International Journal of Physiology, Nutrition and Physical Education

Dr. Ammar Shihab Ahmed
Assistant Professor, College of
Physical Education and Sport
Sciences, Mosul University,
Mosul, Iraq

Dr. Omar Sameer Dhannoon
Assistant Professor, College of
Physical Education and Sport
Sciences, Mosul University,
Mosul, Iraq

Hussien Lauy Ghanim
Assistant Lecturer, College of
Physical Education and Sport
Sciences, Mosul University,
Mosul, Iraq

Construct interactive test to measure the scoring accuracy of female futsal players

Dr. Ammar Shihab Ahmed, Dr. Omar Sameer Dhannoon and Hussien Lauy Ghanim

Abstract
The study aims to construct an interactive test to measure the scoring accuracy, recognize the level of goal-scoring accuracy, and identify the scores and standard levels for the interactive test of goal-scoring of female futsal players.

As procedures, the researchers used a descriptive approach with a survey method. The sample consists of (111) female futsal players representing the participant teams (Fatat Ninawah, Fatat Erbil, Aphrodite, Jehan, Sirwan Noi, Zarifani, North Gas). The researchers used scientific bibliographies, references, questionnaires, and tests as means of data collection, and the researchers used the arithmetic mean, standard deviation, variation factor, simple correlation factor, percentage, Chi-square test, and the modified z-score (six-sigma) as statistical means.

The researchers conclude that an interactive test has been constructed to measure the accuracy of goal-scoring for female futsal players following the scientific conditions of the tests and standard scores and levels have been reached for an interactive test to measure the scoring accuracy of female futsal players.

Keywords: Interactive test, goal-scoring, futsal

Introduction

In recent times, sports, like any other field, has experienced development and that was not a pure coincidence but is the result of the development of science and knowledge. This development contributed to gaining high achievements in breaking records, and the aesthetics of performance. Tests and measurement are one of these sciences that have emerged for being the scale that measures and determines the levels of participants for what they have learned from sciences and what these sciences reflected on their activities in the different sports fields as it is the main determinant of other sciences i.e. measuring development in different aspects such as (physical, skill, psychological, tactic, etc.). Tests are one of the important factors because of their great importance in identifying many characteristics of development in the field of sports whether in the selection process, assessment of training programs, or identifying the levels of players, and so on. Therefore; focusing on skill measure as a test has critical importance because it determines and explains our planning and decisions.

Moreover, many tests may be designed for a particular category or skill level close to the actual performance in competitions or matches" [1], futsal game is a modern group games [4], especially for the women in the country as it has received great attention from the concerned specialists and academics in recent years through the scientific and practical efforts in the interest of the game as well as the interest of the game as well as using tests and scales that help in the process of evaluating players for the purpose of preparing them optimally, as the evaluation process is primarily an economic process that is resorted to by developed countries in the field of sports with the aim of saving both effort, time and money as well, because the purpose of the evaluation is to get players to the best levels and development in their performance as well as discover and identify them, as well as the skill of goal-scoring is one of the most important skills in the game of futsal where success and win matches are achieved goal-scoring is a consensual movement between foot and ball and needs mental focus and mobility in performance [3, 2].

Corresponding Author:
Dr. Ammar Shihab Ahmed
Assistant Professor, College of
Physical Education and Sport
Sciences, Mosul University,
Mosul, Iraq

As aforesaid, it is clear to us the importance of study in the design of interactive skills tests for the accuracy of goal-scoring to reach a level close to the actual futsal game or during the actual performance inside the court, which allows the relevant academics, coaches and workers in the to give an evaluation of the players as close as possible to the real play, i.e. an attempt similar to the conditions of the test with the conditions of the game on the one hand and also assess the level of mental focus and speed of movement time on the other hand.

Through the follow-up of the researchers to many references that are interested in skill and physical tests of futsal efficiency in general and the tests of female players in particular, they note inefficiency tests of goal-scoring accuracy, as the accuracy and speed in the skill performance of the goal-scoring skill is the base and the main pillar of futsal players so that the player can achieve the desired goal of winning matches, and an attempt by researchers to find the best way in assessing the level of goal-scoring in women futsal players interactively so they suggested construction an interactive test that somewhat reflects the true level of goal-scoring of futsal players.

The study aims to build an interactive test to measure the scoring accuracy of futsal players.

Identify the level of goal-scoring accuracy for the interactive test for futsal players and find the scores and standard levels of interactive goal-scoring test for futsal players

Previous studies

Like many former studies, Rukwong, 2022 "Construct futsal skills tests and to establish norms of futsal skills for undergraduate students of Rajamangala University Technology Thanyaburi (RMUTT), Thailand. 260 samples of RMUTT students were used to study in 2 Areas: 60 RMUTT students for studying the quality of the futsal skills tests, and 200 RMUTT students for establishing norms of futsal skills. The data were analyzed by percentage, mean, standard deviation, and the quality of the tests was analysed by Pearson's product-moment correlation coefficient. The research results showed that the instruments for the futsal skills tests constructed in this research comprised 3 Tests: 1) dribbling test, 2) wall test, and 3) shooting test. The objectivity and reliability were at a very high level (r = 908 - 995) with a statistically significant level of 0.05. Further, the scores of 3 tests were positively related at a very high level (r = 907-985) with a statistically significant level of 0.05. These could be indicated that the content validity of the futsal skills tests constructed in this research was at a very high level. Considering the test results of the dribbling test, wall test, and shooting test, the average test scores of male students were 17.76, 15.85, and 7.77 respectively and the average test scores of female students were 29.99, 10.60, and 6.93 respectively. Also, the norms of futsal skills in this research were divided into very good, good, average, acceptable, and weak" [5].

Material and Methods

The researchers used the descriptive approach in the survey method to suit the nature and problem of the research. The research community includes female futsal players for premier league teams in the northern region, while the research sample is chosen in a deliberate manner, which was formed from teams (Fatat Ninawah, Fatat Erbil, Aphrodite, Jehan, Sirwan Noi, Zarifani, Gas Alshimal). The specimen is (122) players as the players (goalkeepers) were excluded from the population, but only the construction sample was made up of (111) players from the teams mentioned (90.98%) of the total research community, and table 1 shows this.

Table 1: Shows the number and percentage of female players on the research teams and the construction sample

Team	No. of players	Control	Percentage
Fatat Ninawah	18	14	11.47%
Fatat Erbil	17	16	13.11%
Aphrodite	17	15	12.29%
Jehan	15	14	11.47%
Sirwan Noi	20	19	15.57%
Zarifani	18	17	13.93%
Gas Alshimal	17	16	13.11%
Total	122	111	90.98%

Homogeneity of the research sample

The homogeneity of the research sample was performed in variables (age, mass, height) and table (2) showing arithmetic means, standard deviations, and the value of the variation factor for variables adopted inhomogeneity.

Table 2: Shows the arithmetic means, standard deviations, and the value of the variation factor for the search sample

Variables	Unit	Sample		Difference coefficient
		$\bar{x}$	S	
Age	Year	23	0.852	3.704
Mass	Kilogram	59.488	5.766	9.692
height	Centimetre	154.65	7.450	4.817

Table 1 shows that the values of the variation factor were respectively (3.704, 9.692, 4.817) and all of these values are smaller than (30%), indicating that the research sample is homogeneous with variables (age, height, mass).

Data collection methods: Researchers use questionnaires, testing, and content analysis as data collection tools.

Proposed test

Test Building: The proposed test was initially developed by the researchers as a questionnaire in which the test was shown in all its dimensions in terms of name, purpose, and full description of performance

The method of registration uses illustrations showing the method of carrying out the test, distances, and divisions of the goal, measuring the scoring distance, and developing divisions of different forms of the goal. After completing these procedures, the researchers presented the test to a group of experienced and competent gentlemen in football, futsal, measurement, assessment, and sports training science [1] to identify the validity of the test.

1

Name of expert	Proficiency	Affiliation
Prof. Dr. Thilam Y. Allawi	Measurement and Assessment	College of Physical Education and Sports Sciences / Mosul University
Prof. Dr. Makki M. Hussien	Measurement and Assessment / Soccer	College of Physical Education and Sports Sciences / Mosul University
Prof. Dr. Abdulmunem A. Aljanbi	Measurement and Assessment / Soccer	College of Physical Education and Sports Sciences / Tikrit University
Prof. Dr. Majeed Kh. Asad	Measurement and Assessment	College of Physical Education and Sports Sciences al-Sulaymaniyah University
Asst. Prof. Dr. Maan Abdulkarim	Athletic Training / Soccer	College of Physical Education and Sports Sciences / Mosul University
Asst. Prof. Dr. Ahmed H. Ahmed	Measurement and Assessment	College of Physical Education and Sports Sciences / Mosul University
Asst. Prof. Nashat Bashir	Biomechanics/Soccer	College of Physical Education and Sports Sciences / Mosul University
Asst. Prof. Mahmoud H. Younis	Athletic Training / Soccer	College of Physical Education and Sports Sciences / Mosul University
Asst. Prof. Mohammed Kh. Salih	Athletic Psychology / Futsal	College of Physical Education and Sports Sciences / Mosul University

Here is an explanation of the proposed test with the illustration

Test Name: Interactive test to measure scoring accuracy for futsal players.

The purpose of the test is to measure the accuracy of goal-scoring.

Tools used: Football field lounges, legal football parlours, football lounges number (9) balls, measuring tape, adhesive tape, number (1).

Test specifications (Performance Method): The player stands at the person who is away from the balls (1.5) meters and her back towards the goal, Upon hearing the start signal, the player aims at the nine balls that are away from the goal (6) meters and according to the sequence requested by the test operator, where the player aims the balls towards the divisions in the goal which are (circle, square, triangle) and each form three forms duplicated and contain numbers (1, 2, 3) and according to the instructions given by the test operator on the division required of her to return the player to the shape again and start shooting the second ball and so on to the ninth ball.

Test process
1. The player begins the test by standing on her feet with her back facing the goal.
2. The tester must give the instructions to the player to aim at the form required of her when she arrives and before turning towards the goal
3. The player must return to the person after each correction.
4. The player is free to use either person or any part of the person during the scoring.
5. The test operator must include all forms in the numbers included in the test and randomly to become the total (9) instructions during which the player (9) balls.

Goal-scoring
▪ The player is given one degree if the shoot is towards the figure number required for the player.
▪ The player is given one degree if the ball touched one of the dividing lines for the form required of Total score are 9 scores.

Fig 1: Interactive test to measure the scoring accuracy of female futsal players

Survey experiments

First Survey experiment: The first survey experiment was conducted on (16 January 2022) on Saturday, which approves (4) players from the Nineveh Girl Team were selected in a random way and on the hall (Andalusian Youth Forum), and the aim of the experiment was to achieve the following results.

Practicality and training in how to measure and record it.

Ensuring the safety and validity of the devices and tools used in the research.
▪ Sentences of dimensions and distances and control.

Figure 1 Interactive test of futsal players

Survey Experiments: The first survey experiment was conducted on (16 January 2022) on Saturday, which was approved (4) players from the Nineveh Girl Team were selected randomly and the hall (Andalusian Youth Forum), and the experiment aimed to achieve the following results.
▪ Practicality and training in how to measure and record it.
▪ Ensuring the safety and validity of the devices and tools used in the research.

▪ Sentences of dimensions and distances and control for testing
▪ Adjust the implementation of the test (how to place the persona and install the balls).
▪ Training the auxiliary team on how to register for the test on the registration card.
▪ Ensure that the search sample can perform the test well.
▪ Learn how long it takes to perform the test.

Second Survey Experiment: The researchers conducted the second survey experiment on 25 January 2022 on the hall (Erbil Girl Team) and on a sample of (30) players selected in the deliberate manner of the research community to obtain raw data used by researchers in finding scientific transactions for tests.

The Third Survey Experiment: The followers of the researchers' method of applying the test and re-folding it requires them to conduct the third survey experiment, where the researchers conducted the third survey experiment one week after the second survey experiment and on the same

sample for the second survey experiment on (2/2/2022) and under the same circumstances and the aim was to obtain data for the test and Its purpose is to obtain test data to calculate the reliability factor for the test.

Test Validity: Validity is one of the most important criteria for test quality, referring to the truth or extent to which tool or norms is supposed to measure it [6] and to reach the validity of the test, the researchers used several types of validity as follows.

Content Validity: The content validity is the most valid form to use.

The authenticity of the content or content was obtained by surveying the opinions of experts on the validity of the test and its reliability in measuring what was put for it, where the test was presented to a group of specialists as in Annex 2, and the number of (9) experts, where the test obtained an agreement rate of 100% of the opinions of the experts.

Discriminant validity: The researchers extracted the validity of the test through the square root of the reliability coefficient [7] and table (3) shows this as informed sources indicate scientific support for acceptance tests that the researcher will use more than one type of validity and that is an increase in the sobriety of acceptable tests [8].

Test Reliability: Test reliability indicates "the correlation between the results of the different times of testing, i.e. between the test and itself, where the researcher used the method of applying the test and reapplying it to find the reliability of the test

This method is one of the easiest and most common methods of calculating reliability for the test and the most common in the field of scientific research in physical education, as the reliability of the test scores is verified by applying the tests to a representative sample of individuals and then the same tests are reapplied under the same conditions after a certain period, and the coefficient of the association between the scores of individuals in the same test can be found in the same test times" [9], as researchers found the reliability factor by applying the test and reapplying it to a sample of 30 players (2nd and 3rd survey experiment).

Between the first and second applications with one week and table (3) shows this

Objectivity (Interrater reliability): Objectivity was found by finding the correlation coefficient between two arbitrator's scores for the performance of the sample at the same time and on a sample of (5) female players on 5 February 2022, where the correlation coefficient between the first arbitrator and the second arbitrator[2] is the test objectivity or interrater reliability [10].

Test specifications as final
Test Name: Interactive test to measure scoring accuracy for futsal players.

---

[2] Assistant Lecturer, Mohammed Sharqi, College of Physical Education and Sports Sciences / Mosul University: Sport Training, soccer Asst. Lect. Mustafa Rashid Sly, College of Physical Education and Sports Sciences / Mosul University: Measurement and Assessment, Soccer.

The purpose of the test is to measure the accuracy of goal-scoring.

Tools used: Football field lounges, legal football parlors, football lounges number (9) balls, measuring tape, adhesive tape, Number (1).

Test specifications (Method of Performance): The player stands at the person who is away from the balls (1.5) meters and her back towards the goal, when you hear the start signal the player aims at the nine balls that are 6 meters away from the goal
According to the sequence requested by the test operator, the player aims the balls toward the divisions in the goal which are (circle, square, triangle) and each form has three duplicate shapes and contains numbers (1, 2, 3) and according to the instructions given by the test operator on the division required of her to return the player to the person once again and begin to aim the second ball and so on to the ninth ball.

Table 3: Shows the reliability, discriminant validity, and objectivity of the test

Scientific standard	Unit	1st practice		2nd practice		Reliability	Discriminant	Objectivity
		x̄	S±	x̄	S±			
Goal-Scoring Accuracy	Score	4.72	0.66	5.05	0.87	0.94	0.96	1

Goal-scoring
- The player is given one degree if the shot is towards the figure number required of her.
- The player is given one degree if the ball touched one of the dividing lines for the form required of her.
- The player is not given any degree if the ball is aimed outside the division of the figure number required of her.
- The total degree of testing (9) degrees.

Figure (1) Interactive test of futsal players
- Devices and tools used.
- Football field lounges.
- A legal football goal.
- Football lounges number (9).
- Measuring tape.
- Duct tape.
- One person.

Final application of the test: The final implementation of the test was conducted on a sample of (111) players from (10 February 2022) until (2 march 2022).

Statistical means: In reaching the results, the researcher relied on the computer where he used excel and SPSS to obtain the following statistical treatments.
- Arithmetic mean.
- Standard deviation.
- Percentage.
- Simple correlation coefficient (Pearson).
- Discriminant validity
- Variation coefficient.
- Chi-Square.
- Six sigma (δ-6).

Results and Discussion
Test arithmetic means standard deviation, and Chi-Square

value (statistical description of the test).

As table 4 shown, it is clear to the researchers that the test is appropriate for the level of the research sample and approaches the natural distribution of the Chi-Square value (x^2) as being below its scheduled value of (11.07), which indicates the natural distribution of the sample, which allows the possibility of generalizing the results and adopting the test (Radwan, 2003:378) [11].

Show standard levels of interactive test to measure scoring accuracy for futsal players.

Table 4: Shows statistical description of the test

Test	Unit	x̄	S±	Chi-Square
Goal-scoring accuracy	Score	6.369	1.451	8.456

Table 5: Show the standard levels of goal-scoring interactive test

Level	Maximum	Minimum	Frequency	Percentage
V. good	Above	8.839	3	2.70%
Good	8.829	7.609	17	15.32%
Average	7.599	6.379	35	31.53%
Fair	6.369	5.149	47	42.34%
Low	5.139	3.919	6	5.41%
V. low	3.909	Below	3	2.70%

As table 5 shown, the researchers note that the number of female players at a very good level is (3), (2.70%), While the number of female players at a good level is (17), (15.70%), while the number of female players at an average level (35) (31.53%), the number of female players at an acceptable level (47), (42.34%), while the number of female players at a weak level (6), (5.41%), The number of female players at very low level (3), (2.70%).

The (δ-6) table for the interactive test to measure scoring accuracy to measure the accuracy of goal-scoring for futsal players.

Table 6: The raw scores and (6-δ) of the interactive test show the scale of goal-scoring accuracy for futsal players

Raw score	(6-δ)
2	0
3	11
4	23
5	34
6	46
7	57
8	69
9	80

Conclusions

An interactive test has been reached to measure the goal-scoring accuracy of futsal players. Standard scores and levels have been developed for the interactive test to measure the goal-scoring accuracy of futsal players.

References

1. Wegner M, Teubel T. The implicit achievement motive predicts match performance and the explicit motive predicts choices for target distances in team sports. International Journal of Sport Psychology. 2014;45(6):621–638.
2. Sturgess P. Futsal: Training, technique and tactics. Bloomsbury Publishing; c2017.
3. Kearney S, Copeland R. Goal Ball, Journal of Physical Education and Recreation. 1979;50(7):24-26. DOI: 10.1080/00971170.1979.10618997
4. Travassos B, Araújo D, McGarry T, Vilar L. Interpersonal coordination and ball dynamics in futsal (Indoor Football). Human Movement Science. 2011;30:1245-1259. https://doi.org/10.1016/j.humov.2011.04.003
5. Rukwong A, Tubklay I, Chaowilai C, Jankorn S. A Construction of futsal skills tests for undergraduate students of Rajamangala University of Technology Thanyaburi, Thailand. Journal of Positive School Psychology. 2022;6(3):4508-4513.
6. Gratton C, Jones I. Research methods for sports studies. Routledge; c2014.
7. Hopkins WG. Measures of reliability in Sports Medicine and Science. Sports Medicine. 2000;30(1):1-15.
8. Johnson RB. Examining the validity structure of qualitative research. Education. 1997;118(2):282-292.
9. Arnold BL, Schilling BK. Evidence-based practice in sport and exercise: A guide to using research. FA Davis; c2016.
10. Roger WE, Thomas RB. Essentials of strength training and conditioning/National Strength and Conditioning Association; c2008.
11. Meghraoui M, Gomez F, Sbeinati R, Van der Woerd J, Mouty M, Darkal AN, et al. Evidence for 830 years of seismic quiescence from palaeoseismology, archaeoseismology and historical seismicity along the Dead Sea fault in Syria. Earth and Planetary Science Letters. 2003 May 15;210(1-2):35-52.