Original

Designing complex tests according to energy production systems and their relationship to the physical intelligence of volleyball players

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ABSTRACT:-The importance of research in designing physical and skill tests based on the energy systems of volleyball players appears because the tests that were developed were related to either physical or skill aspects without linking them with the energy systems working with them, in addition to knowing the relationship between physical intelligence and physical and skill tests to put them modestly in the hands of coaches to detect the levels of players and work to develop their levels through these tests. The **problem of research** was the lack or absence of physical and skill tests, which should seek to identify complex tests according to the energy systems that suit the game of volleyball and the lack of clarity of the relationship between physical intelligence and determine these tests, which may give us a real indication of the physical and skill performance of the game, as these tests can be an alternative to individual tests to be comprehensive to measure

physical, skill and physiological abilities and shorten our time and effort, as well as the possibility of conducting analyses of each energy system and its impact on those components and detecting the weaknesses and strengths of those components to develop real-time solutions for them. Therefore, the researcher decided to go into identifying (physical-skilled) skill tests based on new standards and levels in order to Continuing the progress and development of the game in order to use it in the process of evaluating volleyball players. The **objectives of the research are** to design complex (physical-skilled) tests according to energy systems, design a physical intelligence test, and identify the correlation between physical and skill tests and physical-motor intelligence. **The researcher used the descriptive approach** in the survey method and correlational relations, due to its solvency and the nature of the research problem. The research **community** was determined in a deliberate manner, as the research community included young players in the specialized volleyball center in Dhi Qar Governorate who are between the ages of 16-18 years for the season (2023-2024), which represents the youth group of (160) players, (10) players were selected for the survey sample and (150) players were selected representing the research **sample** and (93.66%) from the original community. One of the most important **conclusions** was that the energy systems of the tests were two tests according to the phosphagene system and two tests according to the lactic system. Through the selected tests, the fact that there is an overlap between skill performance, physical performance and energy systems cannot be separated, and most of the tests were within the phosphagene system and within the lactic system, and this confirms that the game of volleyball falls within the non-oxygenic energy system As for the **recommendations**, the researcher recommended adopting the use of these tests in measuring volleyball players from the physical , skill and physiological aspects for young

people and the possibility of trainers relying on these tests to really stand at the levels of their players during the training stage and in their training units because they are closer to real play situations.

1- Definition of research

1-1 Introduction and importance of research:

Volleyball is one of the team games that requires the development of many aspects, physical, skill, planning and raising the efficiency of the functional devices of players to face the pressure of high intensity training loads, especially since it is one of the games that are characterized by strength and speed of performance except for legal pauses that occur according to the requirements of play, which requires that the player has a very high physical efficiency and ability that makes him maintain his physical performance and skill ability with high accuracy and efficiency. Volleyball is one of the team games that require high levels of physical and skill performance, in addition to mental and intelligent abilities that contribute to the speed of decision-making and the accuracy of skill implementation during the game, and from this point of view, the need arises to design accurate and comprehensive tests that measure the physical and skill aspects of the complex, which are integrated with the physiological requirements of the energy systems that the player relies on during the actual performance of the game.

Understanding the nature of energy systems (anaerobic , aerobic , and phosphagene) and using them to design tests that simulate realistic situations on the field is an essential step towards developing the physical and skill abilities of volleyball players. Physical intelligence, which is known as the individual's ability to control his or her body movements accurately and efficiently, is also an influential factor in the quality of performance, which calls for studying the relationship between him or her and the results of complex skilled physical tests.

Hence, this research seeks to design and codify complex tests based on the nature of the energy systems used in the game of volleyball, and then study their relationship to physical intelligence, thus contributing to improving the selection, training and evaluation processes of volleyball players, according to accurate and integrated scientific foundations.

Therefore, the development in the field of volleyball that we observe through the achievements that are achieved and the level of remarkable performance performed by players in competitions is the result of the concerted efforts of coaches and players in organizing training loads that are effective in raising the physical, skill and functional efficiency of players, and sports training is not a science in itself to be able to achieve those achievements unless it is based on other sciences that are helpful to facilitate the way to success and prove it faster and better. From these sciences of physiology, tests and measurement , it is very important to study the functional capabilities of the player's body systems and their response to the training loads and pressures that he carries out in training and finally in competitions, as well as to know the type of energy expended and its impact on its performance and the extent to which those loads respond to it , which is mainly based on conducting physical and skill tests, to know the extent of development that

occurs through the measurements shown by the results of these tests , and then reveal the appropriateness of those loads with the level of training and the vocabulary of the training curricula.

This research addresses a vital aspect of the volleyball training process, which is the design of complex physical skill tests based on energy systems, which have not received sufficient attention in previous research.

The importance of this research lies in the design and construction of skill physical tests according to the energy systems of volleyball players, by linking physical and skill performance to the requirements of the actual energy systems of the game, providing modern and standardized measurement and evaluation tools that help trainers to identify the levels of players accurately and comprehensively, thus contributing to improving the efficiency of training and continuous development in enhancing understanding the relationship between physical intelligence and sports performance, which contributes to guiding training programs to include mental and cognitive aspects as well as physical and skill, supporting sports selection and classification processes on accurate scientific grounds through objective tests that reflect the requirements of the realistic game Improving the level of preparation of players by designing tests that correspond to the real conditions of competitions, which leads to improving individual and collective performance on the field.

Research problem:

Tests are one of the important means and one of the very necessary requirements in monitoring the development of the level reached by the player or team and the researcher being one of the practitioners of volleyball as well as the opinion of many specialists in this field. After reviewing many tests and problems facing those in charge of the game and the use of scientific sources and references, it was found that there is a lack or absence of physical and skill complex tests. Therefore, it is necessary to seek to identify complex tests according to the energy systems that suit the game of volleyball and the lack of clarity of the relationship between physical intelligence and determine these tests, which may give us a real indication of the physical and skill performance of the game. These tests can be an alternative to solitary tests to be comprehensive to measure physical, skill and physiological abilities and shorten us time and effort, as well as the possibility of conducting analyses of each energy system and its impact on those components and revealing the weaknesses and strengths of those components to develop real-time solutions, especially physical intelligence, which is one of the important factors that affect the accuracy and speed of motor performance.

Therefore, the researcher decided to delve into the identification of skill (physical-skilled) tests based on new standards and levels in order to continue the progress and development of the game in order to use it in the process of evaluating volleyball players.

Research objectives:

1- Designing composite (physical-skilled) tests according to energy systems.

2- Designing a Physical Intelligence Scale.

3- Recognize the correlation between physical and skill tests of somatic-motor intelligence.

1-4 Research Assumption:

There is a relationship between physical and skill tests designed according to energy systems with physical and motor intelligence.

1-5 Research fields

1-5-1 Human Field: Youth Players in Volleyball Specialized Centers in Dhi Qar Governorate for the Year 2023-2024

1-5-2 Time Range: Duration from 24/9/2023 to 25/6/2025

1.5.3 Spatial scope: Club training centers in Dhi Qar Governorate with volleyball

Identifying terms

Physical-motor intelligence:

Physical-motor intelligence is the ability to use the body or parts of it in solving a problem, performing movement, athletic skill, or performing a productive process and doing some work , and expressing thoughts and sensations by means of movements. Learners who enjoy this intelligence excel in physical activities, and in visual-motor coordination, and they have the ability to practice physical sports or practice dance arts and acting. The owners of this intelligence have superior physical-motor abilities, and it depends on the interaction of physical-motor configurations or abilities and environmental factors (1).

3- Research Methodology and Field Procedures :

3-1 Research Methodology

The researcher used the descriptive approach in the survey style and correlations, given its solvency and the nature of the research problem.

3-2 The research community and sample

(3) Khawla Ahmed Hassan : Building and codifying a measure of physical-kinetic intelligence on students of colleges and departments of physical education in Iraq , PhD thesis, University of Baghdad , College of Girls' Education, 2006 , p . 20 .

The research community was determined in a deliberate manner. The research community included young players in the specialized volleyball centers in Dhi Qar Governorate who are 16-18 years old for the season (2023-2024) and who represent the youth group of (160) players. (10) players were selected for the survey sample and (150) players representing the research sample were selected, with a percentage of (93,75%) from the original community. Table (1) shows this.

(e) Focus area 5.

Shows the distribution of the research population and the percentage

	Name of the Center	ages otal	Explorat	Constru n Sample	Standar ion sample
1	raining Center in Nasiriyah		5	12	10
2	he training center in Shatra	22		12	10
3	The training center harraf	25	5	10	10
4	The training center l-Shuyukh	20		10	10
5	Training Center in habaish	23		13	10
6	Al-Batha Training C	19		10	9
7	Al-Nasr Training C	19		10	9
8	Citadel Capital Trai enter	5		3	2
Total		160	10	8	7

3-3 Means, tools and devices used in the research:

⊙ Observation

⊙ Interviews

⊙ Tests and Metrics

|||UNTRANSLATED_CONTENT_START|||⊙ |||UNTRANSLATED_CONTENT_END|||

⊙ Statistical Analysis

International Information ⊙ Network (Internet)

|||UNTRANSLATED_CONTENT_START|||⊙ .|||UNTRANSLATED_CONTENT_END|||

⊙Stationery (papers , pens).

Japanese-made ⊙ whistle.

Medical ⊙scale type (Chinese) number (1).

⊙ The volleyball court is legal .

Legal ⊙ volleyballs (MIKASA) (Chinese) number (7) .

Adhesive ⊙ tape (5) cm wide.

Electronic manual ⊙ stopwatch (KENKO) .

Rubber ⊙ ropes of different weights and colors (8).

TRX ⊙ tapes.

⊙ Vertimax Base.

(10) ⊙ checkpoints with a height of 30 cm.

Weight ⊙ slings 5 kg.

2 – 4 Field research procedures:

For the purpose of determining the most important variables (physical qualities) for the physical and skill tests of volleyball, the researcher used sources, scientific references and personal interviews, through which the variables are identified in a questionnaire and presented to experts and specialists in tests and measurement, as well as specialists in volleyball for the purpose of polling their opinions in determining the most important physical qualities on which the game is based. After collecting the forms and separating the data, the qualities of moral significance were evaluated and nominated by the relative importance of each attribute .

Schedule 2.

Shows the agreement of experts and specialists on determining physical abilities in order of relative importance

	Physical capacities	io	io	io	io	io	n We Arithmetic	Imp pa	Rat
	Maximum capacity rms						1.72	545	No m lected.
	Maximum Abc apacity						2.36	.272	No m lected.
	Maximum back ca						2.45	090	No m lected.
	The maximum stre e two men						Stop	364	Selec
	Power characterist e speed of the arms						2.45	090	No m lected.
	Velocity Character bdominal Strength						1.72	545	No m lected.
	Speed Charac ack Strength						2.36	.272	No m lected.
	The speedy power vo legs						Stop	364	Selec
	Carrying power rms						2.36	.272	No m lected.
	Abdominal S olerance						2.45	090	No m lected.
	Strength tolerance ack						2.36	.272	No m lected.
	She holds the pov e two men.						727	545	Selec

Number of Iraqi experts and specialists = 11

3 – 4 – 1 Identification of research variables and tests :

Through the researcher's access to a lot of studies and research that researched the field of volleyball , and the survey of many scientific references that examined the most important capabilities in terms of physical and skill and reference to a large number of specialists and professors in the field of game, tests, measurements and mathematical physiology, as the tests were presented initially to experts and specialists and as in Table (3)

Schedule3
Shows the relative importance value and acceptance ratio of tests and skills

ت	Tests and Skills	Relative importance	2. cceptance R	Signif
1.	TRX bars and crushing multiplica om the back area of area (1) .	15,81%	54.54	Unacc
2.	Pushing the medicine ball back a e wall and performing the crushing bea	43,63%		Unacc
3.	Throwing the medical ball over t ead back and performing the crushing s kill	38:18		Unacc
4.	Deep jumping and performing ffensive block wall skill	40%		Unacc
5.	The quick partridge at the checkp ternately and perform the posterior crus atting skill	80%		Pass

Phosphoganine Power System (ATp-pc)

Quiz 4

Test Name: Rapid Partridge on Barriers Interchangeably and Perform Rear Crusher Spanking Skill

Purpose of the test: Measure the force tolerance of the two legs and the accuracy of the Qatari rear crusher batting skill

Tools used: a legal volleyball court, (5) legal volleyballs and a colored strip to divide the areas of the opposite court, (10) barriers with a height of (40) cm .

- **Performance Description**: From the heavy standing position, the player takes a partridge with one leg above the barrier for a distance of (10 meters), the number of barriers (10), the distance between one barrier and another (50 cm), and the height of the barrier (30 cm)

−The laboratory records the scores obtained in the three attempts, that is, the final score for this test is (15) points divided by the time of performance of the repetitions. The final score = accuracy / time. Note that in the event that the ball falls on a line separating two areas, the laboratory player is counted as the highest area score. It is considered an attempt in the event that the ball falls outside the specified points.

3-5 Exploratory experiments:

First : The first exploratory experiment:

The most important thing that scientific research scientists recommend for the purpose of obtaining accurate and reliable results is to conduct the exploratory experiment, which is defined as "a practical training for the researcher to identify the negatives and positives that the researcher may encounter while conducting the main experiment to avoid them." (1)

The exploratory experiments were conducted on a sample of (10) players from the Specialized Center for Nasiriyah and Gharraf, in order to identify the following :

1. Safety and adequacy of the instruments used in the tests .
2. Calculate the time allotted for each test .
3. Method of sequencing tests in terms of performance .
4. The method of recording the tests by the team .

The first exploratory experiment was conducted on (7/5/2024)

Through the application of the exploratory experiment, the organizational aspects of performing the tests were identified, sufficient time was taken to rest between one test and another, and the assistant staff was directed to how to register for the performance of the tests, as well as following up the players in the tests and delivering the ball to the laboratory player at the correct time, as well as installing the correct position of the camera for the purpose of filming the performance of the testers .

Second : The second exploratory experiment:

Then the second reconnaissance experiment was conducted on (14/5/2024) on the same group of players in the same stadium and at the same time as the first reconnaissance experiment in order to verify the scientific basis of the tests .

3 – 6 Scientific foundations of tests :

1-Validity of the test :

The researcher used (the veracity of the arbitrators) by presenting the tests to a group of experts and specialists in the field of scientific research, tests, measurement,

(1) Qasim Al-Mandlawi : Testing and Measurement in Physical Education, Mosul , Higher Education Press, 1989 , p . 107 .

training and specialization in volleyball to determine the validity of the tests and make adjustments to them

Test Reliability:

The researcher has used to calculate the coefficient of stability (the test and retest method) and with an interval between the first and second test (7) days. Ibrahim Salameh explains, " The retest method is one of the simplest methods and is characterized by determining the interval of consistency because the error associated with the measurement is always clearer when there is a period between the two tests from one day to more" (1).

The first application was conducted on 7/5/2024 at 9 am on (8) players from the researcher community and outside the sample. The application was reapplied on 14/5/2024 at 9 am. The researcher extracted the stability coefficient through the correlation coefficient (Pearson) between the results of the first application and the results of the second application and extracted the significance of the correlation, as the values of the correlation coefficient were significant when compared to the level of significance, and this means that the tests have a high degree of stability because the level of significance ≤ (0.05) . As shown in Table (3).

3- Objectivity :

The researcher found the objectivity coefficients for each of the composite tests by finding the simple correlation coefficient (Pearson) between the results of the two arbitrators (*) in the first application conducted during the exploratory experiment, and the correlation coefficients were high, which indicates the objectivity of the tests used in the current study.

Table (4)

Indicates the reliability and objectivity coefficient of the tests under study

	Testing	Sta coefficie	Si	Object coefficient	Si
	The quick partridge at the checkpoin ternately and perform the posterior crushin atting skill	0.88	0.0	0.92	0.0

3-7 Physical-Motor Intelligence Scale:

3-7-1 Steps to Building a Physical-Motor Intelligence Scale:

3-7-1-1 Determining the idea of building the scale and the justifications for its design:

The researcher must identify the idea in his mind that led him to study the problem of the study and work to build a tool to measure the phenomenon, which is a justification

(1)Ibrahim Ahmed Salama: Testing and Measurement in Physical Education: ,Cairo, Giza Press, 1980, p . 49 .

(*) Arbitrators : 1- Dr. Haider Sadiq Makki, Ph.D., Physical Education and Sports Science, volleyball. 2- Eng. Laith Ali Mohamed, Master of Physical Education and Sports Sciences, football.

for designing a test tool based on the frame of reference for this phenomenon to be designed (scale), and what is the need for this tool?

3-7-1-2 Determining the objectives and purpose of the scale:

Before building the research tool (scale), it is necessary to determine the purpose and objective that called for building this tool, and what is the need for this tool? The purpose of building this test was to:

أ-A general goal: to recognize the physical-motor intelligence levels of volleyball players.

ب- Special Objective: Use this tool for the purpose of measurement.

3-7-1-3 Determining the theoretical framework of the scale variables:

For the purpose of determining the theoretical framework of somatic-motor intelligence, the researcher reviewed a set of sources and references that contribute to the formation of a vision that clarifies the reference framework from which the measured study variables emerged. Where the theoretical frame of reference is a step that contributes to the awareness of the measured phenomenon in order to choose the exclusion that can belong to this phenomenon and to which it belongs is a concept and meaning. In the field of psychology, there is a prevailing opinion that there is no single comprehensive and integrated theory that has succeeded in giving, treating and explaining all human facts and phenomena in this science , but there are multiple theories that have interpreted these facts in some way, starting from the intellectual frameworks on which these theories are based or adopted as a frame of reference.

3.7.1.4Identificationof the subaxes of the characteristic (measured phenomenon):

After reviewing the previous sources and studies, three axes were identified:

- **Authenticity .**
- **Reliability**
- **Punctuality and Attendance**

3-7-1- 5 Preparing answer instructions for the scale:

The instructions for the (Physical-Motor Intelligence Scale for Volleyball Players) were prepared in a way that shows the respondent how to answer his paragraphs. These instructions were prepared with ease and clarity in mind, and included a special form that shows how to answer the paragraphs of the scale. In it, it was pointed out that the answer must be in line with the requirements of the respondent, that is, the answer that applies to the work of the respondent, and that all paragraphs of the scale must be answered frankly and accurately, with the emphasis that the answer must be confidential for the purposes of scientific research.

3-7-1-6Determining the validity of the paragraphs of the scale:

This procedure requires obtaining the consensus of a group of experts on the validity of the paragraphs of the scale. After building the paragraphs of the physical-motor

intelligence scale in its initial form, which contained (48) paragraphs, the researcher presented the scale in its initial form to a group of experts with experience and specialization in the field of physical education and sports sciences, and in the following areas: (tests and measurement, sports psychology, and volleyball) in order to identify the validity of the test paragraphs, and their suitability to measure what has been set for him. In addition to evaluating, amending and judging the paragraphs in terms of wording and accuracy in content, each expert was asked to make observations about the validity of the paragraphs, their content, integrity and main areas, and the relevance of each position to the field it follows, and the realism of the situation and its representation, the quality it measures, with mentioning their observations and suggestions about the scale in general, and about the use of the five-point scale to estimate the scores of the sample members. The process of answering the experts is done by placing a sign (√) to the left of the phrase to determine the validity of the paragraph or not.

After the experts expressed their opinions and observations about the paragraphs of the scale, the researcher analyzed the opinions of the experts using the K2 test as a criterion for accepting or excluding the test paragraphs. It accepted paragraphs whose level of significance was (sig) less than (0.05), and excluded paragraphs whose level of significance was (sig) greater than (0.05). The values represent the opinion of (11) experts in tests and measurement, sports psychology, and volleyball.

Based on the above, (6) paragraphs out of (48) paragraphs were excluded for the scale of physical-motor intelligence, and Table (7) shows that:

Table (5)

Shows the validity of each paragraph of the axes of the physical-motor intelligence scale

First : Authenticity							
	Vertebrae	**ber per**	**Repair**	**itable.**	**Chi (2)**	**Sig**	**Sign**
	I can perform warm-up movements and physical tests e thout mistakes.		**10**		**364**	**0.007**	**mor**
	I have good abilities that qualify me to perform skills th quire high flow		**10**		**364**	**0.007**	**mor**
	I have good balance while jumping and landing while p		**11**		**11**	**0.000**	**mor**
	My motor skills performance improves with increased		**11**		**11**	**0.000**	**mor**
	I can quickly adjust my posture to suit the movement o ll.		**11**		**11**	**0.000**	**mor**
	I perform motor skills with high flow		11		11	0.000	mor
	My skill performance is better when I am not in front o		9		4.45	0.035	mor
	I am the type to perform motor synergy skills fluently		7		818	0.366	imm
	I skillfully use my body to perform complex movemen spinning or sudden lunge.		10		364	0.007	mor
	I have a good sense of where the ball is in the air even oking directly at it.		9		4.45	0.035	mor
	It is difficult for me to perform some skills that require nnection between the senses and movement		7		818	0.366	imm
	I can accurately time my jump while performing the bl		9		4.45	0.035	mor
	I can move according to musical rhythms		9		4.45	0.035	mor
	I can use my body parts at once when required		11		11	0.000	mor
	I focus a lot on the interconnection exercises and the mpatibility between the senses and movement		11		11	0.000	mor

	It is difficult for me to show my muscle strength perma		7		818	0.366	imn
Second: Reliability							
	Vertebrae	**ber per**	**Repair**	**itable.**	**Chi (2)**	**Sig**	**Sign**
	My strength is constantly increasing unlike many of my lleagues		**9**		**4.45**	**0.035**	**mor**
	I can use my body movements to mislead an opponent eate a suitable playing space.		**11**		**11**	**0.000**	**mor**
	I feel that I will not be able to perform to the best of my performance requirements increase		**9**		**4.45**	**0.035**	**mor**
	I can perform well on tests to measure muscle strength		**9**		**4.45**	**0.035**	**mor**
	resorting to roughness in most cases if my colleague is me in the element of force		**8**		**2.27**	**0.132**	**imn**
	I can perform some new skills faster and more accurate y colleagues		**10**		**364**	**0.007**	**mor**
	My slow movement loses a lot of my skill and accuracy rforming a new movement		**10**		**364**	**0.007**	**mor**
	I can easily regain my speed and accuracy as I perform ills		**10**		**364**	**0.007**	**mor**
	I can quickly return to my normal state after performing d violent physical exertion		**7**		**818**	**0.366**	**imn**
	I am able to change my motor directions quickly and ac		**11**		**11**	**0.000**	**mor**
	I easily handle the ball from various angles and heights		**11**		**11**	**0.000**	**mor**
	I can move my body in different directions and efficien		**9**		**4.45**	**0.035**	**mor**
	I can perform some motor skills with high flexibility		**9**		**4.45**	**0.035**	**mor**
	I use my hands and feet effectively to collaborate with lleagues in building an attack or defense.		**10**		**364**	**0.007**	**mor**
	I can maintain a regular motor rhythm while implemen ries of skills		**11**		**11**	**0.000**	**mor**
	I find it difficult to make the critical decision to move v n faced with multiple choices		**10**		**364**	**0.007**	**mor**
Third: Attendance							
	Vertebrae	**ber per**	**Repair**	**itable.**	**Chi (2)**	**Sig**	**Sign**
	I am able to coordinate hand-eye movement while perf ushing blows.		**11**		**11**	**0.000**	**mor**
	The more I experience, the easier it is for me to perceiv w complex movement		**11**		**11**	**0.000**	**mor**
	I deal flexibly and quickly with sudden changes in play		**11**		**11**	**0.000**	**mor**
	I have enough flexibility to perform various volleyball ovements without difficulty.		**11**		**11**	**0.000**	**mor**
	I can retain my attention for long periods		**10**		**364**	**0.007**	**mor**
	I have a quick reaction when tackling surprise balls.		**11**		**11.0**	**0.000**	**mor**
	I have a physical sense that helps me accurately estima stance between me and the ball or net		**10**		**364**	**0.007**	**mor**
	I can control my body even while performing quick and ovements.		**9**		**4.45**	**0.035**	**mor**
	I control my fine movements even in situations of stres tense competition.		**10**		**364**	**0.007**	**mor**
	I learn new movements quickly by watching or practici		**11**		**11**	**0.000**	**mor**
	I feel like I almost cry so hard when I fail to perform		**7**		**818**	**0.366**	**imn**
	I use my body in an effective way to avoid injuries or f		**9**		**4.45**	**0.035**	**mor**
	I maintain my stability and balance even in difficult sit the field		**10**		**364**	**0.007**	**mor**
	I can give a quick reaction to a particular athlete's situa		**10**		**364**	**0.007**	**mor**

	I have the ability to change direction quickly when cha ll.		11		11	0.000	mo
	I am able to carry out tactical moves without interferin y teammates.		10		364	0.007	mo

***Moral at the level of significance (0.05).**

3-7-1-7Scaleof physical-motor intelligence in the initial form after presenting the vertebrae to the experts:

After the exclusion of the unacceptable paragraphs in the scale by the experts, the physical-motor intelligence scale became composed of (42) paragraphs as follows:

- Authenticity: (13) paragraphs.
- Reliability : (14) paragraphs.
- Attendance : (15) paragraphs.

3-7-1-8 Scale Correction Switch:

For the purpose of obtaining the total score for each sample member, appropriate weights are given to the alternatives of the scale vertebrae, and by adding the respondent's scores on the five-point scale, we obtain the total score for each individual. Note that the paragraphs of the physical-motor intelligence scale were formulated in both positive and negative directions, and the weights of its paragraphs were determined from (5-1) degrees for each of the test paragraphs. Therefore, five alternatives and graded responses were developed. Table (10) shows this:

Table (6)

Shows the weights of alternatives to the vertebrae of the physical-motor intelligence scale for volleyball players

Alternatives	applies to him a great extent	reatly applicable	oderately appl	Applies to hall degree	oes not apply to him a
Positive Trend	5	4		2	1
Negative trend	1	2		4	5

3-7-1-9Exploratory experiment of the scale of physical-motor intelligence:

To ensure the clarity of the instructions of the scale and the clarity of the paragraphs, to identify the time taken to answer, to identify the conditions for applying the scale, and the accompanying difficulties or obstacles. Scientific research experts often emphasize the need to conduct a study or exploratory experiment of the tests used in research, because it is "a preliminary study carried out by the researcher on a small sample before carrying out the research, with the aim of choosing his research methods and tools"[(1)].

Thus, the researcher, with the help of the team, conducted a reconnaissance experiment on Sunday, 22/10/2023, at ten o'clock in the morning, on a sample of (10)

(1) Arabic Language Academy: Dictionary of Psychology and Education, Part 1 , General Authority for Amiri Press Affairs, 1998 , p. 79.

players . It distributed the questionnaire forms of the scale to the members of the survey sample, reading the instructions and steps according to which the form was filled out, and then collected the answers of the individuals.

Through this, it became clear that all the paragraphs were understandable and clear to the sample, and that they were appropriate, and that the average time spent answering was (15) minutes for the scale of physical-motor intelligence. This time was calculated based on the time of the first response from the student who was given the scale , and the time of the last respondent. So that these two times are combined and divided by (2), and the average of the answers was (12) minutes. As mentioned above, this procedure aims to:

أ-Reaching the test time (measurement).

ب- Stability in the optimal order of the vertebrae.

3-7-1-10Applyingthe Physical Intelligence Scale to the Building Sample:

The physical-motor intelligence scale was applied to the construction sample, with the aim of conducting an analysis of the paragraphs, selecting the valid ones and excluding the invalid ones based on their discriminatory strength, using statistical means to obtain accurate, clear and appropriate paragraphs by extracting the validity and stability coefficient. "Paragraph analysis is a process of examining or testing the responses of individuals for each paragraph of the scale. This process includes revealing the strength of the paragraph and the effectiveness of alternatives in the test paragraphs (1).

Accordingly, the researcher applied the study scale (physical-motor intelligence) to the construction sample consisting of (80) players . It was distributed to players in the sports halls of the targeted centers on Tuesday and Wednesday, 24-25 / 10/2023 .

3-7-1-11Statistical analysis of the paragraphs of the Physical-Motor Intelligence Scale:

Statistical analysis aims to calculate the discriminating ability and internal consistency of the paragraphs of the scale. Discriminatory ability refers to the ability to differentiate or distinguish between individuals who score high and individuals who score low on the same test, while internal consistency refers to how homogeneous the paragraphs are in their measurement of the sample, meaning that analyzing the paragraphs means keeping the good paragraphs on the scale(2). Despite the accuracy of logical methods and expert judgments, they do not replace the field experimentation of the test, and the analysis of the scores of its paragraphs using statistical methods (1).

The researcher followed two methods in analyzing the paragraphs of the scale:

(1) Abdul Jalil Ibrahim Al-Zobaie(et al.): Educational Psychology, 3rd Edition , Ministry of Education Press, Baghdad , 1987 , p. 74.

(2) Atanius Michael: Measurement and Evaluation in Modern Education, Damascus , Damascus University Publications, 1996 , p. 98.

(1) Salah Al-Din Mahmoud Allam: Educational and psychological measurement and evaluation, its basics, applications and contemporary trends, Dar Al-Fikr Al-Arabi , Cairo , 2000 , p. 267.

1. Terminal groups.
2. The method of internal consistency.

3.7.1.12 Internal Coefficient of Consistency:

First: The relationship of the paragraph to the total score of the test:

To show the relationship of the score of each paragraph of the (Physical-Motor Intelligence Scale) to the total score of the test, the simple correlation coefficient (Pearson) was calculated. The results showed that all the paragraphs of the scale are significantbecause the level of significance (sig) is less than (0.05) per paragraph, which indicates that there is a significant correlation between the degree of the paragraph and the total score of the scale. Table(12) shows this:

Table (7)

The correlation coefficient between the score of each paragraph and the overall score of the physical-motor intelligence scale shows

Physical-Motor Intelligence Scale				
Seque Paragr	Vertebrae	Correl coeffic		Signific
	I can perform warm-up movements and physical tests eas thout mistakes.	6950		moral
	I have good abilities that qualify me to perform skills that gh flow	5,680		moral
	I have good balance while jumping and landing while pla	6234		moral
	My motor skills performance improves with increased pra	7463		moral
	I can quickly adjust my posture to suit the movement of th	6430		moral
	I perform motor skills with high flow	5730		moral
	My skill performance is better when I am not in front of o	RCPR		moral
	I skillfully use my body to perform complex movements s inning or sudden lunge.	.8264		moral
	I have a good sense of where the ball is in the air even if I oking directly at it.	5834		moral
	I can accurately time my jump while performing the block	4-769		moral
	I can move according to musical rhythms	7843		moral
	I can use my body parts at once when required	5328		moral
	I focus a lot on the interconnection exercises and the com tween the senses and movement	8563		moral
	My strength is constantly increasing unlike many of my lleagues	|||UNT TED_CONTE RT|||0.7563|||U SLATED_CO ND|||		moral
	I can use my body movements to mislead an opponent or uitable playing space.	0.740		moral
	I feel that I will not be able to perform to the best of my a rformance requirements increase	6123		moral

	I can perform well on tests to measure muscle strength	5430		moral
	I can perform some new skills faster and more accurately lleagues	6098		moral
	My slow movement loses a lot of my skill and accuracy w rforming a new movement	7234		moral
	I can easily regain my speed and accuracy as I perform ne	D6978		moral
	I am able to change my motor directions quickly and accu	7498).		moral
	I easily handle the ball from various angles and heights	7342		moral
	I can move my body in different directions and efficiently	7342		moral
	I can perform some motor skills with high flexibility	0.757(		moral
	I use my hands and feet effectively to collaborate with my lleagues in building an attack or defense.	5230		moral
	I can maintain a regular motor rhythm while implementin ries of skills	7347		moral
	I find it difficult to make the critical decision to move wh ced with multiple choices	0.6548		moral
	I am able to coordinate hand-eye movement while perfor ushing blows.	5260		moral
	The more I experience, the easier it is for me to perceive a mplex movement	6350 (		moral
	I deal flexibly and quickly with sudden changes in play.	5340		moral
	I have enough flexibility to perform various volleyball mo thout difficulty.	0.530(		moral
	I can retain my attention for long periods	5650		moral
	I have a quick reaction when tackling surprise balls.	- 7500		moral
	I have a physical sense that helps me accurately estimate t stance between me and the ball or net	7920		moral
	I can control my body even while performing quick and s ovements.	5520		moral
	I control my fine movements even in situations of stress o mpetition.	0.530(		moral
	I learn new movements quickly by watching or practicing	6180		moral
	I use my body in an effective way to avoid injuries	5250		moral
	I maintain my stability and balance even in difficult situ	5800		moral
	I can give a quick reaction to a particular athlete's	6040		moral
	I have the ability to change direction quickly when ch	7260		moral
	I am able to carry out tactical moves without interfering tea	0.831(		moral

*** Moral at the level of significance ≤ (0.05).**

3-7-1-13Psychometric Characteristics of the Physical-Motor Intelligence Scale:

Psychometric properties are one of the necessary requirements for achieving the objectivity of the scale through the properties of honesty and stability. Honesty is more important than stability because an honest measure is fixed, while a fixed measure may sometimes not be true "as the measure may be homogeneous in its paragraphs because it measures a characteristic other than that for which it was prepared"(1). The availability of conditions in the construction of the scale is also of great importance in confirming the safety and scientificity of this construction, and the most important of these conditions is the validity, stability and objectivity of the measurement tool (2). To achieve this, the researcher carried out these characteristics, which were:

3-7-1-13-1Validityof the scale:

Honesty is a broad concept and has several meanings that vary according to the tests or standards used. It means measuring the test for what it was developed for, that is, measuring the honest test for the job that it claims to measure and does not measure anything else instead or in addition to it(3). The researcher adopted two types of honesty to ensure the validity of the test:

First: Validity of the content:

This type of validity aims to know the extent to which the test or measure represents aspects of the attribute or trait to be measured, and whether the test or measure measures a specific aspect of the phenomenon or all of it, that is, the extent to which its content matches what it wants to measure. His determination entails taking the opinions of experts and specialists in the field he is trying to measure (4). This type of validity was achieved when the physical-motor intelligence scale was presented to a group of experts and specialists in the field of volleyball, sports psychology, testing and measurement, to establish the validity of the paragraphs of the scale, and to know the extent to which these paragraphs represent the axes that measure them, to delete the invalid paragraphs, and to keep the valid paragraphs that get the support of most specialized experts. As shown in Table (5):

Second: The sincerity of the construction:

The validity of the construction is one of the most representative types of validity of the concept of validity, and it is sometimes called the validity of the concept or the validity of the hypothetical formation, because it depends on experimentally verifying the

(1) Laila Al-Sayed Farhat: Mathematical Cognitive Measurement, 1st Edition , Al-Kitab Publishing Center, Cairo, 2001 , p. 68.

(2) Abdullah Al-Emadi and Maher Rabie: Psychological and Educational Measurement and Evaluation, 1st Edition , Wael Publishing House, Jordan , 2004 , p. 169.

(3) Ikhlas Mohamed Abdel Hafeez and Mustafa Bahi : Scientific Research Methods and Statistical Analysis in the Educational, Psychological and Sports Fields, 2nd Edition , Al-Kitab Publishing Center, 2002 , p. 173.

(4) Mohammed Hassan Allawi and Mohammed Nasr Al-Din Radwan: Measurement in Physical Education and Sports Psychology, Dar Al-Fikr Al-Arabi , Cairo , 2002, p. 358.

extent to which the scores of the scale match the measured property or concept. It is one of the most important types of validity in the stages of building the scale, because it forms the theoretical framework of the scale (1). This kind of honesty has been achieved through the following:

B. Internal consistency coefficient (internal criterion validity):

The internal consistency coefficient was used in the analysis of the paragraphs of the scale, and it means calculating the validity of the paragraphs of the scale using the internal scale by finding the correlation between the degree of each paragraph and the total score of the scale. This type of honesty was achieved using the simple law of association (Pearson). As shown in the tables (7)

3-7-1-12-2Stabilityof the scale:

Stability is an important psychological characteristic of well-prepared tests, in that a stable test is "a test that gives similar or the same results if applied more than once in similar circumstances"(2), and it means the stability of the results when reapplying the test to individuals and maintaining the real variance of the test(3). In order to verify the stability of the test, the researcher used the following methods:

Second: Fakronbach coefficient:

It is one of the most common and appropriate measures of stability for scales with a graded scale. This method depends on the extent to which the paragraphs are related to each other within the scale, and the extent to which each paragraph is related to the scale as a whole. The rate of coefficients of internal correlation between the paragraphs determines the coefficient of (Fakronbach). Many sources indicate that if the degree of Fakronbach is from (70) and above, his paragraphs were better (1).

The researcher calculated the stability coefficient in the Fakronbach method for all members of the 80-player construction sample, using the statistical bag (spss). He showed that the value of the stability coefficient is equal to (0.919) for the scale of physical-motor intelligence, which is a high stability value. Table (8) shows this:

Table (8)

It shows the stability coefficients with the Fakronbach coefficient of the axes of physical-motor intelligence.

	Themes	Fakronbach
	Authenticity	.954
	Reliability	0.904

(1) Mikhail Ibrahim Asaad: Psychometry, Damascus, Republic Press, 1981 , p. 331.

(2) Mowaffaq Asaad Mahmoud: Tests and Tactics in Football, Dar Degla , Jordan, 2007 , p. 22.

(3) Essam Al-Nimr: Measurement and Evaluation in Special Education, Dar Al-Yazouri for Printing , Jordan, 2008 , p. 77.

(1) Mustafa Bahi: Scientific and Practical Transactions between Theory and Practice, I , Al-Kitab Publishing Center, Cairo, 1999 , p. 18.

	Punctuality and Attendance	0.914
	Physical-motor intelligence	0.919

3-7-1-1-23 The final version of the Physical-Motor Intelligence Scale:

The scale became ready in the final form of application , as it consisted of (42) paragraphs distributed over (3) axes: (**originality, reliability, perseverance),** and the total score of the scale is (210), and the minimum score is (42).

3-8 Main Experience:

After ensuring the safety and validity of all procedures through exploratory experiments and included in the scientific conditions of the tests , the researcher conducted his main experiment after preparing the requirements for conducting all the experiment from the assisting cadres and fixing the test times on 3 days and the period from 20-22 /5/2024 on the research sample of (70) players .

The researcher also extracted the discriminatory ability of the tests by ranking the raw scores ascendingly and taking (27%) of the upper scores and (27%) of the lower scores because it is the best ratio by which we obtain the highest discrimination coefficients [(1)] and the test (t) was applied between the two groups of independent samples by (19) players of a low group and an equal upper group as shown in Table (4) , from which we note that all tests have a high discriminatory ability at the level of significance (0.5)

Table (9)

Shows the discriminating ability of the tests in question according to the main sample

	Test Name	Low-level		high gr		calculat
		C	.	C	.	
	The quick partridge at the checkp alternately and perform the posterior crus batting skill	28/	98	Tri	0.8	4.15

3 – 9 Statistical methods used in the research:

The researcher used the statistical bag spss to issue 25

4-Presentation, analysis and discussion of research results:

(1) Marwan Abdul Majeed Ibrahim : Scientific Foundations and Statistical Methods of Tests and Measurement in Physical Education, 1st Edition , Amman , Dar Al-Fikr for Printing and Publishing , 1999 , p. 140.

4-1 Presentation, analysis and discussion of the results of the test of the research variables:

Table (10)

Shows the arithmetic media, standard deviations, torsion coefficient and kurtosis of tests (physical – skilled)

	Statistical Proc Methods: Variables	meas	Arit Mean	Sta error	Sta Deviati	Tv	Ku
	The quick par the checkpoints alte and perform the post crushing batting sk	D	9	3242 inden	7132	-0.(	.790

DISCUSSION OF RESULTS

The test, which is the rapid partridge on the barriers in exchange and the performance of the posterior crushing batting skill, which was represented by partridge exercises on the barriers that were performed by the resistance of the body, which worked to develop the muscular strength produced in the muscles of the lower limbs, and this is explicitly confirmed by Abdul Karim Al-Fadhli "The development of strength in the working muscles requires the use of body resistance or added resistance to the parts of the working body to represent resistance to these muscles in order to develop their efficiency" (1) and thus improve the ability of the player to overcome the external forces that hinder movement, which in turn works to increase the motor speed of the player, which is confirmed by both Raysan Khubait and Mahdi's success. "The increase in speed is directly proportional to the induced force of the movement if the mass is relatively constant" (2). In addition, Samir Muslat indicates that the amount of movement obtained is proportional to the impacting force as the impacting force increases the movement and thus increases the amount of movement and linear kinetic energy. (3) .

The researcher believes that the nature of resistance was through the central muscle contraction that occurs as a result of overcoming resistance during the performance of the exercise by bringing the working muscles closer to their center and the eccentric muscle contraction in which the muscles contract away from their center worked to increase the amount of muscle fibers raised as a result of the used resistors, which in turn led to an increase in the muscle strength produced. This is what Jabbar Ali Jabbar stressed, "The

(1) Explicit Abdul Karim : Source previously mentioned, 2010 , p. 280.

(2) Raysan Khuraibet and Najah Mahdi : A source previously mentioned, 2002, p. 104 .

(3) Samir Muslat Al-Hashemi : Sports Biomechanics, 2nd Edition , Dar Al-Kutub for Printing and Publishing , Mosul , 1999 , p. 131 .

muscle strength produced increases as the number of muscle fibers raised in one muscle or muscle group increases."(1) The used resistors that the muscles try to overcome were.

When reviewing the test, it is the lactic lactic nonoxygen system, as the time of the third test was (80) seconds and the fourth (90) seconds. These times fall within the scope of this system that the nature of performance in volleyball is characterized by the constant speed alternating between attack and defense and for a period of time within certain limits of the point. This means that the player must bear and maintain his speed throughout this period, resisting the fatigue he feels, because the accumulation of lactic acid in the muscles that generates a feeling of fatigue, and this means that the installed ability to carry speed dominates this system and the game of volleyball .

Therefore, it is very necessary to pay attention to the development of anaerobic capabilities in this system because fatigue, especially early, affects the physical, skill and linear ability of the team and reduces the performance of players and then affects the accuracy of shooting and scoring points. Therefore, there must be physical skill tests within this system to measure the responsiveness of players' performance under the influence of high pressure and then develop solutions later

4-3 Matrix of correlational relationships between study variables

Table No. (11)

Shows the matrix of correlational relationships between the study variables

Tests	See Annex 4 for t roportion of regular and xtra-budgetary funds.		Module		R	Sig	Sig
	You wil	W	You	W			
Fast partridge on the barri ternately and perform the posteri ushing batting skill	9	3242 linden	162	.53	861	0.0	mo

4-3 - 1 Matrix of correlational relationships between study variables

For the purpose of obtaining the matrix of interrelationships of the variables studied and their estimates in Table(25) , the researcher used the simple correlation coefficient (Pearson) for the variables, which amounted to (5) variables and as shown in Table (25).

The matrix included (10) correlation coefficient, as can be seen from the table that the number of correlations of the first test is the second test (0.765), the first with the third , the correlations of the variables (spss) system.

|||UNTRANSLATED_CONTENT_START|||جدول (12)|||UNTRANSLATED_CONTENT_END|||

Shows the width of the correlation matrix table

Variables	Quiz 4	intelligence sc

(1) Jabbar Ali Jabbar : Source previously mentioned, 2014, p. 56.

Quiz 4	1,000	.782
intelligence scale	782	1,000

4-3-2 Characterization of the relationship between physical and skill tests and the physical intelligence scale (simple and complex):

For the purpose of reaching the significance of the correlation coefficients, the structural and skill tests installed within the energy systems and their relations to the intelligence scale of the research sample

Table No. (13)

Linear regression between physical and skill tests and their relationship to the scale shows physical intelligence

Var Rese arch	Relationship Regression	Correlation efficient(T)	Ratio legal ||| NTRANSLTED_CONENT_STAT|||($\mathcal{J}^2$)|||UTRANSLAED_CONTNT_END|||	Laboratories Alienation	Correlation Coefficient Confidence Ratio	|||UTRANSLAED_CONTNT_START|||FNTRANSLTED_CONENT_END||| Value	Significance level	ov nerships
Quiz 4	Minor	.782	0.611	0.466	0.534	269.	0.002	m oral

From the previous table, it appears to us that the correlation coefficients of the tests and both and the physical intelligence that resulted from the statistical analysis processes were as follows :

As for the test, it lost the nature of the correlation (simple) if the value of the correlation coefficient is (0.782), which is a significant value if its significance comes from the calculated value of the Fae test (10,269), which is a significant value and at the level of significance (0,002) and two degrees of freedom (F). Its significance came from the calculated value of the Fae test (10,265), which was a significant function and at the level of significance (0,002) and two degrees of confidence in the correlation coefficient (2-67). The amount of the coefficient of alienation (0,484) and the confidence in the correlation coefficient (0,516) was the contribution rate (0,181).

5. Conclusions and recommendations

5-1 Findings

In light of the results presented, the researcher came to the following conclusions:

1- In light of the conditions for accepting the factors, the test was extracted, which represented the highest morale

2- Through the selected test the fact emerges that there is an overlap between skill performance, physical performance and energy systems that cannot be separated .

3- A scientific scale was built and valid paragraphs were codified to measure physical intelligence.

7- The tests that have been rated physical and skill vehicle measure the characteristic for which it was developed

8-There is a linear correlation between the tests and the scale of physical intelligence

5-2 Recommendations:

1- Adopting the use of tests in measuring volleyball players from the physical, skill and physiological aspects of young people .

2- Adopting the standards reached in evaluating the performance of young players in volleyball .

3- Trainers rely on these tests to really stand at the levels of their players during the training phase and in their training units because they are closer to real play situations.

4- The possibility of conducting a similar study on other categories using these tests to extract standard scores for those categories .

5- Designing other composite tests on non-youth samples that have not been previously researched.

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