Some Anthropometric Measurements and Sensor motor Perceptions and their Relation to Performance Level of Individual Play for Speedball Players

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Introduction and Research Problem:

Sports level in the championship sector requires the use of the scientific method to plan and direct the training process which requires the trainer to have comprehensive objective and effective indicators of the status and level of players so that he can plan their training programs as well as the selection process to select the best elements to achieve the high level.

In order to achieve the best results according to the characteristics of the player to adjust the requirements of sports activity, it is impossible to ignore the phenomenon of the relationship between anthropometric measurements (A.M) and performance level which is considered special requirements that need to be available to those who aim to win the tournaments. (9: 597), (1: 293)

Anthropometric measurements (A.M) is a branch of anthropology which concerns with human body and its parts, and includes lengths, circumferences, widths, depths, thickness of the lipid layer, and are executed for scientific and practical purposes, and are of particular importance in studies concerned with the evaluation of the physical-skillful development which has attracted the attention of scientists of measurement in the modern era. Also these measurements are characterized by rigorous scientific method and closely related to many of the motor abilities and skills. (14: 37, 43), (12: 67, 72)

The anthropometric measurements affect the player's response to different play situations, which vary according to the movement of the ball, its speed, spatial and temporal characteristics, and

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the player's style which requires

a high amount of Sensory-motor abilities that contribute to provide information he needs to perform specific motor performance under changed conditions and different speed, strength and time. (3: 75), (16: 272)

In order to avoid the error that is obvious during the performance of the lack of concentration of the amount or amount necessary for the proper contraction to the muscle of one part of the body or the whole body. So, the player has to the use of sensory motor perception (S.M.P) to correct the performance of skills in proper time based on a set of sensory stimuli that move to the nervous system which, in turn, affects and modify the positions of the body to help him to master the skill. Also, the perception of the movement is considered a good basis for all movements of the player because of the ability to use the visual and audio movement beside to control voluntary movements and sense of place and movement. (2:14), (17: 56), (18: 120), (19: 467)

The effectiveness and direction of movement are reduced in the absence of information about their basic variables (distance-force-time), because of the sensory-motor perception (S.M.P) elements are the primary subjective sources of these characteristics. Therefore, the study of different types of sensory-motor abilities, both as individual phenomena or in their reciprocal relationship is important aspects. (15: 247)

The results of the study of Alia Mohammed (2004), (9), Muhammad Salama (2005), (13), Talb Jassim (2011), (7) points out to the existence of significant correlation between some anthropometric measurements (A.M) and the level of skill performance of some sports activities. Also,the study of Eman Najm elddin (2008), (5), and Iyad Mashhour (2010), (4). to the existence of correlation between the function of some sensor motor perceptions (S.M.P) and the level of the performance of some skills of sports activities.

Also, the results of the study of Ahmed Subhi (2001), (2), Zakaria Al Sayed (2012), (6) showed that the existence

of positive correlations between some (A.M) and (S.M.P) in some sports activities.

Speed ball is considered modern racquet sports and Egyptian origin which is practiced by ball and racket using a simple device that makes the ball spins in circles around its center (pulley) in horizontal and vertical rotors that differ in their angles and does not exceed 3 m. in diameter, by the rubber ball so that it swings in both directions according to the rules of individual play which is practiced by the player in a race against time in an attempt to hit the ball with a single or tow bats hitting the largest number of correct strikes during a predetermined time in four positions determined by the rules of play, where the individual play is considered the basis of that sport and by this way of this performance players are classified to double competitions according to score a certain number as a minimum, which requires physical, skillful and dynamic burden. (10: 11-37)

By analysis of the skillful performance of the speed ball sport it was noted that sport requires (S.M.P)and physical characteristics that characterize the players of the speed ball, which serve as a guide to the trainers in the development of training programs and selecting the best elements that achieve high levels. Egypt now has an advanced world level in that sport and has election team of international players who are classified in the world by obtaining a large number of advanced ranking in international tournaments, which requires maintaining this prominence by taking care to study aspects of the strengthening of that sport using scientific method in determination of some (A.M) and (S.M.P)and their relationship to the level of performance of individual play for speedball players as an attempt to take advantage of what the outcomes of this study of guidance and the selection process of players and the development of training programs for them according to objective scientific basis.

Research Objectives:

This research aims to:

1- Identify the relationship between some (A.M) () and the level of performance of the

individual play of speedball players.

2- Identify the relationship between some of (S.M.P) and the performance level of the individual play of speedball players.

3- Identify the contribution of some (A.M) (circumferences- ocean- widths) in the level of performance of the individual play of speedball players.

4- Identify the contribution of some of (S.M.P) in the level of performance of the individual play of speedball players.

Research questions:

1- Is there statistical significant correlation between some (A.M) (circumferences- ocean- widths) and the level of performance of the individual play of speedball players?

2- Is there statistical significant correlation between some (S.M.P) and the performance level of individual play of speedball players?

3- Do some (A.M) (circumferences- ocean- widths) contribute in performance level of individual play of speedball players?

4- Do some (S.M.P) contribute in performance level of individual play of speedball players?

Terms used in the research:

Individual Play in Speedball:

The player who practices on his own in a race against time in an attempt to hit the ball with a single bat (left or right) or two bats (front-back), achieving the largest number of correct strikes during certain predetermined time in the four positions. (10: 31-34)

Research procedures:

Research Methodology:

In light of the nature of the research and within the limits of objectives, the researcher used the descriptive survey method because of nature of the research.

Population and research sample:

The research population includes the players of the Cairo, Ismailia, Kafr El-Sheikh, Suez, Al-Gharbia, and the size of the sample include (40) players under the age of 21 for the 2015/2016 sports season. The researcher excluded (10) players to conduct pilot study to find scientific coefficients on them and thus became the basic study sample included (30) players, Table (1)

Table (1)

Numbers represented for the research sample

The research sample	Basic Study				Total	Pilot study and scientific coefficients	Total	total sample			
Region	Cairo	Suez	Kafr El Sheikh	El Gharbia		Ismailia					
The club	The Arab Contractors	ElNasr sport club	Ahmed Abdou New Youth Center	Montzah Badr	Zefta	Desouq		Suez Canal Author.	Ismaily		
the number	6	6	5	5	4	4	30	5	5	10	40

The homogeneity of the research sample was conducted in the variables of age, height, weight, and training age, as shown in Table (2).

Table (2)

Homogeneity of the research sample in variables of age, height, weight and age of training

Statistical data / Variables	Measuring unit	Arithmetical mean (A.M)	Standard deviation (S.D)	Median	Skewness coefficient
Age	Year	20.05	0.53	19.9	1,166
Length	Cm.	171,23	2.49	170.5	0.651
Weight	Kg.	70.10	1.89	70.0	0,290
The training age	Year	7,13	0.45	7,00	0.314

Table (2) shows that all the values of the coefficients of skewness in the variables of age, height, weight, and training age ranged between (0.290 and 1.166) and are limited to (± 3), which indicates homogeneity of the research sample in these variables.

Data collection tools:

1- Expert opinion of questionnaire form:

The researcher reviewed the references and studies that dealt with (A.M) and (S.M.P), and reached to (10) (S.M.P) as well as the tests that measure them and reached to (35) (A.M) of the body in (lengths, widths, circumferences, and fat) and the researcher

presented his findings in an expert consultation form. Appendix (1).

- Conclusions of the expert survey questionnaire form:

By presenting and reviewing the questionnaire form by interviewing the experts, the researcher concluded that:

* Experts agreed on the most important (S.M.P) of speedball players which were (6) ones and selected the tests that measured them and which got 70% and above. Appendix (2).

* Experts agreed that the most important (A.M) of speedball players which were (17) ones, and selected the measurements which obtained 70% and above. Appendix (3)

Tools and devices used in research:

- Medical standardized scale for measuring weight.
-Restameter device for measuring the total length of the body (cm.).
-Stop Watch.
- Manomometer for measuring the strength of grip.
- Dynamometer for measuring the strength of back muscles.
- Dynamometer for measuring the strength of leg muscles.
- Angular apparatus for measuring angular perception to shoulder joint.
-Angular apparatus for measuring angular perception to elbow joint.
- Angular apparatus for measuring angular perception to wrist joint.
-Sheet Form for measurement and tests.
- Standardized Belvometer for measuring widths.
- Standardized tope for measuring widths and circumferces.
- Mask for eyes.

Determining the level of performance of speedball players:

The researcher used the results of competitions for the 2015/2016 of sports season organized by the Egyptian Federation of Speedball for speedball players for members of the research sample under 21 years from the registration of the federation in measuring the level of performance for individual play in all four different positions in consideration of (60sec.) and (30sec.) comfort period between each position and another by counting the number of correct strikes in each position.

Pilot Study:

The researcher conducted the pilot study in the period from 7/11/2015 to 13/11/2015 on the number of (10) players from outside of the research sample and from the same research population from Ismaily, and the Suez Canal clubs of speedball zone, the study aimed to identify:

-Validity of tools and devices used in the research.

-Training assistants on measurements and tests and organizing sample members to conduct measurements.

-Determining difficulties which might face the researcher during measurements and tests and how to overcome them.

-Check the validity of the registration form of measurements and tests.

-Determining the time taken to perform tests and measurements.

Scientific coefficients:

Validity of test:

The validity coefficients were calculated by means of a distinct group of players under the age of 21 years, consisting of (n=10) players from the research population and out of sample of research from Ismailia zone speedball (Ismaily and Suez Canal Authority Clubs), and compared them with non-distinct another group of the same age stage, as shown in Table (3).

Table (3)

Validity coefficients for sensory-motor perception tests of research ($N_1 = n_2 = 10$)

Statistical data / tests		Measuring unit	dist . Group		nondist . group		Difference between the two averages	Value of ''t''
			X_1	P_1	X_1	P_1		
Strength Perception	(S.M.P) of 75% strength of the grip	Degree	3.83	0.64	4.73	0.75	0.9	2.904
	(S.M.P) of 50% of the back muscle strength	Degree	6.30	0.98	7.30	0.98	1.0	2.287
	(S.M.P) of 50% of leg muscle strength	Degree	5.11	1.28	7.90	1.05	2.79	5.327
Angular perception	Angular perception of the wrist joint at the angle 45	Degree	3.11	0.99	7.11	0.98	4.0	9.051

Follow Table (3)

Validity coefficients for sensory-motor perception tests of research ($N_1 = n_2 = 10$)

Statistical data / tests		Measuring unit	dist . Group		nondist . group		Difference between the two averages	Value of ''t''
			X_1	P_1	X_1	P_1		
	Angular perception of elbow joint at angle 60	Degree	4.66	1.48	9.65	1.04	4.99	7.501
	Angular perception of the shoulder joint at the angle 120	Degree	7.20	1.23	8.80	1.23	1.60	2.910
Time Perception	The perception of time (10sec.)	Degree	3.16	0.78	4.00	0.94	0.84	2.177
	Perception of time (5sec.)	Degree	0.74	0.14	0.87	0.11	0.13	2.437
	perception of time (3sec.)	Degree	0.19	0.03	0.23	0.03	0.04	2.792
Balance perception	Perception of balance of the feet together	time	4.51	0.90	2.50	0.91	2.01	4.955
	Perception of balance of the right foot crossing	time	2.1	0.25	1.6	0.33	0.5	4.142
	Perception of balance of the left foot (crossing)	time	1.40	0.18	1.19	0.11	0.21	3.115
Movement perception	Perception of arm symmetry horizontally	Degree	4.95	1.40	7.30	1.86	2.35	3.191
	Perception of arm symmetry vertically	Degree	2.10	0.99	4.50	1.72	2.40	3.827
Speed Perception	Perception the speed of the arm in the horizontal direction	Number	45.0	9.43	27.0	8.23	18.0	4.548
	Perception the speed of preferred hand	Degree	5.60	1.27	7.8	1.32	2.20	3.811
	Perception 50% of the body speed	Degree	5.40	1.08	7.30	1.34	2.10	3.501

The value "t" of table at the level of 0.05 = 2.10

Table (3) shows that there are statistically significant differences between the distinct and non-distinct groups in the (S.M.P) tests of research groups for distinct group, where "t" value were between (2.177 and 9.051), and all were significant at 0.05. It means the tests of research are valid.

Reliability of tests:

To determine the degree of reliability of (S.M.P) tests , the researcher used the method of applying the test and reapplying it after a week on a sample of (n=10) players from the same research population and outside the basic research sample and from the Ismaily and Suez Canal Authority clubs belonging to the Ismailia speed zone of speedball. The correlation coefficients between the two applications were calculated to indicate the reliability of the tests. As shown in Table (4).

Table (4)

Reliability coefficients of sensory - motor perception tests N = 10

Statistical data / tests		Measuring unit	The first application		The second application		Reliability coefficient
			S	¡± p	S	¡± p	
Strength Perception	(S.M.P) of 75% strength of the grip	Degree	3.80	0.63	4.22	1.14	0844
	(S.M.P) of 50% of the back muscle strength	Degree	6.30	0.98	7.05	1.61	0.856
	(S.M.P) of 50% of leg muscle strength	Degree	5.11	1.28	5.66	1.64	0.946
Angular perception	Angular perception of the wrist joint at the angle 45	Degree	3.11	0.99	3.86	1.71	0.804
	Angular perception of elbow joint at angle 60	Degree	4.66	1.48	5.41	2.40	0.927
	Angular perception of the shoulder joint at the angle 120	Degree	7.20	1.23	8.10	1.79	0.747
Time Perception	The perception of time (10sec.)	Degree	3.16	0.78	3.80	1.53	0.863
	Perception of time (5sec.)	Degree	0.74	0.14	0.77	0.16	0.977
	Perception of time (3sec.)	Degree	0.19	0.03	0.20	0.03	0.910
Balance perception	Perception of balance of the feet together	time	4.51	0.90	5.45	1.94	0.761

Follow Table (4)

Reliability coefficients of sensory - motor perception tests N = 10

Statistical data / tests		Measuring unit	The first application		The second application		Reliability coefficient
			S	¡± p	S	¡± p	
	Perception of balance of the right foot (crossing)	time	2.10	0.25	2.22	0.38	0827
	Perception of balance of the left foot is (crossing)	time	1.40	0.18	1.49	0.19	0.821
Movement perception	Perception of arm symmetry horizontally	Degree	4.95	1.40	5.35	1.72	0.965
	Perception of arm symmetry vertically	Degree	2.10	0.99	2.50	0.97	0.747
Speed perception	Perception the speed of the arm in the horizontal direction	Number	45.0	9.43	50.0	12.91	0.822
	Perception the speed of preferred hand	Degree	5.60	1.27	6.0	1.16	0.913
	Perception 50% of the body speed	Degree	5.40	1.08	5.5	1.32	0.942

The value "r" of table is at 0.05 = 0.632

Table (4) shows that there is a statistically significant relationship at 0.05 level between the first and second applications in (S.M.P) tests of research. The value of the calculated "r" ranged from (0.747) to (0.977), which is greater than the "r" of table. So, the tests are characterized by a high degree of reliability.

Basic Study:

The researcher conducted the basic study on the members of the basic research sample (n=30) players who are registered in the Egyptian Federation of Speedball in the period from 15/11/2015 to 30/11/2015. The conditions of the measurements were conducted under the same rules and the data were collected and processed statistically.

Statistical treatments:

-Arithmetic mean (A.M).

- Standard deviation (S.D).
- Simple correlation coefficient (R).

Median.

- Test "T".
- Skewness coefficient.
-Calculating multiple correlation by step wise regression (S.W.R) to determine the proportion of the contribution of (A.M) and (S.M.P) in the level of performance.

Displaying and discussion of the results:

Displaying results:

A - Displaying the results of (A.M):

Table (5)

Homogeneity of research sample in some (A.M) lengths and the level of performance of individual play for speedball players.

N = 30

Statistical data / (A.M)(lengths)	Measuring unit	Arith. mean (A.M)	Standard deviation (S.D)	Median	Skewness coefficient
Total length (height)	cm	171 .23	2 .49	170.5	0.651
Trunk length	cm	54.73	8.54	54 .50	-0 .084
Thigh length	cm	56 .03	10.86	55.50	0 .188
Leg length	cm	51.80	8.24	51.50	-0.086
Arm length	cm	70.50	9.27	69.50	-0.088
Upper armlength	cm	27.67	11.02	27.0	0.329
Forearm length	cm	28.20	10.18	28.0	0.046
Shoulder length	cm	16.63	3.32	16.50	-0.031
Foot length	cm	27.40	5.35	26.0	2.277
Performance level	Number	557.0	112.59	555.0	0.126

Table (5) shows that all the values of the skewness coefficients of the research sample in the A.M (lengths) and the level of performance of the individual play of the speedball players ranged from (-0.088,2.277), where it is limited to (± 3) indicating to the homogeneity of research sample in those variables.

Table (6)

Correlation coefficients between some (A.M) lengths and performance level of individual play for speedball players N = 30

Statistical data (A.M) lengths	Correlation coefficient "R"	Level of significance
Total length	0.177	Non-sig.
Trunk Length	0.192	Non-sig.
Thigh length	0.987	Significant.
Leg length	0.228	Non-sig.
Arm length	0.885	sig.
Upper arm length	0.932	sig.
Forearm length	0.907	Significant.
Shoulder length	0.323	Non-sig.
Foot length	0.275	Non-sig.

The "r" value of the table is at 0.05=0.349

Table (6) shows that there is a statistically significant correlation between some (A.M) lengths and the level of performance of the individual play for speedball players in the length of the thigh, the length of the arm, the length of the upper arm and forearm length, where the calculated "r" is greater than "r" of the table at level of 0.05.

Table (7)

Some (AM) lengths contributing to the level of performance of individual play for speedball players N = 30

Statistical data (AM) lengths	Const. amount	coefficient	coefficient error	Value of "t"	Degree of freedom	Value of "F"	Contribution Ratio
Thigh length	-16.499	10.235	0.315	32.528	28	1058.06	97.4
Thigh length	-68.663	8.939	0.552	16.187	27	7.481	0.6
Arm length		1.770	0.647	2.735			
Thigh length	-27.811	7.557	0.775	9.757	26	5.621	0.4
Arm length		1.679	0.599	2.802			
Upper armlength		1.553	0.655	2.371			

Table (7) shows that thigh length is the main contributor to the level of performance of individual play for speedball players. Its contribution is 97.4%. The length of the arm as a second contributor is 0.6%, and upper

arm length as third contributing variable of 0.4%. Thus, the equation of the predictive regression line is:

R = w + m x1 + m x2 + m x3

Whereas:

R=performancelevel

W = constant amount

M= coefficient of the contributing variable multiplied by its value , so, the equation is:

Performance level = (-27.811) + 7.557 × thigh length +1.679 × arm length + 1.553 × forearm length

Table (8)

Homogeneity of the research sample in some (A.M) circumferences and performance level for individual play for speedball players N = 30

Statistical data (A.M) circumferences	Measuring Unit	Arith. Mean	standard deviation	Median	skewing coefficient
Chest circumference	cm	94.10	2.17	94.0	-0.159
Upper arm circumference	cm	25.57	5.34	24.0	0.794
Forearm Circumference	cm	34.67	11.02	34.0	0.329
Thigh circumference	cm	51.03	10.8	50.50	0.188
Calf circumference (leg)	cm	35.60	9.81	34.0	0.309
Performance level	Number	557.0	112.59	555.0	0.126

Table (8) shows that all values of skewing coefficients values of the sample individuals of some (A.M)circumferences and the level of performance of the individual play of speedball players ranged between (-0.159, 0.794), it is limited to between (± 3) , which refers to the homogeneity of the sample research individuals for those variables.

Table (9)

Correlation coefficients between some (A.M) circumferences and performance level of individual play for speedball players N = 30

Statistical data / (A.M) circumferences	Measuring Unit	Coefficient of correlation	Level of significance
Chest circumference	cm	0.345	Non Sig.
Upper arm	cm	0,267	Non Sig.
Leg circumference	cm	0.932	Sig.
Thigh circumference	cm	0.987	Sig.
calf circumference	cm	0.915	Sig.

”R ” value of the t-table is at 0.05 = 0.349

Table (9) shows that there is a statistically significant correlation between some (A.M) circumferences and the level of individual performance level of the speedball players (forearm circumference, thigh circumference, calf circumference), where the value of (r) at the level of 0.05.

Table (10)

Some (A.M) circumferences contributing to the of performance level of individual play for speedball players N = 30

Statistical data / (A.M) circumf.	const.	coefficient	coefficient error	Value of “ t”	Degree of freedom	Value of “ F ”	Contribution Ratio
Thigh circumference	34.676	10.235	0.315	32.528	28	1058.066	97.4
Thigh circumference	45.456	8.663	0.622	13.921	27	8.015	0.6
Calf circumference(leg)		1.950	0.689	2.831			
Thighcircumf.	63.676	7.411	0.806	9.197	26	5.020	0.3
Calf circumference(leg)		1.796	0.646	2.779			
forearmcircumf.		1.476	0.596	2.241			

Table (10) shows that the thigh circumference is the main contributor to performance level of individual play for speedballplayers. Its contribution rate is 97.4%, while the circumference of the calf is about 0.06%, andthe circumference of the forearm as a third variable by 0.3%.

Thus, the equation of the predictive regression line is:

$R = w + m \times 1 + m \times 2 + m \times 3$

So, the equation is

Performance level = 63.676+ 7,411× Thigh circumference + 1.796 × calf circumference (leg) + 1.476 × forearm circumference

Table (11)

Homogeneity of the research sample in some (A.M) widths and performance level of individual play for speedball players N = 30

Statistical data / (A.M) widths	MeasuringUnit	Arith. Mean	standard deviation	Median	skew. coefficient
Chest width	cm.	35.67	11.02	-35.0	0.329
Abdomen width	cm.	29.00	1.44	-29.0	-0.670
Foot width	cm.	9.51	1.55	9.50	0.571
Performance level	Number	557.0	112.59	555.0	0.126

Table (11) shows that all skewness coefficients of sample individuals and the level of performance of the individual play of the speedball ranged between (-0.670, 0.571), it is limited to (± 3), indicating the homogeneity of the members of the research sample in those variables.

Table (12)

Correlation coefficient between (A.M) widths and performance level of individual play for Speedball N = 30

Statistical data / (A.M) widths	Measuring Unit	Coefficient of correlation	Level of significance
Chest width	cm.	0.932	Sig.
Abdomen width	cm.	0.034	Non Sig.
Foot width	cm.	0.560	Sig.

" R " value of the table is at 0.05 = 0.349

Table (12) shows that there is a statistically significant correlation between some (A.M) widths and the level of performance of the individual play of speedball players in (chest width, foot width), where the value calculated (r) is greater than the value of (r)at 0.05.

Table (13)

Some (A.M) widths contributing to the level of performance of individual play for speedball players N = 30

Statistical data (A.M) widths	const.	coefficient	coefficient error	Value of " t"	Degree of freedom	Value of " F "	Contribution Ratio
Chest width	217.309	9.524	0.698	13.639	28	186.011	86.9
Chest width	85.844	8.591	0.611	14.072	27	15.926	4.9
Foot width		17.322	4.341	3.991			

Table (13) shows that chest performance is the main contributor to the performance level of individual play for speed ball players, its contribution was 86.9%, while the foot width was 4.5%.

Thus, the equation of the predictive regression line is:

R = w + m x 1 + m x 2

So thee quation in the equation:

Performance level = 85.844 + 8.591 × Chest width + 17.322 × Foot width

Displaying of the results of sensory-motor perceptions (S.M.P):

Table (14)

The homogeneity of the research sample in the sense(S.M.P) of and the level of performance of the individual play of research N = 30

Statistical data (S.M.P) tests		Measuring Unit	Arith. Mean	Standard Deviation	Median	Skewness Coefficient
Strength Perception	(S.M.P) of 75% strength of the grip	Degree	3.81	0.51	3.80	-0.271
	(S.M.P) of 50% of the back muscle strength	Degree	7.00	1.54	7.00	0.589
	(S.M.P) of 50% of leg muscle strength	Degree	5.50	1.13	5.40	0.263
Angular perception	Angular perception of the wrist joint at the angle 45	Degree	3.40	0.97	3.35	-0.116
	Angular perception of elbow joint at angle 60	Degree	4.86	1.40	4.80	0.186
	Angular perception of the shoulder joint at the angle 120	Degree	8.30	2.87	8.00	1.163

Follow Table (14)

The homogeneity of the research sample in the sense(S.M.P) of and the level of performance of the individual play of research N = 30

Statistical data / (S.M.P) tests		Measuring Unit	Arith. Mean	Standard Deviation	Median	Skewness Coefficient
Time Perception	The perception of time (10 sec.)	Degree	3.38	0.86	3.35	0.142
	Perception of time (5 sec.)	Degree	0.77	0.13	0.77	-0.236
	Perception of time (3 sec.)	Degree	0.18	0.05	0.18	0.192
Balance perception	Perception of balance of the feet together	time	4.57	0.96	4.55	0.290
	Perception of balance of the right foot (crossing)	time	2.15	0.20	2.15	0.071
	Perception of balance of the left foot is (crossing)	time	1.55	0.15	1.54	0.189
Movement perception	Perception of arm symmetry horizontally	Degree	5.02	1.08	4.90	0.279
	Perception of arm symmetry vertically	Degree	3.03	0.77	3.00	0.438
Speed perception	Perception the speed of the arm in the horizontal direction	Number	47.57	11.47	45.00	0.318
	Perception the speed of preferred hand	Degree	6.30	1.29	6.00	0.116
	Perception 50% of the body speed	Degree	7.80	1.30	7.50	0.116
Performance level		Number	Degree	112.6	555.0	0.126

Table (14) shows that all the values of the skewness coefficients of the research sample in the (S.M.P) and the level of performance of the individual play ranged between (-0.271 and 1.163), and they are limited to ± 3.

Table (15)

The correlation coefficients between (S.M.P) and performance level of individual play for speed ball players N = 30

Statistical data / (S.M.P) tests		Measuring Unit	Arith. Mean	Skewness Coefficient
Strength Perception	(S.M.P) of 75% strength of the grip	Degree	0.403	Sig.
	(S.M.P) of 50% of the back muscle strength	Degree	0.556	Sig.
	(S.M.P) of 50% of leg muscle strength	Degree	0.948	Sig.
Angular perception	Angular perception of the wrist joint at the angle 45	Degree	0.946	Sig.
	Angular perception of elbow joint at angle 60	Degree	0.761	Sig.
	Angular perception of the shoulder joint at the angle 120	Degree	0,282	Non- Sig.
Time Perception	The perception of time (10 sec.)	Degree	0.816	Sig.
	Perception of time (5 sec.)	Degree	0.297	Non-Sig.
	Perception of time (3 sec.)	Degree	0.467	Sig.
Balance perception	Perception of balance of the feet together	time	0.949	Sig.
	Perception of balance of the right foot (crossing)	time	0.176	Non- Sig.
	Perception of balance of the left foot is (crossing)	time	0.071	No-Sig.
Movement Perception	Perception of arm symmetry horizontally	Degree	0.927	Sig.
	Perception of arm symmetry vertically	Degree	0.177	Non- Sig.
Speed perception	Perception the speed of the arm in the horizontal direction	Number	0.820	Sig.
	Perception the speed of preferred hand	Degree	0.122	Non- Sig.
	Perception 50% of the body speed	Degree	0.122	Non- Sig.

The" r" value of the r-table is at 0.05 = 0.349

Table (15) shows statistically significant correlation between the level of performance of the individual play and the (S.M.P) of the angular perception of time, perception of balance, and (r) tabular at the level of 0.05.

Table (16)

Sensory - motor perceptions contributing to individual performance of individual play for speed ball players N = 30

Statistical data / (S.M.P)variables	Constant amount	Coefficient	Coefficient error	Value of"t"	Degree of freedom	Value of P	Participation ratio
Balance Perception of feet together	48.776	111.210	6.992	15.905	28	252.962	90.0
Balance Perception of feet together	12.187	59.571	10.680	5.578	27	29.660	5.2
Balance Perception 50% of the strength of the muscles of the two legs		49.529	9.094	5.446			
Balance Perception of feet together	-26.353	48.445	9.324	5.196	26	13.579	1.6
S.M.P of movement of 50% of the strength of the muscles of the two legs		52.128	7.544	6.909			
S.M.P of movement of 50% of the strength of the back muscles		10.726	2.911	3.685			
Balance Perception of the feet together	29.574	59.541	9.410	6.328	25	6.932	0.7
S.M.P of movement of 50% of the strength of the muscles of the two legs		95.505	17.826	5.358			
S.M.P of movement of 50% of the strength of the back muscles		8.420	2.769	3.041			
Perception of the symmetry of the arms horizontally		-53.798	20.433	2.633			
Balance Perception of feet together	-27.530	55.502	8.849	6.272	24	5.403	0.4

Follow Table (16)
Sensory - motor perceptions contributing to individual performance of individual play for speed ball players N = 30

Statistical data / (S.M.P)variables	Constant amount	Coefficient	Coefficient error	Value of"t"	Degree of freedom	Value of P	Participation ratio
S.M.P of movement of 50% of the strength of the muscles of the two legs		85.645	16.976	5.045			
S.M.P of movement of 50% of the strength of the back muscles		7.063	2.619	2.697			
Perception of the symmetry of the arms horizontally		-48.046	19.003	2.528			
Perception arm speed of horizontal direction		1.079	0.464	2.324			
Balance Perception of feet together		50.140	8.424	5.952			
S.M.P of movement of 50% of the strength of the muscles of the two legs		76.750	16.012	4.793			
S.M.P of movement of 50% of the strength of the back muscles	-24.330	6.835	2.403	2.845	23	5.562	0.4
Perception of the symmetry of the arms horizontally		-40.593	17.704	2.93			
Perception arm speed of horizontal direction		1.053	0.426	2.476			
Angular Perception of the elbow joint at angle 60		7.331	3.109	2.358			
Balance Perception of feet together		34954	9.743	3.588			
S.M.P of movement of 50% of the strength of the muscles of the two legs	7.450	61.826	15.645	3.952	22	6.220	0.4

Follow Table (16)
Sensory - motor perceptions contributing to individual performance of individual play for speed ball players N = 30

Statistical data / (S.M.P) variables	Constant amount	Coefficient	Coefficient error	Value of "t"	Degree of freedom	Value of P	Participation ratio
S.M.P of movement of 50% of the strength of the back muscles		4.575	2.351	1.946			
Perception of the symmetry of the arms horizontally		-29.769	16.562	1.797			
Perception arm speed of horizontal direction		1.04	0.389	3.096			
Angular Perception of the elbow joint at angle 60		7.204	2.807	2.566			
Angular Perception of the wrist joint at angle 60		21.47	8.800	2.494			

Table (16) shows that perception of the balance of the feet together is the first contributing variable in the level of performance of the individual play of the speed ball players, and its proportion contribution is 90%, while the (S.M.P) of strength of the muscles of the two legs was50% as a second variable of 5.2%, and the perception of back muscle strength as third contributor got 1.6%. The reception symmetry of the arms horizontally as a fourth contributor got contribution of 0.7%. The speed of the arm in the horizontal direction as a fifth variable was 0.4%. Angular Perception of the elbow joint at angel 60 as a sixth variable by 0.4%. The angular perception of the wrist joint at angle 45 as a seventh variable with a contribution of 0.4%.Thus, the equation of the regression line is:

$$\mathbf{Y = w + mx^{1} + mx^{2} + mx^{3} + mx^{4} + mx^{5} + mx^{6} + mx^{7}}$$

Performance level = 7.450 + 34.954× Perception of feet balance together + 61.826 × perception of 50% muscle strength + 4.575 × perception of 50% of back muscle strength + (-29.769) × horizontal arm prescription + 1.204 × prescription of arm speed in horizontal direction + 7.204 ×

angular of elbow joint at angle 60 + 21.9476 × angular prescription of the wrist joint at angle 45

Discussion of results:

- Discussing the first question that states: "Is there a statistically significant correlation between some physical measurements (lengths - circumference - widths) and the level of individual performance of **players of speed ball?**

Table (6) shows that these is statistically significant correlation between some physical measurements (lengths) and the level of individual performance of the players of the speed ball and thigh length arm length, fore-arm length of the, leg length and attributed to the nature of the performance in the speed ball where is standing in front of the device, which is 170 cm. high above the surface of the floor and a 15 cm. thread hanging and fixed at the end of the rubber ball and when hit, makes circles with a diameter of 3 meters, and in order not to contact the player whose steady at a distance of 60 cm away from the trajectory in which it revolves, and in order to be able to fix this trajectory without falling or rising, the player must be characterized by some physical measurements such as the length of the lower limb or one of its parts as well as the length of the upper limb or one of its parts, represented in the arm on which the greatest burden lies in the performance of the strikes to control the ball and the same level of high-speed spinning, so. The sport of speed ball using the racket and specifications of the device in all situations of individual play requires special characterization of the player's arm as an expression of the positive relationship between the length of the arm and its parts and the level of performance.

Farouk Rajab (1998) points out that performance in the sport of speed ball requires the player distinguished with some anthropometric measurement such as the length of the lower and upper limbs of the body and their parts, and that the consistency of these standards lead to the perfection of the player to the strikes according to the different positions of the individual performance. The length of the arm of the special lengths of the speed ball player

is of great importance as it is the most widely used part of the performance. (10: 72)

These results are consistent with Ahmed Subhi (2001), (2), Alia Mohammed (2004), (9), and Mohamed Salamah (2005), (13), ware studies agreed that some anthropometric measurements (A.M), such as lengths, are closely related to the level of performance and athletic achievement.

As shown in Table (9), there is a statistically significant correlation between some physical measurements (circumferences) and the level of performance of the individual play of the players of the speed ball and the circumference of the forearm and the femoral circumference and the calf circumference. The researcher states that the forearm plays an essential role in the performance of various strikes, using one racquet or two for the four positions of play, and the need of the strength of the muscles of the arm for these strikes, especially the area of the forearm using the racquet of a relatively heavy weight and the continuous use during training and competitions for long periods. Thus, these parts of muscles fit these requirements and help to move and produce high force values, which in turn reflected on the working muscles, The circumference of the thigh and the circumference of the calf form the main factors in maintaining the balance of the player during the strikes and resulting in the upper limb rushing in both directions through the force of the feet alternatively, and then transfer the force resulting from leg to the muscles of the thighs Which affect the increase of the cross-section area and its surroundings as a result of continuous regular training so the association of the thigh and leg with the level of performance is a positive correlation.

Also, Mohammed Salamah (2005) and Talb Jassim (2011) indicate that increasing the circumference of some parts of the body to players of higher levels may be due to the increased use of these parts during training and matches to perform the required motor duties. (13: 62), (7: 75)

Issam al-Din Abd al-Khaliq (2003), points out that there is a relationship between the physical composition of the

individual in terms of the circumference and the possibility of reaching high levels of sport and often every sports activity often requires certain physical characteristics that should be observed when choosing the right person. (8:44)

These results are consistent with Aliaa Mohammed (2004), (9),Talb Jassim (2011)), (7) and Zakaria Al Sayed (2012), (6) that Some physical measurements such as the circumferences are closely related to the level of performance of the distinguished players in various sports activities.

Table (12) shows statistically significant correlation between some physical measurements (widths) and the individual performance of the players of the speed ball and chest width and foot width. This is due to the increase in the size of the exercises and their intensity, the high level of players and the number of matches, which lead to balance of the musculature of the thoracic cage through the amount of physical effort and the impact of training on the efficiency of these groups, which in turn reflected on the chest width of the player clearly improved the vital capacity of the lungs, and the foot width is a considered the basis of reliance the players of speed ball where the greater the width of Mesh It was the opportunity to push and build on the best player in the performance of his duties by relying on install and transfer fast from one foot to another alternately during the performance of strikes at high speed.

Mohamed Ahmed (2007) points out that some (A.M) such as widths are especially important for their significant implications in predicting what a player can achieve as well as their mutual relations with other (A.M). (11: 172)

These findings are consistent with Aliaa Mohammed (2004), (9), Mohammed Salameh (2005) , (13), and Zakaria Al Sayed (2012), (13)where They agreed in the results of their descriptive study that some (A.M) such as widths are positively correlated with skill level performance.

This answers the first question: "There is a

statistically significant correlation between some anthropometric measurements (A.M) lengths - the circumference - the widths and the level of performance of the individual play of speed ball players."

- Discussing the second question, which states: "Is there a correlation between some Sensor motor Perceptions and the level of individual performance of the individual play of speed ball players?"

Table (15) shows that there is a statistically significant correlation between (S.M.P) and the performance level of the speed ball players in perception of strength and the angular perception of the wrist joint at the angle 45, and the elbow joint at angle 60, time perception, balance perception with two feet together, the perception of the symmetry of arms movement horizontally, and the speed of the arm in the horizontal direction. This researcher refers that to the level of performance of the individual play of speed ball players, which forms the basis of this sports, which requires a great deal of (S.M.P) in determining the strength exerted by the muscles of the two legs through the back muscles and ending with the muscles of the arms to perform the powerful strikes characterized by the speed of spinning of the ball around the vertical axis and maintain the stabilization of the horizontal path. In addition, those strikes depend on the movements of the arms and the accuracy in which they take parts of the arm at specific angles to maintain the ball's trajectory and rotation without falling or rising, as it is fixed on the ball by a thread that spins in the principle of free rotation, which is a burden on the player in adjusting the angles of the arms to keep this correct trajectory to score the greatest number of correct strikes in a predetermined certain time. This requires enough time to recognize the time perception during the game, where the player should take the right position in the proper place around the circle to avoid contacting the ball and the speed of rotation of the high ball by swinging arms alternatively. This affects the movement of the head during these strong and rapid swings, which is a burden on how to maintain the balance in the

inner ear. Thus, there should be a degree of motor balance perception with the ability to stabilize and push the instep of the feet alternately in the movement of the hand to follow the rush of the body. Also, the performance of the player of individual positions play, especially the position of playing with front and back bats, shows the player's ability to perceive the symmetry of arms movement horizontally in an effective way as a results The high speed of the ball around its axis, the player requires a great deal of ability to move the arm quickly in the horizontal direction to keep hitting the ball and maintain its speed and accuracy during individual play positions.

Abou Elela Ahmed, Mohamed Subhy (1997) indicate that (S.M.P) play an important role in the performance of all sports activities. The efficiency of the technical performance level depends on the efficiency of the sensory receptors, especially when performing the movements of the whole body or one of its parts. These different processes are improved by training. (1: 168)

These results are consistent with Ahmed Subhy (2001), (2), Iman Najm elddin (2008), (5), Ayad Mashhour (2011), (4), Zakaria al-Sayed (2012), (6), where they agreed in their studies that there is a close and positive correlation between (S.M.P) and level of achievement and skill performance, and the higher the level of sensory-motor perceptions, the higher the performance level of the players increases.

This answers the second question: "There is a statistically significant correlation between some sensory-motor perceptions and the level of performance of individual play of speed ball players."

- Discussing the third question, which states: "Do some anthropometric measurements (lengths - circumference -widths) contribute to the level of performance individual play of speed ball players?"

Table (7) shows that the measurements of the lengths contributing to the level of performance of individual of speed ball players are as follows: length of the thigh as the first contributor by 97.4% ,

and the length of the arm as a second variable of 0.6% , and the length of the upper arm that contributed as a third variable 0.4% . The researcher indicates that these results are due to the length of the lower limb. In addition to that, the length of the arm which came as a second contributor and the length of the upper arm as a third contributor one of the parts of the hitting arm of the ball depend on the use of the arm in strikes and what is resulting as necessary strength to overcome the high ball rotation speed.

Table (10) shows that the circumferences contributing to the individual performance of the speed ball players are as follows: thigh circumference as the first contributor of 97.4% and leg circumference came as a second contributor of 0.6% as and forearm circumference by 0.3% as a third contributor. The researcher points out that the circumference of the lower limb, including parts of the thigh and leg, contributes to its muscle groups in maintaining trunk balance during rapid and repetitive swinging of the arms during strikes.

The results of Table (13) indicate the measurements of the widths contributing to the level of performance of the individual play of the players of the speed ball have shown that chest width as first contributor by 86.9% and foot width as a second contributor by 4.5%. This is due to the chest width which gives more space for swinging arms to benefit from the muscular groups of the thoracic cage and its ability to increase the efficiency of rapid and strong strikes. As for foot width and its contribution to balance the body of the player by maintaining the transfer of the center of gravity between the feet alternately during the swinging arms to perform strikes.

This result is consistent with what Mohammed Salamah (2005), (13), Talib Jassim (2011), (7), and Zakaria Al Sayed (2012) , (6) , indicates that some anthropometric measurements contribute significantly and effectively to the achievement level of skill performance.

This answers the answer to the third question: "The contribution of some of the longest anthropometric measurements by 98.4%, and the circumferences by 98.3%,

and the widths by 91.8% in the level of individual performance of players of speed ball."

Discussing the fourth question, which states: "Do some (S.M.P) contribute to the level of individual performance of speed ball players?"

Table (16) shows that sensory-motor perceptions contribute to the level of performance of individual speed ball players. The first contributor was the balance of the feet together by 90%. The sensory motor perception was 50% of the strength of the two legs as a second contributor by 2%. The (S.M.P) of movement contributed by 50% of the strength of the back muscles by 1.6% as a third variable. The symmetry of horizontal arms movement as fourth contribution by 0.7%. The speed of the arms in the horizontal direction, 0.4% as a fifth contributor, and the perception of the angular sensation of the elbow joint at angle 60 as a sixth contributor by 0.4%. The angular perception of the wrist joint at angle 45 as a seventh contributor of 0.4%. The researcher points out that this is due to the correct readiness standing, where the player opens the feet by widths of pelvis with bending the knees slightly and distributing the center of the gravity of the body on the feet evenly in order to create a balance of the body, which gives the perception of balance this high rate of contribution to the level of performance, The contribution of (S.M.P)of the movement of 50% of the strength of the muscles of the two legs and back muscles to reliance level of performance on the resulting strength and sequential of the muscles of the two legs and the back and the effectiveness and the transfer its impact to the muscles of the arms to hit the ball strongly at high speed. The researcher refers to the contribution of symettery of arm movement horizontal position In keeping the level of rotation of the ball in one level to achieve the largest number of correct strikes in the shortest possible time, as well as maintaining the speed of rotation of the ball without slowing it, this requires a maximum speed of movement of the arm in the direction of the ball horizontally, which contributes significantly to stabilize the rotation speed of the ball

around the axis , and also there was to the angular of the perception sense of each joint at angle 60 , wrist joint at angle 45 . The researcher attributes the contribution of the angular perception of the elbow and wrist to the rotation of the ball to its high speed, making circles with different angles and controlling the stabilization of the appropriate angle to the player that requires him to adjust the angles of the elbow and wrist to maintain the correct angle of the performance of strikes without the rise or fall of the ball. The movement should start by holding the racket parallel to the ground with the head of the racket slightly raised make on acute angle of the wrist joint with the elbow joint bending upwards.

This answers the fourth question, "Some sensory motors perceptions contribute 98.7% to the performance level of individual play of speed ball players."

Conclusions and Recommendations:

- Conclusions:

Through the research objectives and questions and according to the results , the following conclusions were reached:

1- There is a significant correlation between some anthropometric measurements of length (thigh length - arm length - forearm length) and circumferences (thigh circumference - leg circumference) and widths (chest width - foot width) and the level of performance of individual play of speed ball players.

2- There is a significant correlative relationship between some (S.M.P) the balance of the feet together, 50% (S.M.P) of the muscles of the two legs and back, perception of arm symmetry horizontally - perception of arm speed in the horizontal direction , and angular perception of elbow joint at angle 60 and a hand-wrist joint at the angle 45) and the level of performance of the individual play of speed ball players.

3- The contribution of some anthropometric measurements (lengths by 98.4%, circumferences by 98.3% and widths by 91.8%) in the performance level of individual play of speed ball players.

4- The contribution of some sensory-motor perceptions by 98.7% in the level of performance of the individual play of speed ball players.

- Recommendations:

In the light of the results, the researcher recommends the following:

1- The use of anthropometric measurements and sensory-motor perceptions, which concluded from the study as follows:

a) Predicting the performance level of the individual play of speed ball players in terms of anthropometric measurements and sensory-motor perceptions

b) The selection of players in the speed ball in the light of these anthropometric measurements and sensory-motor perceptions.

2- Focus on the development of sensory-motor perceptions by including specific drills in the contents of speed-ball training programs.

3- Applying the tests used in this study during determined and regular periods of training to ascertain the development of aspects of sensory motor perception.

4- Conducting training studies for trainers and players in order to familiarize them with the importance of anthropometric measurements and sense-motor perception for speed ball players.

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