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Design and codification of a test to measure the elasticity of a moving trunk using The bone doll is (13-15) years old.

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ABSTRACT

The importance of the research was manifested in the role and importance of flexibility in the game of wrestling, which requires it to be measured continuously and using the most accurate tests and the reality of the game, because building and correcting the level of progress of wrestling is done according to the most accurate tests. **The problem of the research was:** to build a test that measures the level of flexibility of the moving torso of wrestlers and follow up on its development in training and in an atmosphere similar to the atmosphere of competition, and due to the lack of specialized testing for this ability in the game of wrestling and the lack of the use of training methods similar to the opponent, so the researcher thought The use of the bone puppet as a competitor to build a test of the flexibility of the moving torso for wrestlers.
The objectives of the research were:
1- Designing and codifying a test to measure the flexibility of the moving trunk using a bone puppet (13-15) years old.
2. Finding levels and criteria to evaluate the flexibility of the moving trunk using a bone puppet (13-15 years old).
Accordingly, the conclusions were made: that the test designed by the researcher is able to detect the level of flexibility of the moving torso at the age of (13-15) years. It **was recommended that** the current test be adopted as a means of detecting the level of flexibility of the movable trunk in freestyle wrestling at the age of (13-15) years.

1- Introducing the research

1-1 Introduction and Importance of the Research:

Progress and achievement in all fields is evidence of the country's development and prosperity, and this can be inferred through the continuous evaluation, which depends on measurements and tests that show the extent of this progress and the degree that is reached for the purpose of comparing with the global level, and this also includes the sports aspect and the achievements and championships achieved.

The science of testing and measurement in the field of sports is a basic and important starting point in continuous evaluation, whether in training or achievements achieved in sports competitions and for all sports, and for this reason, tests and measurements, as seen by Qasim Al-Mandalawi et al., 1989, "tests and measurements" are one of the important means to evaluate the level reached by the athlete as well as the validity of any training curriculum (3: 11).

While (Leila Farhat, 2001) believes that "tests express the responses of the individual in a situation that includes a deliberately organized stimulus with specific qualities and presented to the individual in a special way that enables the researcher to record and measure these answers accurately" (5: 68).

In the game of wrestling, which is considered one of the individual games and has a high level of achievements, which cannot be achieved without providing all the necessary physical requirements for this game, including the quality of motor flexibility, which is a basic and important and indispensable requirement for all joints of the body, through which movements can be given that can make the wrestler able to hold the opponent in movements that help achieve the required grip, achieve points and win, and for this reason, flexibility as seen by Shabib , 2017) is "one of the important elements of motor fitness that allows athletes to perform movements economically and effectively at the same time" (9: 359).

Nikolaos, (2022) points out that flexibility in the sport of wrestling "plays an important role in the game of wrestling, as all wrestling skills require a wide range and fluidity in performance, in addition to the wrestler who is characterized by appropriate flexibility whose flexibility helps him to use the rest of the other elements of fitness in a short time and with low effort to improve achievement" (10: 147).

Hence, it is clear the importance of research on the role and importance of flexibility in the game of wrestling, which requires it to be measured continuously and using the most accurate tests and from the reality of the game, because the construction and correction of the level of progress of wrestling is done according to the most accurate tests.

1-2 Research Problem:

Based on the opinion of (Mohamed Jaber Bariq, Ihab Al-Budaiwi, 2022) " The wrestler's need for flexibility If It is considered one of the important qualities of most Activities Sports in general and wrestling in particular, and flexibility is an ability Player on performance Movements with a wide range of joint movements, and Its way the wrestler can perform Transactions Arch effectively whether Offensive or defensive (6:26) We have shown the role and importance of flexibility in free wrestling, so it is necessary to follow its development and progress using the correct and appropriate evaluation.

Through the researcher's modest experience in testing, measurement and the game of wrestling, being a coach and academic, he found it necessary to build a test that measures the level of flexibility of the moving torso of wrestlers and follow up its development in training and in an atmosphere similar to the atmosphere of competition, and due to the lack of a specialized test for this ability in the game of wrestling and the lack of use of training methods similar to the competitor, so the researcher decided to use the bone doll as a competitor to build the test for the flexibility of the moving torso for wrestlers..

1-3 Research Objectives:

1- Designing and codifying a test to measure the flexibility of the moving trunk using a bone doll at the age of (13-15) years.
2. Finding levels and criteria to evaluate the flexibility of the moving trunk using a bone puppet at the age of (13-15) years.

1-4 Research Areas:
1.4.1 Human Field: Freestyle wrestling players at the Specialized School in Basra Governorate at the age of (13-15) years.
1-4-2 Spatial Field: The wrestling hall at the Specialized School in Basra Governorate.
1-4-3 Temporal Domain: Period from 8/4/2025 to 15/5/2025.
3- Research methodology and field procedures:
3-1 Research Methodology:
The researcher used the descriptive method of surveying, which is the most appropriate method for testing and measurement research, which helps to design the required tests.
3-2 Research Population and its Sample:
The research population was determined by the deliberate method, which are the wrestlers of the specialized school in Basra governorate aged (13-15) years, which are (65) wrestlers.
The research sample was selected as they represent the construction and exploratory experiment samples, and the research sample was selected by random method of (50) wrestlers as shown in Table (1).

Table (1)
Shows the details and proportions of the sample

<table>
<tr><td>Total</td><td>Sample Type</td><td colspan="2">Samples</td><td>t</td></tr>
<tr><td>65</td><td>Age (13-15) years</td><td colspan="2">Research Community</td><td>1</td></tr>
<tr><td>5</td><td>Age (13-15) years</td><td rowspan="2">Honesty</td><td rowspan="3">Sample Exploratory Experiment</td><td rowspan="3">2</td></tr>
<tr><td>5</td><td>Age (16-17) years old</td></tr>
<tr><td>Same sample in the honesty of the test</td><td>Age (13-15) years</td><td>constancy</td></tr>
<tr><td>15</td><td>Age (13-15) years</td><td colspan="2">Excluded wrestlers</td><td>3</td></tr>
<tr><td>50</td><td rowspan="2">Age (13-15) years</td><td colspan="2">Sample Rationing</td><td rowspan="2">4</td></tr>
<tr><td>76.92%</td><td colspan="2">Ration Sample Percentage</td></tr>
</table>

3.3 Means, devices and tools used in collecting information:
3-3-1 Data Collection Methods:
1. Arab and foreign references and sources
2. Designed Test.
3. Supplement Benchmark Grades (1)
3.3.2Devices and tools used in information collection:
1- A wrestling court.
2- Wrestling equipment.
3- The bone doll.
4- Measuring tape.
5. Medical scale.
6. Computer type (HB).
7-hour stop.

3-4 Steps to Design and Standardize the Test:

3.4.1 Test Design:

The researcher designed a proposed test to measure the flexibility of the moving torso using the bone puppet in free wrestling according to the conditions of the technical and legal performance of the freestyle wrestling game, and after presenting the test to experts and specialists in the field of the game and various sports sciences for the purpose of evaluating it and expressing their observation on the following:

1. The test actually measures the flexibility of the moving torso in freestyle wrestling.
2. The bone dummy is considered an important tool in the test as a competitor and can be held around
3. Easy test performance.
4. The test is economical in terms of its tools and performance time.
5- Suitable for the research sample and its potential.

After collecting opinions and conducting an exploratory experiment on it, the test was finalized.

3.4.2 Description of the final exam:

Test Name: Freestyle Wrestling Moving Torso Flexibility Test.

Objective of the test: To measure the flexibility of the moving trunk using a bone puppet in freestyle wrestling at the age of (13-15) years.

Tools used: Bone doll - Wrestling court - Stopwatch.

How to perform the test:

- From a standing position, the wrestler holds the bone doll and is in the initial cohesion position, then the wrestler holds the doll and makes the movement backwards by lifting the doll and bending backwards and returning to the starting position, and then the bending forward and the doll downwards between the two legs of the doll, and the number is calculated within the specified time.
- The count starts within (30) seconds from the moment the wrestler performs after the coach's whistle until the time ends and the final whistle is heard.
-The wrestler repeats the performance until the end of the test.

Reviews:

1. The tester must perform a warm-up before the test.
2. The laboratory has the right to conduct a number of attempts for the purpose of the experiment before the test.
3. When the doll falls, it continues to perform within the time again.

Sign up:

1. The number of scores for the complete correct cases is calculated within (30) seconds.
2. Each error transaction is omitted degree.
3. The final grade is (the number of total grades - the number of grades omitted in errors)

Figure (1)
Shows torso flexibility test with freestyle wrestling bone puppet

3.4.3 Exploratory Experiment:

The researcher conducted the exploratory experiment on 8/4/2025 on a sample of (5) players aged (13-15) years. The experiment was repeated again after only one week, i.e. on 15/4/2025, on the same sample and under the same conditions, and the purpose of the experiment was to conduct the following:

1. Knowing the suitability of the test for the research sample.
2. Know the sufficient time to take the test.
3. Knowing the difficulties that may face the researcher and the assistant staff.
4. Knowledge of the necessary tools to conduct the test.
5. Knowing the validity of the doll used.
6. Finding the scientific foundations of the test.

3.4.4 Scientific Basis of the Test:

3.4.4.1 Validity of the test:

In addition to finding the apparent honesty of the test by presenting it to experts and specialists, a differential honesty was found: "One of the components of honesty is the ability to test on the distinction between different abilities " (Nizar, Mahmoud, 8: 142) by calculating the differences between the results of a test with the age of (16-17) years (5) and the results of a test with the age of (13-15) years (5) as shown in Table (2).

Table (2)
Shows the differential honesty of the test

Significance Level	Value T	Age Group (13-15) Years		Age Group (16-17) Years		audition
Moral	4.714	on	Going to	on	Going to	Flexible Moving Trunk
		0.947	16.41	0.889	19.47	

The value of (t) at degree of freedom (8) and the significance level of 0.05 = 2.306

3.4.4.2 Test Consistency:

Consistency refers to "the degree of accuracy, perfection or consistency with which the test measures the phenomenon for which it was designed" (Muhammad Hassan, Muhammad Nasr (7:332).

Therefore, the test was found to be stable by the repetition method, as the first test was conducted for the sample at the age of (13-15) years on 8/4/2025 and the test was repeated again on 15/4/2025 under the same conditions in which the first test was conducted and as shown in Table (3).

Table (3)
Shows the stability of the test by replay method

Level of pampering	Stability Coefficient	Second Test		First Test		audition
Moral	0.91	on	Going to	on	Going to	Flexible Moving Trunk
		0.952	16.54	0.947	16.41	

The value of (t) at degree of freedom (3) and below the significance level of 0.05 = 0.805

3.4.4.3 Objectivity of the Test:

Since the test has a key to correction and cannot be manipulated, and the test result is easy to find by the evaluator, so the test is considered objective and its results cannot be manipulated, as the test is objective because it is constant, as Raysan Khreibt mentions that "the higher the coefficient of stability, the higher the coefficient of objectivity and vice versa" (Raysan, 1:8).

3.5 Test Application:

The test was applied to the construction sample consisting of wrestling players at the Specialized School of Wrestling in Basra Governorate aged (13-15) years, after which the criteria and levels for the test were found as in the two tables (4) (5), and for the period from 13/5/2025 to 15/5/2025.

3-6 Statistical Methods: SPSS was used and the following statistical methods were extracted.

-Arithmetic mean
- Standard deviation.
-Simple correlation coefficient.
-Coefficient of difference.
–T-test for independent samples.

4. Presenting, analyzing and discussing the results:

4.1 Presentation of the results of standard scores and standard levels of the mobile trunk flexibility test.

After the researcher reached the results by applying the proposed test and to achieve the research goal of finding the standard scores for the flexibility test of the moving torso on freestyle wrestling players aged (13-15) years, the raw data was obtained, where (it requires converting the raw scores to standard scores, which is a means of determining the relative state of the raw scores, and therefore these scores can be changed and their results can be evaluated), so the researcher calculated the standard scores according to Table (4).

Table No. (4)

Shows the arithmetic media, standard deviations, coefficient of variance, highest and lowest score

Achieved by the sample members in the test of the flexibility of the movable trunk

Lowest grade	Top Grade	Divergence coefficient	Standard Error	Standard deviation	Arithmetic mean	audition
12.414	21.454	5.435	0.244	0.917	16.87	Flexible Moving Trunk

From Table (4), we can see that the arithmetic mean of the flexibility test of the moving trunk in freestyle wrestling applied by the research sample individuals was (16.87), the standard deviation was (0.917), and the coefficient of difference was (5.435), either the highest score was (21.454) and the lowest score was (12.414).

After extracting the results from the previous table, the researcher extracted the relationship related to finding the fixed number, which was later used in the development of standard tables modified by the sequential method, Appendix (1).

The arithmetic mean represents the score (50) in the table of standard scores, either the fixed value is the amount that must be added or subtracted from the arithmetic mean of the test, as the adjusted standard score is (a standard score with an average of 50 and its standard deviation is equal to zero) (Qais, Bastoisi, 4: 276).

Through the above, the researcher believes that determining the modified standard scores that wrestlers are entitled to in the test of moving torso flexibility is considered a tool for comparing the raw scores obtained by the laboratory with the corresponding adjusted standard scores (Appendix 1) to become the reference through which the performance of the wrestler can be

compared with the performance of his peer in the ability that the test can evaluate, in addition to this, these scores obtained by the wrestlers can be compared with a reference standard test to know the extent of development he has reached Gladiators.

4-2 Presentation and discussion of levels for testing the flexibility of the movable trunk.

The extraction of standard grades is an important step in rationing, considering that the raw bicycles obtained by the laboratory are not used in comparison with other laboratories until they are converted into standard bicycles.

Benchmarks are standard standards that represent the goal or purpose to be achieved, because they include scores that indicate the necessary levels (Qais, Bastuisi, 4: 184).

The researcher used the natural distribution curve (Kauss), which is considered one of the most common distributions in the field of physical education.

The researcher chose that there should be (5) levels for the test, and when distributing the standard scores to the standard levels, we found the levels as in Table (5).

Table (5)

Shows the standard levels and their prescribed ratios in the normal distribution curve, raw grades, sequential adjusted standard scores, number of frequencies and percentages of each level in the flexibility of the moving trunk

Percentage	Iteration	Standard Scores	Raw grades	Standard levels and ratios determined for them in the natural distribution curve	audition
Zero%	zero	1-20	12.414-14.57	Weak	Flexible Moving Trunk
8%	4	21-40	14.249-15.992	Acceptable	
58%	29	41-60	16.083-17.787	medium	
24%	12	61-80	17.878-19.62	Good	
10%	5	81-100	19.712 and above	Very good	

From Table (5), it is clear to us that the standard levels, raw scores, and standard scores adjusted by the sequential method of the results of the Moving Trunk Flexibility Test, and through the table, we note that the players were distributed at all levels except the level (weak), and the percentages were as follows:

The largest percentages were concentrated at the (medium) level, which was equal to (58%) with 29 wrestlers out of the total sample.

The second percentage was concentrated at the level of (good) which is equal to (24%) with the frequency of (12) wrestlers out of the total sample, while we find that the third percentage was concentrated at the level of (very good) which is equal to (15%) with the frequency of (5) wrestlers and the fourth percentage reached the level of (acceptable) which is equal to (8%) and the frequency of (4) wrestlers.

Through this distribution, we found that the largest percentage of wrestlers have obtained an average level, which explains that they need the flexibility of the moving torso for this game, and the level of flexibility does not rise to the level of ambition due to the lack of interest in training, and this is definitely related to the level of skill performance and its development, so (Amer Moussa Abbas, 2011) believes that the higher the physical preparation of the wrestler, the more it helps positively to develop the level of skill (technical) performance, as the wrestler does not He can master the skill performance of throwing catches in the absence of the necessary physical qualities in the main muscles working in performance, and thus the trainer must take into account the close connection between the process of physical numbers and skill in the training process" (2:115).

Nagai (2021) emphasizes that "the lack of flexibility in the wrestler leads to a decrease in the level of the athlete, and excessive flexibility leads to its loosening and may lead to injury, and excessive flexibility has a severe negative effect on strength, so it is necessary to pay attention when training to develop it" (11:130)

5. Conclusions and Recommendations:

5.1 Conclusions:

1- The test designed by the researcher is able to detect the level of flexibility of the moving trunk at the age of (13-15) years.

2- The research sample was distributed in four levels, which are ascending (acceptable, medium, good, and very good).

3- The largest percentages were concentrated in the flexibility of the moving torso of wrestlers aged (13-15) years at the intermediate level.

5.2 Recommendations:

1. Adopting the current test as a means of detecting the level of flexibility of the moving torso in freestyle wrestling at the age of (13-15) years.

2- Emphasizing the importance of developing the flexibility of the movable trunk of the arms for the research sample because their level is not ambitious and within the average level.

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Appendix No. (1)
Demonstrates the standard scores for freestyle wrestling flexibility testing
Age (13-15) years.

Standard Grade	Raw Grade	Standard Grade	Raw Grade	Standard Grade	Raw Grade	Standard Grade	Raw Grade
76	19.254	51	16.961	26	14.707	1	12.414
77	19.345	52	17.053	27	14.799	2	12.506
78	19.437	53	17.145	28	14.981	3	12.597
79	19.529	54	17.236	29	14.982	4	12.689
80	19.62	55	17.328	30	15.074	5	12.781
81	19.712	56	17.42	31	15.166	6	12.873
82	19.804	57	17.511	32	15.257	7	12.965
83	19.865	58	17.603	33	15.349	8	13.057
84	19.987	59	17.695	34	15.441	9	13.148
85	20.079	60	17.787	35	15.533	10	13.24
86	20.171	61	17.878	36	15.625	11	13.332
87	20.262	62	17.97	37	15.716	12	13.423
88	20.354	63	18.062	38	15.808	13	13.515
89	20.446	64	18.153	39	15.9	14	13.607
90	20.537	65	18.245	40	15.992	15	13.699
91	20.629	66	18.337	41	16.083	16	13.79
92	20.721	67	18.428	42	16.175	17	13.882
93	20.812	68	18.52	43	16.267	18	13.974
94	20.904	69	18.612	44	16.358	19	14.065
95	20.996	70	18.703	45	16.45	20	14.57
96	21.088	71	18.795	46	16.542	21	14.249
97	21.179	72	18.887	47	16.634	22	14.34
98	21.271	73	18.978	48	16.706	23	14.432
99	21.363	74	19.07	49	16.798	24	14.524
100	21.454	75	19.162	50	16.87	25	14.616