Factor Analysis of The Strength Capabilities of Players in Futsal Football for Under 18 Years

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This study aimed to Extracting and codifying the tests for the elements of strength for futsal players participating in the Babil Governorate League for clubs (Babylon - Al-Hilla - Al-Mahawil - Al-Nile - Al-Madhatiya - Janaen Babil) through: (identifying the proposed elements of strength - nominating tests for the elements of strength - extracting and codifying the tests for the elements Strength for futsal players). The researchers used the descriptive approach using the survey method on a sample of 112 players. Eight clubs were selected from the clubs participating in the Babil Governorate Futsal League. The researchers conducted the first exploratory study on the exploratory sample, which numbered (28) players, and after that the reliability was verified through By re-applying the tests to the exploratory sample (the second exploratory study) 5 days after the first measurement, after ensuring the validity of the tests, the researcher conducted the basic study on the basic sample, which numbered (84) players. In light of the study carried out by the researchers, they were able to come up with a number of strength elements for futsal players, which have good scientific foundations, including validity, consistency, and an appropriate natural distribution. The researchers recommend the extent of making use of these tests to select players, as well as determining the most appropriate tests for the strength abilities of futsal players, as well as adopting tests that achieve the scientific foundations of honesty, consistency, objectivity, and normal distribution in evaluating and evaluating the strength elements of futsal players.

Keywords: factor analysis, elements of strength, Futsal football.

1. Introduction

Futsal football is a miniature football game played by five players in each team (a goalkeeper and four players) on a field area completely similar to a handball court. The matches are managed by a first, second and third referee and a timekeeper according to a special law for the game consisting of 17 articles. It is played in two halves, amounting to the duration of each half (20 minutes), and is played on indoor or outdoor courts with specific measurements, where the length of the court is (38 - 42 meters) and its width (15 - 25 meters). It is played without

using the side walls and with a specific layout for the eye through which all the skills used are performed. in the game.

(Mustafa Jassim, Ahmed Shakur, and Ali Faisal, 2018, p. 20)

Tests and standards are considered important means of collecting data and are used by researchers in various fields to collect their data in addition to other means such as interviews, questionnaires and observation. Researchers in the sports, educational, psychological and social fields have many standardized tests prepared by experts and are therefore characterized by good preparation and construction and are available in... These tests provide specific instructions for their application, correction, and interpretation of their results, and they also have scientific components of validity and reliability.

(Muhammad Sobhi Hassanein, 2003, p. 132)

Each sport has its own physical requirements, and the opinions of experts and specialists have agreed that the physical elements are the foundation upon which the necessary components are built to bring the athlete to the highest levels. (Hassan Al-Sayyid Abu Abdo(2013, p. 95)

Strength, characterized by speed, is one of the most obvious forms of football players need during matches when performing skillful performances that include speed of running with the ball, passing, dribbling, shooting accuracy, and speed of returning to the defensive position, which makes the game depend primarily on the characteristics of strength and speed, as both of them work. To serve the bottom line and perform properly.

The explosive force It is the result of two kinetic abilities, force and speed. Considering the ability to perform maximum force in the shortest time possible for one time.

That muscular strength is one of the most important physical elements because it has a great impact on life in general, and in the sporting field in particular. Performance in all sports depends on how the body moves, and the muscles are what control the body's movement by contracting and relaxing to attract the limbs from one position to another, and the more the muscles strong these contractions are, the more effective they are.

(Grosser, M., Starischka S., Zimmerman E, 1991, p. 52)

Through the reference survey that the researchers conducted of many references and studies, he did not find a study that dealt with the variables of the current research and their application to Iraqi teams, which made him hope that this study would add some scientific information that might benefit the Technical Committee of the Iraqi Futsal Federation. Through the researchers' experience as former players and futsal coaches, they noticed that there are no special tests for the strength elements of futsal players, as most coaches rely on designing and building their programs on their experience and field abilities in large stadiums, which is reflected negatively when they train football teams. Futsal football, and to design and build training programs, there must be a factorial analysis of the strength capabilities necessary to determine the level of strength elements for futsal football players, so that the coach can develop the skill performance of the players, which called for researchers to study this topic with the aim of identifying the most important appropriate tests for the strength capabilities of futsal players. For Babylon Governorate clubs.

Researchers observe a global or continental futsal championship, to extract the most important

strengths of the game. Then, a factorial analysis of the strength abilities of futsal players is carried out, with scientific coefficients (honesty - consistency - objectivity) being carried out above, It becomes clear to researchers the importance of special tests with elements of strength for futsal players, These tests are the basic components that lead to improving outstanding motor performance, accuracy , and economy of effort to score many goals to reach the best results and high levels of research aims to extract and codify tests on the elements of strength for futsal players participating in the Babylon Governorate League for the clubs (Babylon - Al-Hilla - Al-Mahawil - Al-Nil - Al-Madhatiya - Janaen Babil) through: (identifying the proposed elements of strength - nominating tests on the elements of strength - extracting and codifying Strength tests for futsal players.

2. Search procedures :

2/1 Research methodology:-The researchers used the descriptive survey method to suit the nature of the research problem.

2/2 Research sample:-It consists of (112) players. Eight clubs were selected from the research community by a simple random method. These clubs are (Babylon - Al-Hilla - Al-Mahawil - Al-Nile - Al-Madhatiya - Babylon Gardens - Al-Mashrou' - Al-Baladi), as each club consists of (14) players were divided into (28) players for the exploratory study from the (Al-Mashrou' - Al-Baladi) clubs, representing a percentage of (25%), and (84) players for the basic study from the clubs (Babylon - Al-Hilla - Al-Mahawil - Al-Nil - Al-Madhatiya - Janaen Babil), representing a percentage (75%) of the research sample.

2/3 Homogeneity of the research sample: The researchers conducted a statistical description of the research sample to identify the homogeneity among the sample members of futsal football players in Iraq in basic measurements and strength elements, as shown in the following tables.

Table (2/1) Statistical description of basic measurements for futsal players

(n=112)

No.	Basic measurements	less value	higher value	Average Arithmetic	deviation Standard	Factor skewness	Factor Flatness
1	Chronological age (years)	15	17	16,34	0.766	-0.667	-0.986
2	Training age (years)	5	10	91,7	1,339	-0.040	-0.793
3	Length (cm)	148	172	159,81	6,193	0.148	-0.747
4	Weight (kg)	46	66	55,51	4,780	0.135	-0.393

It is clear from Table (2/1) the lowest and highest values, the arithmetic mean, and the standard deviation in the basic measurements, where the skewness coefficients came close to zero, and

the flatness coefficients were limited to between (±3), which indicates the absence of dispersion, the moderation of the values, and the homogeneity of the members of the research sample of football players. Foot for halls.

Table (2/2) Statistical description of the strength elements of futsal players (n = 112)

Strength elements		less value	higher value	Average Arithmetic	deviation Standard	Factor skewness	Factor Flatness
Power Featured With speed	Getting up and jumping from a long sit 20 seconds (number)	5	9	6.88	1.313	0.097	-1.062
	Running in the same place (number/15 seconds) (number)	28	49	39.73	5.772	-0.164	-0.839
	Stand broad jump (m)	1.25	1.98	1.69	0.135	-0.264	-0.011
Power Explosiveness	From standing bend knees (cm)	6	12	9.25	1.679	0.073	-1.178
	From running, rising on both legs (m)	1.56	2.32	1.98	0.178	-0.152	-0.897
Muscular strength	From running on one leg (cm)	30	52	41.09	6.433	-0.086	-1.181

It is clear from Table (2/2) the lowest and highest values, the arithmetic mean, and the standard deviation in the strength elements, where the coefficients of torsion came close to zero, and the coefficients of flatness were limited to between (±3), which indicates the lack of dispersion, the moderation of the values, and the homogeneity of the members of the research sample of football players. Foot for halls.

2/4 Data collection tools, methods and devices used:-Scientific sources, testing and measurement, field, futsal, computer, photographic camera, digital stopwatch, cones, whistle, measuring tapes.

2/5 Field research procedures:-

2/5/1 The exploratory study:The researcher conducted the first exploratory study (from day 1/2/ 2024to15/2/ 2024) with the aim of determining the scientific coefficients (validity and reliability) for tests of strength items for futsal players on a sample of (28) players from the

research community and outside the basic sample. The results by determining the validity and reliability were as follows:

2/5/1/1 Honesty:

The validity of the tests on the strength components of futsal players was calculated by means of discriminant validity by comparing the two tails between the highest and lowest quartiles, and to verify this using the "t" test and the discriminant validity coefficient.

Table (2/3) The significance of the differences between the highest and lowest quartiles in tests of strength components for futsal players

(n=28)

Strength elements		upper quartiles n=7		Lower quartiles n=7		value "T" Calculated	Factor Honesty Discriminatory
		s-	±p	s-	±p		
Power Featured With speed	Getting up and jumping from a long sit 20 seconds (number)	8.43	0.53	5.57	0.53	10,000**	0.945
	Running in the same place (number/15 seconds) (number)	46.57	1.99	31.71	2.87	11.258**	0.956
	Stand broad jump (m)	1.83	0.04	1.54	0.05	11.563**	0.958
Power Explosiveness	From standing bend knees (cm)	11.57	0.53	7.14	0.69	13.423**	0.968
	From running, rising on both legs (m)	2.08	0.03	1.79	0.02	22.517**	0.988
Power Muscle	From running on one leg (cm)	49.71	1.25	32.71	1.89	19.833**	0.985

*Tabular "t" significance at 0.05 level = 2.179, **at 0.01 level = 3.055

It is clear from Table (2/3) that there are statistically significant differences in the calculated "t" value between the highest and lowest quartiles in item tests.PowerThe values of the discriminant validity coefficient ranged between (0.945, 0.988These are high values that confirm the validity and ability of the tests to distinguish between different levels of futsal players.

2/5/1/2 Stability:

The stability of the tests on strength elements for indoor soccer players was verified by re-administering the tests (the second exploratory study) 5 days after the first measurement (from the day20/2/ 2024to 5 /3/ 2024), then calculate the "T" value and the reliability coefficient between the two applications.

2/5/2 Basic study:After ensuring the validity of the tests for the elements of strength by finding

scientific coefficients and the suitability of the tests to the research sample, the researchers, with the help of the assistant work team, conducted the basic study (from 10/3/ 2024to15/4/ 2022The researchers took into account all the measures taken during the final implementation of the tests, in terms of the sequence of their procedures and unification of the special conditions of the tests.

3. Analysis and discuss the results:

3/1 analysis Results of strength elements for futsal players:

Table (4/2) Correlation matrix between tests related to the strength elements of futsal players

(n=84)

Strength elements		TestsStrength elementsFor futsal players under 18 years old					
		Power Featured With speed			Power Explosiveness		Power Muscle
		X1	X2	X3	Kh4	Kh5	Kh6
Power Featured With speed	Getting up and jumping from a long sit 20 seconds (number)	1.000	0.040	0.238	-0.153	-0.054	-0.011
	Running in the same place (number/15 seconds) (number)	0.040	1.000	-0.012	0.172	0.065	0.001
	Stand broad jump (m)	0.238	-0.012	1.000	0.020	-0.034	0.116
Power Explosiveness	From standing bend knees (cm)	-0.153	0.172	0.020	1.000	-0.044	0.094
	From running, rising on both legs (m)	-0.054	0.065	-0.034	-0.044	1.000	0.147
Power Muscle	From running on one leg (cm)	-0.011	0.001	0.116	0.094	0.147	1.000

It is clear from Table (4/2) the correlation matrix between the tests for the strength elements of futsal players. Through analyzing that matrix, the correlation varies between a direct and inverse correlation between the tests and the absence of a linear correlation problem, which indicates that the correlation matrix is not a unit matrix, i.e. no All of its items are composed of zero, which indicates the validity of conducting factor analysis on the research sample of futsal players.

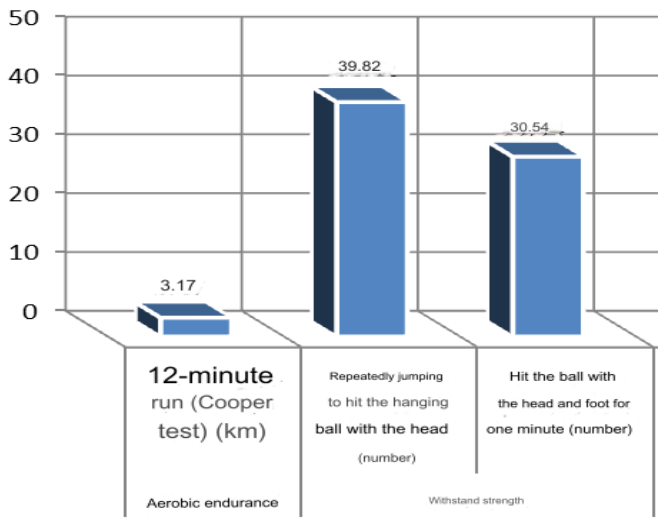

Figure (4/1)
The arithmetic mean of the tests on the strength components extracted from the factor analysis of futsal players

3/2 Discussion of results of the strength elements of futsal players:

The results were discussed and the goal stated was achieved.Extracting and codifying tests for the strength elements of futsal playersThese tests are as follows:

T	Test name	Purpose
1-	From running, rising on the legs	To measure forceExplosiveness
2-	From standing, bend the knees	To measure forceExplosiveness

4. Conclusions and recommendations:

4/1 Conclusions:In light of the study carried out by the researcher, he was able to reach the following conclusions:

1- Following scientific methods for constructing tests, a number of strength elements for futsal players have been found, which have good scientific foundations of validity, stability, and appropriate natural distribution, namely (strengthCharacterized by speed-PowerExplosiveness-Muscular strength).

2- By following scientific methods for constructing tests, a number of tests have been reached regarding the strength elements of futsal players, which have good scientific foundations in terms of validity, stability, and an appropriate natural distribution, which are (Getting up and jumping from a long sit for 20 seconds - running in the same place (15 seconds) - broad jump from standing - from standing with knees bent -From running to rise on two legs - from running to rise on one leg)

4/2 Recommendations:In light of the research sample and results, the researcher recommends the following:

1- Adopting tests that achieve the scientific foundations of validity, consistency, objectivity and normal distribution in assessing and evaluating the strength elements of futsal players.

2- Taking advantage of these tests to select players in futsal.

Identify the dimensions of the tests for the strength elements and determine the players' score for all after knowing the strength elements that need to be strengthened and addressed.

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