

Comparison Of The Senses Of Balance And Proprioception Between Some Individual And Team Sports Players (A Comparative Study)

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Abstract

The purpose of this paper is to design a test to measure (proprioception)

Identifying the level of the senses of balance and proprioception of some individual and team sport players, identifying the relationship between the senses of balance and proprioception among some individual sport players, identifying the relationship between the senses of balance and proprioception among some team sport players, identifying the relationship between the senses of balance and proprioception among some individual and team players. The researchers used the descriptive approach using the survey method and correlational studies as a better method to solve the research problem due to its suitability and the nature of the current study. The research community included a group of local club players in Iraq. The sample included 40 players, 10 of whom were excluded from conducting exploratory experiments. They distributed 20 players who represented individual games, including 5 table tennis players, 5 tennis players and 5 athletics players and 5 badminton players and 20 players represented the team games, including 5 futsal players, 5 volleyball players, 5 basketball players and 5 football players. One of the most important results reached by the researcher is that: The test designed by researchers to measure (proprioception) has proven its efficiency, players of individual and team games have a high level of balance and proprioception, there is no significant correlation between balance and proprioception for individual games, there is a significant correlation between balance and proprioception of team games, there is no significant correlation between individual games and team games in the variable of proprioception, and there is a significant correlation between individual games and team games in the equilibrium variable. One of the most important recommendations recommended by the researchers is that: Adopting the (AINWYNI) test for receiving proprioception in measuring athletes in research and studies, paying attention to the development of the senses related to the sports aspect in terms of measurement and training, paying attention to the psychological aspect, like all other aspects of tactical, physical and skill training, develop training programs that take into account the efficiency of sensory receptors, including proprioception and balance, conducting similar research on different samples in the research variables, and conducting a comparative study between male and female athletes in the variable

Keyword: proprioception, balance, sensation, senses, AINWYNI Proprioceptive Test.

Introduction:

Since sensation represents the beginning of the sequence in the stages of mental processes in

terms of temporal progression, not hierarchy, then the sensation is at the fore in the order of the premises that produce a mental decisions and on the other hand, it represents the gate through which the raw material enters and which the mind adopts in its processes (its simple, complex and complex operations). Hence the importance of studying sensation in its various types and forms, considering that it represents by its total machines (eye, ear, nose, tongue, sensory cells in the skin-sensory sensors-) the input devices into the electronic calculator in the present era if so to speak. The motherboard) via one of the input devices (mouse, keyboard, scanner - scanner, floppy disk, CD, floppy and other innovations such as flash, which is an input and storage unit at the same time). Many may think that the senses are only five, but psychologists and medicine have added two senses, which are the sense of balance and responsible for the vestibular system and the sense of proprioception (the sense of body position), and at a time when modern training methods have developed in all its fields, but they did not give the mental aspect sufficient importance, especially The senses working in each sport in order to train and activate those sensations, which are not limited to the five senses, but go beyond that with other sensations such as a sense of balance and a sense of body position (proprioception) that can be detected within the requirements and privacy of the sport.

The importance of the research lies in designing a special test to measure proprioception for athletes, as well as identifying the level of proprioception variables, balance, and the relationship between them between some individual and team sport players.

Research problem:

The senses are the entrance through which the organism can identify the things that are mostly in its external world, and through the senses, it can conform to the different and appropriate responses in the environment in which it lives (Stimuli) and the internal mental aspect that

explains the stimuli and how to deal with them with responses appropriate to the cognitive experience of the player, among these sensations is the sense of balance, which may differ from dynamic balance because each sense depends on a specific sensory receptor and device, and the perception of proprioception, which is sometimes called the sense of body position, which is considered one of the most important sensations in the sports field, and the research problem is summarized by the lack of attention of most trainers to the senses. The aforementioned measurement and training so that they can prepare the most appropriate training program in some individual and team games, and the absence of a test to measure proprioception, in addition to the necessity of separating individual and group training according to individual differences.

Research objective:

1. Design a test to measure (proprioception)
2. Identifying the level of the senses of balance and proprioception of some individual and team sport players.
3. Identifying the relationship between the senses of balance and proprioception among some individual sport players.
4. Identifying the relationship between the senses of balance and proprioception among some team sport players.
5. Comparison the relationship between the senses of balance and proprioception among some individual and team players.

Research hypotheses:

- There is a correlation between the senses of balance and proprioception among some individual sport players.
- There is a correlation between the sense of balance and the perception of proprioception among some team sport players.
- There is a correlation between the senses of balance and the perception of proprioception among some players of individual and team games.

Research fields:

- Human field: A group of single and team sport players, advanced category in the Middle Euphrates region
- Time field: (4/2/2022) to (2/5/2022)
- Spatial field: Sports club halls in the middle Euphrates region

Research methodology and field procedures:

Research Methodology:

The researchers used the descriptive approach using the survey method and correlational studies as a better method to solve the research problem due to its suitability and the nature of the current study.

Community and sample research:

Research community and research sample: The research community included a group of local club players in Iraq, the Middle Euphrates region. The sample included 40 players, 10 of whom were excluded from conducting exploratory experiments. They distributed 20 players who represented individual games, including 5 table tennis players, 5 tennis players and 5 athletics players and 5 badminton players. In addition, 20 players represented the team games, including 5 futsal players, 5 volleyball players, 5 basketball players and 5 football players.

Field research procedures:

Tests used:

Test (proprioception):

It was clear that there was no single measure of proprioception due to the complexity of the neurophysiological processes that include proprioception (Hillier et al, 2015).

The researchers relied on the global (Romberg) test as the basis for their work and modified it

to fit the target sample with the help of experts, as follows:

The basic features of the test (before modification) are as follows:

- The examinee should stand on both feet, making sure that his eyes are open and his hands are at his sides.
- Then the patient closes his eyes and the doctor observes what happens for a full minute.

Because the doctor was trying to infer if the patient will fall when he closes his eyes, it was recommended that the doctor stand ready to catch the patient before he falls to the ground, and in the case of large patients, it was advisable to use a strong person.

The Romberg test was positive if the patient staggers or falls when his eyes are closed.

The scientific basis of this test was because balance comes because of the cooperation of several nervous systems, namely proprioception, inputs from the vestibular system responsible for balance, and vision. If only two of these systems work, they maintain a reasonable degree of balance, so the key to this test was that we exclude vision from the systems that keep the body in balance, and this leaves only two of the systems to work, if there was a disturbance in the vestibular system or sensory disturbance (impaired proprioception), the patient will become unbalanced.

Suggested test (modified):

It was clear from the above that the internationally approved test is not suitable for (normal people), especially when used to test athletes who have a high level of motor, physical and psychological abilities. Therefore, researchers, in consultation with a group of experts, have been modifying this test in a way that suits (normal) athletes because the research sample is athletes. The normal and we mentioned this because there are tests for sports injuries such as knee injuries and other sports injuries, and their purpose is to assess the level of muscular and sensory rehabilitation,

therefore, we put new challenges on this test that are suitable for the level of athletes, as follows:

Test Name: (AINWYNI Proprioceptive Test)

- Objective of the test: To measure the ability to receive proprioception and correct posture body of the athletes.
- Tools used: 3D glasses type Samsung from Oculus Company, graduated angles clearly printed, the height of 2 meters and width of one meter, colored adhesive tape, stopwatch and whistle to adjust the time, some electronic equipment, camera.
- Method of performance: The player or examinee stands in the corner of the room next to a straight wall on which a vertical line is drawn, where the examinee stands parallel to this line. The examinee includes his feet in a small circle side by side and stands erect and the arbitrator stands next to him where he places the vertical line drawn with the straightness of the examinee and there are branches of side angles extending from the bottom of the wall to both sides of the straight line.

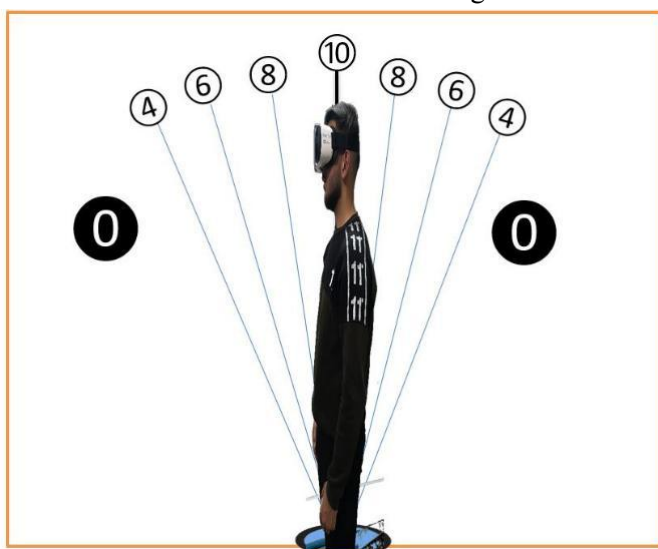


Fig. 1 shows the ALNWYNI Proprioceptive Test

- These angles are sharp and gradual as in the figure, the examinee wears three-dimensional virtual reality glasses A special video that affects balance is played for 30 seconds in order to identify the examinee's ability to correct his body position while watching the video, with another person standing in front of him to protect him from falling if that happens.
- Registration: The arbitrator holds a form in which he writes the numbers of the angles at which the examinee swayed within 30 seconds and corresponding to the vertical line 10 degrees. Points are calculated every 3 seconds, the first angle closest to him from both sides is 8 degrees, the third angle is 6 degrees, and the fourth is 4 degrees, and in the event of his fall or exit from the circle in which he is standing In which the feet are aligned and given zero, the points recorded during the specified period are collected and the average of these points is extracted from the total of 10 points as shows in the figure (1)

- These amendments were presented to a group of experts and the scientific transactions were extracted as shows in the table (1):

Table. (1) Shows the scientific coefficients of the modified test

Fields	approval of experts and specialists				Chi-2 value		Type sig
	Agree	%	Disagree	%	calculated	tabular	
1	11	84.615	2	15.385	6.231	3.48	sig
2	12	92.308	1	7.692	9.308		sig
3	11	84.615	2	15.385	6.231		sig
4	13	100	0	0	13		sig

Static balance test (stork standing):

- Test objective: To measure static balance .
- Tools used: stopwatch.
- Method of performance: From a normal standing position, the player raises his leg and puts the sole of his foot on the knee from the inner side both hands are placed on the waist, and when the coach gives the start signal, the player raises the heel of the foot he is standing on so that it rests on the instep and at the same time the stopwatch starts to work, and the sport remains motionless.
- Registration: The player is given three attempts and records the best time (Yassin Taha 1986).

Research Tools:

- 2 stopwatch
- Lonovo type calculator.
- Oculus 3D glasses.
- Samsung S6 mobile device.
- Measuring tapes.
- Colorful adhesive tapes.
- Wall print included.
- Papers, pens, etc.

Exploratory experience:

Two exploratory experiments were conducted, the first was conducted on 6 players on 4/2/2022, where the proprioception and balance tests were conducted, and some complications occurred in the proprioception test. After referring to the experts, the test was reset again and a second exploratory experiment was conducted on February 18 / 2022 in which 4 players were tested in the test of proprioception, and after adjusting the variables and the objective conditions of the tests, they are ready for application in their final form.

Main experience:

After adjusting the testing procedures, after conducting the exploratory experiments, the main experiment was conducted on a group of 30 players, 15 of them are individual sport players and 15 are team sport players. From the period dated 9/3/2022 to 2/5/2022, where the movement between the governorates and cities of the Middle Euphrates was conducted and tests were conducted on the cooperating players. The data were collected, classified and placed in tables for the purpose of statistically processing.

Statistical methods: The search data was processed through the Statistical Package for the Social Sciences (SPSS).

Results and discussion:

Presenting the results of the arithmetic mean and standard deviation of the

search variables for individual and team games:

Table (2) shows the results of the arithmetic mean and standard deviation of the research variables

Games	Variables	Standard deviation	Arithmetic mean
Individual	Proprioception	8.3600	.22928
	Balance	13.2600	.72486
Team	Proprioception	8.4000	.23905
	Balance	13.8067	.67132

The arithmetic mean value of the proprioception variable for individual games reached (8.3600) with a standard deviation rate of (.22928), while the arithmetic mean of the balance variable for individual games reached (13.2600) with a standard deviation rate of (.72486), while in team games it reached the arithmetic mean For the proprioception variable (8.4000) with a deviation rate of (.23905), while the arithmetic mean of the balance reached (13.8067) with a standard deviation rate of (.67132) as it is clear that the level of the results of the research variables among the members of the research sample in individual and team games with clear convergence levels, which indicates that

athletes enjoy a high level of balance and proprioception, due to the development of kinetic sensation due to exercise and the development of the locomotor system, which represents a person’s awareness of his body as it moves in different directions, as it helps the internal compatibility related to the movement of the body, its position and balance, and without a sense of movement, it cannot perform any physical movement (Ratib. 1995).

Presentation and discussion of the results of the correlation and moral value between balance and proprioception for individual games and team games:

Table (3) Shows the value of correlation and morale between balance and a proprioception of individual games and team games

Games	Correlation coefficient value	Type sig	Level sig
Individual	.376	.167	Non sig
Team	.899**	.000	sig

The value of the correlation coefficient in the individual games was (.376) at the level of morality (.167) and the significance was not significant. The researchers attribute the lack of morality in the relationship of proprioception to balance in the individual games due to the large dispersion value shown by the results and placed as it is in the study to reflect realism and credibility in presenting the results despite the high-level results shown in the two search variables. And the value of the correlation

coefficient in the difference games was (.899**) at the level of significance (.000), and the significance was significant, this confirms the close relationship between proprioception and balance, as well as shows the effect of the sense of balance associated with the vestibular system on the quality of proprioception, as it depends This sensation is on the balance device located in the inner ear. It enables us to isolate all sensations, the sense of balance enables us to know whether we are standing as usual or

upside down (Hanafi. 1990), If the balance is important for sports activities, it is logical to assume that athletes outperform non-athletes in tests of balance, and many researchers have been able to fulfil this assumption, As "Lessl" was able to reach the superiority of university students-athletes over non-athletes in balance tests, and he was also able to reach the superiority of international players over the lower level players (Amer and Sharif. 2017), certainly, there is a reciprocal relationship and a reciprocal effect between balance exercises and proprioception, and this is what prompted the FIFA Medical Research Center to develop the

warm-up program for football players +11, consisting of 27 exercises that include balance, strength and basic stability to support proprioception and balance together. (Soligard et al .), this relationship shows the extent of the impact of sports practice on the quality of the complex senses, including proprioception, which indicates the fulfilment of the second hypothesis.

Presentation and discussion of the results of the comparison in the research variables between individual games and team games:

Table (4) shows the results of the comparison in the research variables between individual games and team games

Variables	Games	Arithmetic mean	Standard deviation	T value calculated	Level Sig	Type Sig
Proprioception	Individual	8.3600	.22928	-.468	.644	Non sig
	Team	8.4000	.23905			
Balance	Individual	13.2600	.72486	-2.143	.041	sig
	Team	13.8067	.67132			

The calculated T value in the proprioception variable between individual and team games was (-.468) at a significant level of (.644), where there was no significant correlation between individual and team games in the proprioception variable, and the researchers attributed the reason for this to the difference in the requirements Performance between individual and team games, where it was found that the accuracy of the test prepared in measuring the simplest difference in performance during the test reversed this statistical relationship, and this "showed in his study as the proprioception represents the sense of body position and is necessary to control strength during movement and balance as it provides information Rapid incremental reactions are therefore crucial to motor learning, especially in the process of refining skills" (Mirdamadi.2021) . "As in team games, proprioception is an important factor in

enhancing job stability in football". (Safran. et al 1999) The rest of the team games are the same as the individual games. These are basic requirements for ordinary people so that they can practice their daily lives normally. There is no doubt that these requirements must be met by athletes who have higher capabilities than ordinary people do.

While the calculated T value in the balance variable between individual and team games was (-2.143) at a significant level of (.041), as there is a significant relationship between individual and team games in the balance variable, and this "arises from a group of factors where the regulation of balance depends on visual stimuli Vestibular and self-stimulation". (White PA .2007), "Balance is also maintained through the dynamic integration of internal and external forces and factors involving the environment". (Heath EM .2007), As Abdulhamid "emphasized, control of balance or

posture can be explained by the ability to maintain a base of support with minimal movement and the ability to perform tasks while maintaining a stable posture". (Abdul Halim .2012) Some individual and team games may differ in terms of motor, psychological and physical requirements, but not everyone differs in the need to possess a large proportion of balance for players according to different training methods according to the requirements of the sport, as indicated "many studies have indicated the effect of different training programs on fixed balance". (Giagazoglou et al.2009)

Conclusions and Recommendations:

Conclusions:

- The test designed by researchers to measure (proprioception) has proven its efficiency.
- Players of individual and team games have a high level of balance and proprioception.
- There is no significant correlation between balance and proprioception for individual games.
- There is a significant correlation between balance and proprioception of team games.
- There is no significant correlation between individual games and team games in the variable of proprioception.
- There is a significant correlation between individual games and team games in the equilibrium variable.

Recommendations:

- Adopting the (AINWYNI) test for receiving proprioception in measuring athletes in research and studies.
- Paying attention to the development of the senses related to the sports aspect in terms of measurement and training.
- Paying attention to the psychological aspect, like all other aspects of tactical, physical and skill training.
- Develop training programs that take into account the efficiency of sensory

receptors, including proprioception and balance.

- Conducting similar research on different samples in the research variables.
- Conducting a comparative study between male and female athletes in the variable proprioception.
- The need to pay attention to examining the efficiency of the vestibular apparatus to develop balance and receive proprioception.
- Paying attention to individual and group training and taking into account individual differences.

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Appendix (1)

Shows the list of experts

sequence	Expert name	Jurisdiction	Workplace
1	Prof.dr. Hassan gharayagh zandi	sports psychology	University of Tehran/ College of Physical Education and Sports Sciences
2	Prof.dr. Yaroub.K hossein	motor learning	University of pittsburgh pa . Usa
3	Prof.dr.Sareeh Alfadly	biomechanics	University of Baghdad College of Physical Education and Sports Sciences
4	Prof.Dr.Amer Saeed Jassim Alkhigani	sports psychology	University of Babylon/ College of Physical Education and Sports Sciences
5	Prof.dr .Hafsaoui ben Youcef	sports psychology	Chlef University, Algeria
6	Prof.dr .Alaa Flayyih Jawad	athletic training	Kerbala University College of Physical Education and Sports Sciences
7	Prof.dr. Ali Yusof al-byaty	sports psychology	alsalam University College
8	Prof.dr. Wisam salah abd alhussein	motor learning	Kerbala University College of Physical Education and Sports Sciences
9	Prof.dr .Ali Hussein Ali	sports psychology	Kerbala University College of Physical Education and Sports Sciences

10	Asst prof.dr. Elaf Rabie	sports psychology	University of Baghdad College of Physical Education and Sports Sciences
11	Asst prof.dr. Mahdi Alrahi	Tests and Measurement	Kut University College of Physical Education and Sports Sciences
12	Lecturer. Dr.Zaman salih	sports psychology	Karbala Education Directorate
13	Lecturer. Dr. Mahmoud Nasser Radhi	exercise physiology	University of Kufa/ Physical Education and Sports Sciences

Appendix (2)

Shows the Virtual reality glasses



Appendix (3)

Shows the standing position in static balance test



Appendix (4)

The last part of the expert form**:Suggested areas for research**

T	the field	Valid	Invalid	Editing or adding
1	Measuring angles The angles of measurement are sharp, corresponding to the minimum and maximum inclination of the body, according to the reconnaissance experiment			
2	Video intensity level A 30-second video clip has 10 seconds of low impact , 10 seconds of medium impact, and seconds of high impact 10			
3	Registration Point values placed according to the angles of inclination			
4	Duration (30 sec) Total video time 30 seconds			
5	add a note			

Second : Please put a sign (/) in front of the degree that corresponds to .the importance of each field compared to the other fields

Thank you very much and appreciation.

Expert name:

The scientific title:

Specialization:

Workplace:

Signature:

Date: / / 2022

Researcher

Assistant Prof.Dr. Muntadhar
Saheb Mahdi

Appendix (5)

Shows the assistant work team staff names

sequence	Name	Workplace
1	Dr.Zaman salih Al-kinani	Football coach\ Kerbala
2	Dr.Sadiq Abdel Reda Attia	Athletics trainer\ Diwaniyah

3	Dr. wisam salah abd alhussein	Badminton coach/ Middle Euphrates region
4	Dr.Mahmoud Nasser Radhi	volleyball coach\ Najaf
5	Dr. Hussien Hakem	Aleamid University
6	Dr. Ahmed Hakem	Athletics trainer/ Middle Euphrates region
7	Hussein khudhair Obayes	Goalkeeper coach\Ghadria Club
8	Barakat M.Ali Dhiaa	Tennis coach\Army Sports Club
9	Sa'ad Mohsen Musa	Table tennis coach\ Kerbala Club