مجلة جامعة ذي قار لعلوم التربية البدنية

المجلد (2) العدد (1) 2024

Design and legalization of physical tests according to energy regulations to select a race runners (800 m) for middle schools ages

Assistant. Lecturer. Ali Hussein Ali Farajallah Al-Bahadli

Maysan Directorate of Education

Taperandpeak@gmail.com

Abstract

The research aimed to prepare and design physical tests according to energy systems to select runners for the (800m) race for middle schools aged (15) years. The research also aimed to standardize those designed tests by setting appropriate standard levels for them. The research problem raised the following question: Do physical tests built and designed according to energy systems have a role in selecting emerging runners from the middle schools of the Arab sector in the (800m) race or not? The researcher used the descriptive approach with the survey method to suit the nature of the research. The research community was represented by the students of the Al-Arabiya sector intermediate schools in Maysan Education Directorate, numbering (420) students. The research sample was determined at a rate of (20%) of the original community, numbering (84) students, divided into the design sample, which amounted to (40) students, the construction sample (32) students, and the exploratory experiment sample (12) students. Five tests were designed according to the aerobic, mixed, and anaerobic energy systems by presenting the tests to the specialists, which obtained a high percentage. After that, the researcher conducted the validity, reliability, and objectivity of the designed tests, the ease and difficulty coefficient, and the discriminating ability of the tests. The researcher and the assistant work team conducted his tests on the exploratory experiment sample on 12 runners on

11/11/2017 - 14/11/2017 corresponding to Saturday - Tuesday. Then the researcher conducted his tests on the design sample on 21/11/2017 - 24/11/2017 corresponding to Tuesday - Friday, after that the researcher conducted his tests on the application sample on 1/12/2017 - 4/12/2017 corresponding to Friday - Monday, and the researcher used the statistical package (SPSS) to process the statistical data, and the researcher concluded through the statistical treatments that the physical tests based on energy systems for juniors aged (15) years measure the purposes for which they were designed and their suitability for the age group and the effectiveness of the (800m) race, as the tests measured the structural capabilities based on energy systems that suit the effectiveness and by using them, juniors can be evaluated and the best among them can be chosen, and the researcher recommends that these tests be adopted by physical education and sports science teachers and coaches in the selection process for players in the (800m) event, and the researcher recommends conducting physical tests based on similar energy systems in other races.

1 Defining the Research:

1 - 1 Introduction and importance of the research :

The sports movement has made great progress in recent years in various theoretical and applied sciences, including the science of tests, whether physical, physiological or skill-based. This science has had and continues to have a major role with other sciences in the development of sports in all fields, especially in track and field sports, as many researches and studies have been conducted in the field of tests on many athletes, most of which were physical, skill and planning tests, which contributed to the development of the sports achievement of various track and field players, and provided many coaches with scientific and applied knowledge. The current study is a tributary to these tests because it is specialized

in selecting good players through tests based on the energy systems in the human body, because the (800m) race requires high physical abilities and functional characteristics that work with high efficiency. Hence, the importance of the research lies in building and standardizing physical tests according to the energy systems for (800m) runners through middle school students so that coaches can know the truth about whether this student is suitable to be A runner for the (800m) race or not.

1-2 Research Problem:

By reviewing the researcher's scientific sources and previous studies in the field of measurement and evaluation, he found that the selection of players depends mostly on physical tests such as speed, strength and endurance and does not depend on the physiological foundations that form the actual basis for these abilities. Hence, the research problem lies in answering the following question: Do tests built and standardized according to energy systems have a role in selecting runners aged (15) years from the averages or not?

1-3 Research Aims:

1. Design physical tests according to energy systems for middle school students aged (15) years.
2. Standardize the designed tests by setting appropriate standard levels for their components.

1-4 Research Fields

1. Human field: Middle school students in the Al-Arabiya sector in Maysan Governorate for the (800m) race aged (15) years.
2. Time domain: The period from 11/11/2017 to 4/12/2017.
3. Spatial domain: The school scout camp stadium in Maysan Governorate.

2 Research methodology and field procedures

2-1 Research methodology

The researcher used the descriptive method with the survey method to suit the nature of the research.

2-2 Research community and sample

The research community is represented by middle school students in the Al-Uruba sector aged (15) years and officially registered in the records of the General Directorate of Education in Maysan Governorate for the academic year (2017-2018) represented by middle schools numbering (7) middle schools and the number of their students amounting to (420) which represents the total origin community, and the research sample was determined at a rate of (20%) of the origin community numbering (84) students; Because "the sample size should be between (5% - 20%) of the study community size in descriptive research" (Rabhi Mustafa Alian, 2000, p. 139), as shown in their description in Table (1), and based on the requirements of the study, the selected sample was divided into three samples according to scientific foundations that suit the research problem and the reference framework of the study and its nature to be consistent with the scientific research methodology with the scientific methods followed in constructing tests in physical education and sports sciences, and as shown in their distribution among these three samples in Table (2).

Table (1)

The description of the study sample from the averages of the Arab sector shows Maysan Governorate

ت	Name of School	Number of Players
1	Al-Razi	30
2	Ibn Al-Haitham	11

9	Martyr Salman	3
10	Al-Safir	4
6	Al-Khandaq	5
12	Al-Jihad	6
6	Oday Ibn Hajar	7
84	Total	

2 - 2 - 1 Sample of designing physical tests according to energy systems (statistical analysis sample):

The sample of designing physical tests according to energy systems consisted of (40) runners, representing (47%) of the total sample, as shown in Table (2). They were randomly selected, and the aim was to verify the scientific foundations and transactions methodologically approved according to the conditions for accepting the tests.

2 - 2 - 2 Exploratory sample (sample for experimenting with physical tests according to energy systems):

After completing the conditions for each of the physical tests, the researcher chose (12) runners for the purpose of experimenting with them, as they were randomly selected from the averages of Maysan Governorate from the total sample at a rate of (10%), as shown in Table (2).

2-2-3 The main application sample (the sample of standardizing physical tests according to energy systems): After withdrawing the number of the two mentioned samples from the averages of Maysan Governorate, the remaining sample of the total sample is the application sample, which numbered (32) players, representing (43%) of the total sample, as shown in Table (2), as the researcher proceeded to

standardize the physical tests on them with the aim of deriving the standards and determining the levels for each test, and then extracting a model for the final selection from the results of standardizing all the tests.

Table (2)

Shows the distribution of individuals in the three research samples and their percentages of the total sample

Construction sample		Survey sample		Design sample		Average runners Al-Arabiya secto Maysan Governorate
Their percentage of Total sample	N	Their percentage of Total sample	N	Their percentage of Total sample	N	
%43	32	% 10	12	%47	40	84

2-3 Means of collecting information, devices and tools used

1- Arabic and foreign sources and the Internet.

2- Questionnaire, interview, physical tests and data collection forms.

3- 10 cones, 2 shooting guns and 4 Chinese-made stopwatches.

4- 2 50m long metric tape measure.

2-4 Field research procedures (steps for designing and standardizing physical tests)

2-4-1 Determining the anaerobic and aerobic energy systems for the tests of runners in the (800m) race

In order to reach the main objective of the tests in order to reach the accuracy of what is required to be measured, the researcher sought to identify the energy systems that facilitate the process of designing the tests, as they must suit the nature of the age group that characterizes the study sample. Therefore, the

researcher sought to resort to scientific sources and field experience and conduct personal interviews with experts and specialists* in the field of athletics and the physiological field in determining the energy systems appropriate for the research sample, which were as follows: the ATP energy production system, which lasts for (6 seconds), the PC energy production system, which lasts from (6-15 seconds), the mixed system, which lasts from (15-30 seconds), and the lactic acid system, which lasts from (30-120 Second), and the oxygen system that continues from (120 and above).

2 - 4 - 2 Designing physical tests for the (800m) race and their validity

After reaching the identification of the five energy systems, a set of physical tests was designed for each of the energy systems for the (800m) race that suits the nature of the age stage in the research, after the researcher took into account that the proposed tests be based on the time specified for each system and presented to the specialists *, and with an agreement rate "greater than (25%) chosen by the researcher according to a specific point of view" (Muhammad Hassan Alawi, Muhammad Nasr al-Din Radwan: 2000, p. 32), as shown in Table (4).

The table Shows the percentage of agreement between experts and specialists in determining the validity of tests by relative importance.

Choice	relative ortance	Weighted rithmetic medium	5 etitions	4 Repetitions	3 Repetitions	2 Repetitions	1 titions		
								ATP system	أ
Excluded	% 9,09	0,454	1	0	0	0	0	30m run test	1

2	40m run test	0	0	1	0	0	0	% 58,18	Chosen
3	50m run test	0	0	0	0	0	1	% 9,09	Excluded
4	60m run test	0	0	0	0	0	2	% 18,18	Excluded
ب	PC PC system								
1	100m run test	0	0	0	0	0	7	% 63,63	Chosen
2	110 run test	0	0	1	0	0	0	% 3,63	Excluded
3	120m run test	0	0	0	0	0	1	% 9,09	Excluded
4	130m run test	0	0	0	0	0	1	% 9,09	Excluded
جـ									
1	150m run test	0	0	0	0	0	9	4,09	% 81,81 Chosen
2	200m run test	0	0	0	0	0	1	% 9,09	Excluded
3	250m run test	0	0	0	0	0	0	% 0	Excluded
4	300m run test	0	0	0	0	0	9	% 9,09	Excluded
د									
1	300m run test	0	0	0	0	0	1	% 9,09	Excluded
2	400m run test	0	0	0	0	0	0	% 0	Excluded
3	600m run testم	0	0	0	0	0	10	4,545	% 90,90 Chosen

Excluded	% 0	0	0	0	0	0	800m run test	4
								هـ
Excluded	% 18,18	0,909	2	0	0	0	1000m run test	1
Chosen	72,72	3,636	8	0	0	0	1500 run test	2
Excluded	% 0	0	0	0	0	0	2000m run test	3
Excluded	% 9,09	0,454	1	0	0	0	3000m run test	4

2 – 4 – 2 Physical Test Specifications According to Energy Systems for Runners (800m) Category (15 Years)

2 – 4 – 2 – 1 First Test

• **Test Name**: Running Test (40m).

• **Test Aim**: Measure the runner's speed, using the energy system (ATP).

• **Tools Used**: Athletics Track, (6) Stopwatches, Shooting Pistol, Registration Forms.

• Procedures: The test area is defined by three lines, a first starting line and a second starting line (10m) from the first line, and a finish line (40m) from the second line and (50m) from the first line.

• **Recording**: The performance time is calculated to the nearest (1/100) second, from the start of the pistol shot until the end of the forty-meter line.

2 – 4 – 2 – 2 The second test

• Test name: Running test (100 m)

• Test objective: To measure the runner's speed using the power system (PC).

• Tools used: Athletics track, (6) stopwatches, shooting pistol, registration forms.

• Procedures: The test area is defined by three lines, a first starting line and a second starting line (10 m) from the first line, and a finish line (100 m) from the second line and (110 m) from the first line.

• Recording: The performance time is calculated to the nearest (1/100) second, from the start of the pistol shot until the end of the 100-meter line.

2 – 4 – 2 – 3 The third test

• **Test name**: Running test (150 m)

• **Test Aims**: To measure the runner's short speed endurance using the mixed power system.

• **Tools used**: Athletics track, (6) stopwatches, shooting pistol, registration forms.

• Procedures: The test area is defined by three lines, a first starting line and a second starting line (10 m) from the first line, and a finish line (150 m) from the second line and (160 m) from the first line.

• **Recording**: The performance time is calculated to the nearest (1/100) second, from the start of the pistol shot until the end of the 100-meter line.

2 – 4 –2 – 4 Fourth Test

• **Test name**: (600 m) running test

• **Test Aims**: Measure the average speed tolerance of the runner using the lactic acid system.

• **Tools used**: Athletics track, (6) stopwatches, shooting pistol, registration forms.

• **Procedures**: The tester stands at the starting line of the (200 m) race from a standing position and assumes the preparation position, and upon hearing the starting whistle, he sets off to the finish line, meaning a lap and a half around the athletics track.

• **Recording**: The performance time is calculated to the nearest (1/100) second, from the start of the pistol shot until the end of the 100-meter line.

2 – 4 – 2 – 5 Fifth Test

• **Test name**: Running test (1500 m)

• **Aims of the test**: To measure the runner's long-term speed endurance using the oxygen energy system.

• **Tools used**: Athletics track, (6) stopwatches, shooting pistol, registration forms.

• **Procedures**: The test subject stands at the starting line of the (1500 m) race from a standing position and assumes the preparation position and upon hearing the starting whistle, he sets off to the finish line, meaning three laps and (300 meters) around the athletics track.

• **Recording**: The performance time is calculated to the nearest (1/100) second, from the start of the pistol shot until the end of the 100-meter line.

2 - 4 - 3 Scientific foundations for designed tests

2 - 4 - 3 - 1 Validity

Validity is considered one of the most important conditions for a good test, as when the test is valid, it is "the one that succeeds in measuring what it was designed for" (Muhammad Subhi Hassanein: 2004, p. 138), and there are many types of validity that vary in their accuracy rate, so the researcher resorted to using self-validity as it is the most appropriate for his research tests, as this type of validity is calculated by the square root of reliability, as shown in Table (5).

2 - 4 - 3 - 2 Stability

The researcher conducted stability for his research tests, in order to achieve the conditions of a good test and its accuracy, "in order to obtain the same data" (Ali Salman Abdul Tarfi: 2013, p. 45), as the researcher conducted a simple Pearson test on the statistical analysis

sample and then repeated the test after one week on the same sample, to verify the stability of the tests as shown in Table (5).

2 - 4 - 3 - 3 Objectivity

Objectivity is one of the most important conditions of a good test, which means "freedom from bias and fanaticism... as it describes the athlete's abilities as they actually exist, not as we want them to be" (Marwan Abdul Majeed Ibrahim: 2002, p. 153), and in order to achieve the condition of objectivity, the researcher found the simple Pearson correlation coefficient between the first and second judges' estimates, as shown in Table (5)

Table (5)

.It shows the coefficient of validity, reliability and objectivity of the tests

ت	Tests	elf-reliability coefficient	tability factor	Objectivity factor
1	40 m run test	0,987	0,975	0,960
2	100m run test	0,981	0,964	0,997
3	150m run test	0,944	0,892	0,985
4	600m run test	0,969	0,939	1
5	1500m run test	0,959	0,921	1

2 - 4 - 3 - 4 Discrimination ability of tests

The researcher calculated the discrimination ability on the statistical analysis sample (design sample) amounting to (40) adolescents after conducting the five tests on them on Friday - Monday corresponding to 11/21/2017 - 11/24/2017. He determined (27%) as the highest values, and (27%) as the lowest values, amounting to (11) adolescents for each

group. Since the running tests are calculated in seconds and fractions of a second, the highest values are the lowest degree of the lowest values, as shown in Table (6).

Table (6)

Discrimination results of physical tests according to energy systems

Unit of measure	Sign	able value	alculated T Value	A	s	Group	N	Tests	ت
Sec	Morale nguished	2,086	7,292	0,081	5,193	Up	11	40m run test	1
				0,311	5,900	Down	11		
Sec	Morale nguished		10,427	0,484	13,140	Up	11	100m run test	2
				0,067	14,680	Down	11		
Sec	Morale nguished		4,550	0,326	20,980	Up	11	150m run test	3
				0,067	24.607	دنيا Down	11		
Sec	Morale nguished		19.432	9.958	121.181	Up	11	600m run test	4
				5.166	186.909	Down	11		
Sec	Morale nguished		22.507	9.822	369.909	Up	11	1500 m run test	5
				7.376	453.272	Down	11		

2 - 4 - 3 - 5 Difficulty and ease of physical tests: The researcher found the difficulty and ease factor for the five physical tests in order to suit them to the research sample, in a balanced manner, and they all obtained acceptability as shown in Table (7).

Table (7)

Difficulty and ease coefficient of physical tests according to energy systems and their acceptability

Difficulty, ease and acceptability factor			N	Test	ت
cceptability					

	Ease Factor	Difficulty factor			
	0,43	0.57	40	40m run test	1
	0,48	0,52	40	100m run test	2
	0,45	0,55	40	15m run test	3
	0,42	0,58	40	600m run test	4
	0,40	0,60	40	1500m run test	5

The researcher conducted his exploratory experiment on Saturday-Tuesday corresponding to 11/11/2017 - 14/11/2017 on the sample of the exploratory experiment, which numbered (12) young people.

2-6 Statistical methods

1-

2- The researcher used the statistical package (SPSS program) version 25, extracting from it:

3-

4- 1 -Arithmetic mean.

5-

6- 2 -Standard deviation.

7-

8- 3 -Coefficient of skewness.

9-

10- 4 -Law (t).

11-

12- The researcher also used the following statistical laws:

13-

14- 1 -Percentage law = Part/Whole × 100.

15-

16- 2 -Weighted arithmetic mean law = S × Number of experts / S = Number of experts.

17-

18- 3 -Relative importance law = Weighted arithmetic mean / Highest value of degrees × 100.

19- 4 -Standard T-score law = Raw score - Arithmetic mean / Standard deviation .

20-

21- 5 -Standard Z-score law = Standard T-score × 10 + 50 .

3 -Presentation, analysis and discussion of results

The researcher presented, analyzed and discussed the results of the designed tests that were applied to the application sample of (32) young people on Friday - Monday corresponding to 12/1/2017 - 12/4/2017, after arranging them in ascending order and finding the standard score and the modified standard score in order to find the standardization for all five tests and by deriving their standard levels .

- 22

3-1 Presentation, analysis and discussion of the results and determining the standard levels for the (40m) running test according to the energy system (ATP)

Table (7)

Computational medium, standard deviation and torsional coefficient for a running test (40) m according to the energy system ATP unit of measurement / second

Test	N	Arithmetic mean	Standard deviation	Torsion coefficient

0.164	0.174	5.373	32	running test (40) m

Table (7) shows the arithmetic mean of the 40m running test according to the first ATP system for juniors in the (800m) race, which amounted to (5.373) with a standard deviation of (0.174) and a skewness coefficient of (0.164). Since the skewness coefficient is limited to (±3), this indicates that the values of the sample individuals were distributed normally, which allows the researcher to work with the following statistical procedures of displaying, analyzing and discussing the results.

Table (8)

Raw score, standard score and modified standard score for the 40m run test according to the ATP energy system for 800m runners

unit of measurement/second

odified standard grade	tandard grade	Raw grade	N	odified standard grade	tandard grade	Raw grade	ن
49.252	- 0.074	5.36	17	68.793	1.879	5.70	1
47.528	- 0.247	5.33	18	68.218	1.821	5.69	2
46.954	- 0.304	5.32	19	67.068	1.706	5.67	3
45.804	- 0.419	5.30	20	64.195	1.419	5.62	4
45.229	- 0.477	5.29	21	62.471	1.247	5.59	5
44.655	- 0.534	5.28	22	60.747	1.074	5.56	6
44.080	- 0.591	5.27	23	58.448	0.844	5.52	7
43.505	- 0.649	5.26	24	57.873	0.787	5.51	8
42.931	- 0.706	5.25	25	55.574	0.557	5.47	9
41.781	- 0.821	5.23	26	54.425	0.442	5.45	10

41.206	- 0.879	5.22	27	53.850	0.385	5.44	11
40.057	- 0.994	5.20	28	53.275	0.327	5.43	12
38.908	- 1.109	5.18	29	52.126	0.212	5.41	13
36.034	- 1.396	5.13	30	51.551	0.155	5.40	14
33.160	- 1.683	5.08	31	51.551	0.155	5.40	15
30.287	- 1.971	5.03	32	49.827	- 0.017	5.37	16

Table (8) shows the raw scores and standard scores, as the arithmetic mean of the standard scores was equal to (0), with a standard deviation of (1), and the values of the standard scores were limited between (±3), which indicates that they fell within the normal average level. The researcher extracted the adjusted standard score through the equation of the Z-score. After that, the researcher identified the standard levels for the (40 m) running test according to the ATP system for runners by tabulating the data in Table (8) by placing the standard levels and repetitions based on the values of the (adjusted) Z-scores, as shown in Table (9):

Table (9)

Standard levels and number of repetitions for the 40-meter run test according to the ATP energy system for runners

Percentage	Repetitions	Modified Standard Levels	
		Level assessment	Level degree
% 0	0		80-71
% 15.625	5		70-61
% 31.25	10		60-51
% 40.625	13		50-41

% 12.5	4		40-31
% 0	0		30-21

32 = n

Table (9) shows the standard levels, number of repetitions and their percentage for the (40 m) running test according to the ATP energy system. The very weak level reached (0%), the weak level reached (15.625%), while the acceptable level reached (31.25%), which is ranked second in the (40 m) running test according to the ATP energy system, while the average level reached (40.625%), which is ranked first in the ranking. The good level reached (12.5%), and the very good level reached (0%). Thus, the players were distributed naturally into five standard levels for this test. The researcher attributes the reason for the difference in the standard levels of the research sample individuals to the nature of this test, which requires working with the anaerobic energy system ATP in the absence of oxygen, and is closely linked to the physical speed characteristic that the 800m runner needs at the beginning and end of the race, especially in the last 40m of the race, as crossing the finish line in the 800m race is the same as in the short-distance race.

4-2 Presentation, analysis and discussion of the results and determination of the standard levels for the (100m) running test according to the PC system.

Table (10)

Arithmetic mean, standard deviation and coefficient of torsion for the (100m) running test according to the PC power system for (800m) runners, measurement unit/second

Torsion coefficient	Standard deviation	Arithmetic mean		Test
-0.708	0.743	13.957	32	Running test

Table (10) shows the arithmetic mean of the 100m running test according to the PC energy system for juniors in the (800m) race, which amounted to (13.957) with a standard deviation of (0.743) and a skewness coefficient of (−0.708). Since the skewness coefficient is limited to (±3), this indicates that the values of the sample individuals were distributed normally, which allows the researcher to work with the following statistical procedures of displaying, analyzing, and discussing the results.

Table (11)

Raw score, standard score and modified standard score for the 100m running test according to the PC power system for 800m runners, unit of measurement/second

fied standard grade	Standard grade	Raw grade	N	fied standard grade	Standard grade	Raw grade	N
50.847	0.084	14.02	17	66.191	1.619	15.15	1
50.444	0.044	13.99	18	60.942	1.094	14.77	2
43.849	- 0.615	13.50	19	60.134	1.013	14.71	3
43.714	- 0.628	13.49	20	59.461	0.946	14.66	4
43.580	- 0.641	13.48	21	59.057	0.905	14.63	5
43.310	- 0.668	13.46	22	58.788	0.878	14.61	6
43.041	- 0.695	13.44	23	58.654	0.865	14.60	7
42.503	- 0.749	13.40	24	58.384	0.838	14.58	8
42.368	- 0.763	13.39	25	58.250	0.825	14.57	9
41.965	- 0.803	13.36	26	57.846	0.784	14.54	10
41.830	- 0.816	13.35	27	57.442	0.744	14.51	11
41.695	- 0.830	13.34	28	57.173	0.717	14.49	12
41.561	- 0.843	13.33	29	56.769	0.676	14.46	13
41.157	- 0.884	13.30	30	56.366	0.636	14.43	14
27.025	- 2.297	12.25	31	55.962	0.596	14.40	15
24.737	- 2.526	12.08	32	55.020	0.502	14.33	16

Table (11) shows the raw scores and standard scores, as the arithmetic mean of the standard scores was equal to (0), with a standard deviation of (1), and the values of the standard scores were limited between (±3), which indicates that they fell within the normal average level. The researcher extracted the adjusted standard score through the equation of the Z-score. After that, the researcher identified the standard levels for the (100 m) running test according to the PC energy system for runners by tabulating the data in Table (11) by placing the standard levels and repetitions based on the values of the (adjusted) Z-scores, as shown in Table (12):

Standard levels and number of repetitions for the 100 m running test according to the PC power system for runners

Percentage	Repetitions	Modified Standard Levels	
		Level assessment	Level degree
% 0	0		80-71
%9.375	3		70-61
%46.875	15		60-51
%37.5	12		50-41
%0	0		40-31
% 6.25	2		30-21

32 = n

Table (12) shows the standard levels, number of repetitions and their percentage for the (100 m) running test according to the PC energy system. The very weak level reached (0%), the weak level reached (9.375%) and ranked third, while the acceptable level reached (46.875%) and ranked first in the (100 m) running test according to the

PC energy system, while the average level reached (37.5%) and ranked second in the ranking, and the good level reached (0%), and the very good level reached (6.25%). Thus, the players were distributed naturally into five standard levels for this test. By observing the results in Table (12), the researcher noticed that there is a difference in the standard levels between the individuals of the research sample. He attributes the reason for this difference to the nature of work with the anaerobic energy system PC, given the nature of the test, which depends primarily on the speed and strength that characterizes the speed and which the 800m runner is distinguished by. He will certainly need this system of energy after 4-5 seconds, which is the second anaerobic energy system, which lasts for 15 seconds.

3-3 Presentation, analysis and discussion of the results and determination of the standard levels for the (150m) running test according to the mixed energy system.

Table (13)

The arithmetic mean, standard deviation and coefficient of skewness for the 150m running test according to the mixed energy system for 800m runners.

Unit of measurement/second

Torsion coefficient	Standard deviation	Arithmetic mean	n	Test
2.895	2.148	22.520	32	150m running test

Table (13) shows the arithmetic mean of the 150m running test according to the mixed energy system for juniors in the (800m) race, which amounted to (22.520) with a standard deviation of (2.148) and a skewness coefficient of (2.895). Since the skewness coefficient is limited to (±3), this indicates that the values of the sample

individuals were distributed normally, which allows the researcher to work with the following statistical procedures of displaying, analyzing, and discussing the results

Table (14)

Raw score, standard score and modified standard score for the 150m running test according to the mixed energy system for 800m runners

Unit of measurement/second

Modified standard grade	Standard grade	Raw grade	N	Modified standard grade	Standard grade	Raw grade	N
45.996	- 0.400	21.66	17	59.404	0.940	24.54	1
45.158	- 0.484	21.48	18	58.938	0.893	24.44	2
44.878	- 0.512	21.42	19	58.379	0.837	24.32	3
44.785	- 0.521	21.40	20	58.054	0.805	24.25	4
44.459	- 0.554	21.33	21	57.541	0.754	24.14	5
44.320	- 0.567	21.30	22	54.702	0.470	23.53	6
44.134	- 0.586	21.26	23	54.562	0.456	23.50	7
43.947	- 0.605	21.22	24	54.469	0.446	23.48	8
43.808	- 0.619	21.19	25	53.864	0.386	23.35	9
43.668	- 0.633	21.16	26	52.839	0.283	23.13	10
43.389	- 0.661	21.10	27	52.234	0.223	23.00	11
43.296	- 0.670	21.08	28	50.372	0.037	22.60	12
43.156	- 0.684	21.05	29	50.046	0.004	22.53	13
42.923	- 0.707	21.00	30	49.600	- 0.040	22.48	14
40.409	- 0.959	20.46	31	48.184	- 0.181	22.13	15
39.292	- 1.070	20.22	32	47.206	- 0.279	21.92	16

Table (14) shows the raw scores and standard scores, as the arithmetic mean of the standard scores was equal to (0), with a standard deviation of (1), and the values of the standard scores were limited between (±3), which indicates that they fell within the

normal average level. The researcher extracted the adjusted standard score through the equation of the Z-score. After that, the researcher identified the standard levels for the (150 m) running test according to the mixed energy system for runners by tabulating the data in Table (14) by placing the standard levels and repetitions based on the values of the (adjusted) Z-scores, as shown in Table (15):

Table (15)

Standard levels and number of repetitions for the 150 m running test according to the mixed energy system for runners

Percentage	Repetitions	Modified Standard Levels	
		Level assessment	Level degree
% 0	0		80-71
%0	0		70-61
%40.625	13		60-51
%56.25	18		50-41
%3.125	1		40-31
%0	0		30-21

32 = n

Table (15) shows the standard levels, number of repetitions and their percentage for the (150 m) running test according to the mixed energy system, as the very weak level reached (0%), the weak level reached (0%), while the acceptable level reached (40.625%) and it ranked second in the (150 m) running test according to the mixed energy system, while the average level reached (56.25%) and ranked first in the

ranking, and the good level reached (3.125%) and ranked third, and the very good level reached (0%), and thus the players were distributed naturally into five standard levels for this test. The researcher attributes the similarity in level to the nature of the work in this test, which requires the characteristic of enduring short speed and working with the anaerobic systems, the phosphagen system and the anaerobic system, and to the harmony of the research sample with this test, which the 800m runner needs at the beginning of the start and transition from the anaerobic system to the beginning of the anaerobic system with the lactic acid system. Thus, the test achieved the characteristic of enduring the maximum speed for which it was designed.

3-4 Presentation and analysis of results and determination of standard levels for the 600m running test according to the lactic acid system

Table (16)

The arithmetic mean, standard deviation and coefficient of skewness for the 600m running test according to the lactic acid system for 800m runners.

Unit of measurement/ minute

Test	N	Arithmetic mean	Standard deviation	Torsion coefficient
Running Test	32	2.5875	0.47704	- 0.270

Table (16) shows the arithmetic mean of the 600m running test according to the lactic system for juniors in the (800m) race, which amounted to (2.5875) with a standard deviation of (0.47704) and a skewness coefficient of (-0.270). Since the skewness coefficient is limited to (±3), this indicates that the values of the sample individuals were distributed normally, which allows the researcher to work with the following statistical procedures of displaying, analyzing and discussing the results.

Table (17)

Raw score, standard score and modified standard score for the 600m running test according to the lactic system for 800m runners,

Unit of Measurement/minute

Modified standard grade	Standard grade	Raw grade	N	Modified standard grade	Standard grade	Raw grade	N
52.358	0.235	2.700	17	63.468	1.346	3.230	1
49.905	- 0.009	2.583	18	62.839	1.283	3.200	2
48.857	- 0.114	2.533	19	62.126	1.212	3.166	3
46.404	- 0.359	2.416	20	61.791	1.179	3.150	4
44.602	- 0.539	2.330	21	61.435	1.143	3.133	5
43.973	- 0.602	2.300	22	60.743	1.074	3.100	6
42.568	- 0.743	2.233	23	60.386	1.038	3.083	7
40.828	- 0.917	2.150	24	60.030	1.003	3.066	8
39.780	- 1.021	2.100	25	58.647	0.864	3.000	9
39.361	- 1.063	2.080	26	57.598	0.759	2.950	10
37.684	- 1.231	2.000	27	57.242	0.724	2.933	11
36.279	- 1.372	1.933	28	56.194	0.619	2.883	12
35.588	- 1.441	1.900	29	55.502	0.550	2.850	13
35.231	- 1.476	1.883	30	54.789	0.478	2.816	14
34.540	- 1.545	1.850	31	53.050	0.305	2.733	15
33.491	- 1.650	1.800	32	52.693	0.269	2.716	16

Table (17) shows the raw scores and standard scores, as the arithmetic mean of the standard scores was equal to (0), with a standard deviation of (1), and the values of the standard scores were limited between (±3), which indicates that they fell within the normal average level. The researcher extracted the adjusted standard score through

the equation of the Z-score. After that, the researcher identified the standard levels for the (600 m) running test according to the lactic system for runners by tabulating the data in Table (17) by setting the standard levels and repetitions based on the values of the (adjusted) Z-scores, as shown in Table (18):

Table (18)

Standard levels and number of repetitions for the 600 m running test according to the lactic system for runners

Percentage	Repetitions	Modified Standard Levels	
		Level assessment	Level degree
% 0	0	Very weak	80-71
%18.75	6	Weak	70-61
%34.375	11	Fair	60-51
%21.875	7		50-41
%25	8	Good	40-31
%0	0	Very good	30-21

Table (18) shows the standard levels, number of repetitions and their percentage for the (600 m) running test according to the lactic system, as the very weak level reached (0%), the weak level reached (18.75%), while the acceptable level reached (34.375%) and it ranked first in the (600 m) running test according to the lactic system, while the average level reached (21.875%) and ranked third in the ranking, and the good level reached (25%) and ranked second, and the very good level reached (0%), and thus the players were distributed naturally into five standard levels for this test. The researcher attributes the reason behind the high percentage of good level to eight players to the nature of the 600m running test and that the value was

directed towards the left, meaning that the test was easy to apply. Also, the difference in some percentages of standard levels determines and predicts the selection of the best among the players according to the anaerobic energy system with the lactic acid system, which measures the ability to endure the average speed of a runner (800m), and selecting the best among them.

3-5 Presentation, analysis and discussion of the results and determination of the standard levels for the 1500m running test according to the aerobic oxygen energy system.

Table (19)

Arithmetic mean, standard deviation and coefficient of skewness for the 1500m running test according to the oxygen energy system for 800m runners, measurement unit/minute

Torsion coefficient	Standard deviation	Arithmetic mean		Test
0.083	0.56805	6.7982	32	1500m running

Table (19) shows the arithmetic mean of the 1500m running test according to the oxygen energy system for juniors in the (800m) race, which amounted to (6.7982) with a standard deviation of (0.56805) and a skewness coefficient of (0.083). Since the skewness coefficient is limited to (±3), this indicates that the values of the sample individuals were distributed normally, which allows the researcher to work with the following statistical procedures of displaying, analyzing and discussing the results.

Table (17)

Raw score, standard score, and modified standard score for the 1500m running test according to the oxygen energy system for 800m runners.

unit of measurement/minute

Modified	Standard	Raw		Modified	Standard	Raw	n

Standard Grade	Grade	grade	N	Standard Grade	grade	Grade	
48.623	- 00.137	6.72	17	66.227	1.622	7.72	1
47.743	- 0.225	6.67	18	65.347	1.534	7.67	2
47.038	- 0.296	6.63	19	64.643	1.464	7.63	3
46.158	- 0.384	6.58	20	64.114	1.411	7.60	4
44.750	- 0.524	6.50	21	62.882	1.288	7.53	5
44.222	- 0.577	6.47	22	61.826	1.182	7.47	6
42.461	- 0.753	6.37	23	60.066	1.006	7.37	7
41.757	- 0.824	6.33	24	58.481	0.848	7.28	8
39.821	- 1.017	6.22	25	57.953	0.795	7.25	9
39.117	- 1.088	6.18	26	57.073	0.707	7.20	10
38.941	- 1.105	6.17	27	56.193	0.619	7.15	11
38.060	- 1.193	6.12	28	55.664	0.566	7.12	12
37.180	- 1.281	6.07	29	54.784	0.478	7.07	13
36.476	- 1.352	6.03	30	51.792	0.179	6.90	14
35.596	- 1.440	5.98	31	50.911	0.091	6.85	15
34.540	- 1.545	5.92	32	50.031	0.003	6.80	16

Table (19) shows the raw scores and standard scores, as the arithmetic mean of the standard scores was equal to (0), with a standard deviation of (1), and the values of the standard scores were limited between (±3), which indicates that they fell within the normal average level. The researcher extracted the adjusted standard score through the equation of the Z-score. After that, the researcher identified the standard levels for the (1500 m) running test according to the oxygen energy system for runners by tabulating the data of Table (19) by setting the standard levels and repetitions based on the values of the (adjusted) Z-scores, as shown in Table (20):

Table (20)

Standard levels and number of repetitions for the 1500 m running test according to the runners' oxygen energy system

Percentage	Repetitions	Modified Standard Levels	
		Level assessment	Level degree
% 0	0	Very weak	80-71
%18.75	6	Weak	70-61
%28.125	9	Fair	60-51
%25	8	Med	50-41
%25	8	Good	40-31
%0	0	Very Good	30-21

$n = 32$

Table (20) shows the standard levels, number of repetitions and their percentage for the (1500 m) running test according to the oxygen energy system, as the very weak level reached (0%), and the weak level reached (18.75%) and ranked third, while the acceptable level reached (28.125%) and ranked first in the (1500 m) running test according to the oxygen energy system, while the percentage of the average and good levels reached (25%) and ranked second in the ranking, and the percentage of the very good level reached (0%), and thus the players were distributed naturally into five standard levels for this test. The researcher attributes the reason for the difference and variation in the standard levels to the difficulty of the (1500 m) running test because it is directed to the right, and also that this test was developed according to the oxygen aerobic energy system, which measures the ability to endure long speed for an (800 m) runner, so the runner is in dire need of this test, and the test achieved the basic purpose of its development.

3-6 Building a selection model for juniors in the (800m) activity at ages (15 years)

For the purpose of determining and estimating the reality of the research sample individuals, the researcher resorted to using the best model method, i.e. the best results from the application sample for the five tests designed by the researcher, and using the method of drawing the side shape to indicate the standard levels obtained by the best junior, and Figure (1) illustrates this.

4 Conclusions and Recommendations

4-1 Conclusions

After the researcher completed the design and construction processes of the physical tests based on energy systems to select juniors for the (800m) event at the ages of (15 years) for the averages of the Arab sector in Maysan, the researcher reached the most important conclusions:

1- The five physical tests based on energy systems to select juniors for the (800m) event at the ages of (15 years) achieved the purpose for which they were designed, and their suitability for this age group.

2- The sample members differed in obtaining different grades and levels and percentages through the application of the tests.

3- The tests proved their validity, stability and objectivity in measuring the physical qualities and abilities based on energy systems.

4- The use of the five physical tests based on energy systems to select juniors for the (800m) event at the ages of (15 years) can be used to evaluate juniors according to the standards they achieved to standardize them.

5- The tests can also be used to predict the level of juniors and select the best among them through the model developed by the researcher.

6- These tests are characterized by ease of application and low costs, as they do not require many devices or tools.

4-2 Recommendations

In light of the conclusions reached by the researcher, a set of recommendations and proposals were developed, the most important of which are:

1- Physical tests based on energy systems for juniors aged (15 years) can be relied upon in evaluating and selecting runners for the (800m) event.

2- Tests can be used as a means of identifying individual differences between runners.

3- The physical characteristics of qualities, abilities and functional characteristics of juniors must be taken into account when designing the tests.

4- Conducting similar studies and research on different age groups and other different events in all sports.

5- Guiding and educating coaches when applying tests in the selection process.

References

• Rabhi Mustafa Alian, Othman Muhammad Ghanem: **Scientific Research Methods and Approaches Theory and Application,** 1st ed., Safa Publishing and Distribution House, Amman, 2000.

• Muhammad Hassan Alawi, Muhammad Nasr al-Din Radwan: **Measurement in Physical Education and Sports Psychology, 3rd ed.**, Dar al-Fikr al-Arabi, Cairo, 2000.

• Muhammad Subhi Hassanein: **Measurement and Evaluation in Physical Education and Sports, Part 1, 6th ed.,** Dar al-Fikr al-Arabi, Cairo, 2004.

• Ali Salman Abdul Tarfi: **Applied Tests in Physical Education Physical - Motor - Skill**, Al-Nour Office, Baghdad, 2013.

• Marwan Abdul Majeed Ibrahim: **Scientific Research in Physical Education**, Dar al-Thaqafa for Publishing and Distribution, Baghdad, 2002.