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Evaluation of the level of the most important visual abilities, visual memory and awareness of creativity of basketball referees in Iraq

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Abstract

This paper's objective is to build a scale of awareness of creativity for basketball referees, set levels for tests of visual abilities, visual memory and a scale of awareness of creativity for basketball referees, and know the level of visual abilities, visual memory and awareness of creativity for basketball referees. Basketball referees' visual skills, visual memory, and creative awareness were assessed by the researchers using a survey method and a descriptive approach. The first and second were used to determine the research community division basketball referees in Iraq for the sports season (2023-2024), numbering (95) referees. The sample for constructing the creativity awareness scale included (80) referees, representing (84.21%) of the research community. Five levels were set for the visual abilities, visual memory and creativity awareness scale tests and applied to (45) referees, representing (47.36%) of the scientific community, in order to determine their level of proficiency in the variables being studied. twenty-fifth version and appropriate statistical techniques. Basketball referees possess visual abilities, visual memory, and an appropriate level of creativity awareness, according to the findings of the current study and the interpretations that followed. The most significant recommendations were obtained by the current study in light of the findings and conclusions. (benefit from the most important tests Visual abilities and visual memory awareness of creativity, which were applied to reveal these important variables for basketball referees, and the use of tests of the most important visual abilities and visual memory awareness of creativity to select basketball referees.

Keywords: Statistical, awareness, creativity

Introduction

Visual abilities are among the basics that referees need, which help them perform well and are closely linked to their success by following all the things that happen within the match in order to reach good refereeing, as visual abilities make the referee have accurate information that contributes to the speed and accuracy of decision-making through sight and is among the most crucial phases in mental processes., as the more the referee has a clear, complete and undistorted vision, the degree of response to his decisions will be serious and influential in the match, and visual abilities also contribute to restoring a clear vision of the nature of what is happening within the match.

Visual memory helps the referee acquire important information, store it, reuse it and prepare it to benefit from it in making the appropriate decision according to the requirements of the case. The term memory has these characteristics only, making it the biggest and most significant in helping the referee by remembering all the information in the law and how to apply it accurately. When there is a deficiency in memory, this leads to a defect in the results of the accuracy of the decision, which requires the referee to pay attention to it so that there are good results by acquiring the information correctly and employing it in appropriate situations, especially when refereeing strong matches. Basketball refereeing requires referees to have an excellent level of visual abilities, visual memory and awareness of creativity in order to fulfill the standards of equitable and good refereeing free of errors or trying to reduce them as much as possible. Awareness of creativity is one of the important variables that has a great impact on the personality and perception of the referee. Therefore, studying the characteristics of the referee has become one of the priorities that he must have and

study, because of its importance in building the personality and creativity of the referee. Referees must possess it and apply it within the match in order to become able to highlight their personality in a creative way and be distinguished within the world of refereeing. This enables them to perform the duties that fall on their shoulders and also makes them cooperative, harmonious and understanding of each other. In order for this creativity and independence to be with each referee in a fruitful and effective way, it must be in harmony with the speed of awareness of creativity, that is, the referees' awareness of their creative ideas and the extent of their employment with the creative energies they possess in leading the match by always producing the largest possible number of new and creative ideas. Basketball refereeing requires referees to have an excellent level of visual abilities, visual memory and awareness of creativity in order to fulfill the standards for fair and competent refereeing that are error-free or aim to minimize them as much as feasible. Thus, the significance of the study lay in determining the degree of visual aptitude, visual memory, and creative awareness of Iraqi basketball referees.

Research problem

Based on the researcher's limited background as a basketball expert and a devotee of most first-class matches and leagues for age groups, he noticed a difference in the performance of some basketball referees and this difference is negatively reflected in their decisions when leading matches, and because the success of any referee is largely linked to the extent of his possession of an important group of variables, including visual abilities, visual memory and awareness of creativity, which are linked to knowledge of the basketball law and also other aspects such as physical, health and physiology that are no less important than these variables that will be studied, which motivated the researcher to study these important variables, so the researcher decided to know these variables and set levels for them to know the level of basketball referees in an accurate scientific manner.

The following inquiries can also be used to determine the research problem

- To what extent do basketball referees possess visual abilities, visual memory, and awareness of creativity?
- What is the level of visual abilities, visual memory, and awareness of creativity for basketball referees?

Research objectives

- Building a scale of awareness of creativity for basketball referees.
- Setting levels for tests of visual abilities, visual memory, and a scale of awareness of creativity for basketball referees
- Knowing the level of visual abilities, visual memory, and awareness of creativity for basketball referees.

Research hypothesis

There are actual variations in the degree of visual abilities, visual memory, and awareness of creativity for basketball referees.

Research fields

- **Human field:** First and second division basketball referees for the athletic season of 2023–2024.

- **Time field:** From 12/10/2023 to 15/6/2024
- **Spatial field:** Sports halls where basketball referees (first and second divisions) are present.

Definition of terms

Visual abilities: It is the referee's ability to apply sound and accurate decisions when refereeing basketball based on visual information to determine the movements of players with or without the ball and their actions inside and outside the court and the friction that occurs between them and also the location of other fellow referees inside the court.

The operational definition of (visual abilities): The score that the referee obtains as a result of his performance on visual abilities tests, which in turn determines the extent of his possession of them and is corrected according to the test correction key.

Visual memory: It is the process of encoding perceptions, which is represented by absorbing images that work as an alternative to verbal connotations as special means of visualizing information. (Ayed Karim Abdul Aoun, 2011, p. 44) ^[1].

The operational definition of (visual memory): The score that the referee obtains as a result of his performance on the visual memory test, which in turn determines the extent of the referee's possession of visual memory and is corrected according to the test correction key.

Awareness of creativity: It means the extent to which an individual possesses the cognitive processes, emotional feelings, and physiological experiences that accompany creative thinking that prepare them to produce in a creative manner. (Enas Mohammed Mahdi Al-Mahdawi 2010, p. 26) ^[2]

The operational definition of (awareness of creativity): The degree that the judge obtains as a result of his answer to the scale of awareness of creativity built for this purpose.

Fieldwork techniques and research methodology

- **Methods of research:** To address the issue, the researcher measured basketball referees using the survey approach and the descriptive method.
- **The sample and research community:** The first and second were used to determine the research community. division basketball referees in Iraq, numbering (95) for the 2023-2024 sports season.
- **Sample of the exploratory experiment for the variables (visual abilities, visual memory, and awareness of creativity):** The experiment was conducted on (10) referees at a rate of (10.52%).
- **Sample of building the creativity awareness scale:** It included (80) referees at a rate of (84.21%) of the research community.
- **Sample of applying the variables (visual abilities, visual memory, and awareness of creativity):** All research variables were applied to (45) referees representing a rate of (47.36%) In the scientific community, in order to determine the degree of visual abilities, visual memory, and awareness of creativity.
- **Techniques, instruments, and equipment employed in the study:** Research methods: including: (foreign

sources and questionnaire, test and related to the research variables).

- **The following equipment was employed in the study:** A DELL, a legal basketball court, and a stopwatch number two calculator number (1), office supplies (papers, pens), 10 aluminum squares measuring (30 x 30 cm), whistle, measuring tape, 5 aluminum squares measuring (30 x 30 cm) numbered from (1 to 5), adhesive tape, plastic table measuring 1 m x 1.20 m).

Field research procedures

Procedures for selecting visual ability and visual memory tests: Visual ability tests were selected for researcher Mustafa Adel Alwan (Mustafa Adel Alwan, 2023, p. 159), as the abilities consisted of (visual motor ability, visual reaction speed, visual depth perception, visual tracking) (see Appendix 1).

As for the visual memory test, the test of researcher Muhammad Aboudi Hussein (Muhammad Aboudi Hussein, 2021, p. 94) was chosen, as the test consisted of (20) paragraphs that the examinee answers according to a correction key (see Appendix 2).

To put the tests into practice, they were shown to the experts (refer to Appendix 3) so that they could assess and judge them for validity. The researcher determined the value of (Ka2) based on the experts' agreement, and it was accepted as valid with a 100% agreement rate.

Tests of visual memory and abilities: An exploratory experiment On December 11, 2023, the exploratory experiment was carried out on ten judges from the Babil Governorate, and the results showed: To identify the negatives and positives before conducting the main test.

The following was discovered by the experiment

- The judges' directions were unambiguous.
- The tests were suitable for the given sample.
- The stability coefficient was extracted.

Procedures for constructing the creativity awareness scale

Identifying the creativity awareness scale's objective: The goal of was determined as the goal of creativity awareness was to measure the creativity awareness of basketball referees in Iraq.

Identifying the creativity awareness scale's theoretical foundation: The theoretical definition was relied upon in developing, specifying and formulating the paragraphs.

Developing the initial formula for the creativity awareness scale: To develop the initial formula for the scale, several scientific steps were taken, which were summarized as follows:

Collecting and preparing the paragraphs in the initial formula: In order to collect the paragraphs of the scale, the scales were reviewed and the researcher prepared some of the paragraphs, so the total number became (2) paragraphs (see Appendix 4).

Determining the style and foundations of formulating the initial paragraphs: formulating was determined form of declarative phrases and the first-person formula was used

to unify the style of the paragraphs. The researcher took into account important matters when formulating the paragraphs, which are: (Amer Saeed Al-Khaikani and Ayman Hani Al-Jabouri, 2016, p. 59) [5]

- That the paragraph has one meaning.
- That each paragraph is independent from the others.
- Avoiding the use of the negation of the negation style.
- Excluding complex and compound paragraphs.
- Putting relatively short phrases or paragraphs.
- The phrases or paragraphs must be clear and not ambiguous.

Choosing answer alternatives: The answer alternatives for the scale were chosen from the formula of choosing from three alternatives (always, sometimes, rarely).

Determining the paragraphs on creativity awareness's validity: The scale was presented to the experts (see Appendix 4) after the paragraphs had been gathered, prepared, and the answer alternatives had been determined. Appendix (3) states identifies the positive negative, deletes the invalid ones, and indicates the possibility of modifying them. The scale's paragraphs were all accepted with 100% agreement. The researcher forwarded the scale's paragraphs to M.M. Ahmed Hassan Mohammed, an expert in Arabic, after confirming their validity to ensure they were accurate and devoid of grammatical problems. The comments and modifications he made were taken into account, and thus the scale is free of linguistic errors. 2-4-2-4 Preparing the instructions for the creativity awareness scale: Instructions for answering were prepared, see Appendix (4). 2-4-2-5 Pilot experiment for the creativity awareness scale: The pilot experiment was conducted on 12/11/2023 on (10) judges from Babil Governorate, to reveal the following:

Objectives of the experiment:

- Ensure the stability of the scale.
- Know the drawbacks and advantages the researcher experiences prior to carrying out the primary test.
- Identify time taken to answer the scale.
- Identify the judges' understanding and clarity.

The most important results:

- The stability of the scale was identified.
- It took an average of seven minutes to complete the scale.
- Instructions were clear from the judges.
- The efficiency of the support team and its understanding of the nature of the work.

The main The creativity awareness scale experiment: The construction sample was subjected to the scale. of (80) judges for the period from 15/12/2023 to 21/12/2023.

Correction of the creativity awareness scale: After applying the scale and collecting the answer forms, were extracted prepared by the researcher.

Objectivity of response: (3) paragraphs were selected from each scale, then paragraphs similar to them in meaning and content but different in text were formulated, and the following procedures were taken: (Abdul Majeed Sayed Ahmed (and others), 2000, p. 77) [7]

- Paragraphs (5-21), (10-22) and (15-23) of the creativity awareness scale were repeated.
- Extracting the absolute differences between the original and repeated scores for comparable passages in each form.
- Determining the absolute variations in these scores for every sample member.
- Calculating the standard deviation and arithmetic mean for the sums of these absolute differences.
- To determine the verbal score at which or without which any judge's responses from the sample were given, the arithmetic mean and standard deviation were gathered. members are accepted, and when these forms were subject to the objectivity of response and the previous procedures were applied, no form was excluded and all of them are valid for analysis purposes.

The two extreme categories in terms of their capacity for discrimination: Since is known as discriminating power, the two extreme groups method is a suitable technique for analyzing the paragraphs in order to identify the paragraphs with high distinction." (Qasim Hamid, 2003, p. 32) [8].

The researcher verified the paragraph's ability to distinguish Utilizing the two extreme groups and the construction sample form data totaling eighty judges, the researcher computed the paragraphs' discriminating capacity by following these methods:-

- Arranging the judges' ratings on a scale that goes from lowest to highest.
- Assigning the forms 33% of the highest and 33% of the lowest scores allows for the creation of two groups with the greatest size and distinction conceivable, as each group's sample size reaches 26 judges.
- creativity awareness scale by comparing the arithmetic means of the two extreme groups at each paragraph and testing.

Analysis of The creativity awareness scale's paragraphs :

Table 1: Provides a statistical overview of the creativity awareness scale

No.	Minimums 33%		Upper limits 33%		Calculated value of (t)	Sig value	Power of paragraph Distinction
	Mean	Standard deviation	Mean	Standard deviation			
1	1.00	0.000	2.64	0.48	13.78	0.000	Distinction
2	1.00	0.000	2.72	0.38	14.97	0.000	Distinction
3	1.00	0.000	2.94	0.24	33.00	0.000	Distinction
4	1.00	0.000	2.91	0.25	36.44	0.000	Distinction
5	1.00	0.000	2.55	0.44	12.98	0.000	Distinction
6	1.00	0.000	2.59	0.50	12.90	0.000	Distinction
7	1.23	0.42	2.77	0.42	10.19	0.000	Distinction
8	1.17	0.39	2.72	0.40	11.13	0.000	Distinction
9	1.05	0.24	3.00	0.000	33.12	0.000	Distinction
10	1.18	0.36	3.00	0.000	19.13	0.000	Distinction
11	1.00	0.000	2.86	0.31	23.36	0.000	Distinction
12	1.00	0.000	2.96	0.20	33.44	0.000	Distinction
13	1.00	0.00	2.97	0.21	33.88	0.000	Distinction
14	1.33	0.32	3.00	0.000	24.56	0.000	Distinction
15	1.21	0.25	2.71	0.42	10.21	0.000	Distinction
16	1.00	0.000	2.84	0.36	19.44	0.000	Distinction
17	1.00	0.000	2.64	0.44	27.32	0.000	Distinction
18	1.00	0.000	2.92	0.24	33.14	0.000	Distinction
19	1.00	0.000	2.89	0.29	23.36	0.000	Distinction
20	1.42	0.54	3.00	0.000	25.40	0.000	Distinction

Internal consistency coefficient: When assessing the observed behavioral phenomenon, the internal consistency coefficient is utilized to ascertain how uniform the paragraphs are. The researcher will use this method to distinguish it as follows: (Amer Saeed Al-Khaikani and Ayman Hani Al-Jabouri, 2017, p. 88) [9]

- It provides provides us with a uniform scale across its paragraphs, meaning that every paragraph assesses the

same behavioral dimension as the scale as a whole does.

- The scale's discriminating power and the paragraph's discriminating power are comparable.
- The capacity to draw attention to the relationship between the scale's paragraphs.

Table 2: The correlation coefficient between each paragraph's score and the overall sum of the creativity awareness scale is displayed in

No.	R value	Sig value	Significance	No.	R value	Sig value	Significance
1	0.40	0.000	Sig	11	0.42	0.000	Sig
2	0.48	0.000	Sig	12	0.48	0.000	Sig
3	0.43	0.000	Sig	13	0.46	0.000	Sig
4	0.46	0.000	Sig	14	0.43	0.000	Sig
5	0.44	0.000	Sig	15	0.40	0.000	Sig
6	0.41	0.000	Sig	16	0.44	0.000	Sig
7	0.47	0.000	Sig	17	0.40	0.000	Sig
8	0.49	0.000	Sig	18	0.43	0.000	Sig
9	0.41	0.000	Sig	19	0.46	0.000	Sig
10	0.44	0.000	Sig	20	0.43	0.000	Sig

Thus, the scale is ready for application to the application sample. See Appendix (4).

2- Scientific transactions for visual abilities and visual memory tests

- **Test validity:** The most crucial component of test and scale quality criteria is their degree of validity. A test that precisely measures the phenomenon it was intended to assess and does not measure anything in addition to or instead of it is said to be legitimate. (Page 102) Mustafa Mahmoud Al-Imam (and others)
- Depending on how the exam is used, validity can indicate different things. In other words, a valid test measures the function it is intended to assess and does not measure anything else in addition to or instead of it. This is known as validity. (Mustafa Hussein Bahi and Ikhlas Muhammad Abd al-Hafiz, 2000, p. 173) ^[11]
- **Content validity:** When determining whether a test measures a particular aspect of a phenomenon or all of it, this type of validity seeks to determine how well the test reflects the characteristic that needs to be measured. In other words, how well the test's content aligns with its intended measurement and how it uses the opinions of experts in the field to determine its validity. Muhammad Nasr al-Din Radwan and Muhammad Hasan Alawi (2000) ^[12], p. 258
- By presenting the tests and scales to a group of experts and professionals, the researcher was able to confirm the validity of the tests using the content validity index. Refer to Appendix (3) for confirmation.

- **Validity of the hypothetical structure:** The researcher verified the validity of the hypothetical structure or construction using the following methods:
- Finding the discrimination coefficient using the two extreme groups, which was relied upon to keep the paragraphs with high distinction, as in Tables (1).
- Internal consistency: The researcher used this method when he found the
- **Test stability:** One of the fundamental ideas in measurement is stability, which the scale must have in order to be considered usable (Sabah Hussein Al-Ajili (and others), 2001, p. 78) ^[13]. Testing and retesting were used to determine the test stability coefficient. The test was administered on December 11, 2023, and it was repeated on the same day. If the value of (r) reached (0.90) for visual motor ability, (0.92) for visual reaction speed, (0.89) for depth perception, (0.91) for visual tracking, (0.94) for visual memory, and (0.87) for the creativity awareness scale, the researcher concluded that all tests have a high degree of stability after emptying the data.
- **Objectivity of the tests:** As long as all tests and the scale have a correction key prepared for each of them, the testers' scores in the tests and the scale are objective when correcting.

Setting levels for tests of the most important visual abilities, visual memory, and awareness of creativity:

In order to evaluate the level of the most important visual abilities, visual memory, and awareness of creativity, levels were set for these tests as shown in Table (3).

Table 3: Shows the levels and their limits in raw scores and their significance in tests of the most important visual abilities, visual memory, and awareness of creativity

Variables	Level	Define them in raw degrees.	Its significance is the measure
Visual abilities tests	First	0-2	Very low
	Second	3-4	Low
	Third	5-6	Acceptable
	Fourth	7-8	High
	Fifth	9-10	Very high
Visual memory test	First	0-4	Very low
	Second	5-8	Low
	Third	9-12	Acceptable
	Fourth	13-16	High
	Fifth	17-20	Very high
Creativity awareness scale	First	0-12	Very low
	Second	13-24	Low
	Third	25-36	Acceptable
	Fourth	37-48	High
	Fifth	49-60	Very high

Application of tests and scales on the application sample:

After the completion of the preparation of the measurement tools, On 10-12/2/2024, the researcher and assistance staff applied them to the application sample, which consisted of 45 referees, in the control course that was held in the People's Sports Hall in the Baghdad Governorate (see Appendix 5). The findings were gathered in order to determine the level of the most important visual abilities, visual memory, and awareness of creativity for basketball referees in Iraq and to achieve the research objectives.

Statistical techniques: The researcher extracted the statistical techniques discussed in the research article using the Statistical Package for Social Sciences, 25th edition.

Presentation, analysis, and discussion of the results: This section includes presenting the results that were reached, analyzing them, and discussing them according to the sequence of the main research objectives.

(Knowing the level of the most important visual abilities, visual memory and awareness of creativity for basketball referees in Iraq): In order to achieve this goal, the tests and scale were:

Visual abilities

The statistical explanation of the findings is displayed in**Table 4:** Tests of the most important visual abilities for basketball referees

The most important visual abilities	Unit of measure	Arithmetic mean	Standard deviation	Coefficient of skewness	Calculated value of (t)	Sig value	Type of indication
Visual motor ability	Degree	6.14	0.53	0.12	22.18	0.000	Sig
Visual reaction speed	Degree	6.33	0.71	0.08	24.19	0.000	Sig
Depth perception of vision	Degree	6.22	0.66	0.52	28.11	0.000	Sig
Visual tracking	Degree	6.47	0.57	0.16	26.36	0.000	Sig

Given that the visual motor ability test's arithmetic mean was 6.14, its standard deviation was 0.53, and its skewness coefficient was 0.12, the results of the most significant visual abilities test for basketball referees are displayed in Table (4). This suggests that the research sample members' test scores are distributed moderately. The research sample's average test scores were found to be at an acceptable level when compared to the predetermined level, indicating that the sample possesses an adequate level of visual motor ability. To ascertain whether the differences are statistically significant, One sample was subjected to the t-test; the calculated t-value was 22.18, which is significant since the degree of freedom is (44), and the sig value of (0.000) is less than the significance level (0.05). The visual reaction speed test results are displayed in Table (4). The arithmetic mean, standard deviation, and skewness coefficient were 6.33, 0.71, and 0.08 respectively, indicating that the research sample's test scores are moderately distributed. The research sample's average test scores were found to be at an acceptable level when compared to the predetermined level, indicating that the sample's visual mobility ability is acceptable.. The t-test was used for one sample to assess the statistical significance of the differences since the degree of freedom is (44), and the calculated (t) value was (24.19), which is significant because the (sig) value of (0.000) is less than the significance level (0.05). The depth perception test results are displayed in Table (4). The arithmetic mean,

standard deviation, and skewness coefficient were 6.22, 0.66, and 0.52 respectively, indicating that the research sample's test scores are moderately dispersed. The research sample's average test results were found to be at an acceptable level when compared to the predetermined threshold. This indicates that the depth perception of the sample is satisfactory. The calculated (t) value was (28.11), which is significant because the (sig) value of (0.000) is smaller than the significance threshold (0.05), and the degree of freedom is (44). The t-test was employed for a single sample in order to ascertain the statistical significance of the differences. The visual tracking test results are displayed in Table (4), where the skewness coefficient was 0.16, the standard deviation was 0.67, and the arithmetic mean was 6.47. which shows that the test scores of the research sample individuals are distributed moderately. The average test scores of the research sample were found to be at the acceptable level when compared to the level that was set, indicating that the sample has acceptable visual tracking. The t-test was used for a single sample to determine the statistical significance of the differences, and the calculated (t) value was 26.36, which is significant because the degree of freedom is 44 and the (sig) value of 0.000 is smaller than the significance level (0.05).

Visual memory**Table 5:** Shows the statistical description of the visual memory test for basketball referees

Unit of measure	Arithmetic mean	Standard deviation	Coefficient of skewness	Calculated value of (t)	Sig value	Type of significance
degree	12.33	1.16	0.62	24.17	0.000	sig

As can be seen from Table (5), the visual memory test scores of the research sample participants are moderately distributed, with an arithmetic mean of 12.33, a standard deviation of 1.16, and a skewness coefficient of 0.62. The research sample's average test scores were found to be at an acceptable level when compared to the predetermined level, indicating that the sample's visual memory is adequate. The

t-test was utilized for a single sample to ascertain the statistical significance of the differences; the computed (t) value came to (24.17), which is significant since the (sig) value of (0.000) is less than the significance level.

Awareness of creativity**Table 6:** Displays the scale's statistical description awareness of creativity for basketball referees

Unit of measure	Arithmetic mean	Standard deviation	Coefficient of skewness	Calculated value of (t)	Sig value	Type of significance
Degree	35.44	0.79	0.74	18.22	0.000	sig

As can be seen from Table (6), the creativity awareness scale scores of the research sample members are moderately distributed, with an arithmetic mean of 35.44, a standard deviation of 0.79, and a skewness coefficient of 0.74. The research sample's average scores on the scale were found to be at an acceptable level when compared to the predetermined level. This indicates that the sample's degree of creativity awareness is acceptable. The t-test was utilized for one sample to ascertain the statistical significance of the differences since the computed (t) value came to 18.22,

which is significant as the (sig) value of (0.000) is less than the significance threshold (0.05). is (44). The researcher attributes the referees' possession of an acceptable level to the fact that most of the referees are at the beginning of their refereeing career, as well as their focus on the aspect of physical fitness and legal knowledge and their lack of interest in developing the variables that have been studied, on the one hand, and on the other hand, the referees behave in an acceptable manner with the different playing situations and conditions and what the basketball refereeing

mechanism requires, which ultimately leads to implementing the match requirements but in an acceptable and this results in the referees making the correct decisions and carrying them out in accordance with the situation and circumstances that the referee encounters in the research variables. The current research variables are crucial for attaining favorable outcomes and ensuring the safety of the matches in the majority of games and sporting events, particularly when it comes to officiating basketball games, which demand a lot of work and constant effort throughout the game. According to the statement that "the match must be focused on, prepared, and actually ready for it, and the referees must possess it because it can cause an increase in the level of excitement and memory and direct attention to what is happening within the match, which leads to making the right decisions, and this matter is in the referee's favor, and finally the referee wants to enter a state of feeling positive and appropriate physical activity (especially the current research variables)," the current research variables play a significant role and are important in the referees' performance. (Tiris Odisho Anuya, 2002, p. 108) ^[14]

Referees must demonstrate a high level of awareness of creativity and they must have a personality prepared to provide creative solutions and that they are aware of everything that is sensory and physical, meaning they have the ability to transfer the results of the creative act to the inside of the field through distinguished performance in matches. The researcher also believes that basketball refereeing plays its role in inspiring and bringing out the creative energies of referees in order to prove their presence on the playing field, as "Nouri Jaafar believes that creativity derives its content and substance from the social environment, so two factors must be present together, namely the physical factor that provides creativity with its foundation, and the environmental factor that prepares creativity with its content, and there must be a third factor that is no less important and influential than them, which is the psychological factor that pushes its owner to invest the maximum amount of his mental, or mental, and physical (motor) balance in reaching what he aspires to" (Nouri Jaafar, 1986, p. 22).

Conclusions and Recommendations

Conclusions

- The ability of the most important visual abilities tests, which were applied and five levels were set for it, to measure the level of visual abilities among basketball referees.
- The ability of the visual memory test with (20) paragraphs, which was applied and five levels were set for it, to measure the level of visual memory among basketball referees.
- The ability of the creativity awareness scale with (20) paragraphs, which was built and applied and five levels were set for it, to measure the level of creativity awareness among basketball referees.
- Basketball referees have visual abilities, visual memory and creativity awareness at an acceptable level.

Recommendations

- Benefit from the tests of the most important visual abilities, visual memory and creativity awareness, which were applied to reveal these important variables for basketball referees.

- Using the most important visual abilities, visual memory and creativity awareness tests to select basketball referees.
- The necessity of developing training and guidance programs for basketball referees based on the most important visual abilities, visual memory and creativity awareness tests.
- Benefiting from these tests and applying them to novice referees to know their level and to samples in other games.
- Placing the most important visual abilities, visual memory and creativity awareness tests in the hands of the Iraqi Central Basketball Federation, the referees committee and researchers to test their samples accurately.

Conflict of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix (1)

Questionnaire to survey the opinions of specialists on the validity of visual abilities tests

Dear Professor.....

Greetings:-

The researcher aims to conduct his research entitled (Evaluation of the level of the most important visual abilities, visual memory and awareness of creativity for basketball referees in Iraq). Given your scientific and practical experience in your field of specialization, I would be grateful if you could provide possible assistance regarding determining the validity of the (visual abilities of basketball referees) tests, by placing a mark (√) in the selected box. You can also make any observation that the specialist finds important and was not included in the form. Thank you very much.

Name of the expert:-

Title, academic degree and date of obtaining:-

Specialization:-

Place of work:-

Signature:-

Date:-

No.	The most important visual abilities for basketball referees	Suitable	Write off	Notes
1	Visual movement ability			
2	Visual reaction speed			
3	Visual depth perception			
4	Visual tracking			

First: Test name: Visual-Movement Ability Test

- Test objective: Measure visual-move ability.
- Required tools: Half a basketball court, 5 aluminum squares measuring (30 x 30 cm), whistle, measuring tape.
- Test specifications: The test is conducted in half a basketball court and colored aluminum squares are distributed in areas (lead left. lead close down. lead right. trail. center), the referee is required to stand on the starting line in the central circle and face the middle of the second court and upon hearing the order from the tester to give the color of the square randomly, the referee runs to the correct square and then gives one of the arbitration decisions called by the tester, after which the referee runs back to the same place to continue completing the rest of the squares, as shown in the figure below.

Recording

- Two points are given for each correct attempt, which comes from (1) point for reaching the correct place and (1) point for the correct decision.
- Zero is given for each incorrect attempt.
- The highest grade that can be obtained is (10) grades.
-

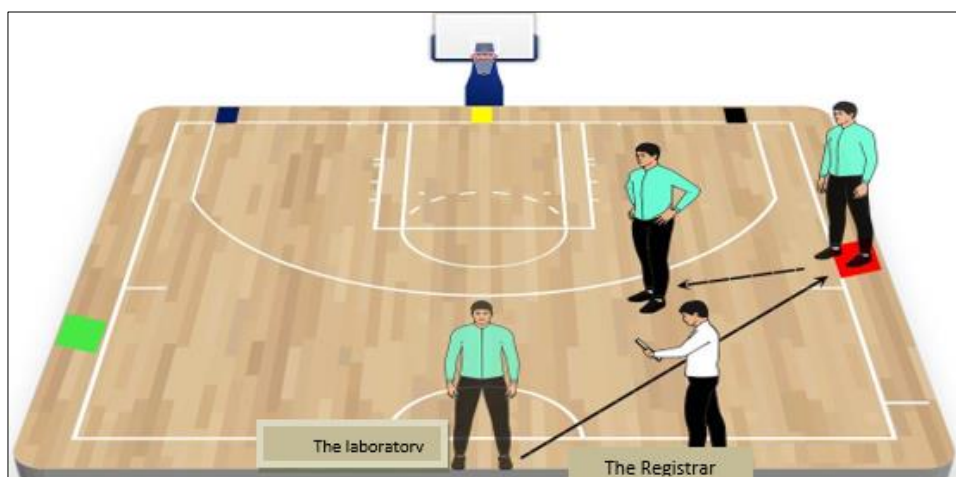


Fig 1: The figure shows the visual-motor ability test

Test name: Visual reaction speed

- **Test objective:** Measuring visual reaction speed.
- **Required tools:** Half basketball court, measuring tape, whistle, 5 aluminum squares measuring (30 x 30 cm) numbered from (1 to 5), stopwatch.
- **Test specifications:** The test is conducted in half basketball court, divided into five areas distributed in (lead left. lead close down. lead right. trail. centre), and the referee is required to stand in the middle of the central circle and face the other middle of the court. After hearing the command, the referee quickly moves to the square that carries the same command, and then the referee runs back to the same place to continue completing the rest of the squares, and the timekeeper calculates the time from the moment the command is heard until the moment of reaching the correct square, as shown in the figure below.

Registration

- The average score is calculated in the (5) attempts, which are as follows:-
- If the test ends in (3) seconds, (10) points are given.
- If the test ends in (4) seconds, (8) points are given.
- If the test ends in (5) seconds, (6) points are given.
- If the test ends in (6) seconds, (4) points are given.
- If the test ends in (7) seconds, (2) points are given.
- Zero is given for each attempt that exceeds (8) seconds and for each incorrect attempt.



Fig 2: The figure shows the visual reaction speed test

Test name: Depth perception test

- **Test objective:** Measure depth perception.
- **Required tools:** Basketball court, measuring tape, adhesive tape.
- **Test specifications:** The test is conducted in the basketball court, which is divided into (7) areas, each area is (4m) in size, and the areas are numbered from (1-5), starting from the third to the seventh area. The referee stands on the starting line, which is (1m) away from the outer borders of the court, and is blindfolded. He must give the number of the area he wants to go to, and then run to that area. When stopping in the area, the blindfold is lifted to see the extent to which the number he gave matches the place, and then return to complete the remaining attempts under the same performance conditions, as shown in the figure below.

Recording

- Five attempts are given to each tested individual.
- Two points are given for each correct attempt.
- A point is given when stopping on the line in the correct area.
- Zero is given for each incorrect attempt.
- The highest grade that can be obtained is (10) grades.



Fig 3: The figure shows the depth perception test

Test name: Visual tracking test

- **Test objective:** Measure visual tracking.
- **Required tools:** Half basketball court, 10 aluminum squares measuring (30 x 30 cm), a plastic table measuring 1m x 1.20m, a whistle, a measuring tape.
- **Test specifications:** The test is conducted in half basketball court and the (5) aluminum squares are distributed in areas (lead left. lead close down. lead right. trail. centre), and the referee is required to stand on the starting line in the central circle with his face facing the other middle and the referee takes one of the other (5) squares on the table whose colors are similar to the same squares mentioned in the areas above, and upon hearing the command, the referee takes the square and then returns to the same starting place in the middle of the central circle to complete the rest of the squares, as shown in the figure below.

Recording

- (2) points are given for each correct attempt.
- Zero is given for each incorrect attempt.
- The highest score that can be obtained is (10) points.

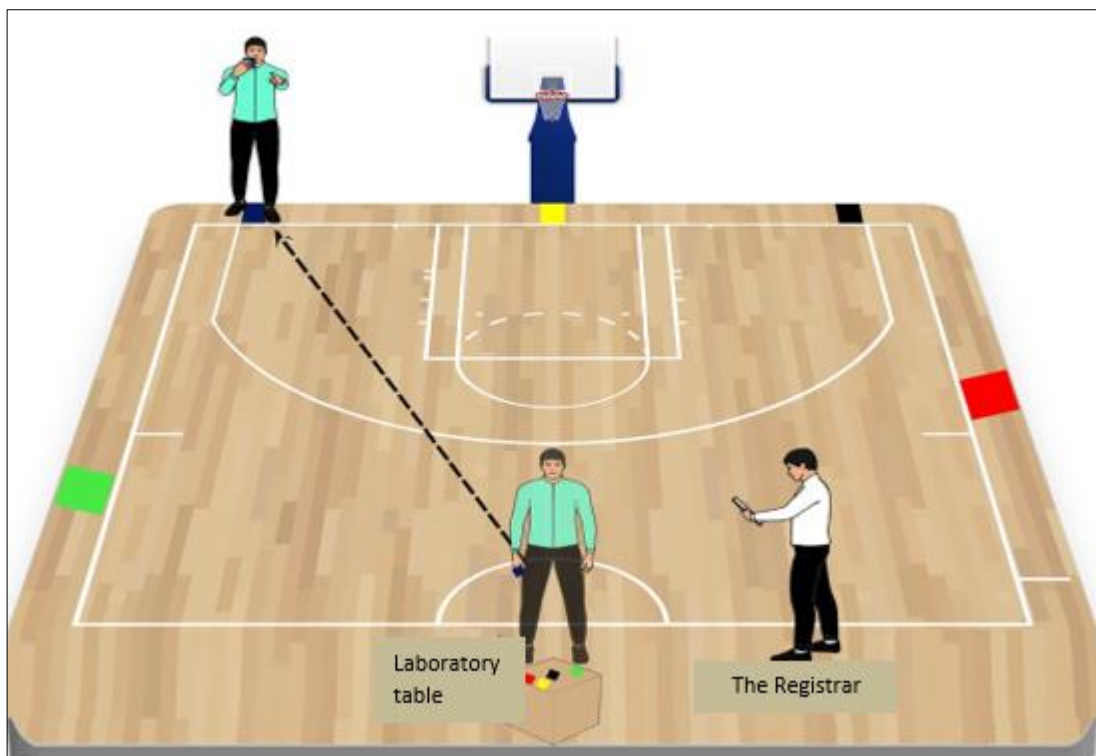


Fig 4: The figure shows the visual tracking test

Appendix (2) shows the questionnaire for determining the validity of the visual memory test

Professor Dr. Respected

Greetings:

The researcher aims to conduct his research entitled (Evaluating the level of the most important visual abilities, visual memory and awareness of creativity for basketball referees in Iraq). Due to the scientific status you enjoy, you have been selected to the (Visual Memory) Test Validity Committee. The test consists of (20) refereeing situations. In order to put it in its final form, the

researcher believes that scientific integrity requires him to present this test to you, hoping that you will kindly agree to read it and mark (✓) in the appropriate column, and make any observation that the specialist finds important and is not included in the form. We appreciate your cooperation with me in the service of scientific research.

Photographic memory	It is suitable	It is not suitable	Needs to be modified
	✓		

Signature
 Name of the expert:
 Academic title and date:
 Specialization:
 Place of work:

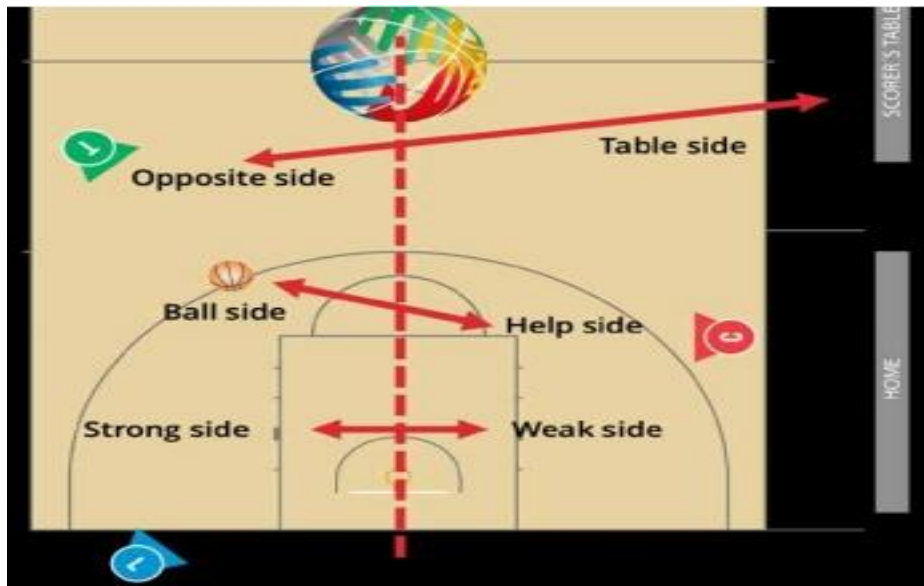


Fig 5: In the picture above, the late referee is always facing the scoreboard (yes, no)



Fig 6: In the picture above, the referee (crew chief) is sometimes in the middle of the field when the match starts (yes, no).



Fig 7: In the above picture, the coverage when a foul occurs in zones 1 and 2 is the responsibility of the forward referee (yes, no)

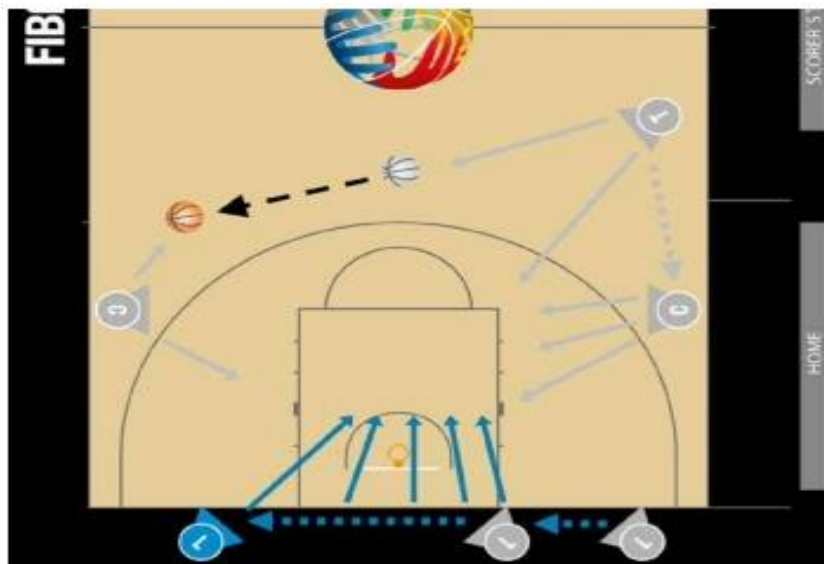


Fig 8: In the picture above, one of the duties of the advanced referee during the turn is to calculate the error or violation (yes, no)



Fig 9: In the picture above the center referee must stay with the back referee until the end of the round (yes, no)



Fig 10: In the picture above, the forward referee must run quickly to the end of the field in a diagonal manner (yes, no)



Fig 11: In the picture above, during a quick attack, the center referee must run quickly until the team takes control of the ball (yes, no)

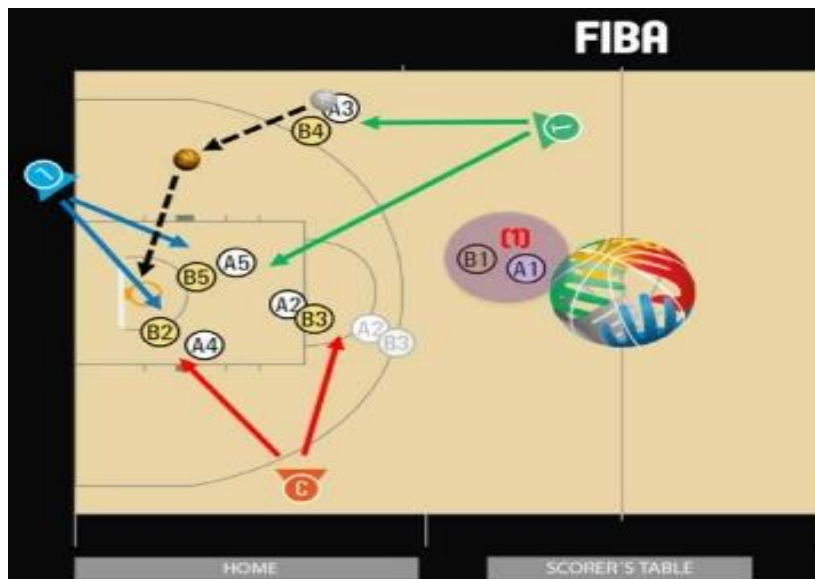


Fig 12: In the picture above when shooting from the strong zone the forward referee must be close to the basket (yes, no)



Fig 13: In the picture above the ball always remains in the front zone at the double whistle by (T.C)(Yes, No)

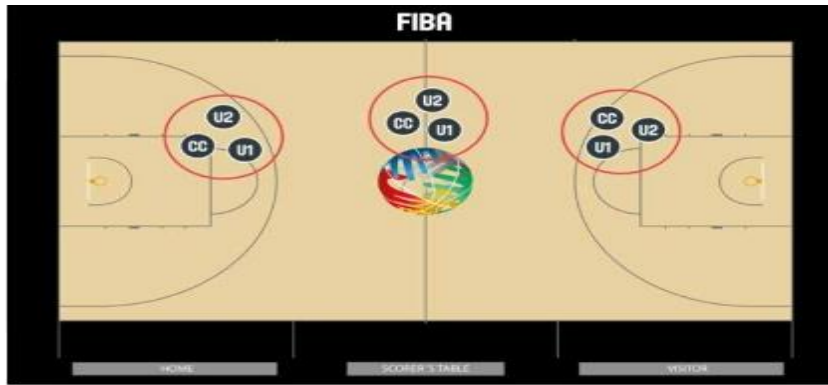


Fig 14: The picture above shows the permanent positions of the referees during the time-out (yes, no)



Fig 15: In the picture above, (T.C) is always in the back zone when the defense is pressing (yes, no)



Fig 16: In the picture above the referee is centered on the free throw extension (yes, no)



Fig 17: In the picture above the forward referee must give the center referee credit when he is on the opposite side (Yes, No)

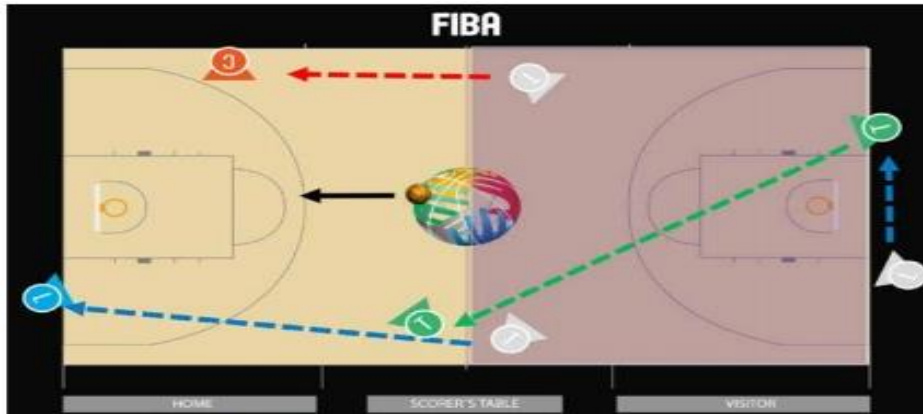


Fig 18: In the picture above when the ball goes to the other side referee C is always in control of the field (yes, no)



Fig 19: In the picture above U1 always goes to the right side towards the jump and becomes advanced (yes, no)



Fig 20: In the picture above when the foul is near the referee T it is possible for him to enter the field in order to watch the referees (yes, no)



Fig 21: In the picture above, the referee who called the foul should be facing the scoreboard (yes, no)



Fig 22: In the picture above the referee must cover his half of the field quickly when there is a fastbreak (yes, no)



Fig 23: In the picture above, referee C's duties during a free throw are to monitor the referee executing the free throw. (Yes, No)

Photographic Memory Test Correction Key

NO.	Answer	NO.	Answer
1	Yes	11	Yes
2	No	12	Yes
3	Yes	13	Yes
4	No	14	Yes
5	Yes	15	Yes
6	No	16	Yes
7	Yes	17	Yes
8	No	18	Yes
9	No	19	Yes
10	Yes	20	Yes

Appendix (3) shows a table with the names of the experts that the researcher relied on in his research procedures.

NO.	Expert name	Specialization	Affiliations
1	Prof. Dr. Amer Saeed Jassim Al-Khaikani	Sports Psychology	College of Physical Education and Sports Sciences / University of Babylon
2	Prof. Dr. Ali Samoum Daghil Al-Fartousi	Test and Measurement - Basketball	Al-Mustansiriya University - College of Physical Education and Sports Sciences
3	Prof. Dr. Nasr Hussein Abdul Amir	Sports Training - Basketball	College of Physical Education and Sports Sciences - University of Babylon
4	Prof. Dr. Adi Abdul Hussein	Basketball Testing and Measurement	College of Physical Education and Sports Sciences - University of Diyala
5	Prof. Dr. Abdul Moneim Ahmed Jassim	Testing and Measurement	College of Physical Education and Sports Sciences / Tikrit University
6	Assist. Prof. Dr. Ahmed Rafid Hamid	Basketball Test and Measurement	College of Physical Education and Sports Sciences - University of Diyala
7	Assist. Prof. Dr. Bashar Abdul Latif	Motor Learning - Basketball	College of Physical Education and Sports Sciences / Al-Qasim Green University

8	Assist. Prof. Dr. Ahmed Kazem Abdul Karim	Test and Measurement	College of Education for Girls - Department of Physical Education and Sports Sciences / University of Kufa
9	Assist. Prof. Dr. Ali Ashour Obaid	Test and Measure	College of Physical Education and Sports Sciences / University of Basra
10	Assist. Prof. Dr. Nizar Ali Jabbar	Test and Measure	College of Physical Education and Sports Sciences / University of Diyala

Appendix (4) shows the questionnaire for determining the validity of the creativity awareness scale

Professor Dr. Respected

Greetings: The researcher aims to conduct his research entitled (Evaluating the level of the most important visual abilities, visual memory and creativity awareness of basketball referees in Iraq). Due to the scientific status you enjoy, you have been selected to the committee for the validity of the (creativity awareness) scale. The test consists of (20) paragraphs. In order to put it in its final form, the researcher believes that scientific integrity requires him to present these paragraphs to you, hoping that you will kindly agree to read them and mark (✓) in the appropriate column, and make any observation that the specialist finds important and is not included in the form. We appreciate your cooperation with me in the service of scientific research.

Awareness of creativity	It is suitable	It is not suitable	Needs to be modified

Signature

Expert Name:

Scientific Title and Date:

Specialization:

Place of Work:

The final version of the creativity awareness scale

Dear referee:

Greetings: In your hands are paragraphs that represent personal qualities and characteristics in your sports life. Please indicate the extent to which they apply to you by answering the paragraphs in front of you and not leaving any paragraph unanswered by putting a check mark (✓) in front of the alternative that you see applies to you. There is no right or wrong answer, and remember that your answer is for scientific research purposes, so there is no need to mention the name.

Example of the answer:-

NO.	Paragraphs	Always	Sometimes	Rarely
1	My limbs tremble when I face a problem when refereeing any match	✓		

Thank you for your cooperation

NO.	Paragraphs	Always	Sometimes	Rarely
1	I have the ability to organize my thoughts quickly while refereeing any match			
2	I express my decisions freely on the field			
3	I am aware of the refereeing matters that are taking place in the match			
4	I am committed to performing the refereeing task with perseverance			
5	My style is appropriate to face different situations in refereeing			
6	I have information that helps me in discussions with my fellow referees			
7	I apply my knowledge of the law in the match			
8	I have the ability to deal with information according to its importance			
9	I seek to discover information in the world of basketball refereeing			
10	My heartbeat increases when I face any problem during the match			
11	I am calm when I am under pressure from the crowd			
12	When I find a solution to the problem, I give myself some time to contemplate creative solutions			
13	I tend to have creative ideas in the world of basketball			
14	I feel that I have creative ideas when talking to my fellow referees			
15	I get along with my fellow referees			
16	I respect the opinions and ideas of others			
17	I challenge difficult situations and cases during the match creatively			
18	I identify and organize creative ideas related to solving the problem to implement them			
19	I have the ability to predict problems before they occur in the match			
20	I feel anxious when I referee for strong teams			

Appendix (5): Shows a table showing the names of the assistant work team, their specializations and addresses.

NO.	Name	Specialization	Affiliations
1	Dr. Mohammed Hassan Shaalan	PhD in Physical Education and Sports Sciences - International Referee	Babylon Governorate
2	Dr. Hassanein Jumaa Asri	PhD in Physical Education and Sports Sciences	Babylon Governorate
3	Assis t.Lec. Haider Salman Mazloun	Master in Physical Education and Sports Sciences	Najaf Governorate
4	Jawad Hassan Shaalan	International Basketball Referee	Babylon Governorate