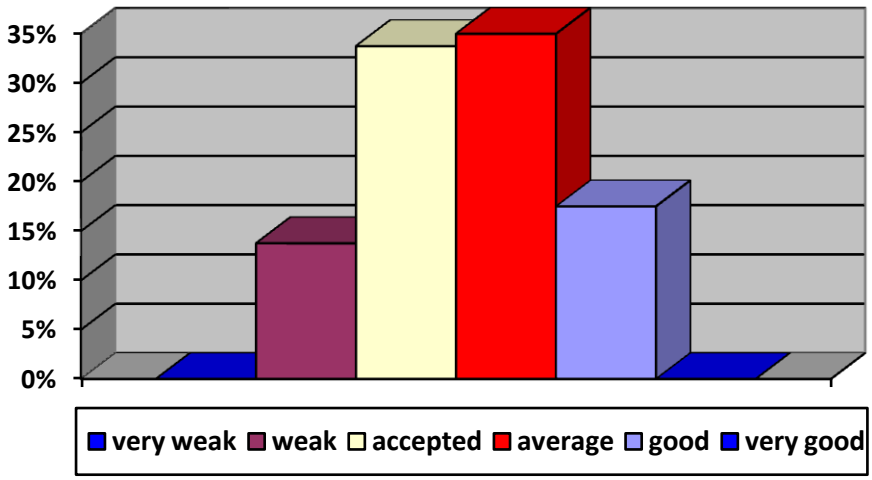

Figure (1) shows the percentages of standard levels achieved by the sample in the test

Through the foregoing results of the muscular ability to test and bend the arm carrying the fencing sword weapon, 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 its design and kinetic performance to the technical performance of extending and bending the armed arm in terms of congruence and symmetry in the implementation of the duty of the act The kinematics of the kinetic paths of the muscles (operating and opposite) that contributed that the ability of those muscles in an unquestionable way to these muscle groups of that arm, which was positively reflected in the desired effect on the results of the designed test. This is consistent with what was indicated by (Abbas, 1993) "There is a group of muscles on which work is done, the muscles of the armed arm, which extend and contract most of the time, the most important of which are the humerus and forearm muscles when they continuously perform offensive and defensive movements."

Conclusions

1- The test that was designed and legalized proved its validity in measuring the muscular ability to extend and bend the arm carrying the fencing sword among the research sample members.

2- The standard grades and levels obtained from the test represent the actual level of the research sample members.

Recommendations

1- Approval of the designed and codified test to measure the muscular ability to extend and bend the arm carrying the fencing sword.

2- Legalizing the test designed for other age groups and for different sexes in the sport of fencing.

3- Design and legalization of a similar test to measure the muscular ability to extend and bend the arm carrying the Arab sword weapon in the sport of fencing.

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

T	The name	Specialization	Workplace
1	Prof. . Mohammed Jassim Al-Yasiri	Tests and Measurement	\ College of Physical Education and Sports Sciences \ University of Babylon
2	Prof. . Abdul Karim Fadel Abbas	Training - Duel	College of Physical Education and Sports Science/University of Baghdad
3	Prof. . Abdul 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. . Raed Muhammed Mashtaat	Tests and Measurement	College of Physical Education and Sports Sciences/ University of Basra

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

T	The name	Specialization	Workplace
1	Prof. . Mohammed Jassim Al-Yasiri	Tests and Measurement	\ College of Physical Education and Sports Sciences \ University of Babylon
2	Prof. . Fatima Abdel Maleh	Training - Duel	College of Physical Education and Sports Sciences/ University of Baghdad - Al-Waziriyah
3	Prof. . Mithaq Ghazi Muhammed	Tests and Measurement	College of physical education and sports sciences/ University of Dhi Qar
4	Prof. . Rahim Attia Jannati	Tests and Measurement	College of physical education and sports sciences/ University of Maysan
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. Mohamed Maged Mohamed	Tests and Measurement	College of Physical Education and Sports Science for Girls/University of Maysan
2	Prof. Dr. Mustafa Abdel-Zahra Abbou Dr	Tests and Measurement	College of Physical Education and Sports Science for Girls/University of Maysan