



## **DETERMINING REFERENCE LEVEL OF PHYSICAL EFFICIENCY STANDARDS AND THE BODY MASS INDEX, ACCORDING TO WORLD HEALTH ORGANIZATION STANDARDS AMONG SECONDARY SCHOOL STUDENTS NORTH OF BASRA AGES (16-17) YEARS**

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### **Abstract**

This study aimed to set standard levels of the level of physical efficiency of the preparatory study stage of ages (16-17) years of age. Obesity and health risks due to international deficiency in order to identify the researcher, the descriptive curriculum, as the total of the sample (1110) was a student from various schools in northern Basra preparatory) by (370) students for each study stage. It also included some measurements for (length, weight, vertical jump .

### **1 -1 Introduction and Importance of Research:**

Attention to sports in the school sector is the basis for progress in the level of sport in general and healthy in particular, but this requires a set of logical and research steps and the choice of the appropriate method and approach. Therefore, we try in our research an important study, one of which is physical efficiency, which is one of the important and expressive indicators of the physical situation in order to face the challenges and requirements of the current and urgent life successfully, especially since our lives at the present time are characterized by a lack of movement, which is accompanied by a clear decline in the health and psychological level, and this is reflected in the nature of the nature The case on construction and physical composition in the future in the occurrence of weight gain is adipose lump) at the expense of the muscle mass, and from here we find it important in the place of studying the second index, which is the body mass index and its application according to the standards of the International Health Organization to know the classification of the research sample and according to the middle school stages in the north of Basra under research In order to



determine the changes that occur from the lack of movement and health risks in light of the aforementioned criteria.

### **1-2 Research Problem:**

The research problem is determined in detecting standard levels of physical efficiency in order to determine the strengths and weaknesses and according to the academic levels, in addition to a comprehensive assessment of the body mass index and the type of obesity, and thus we have classified the level of students and indicate the extent of the harmony of these indicators with the standards of the World Health Organization in an effort to apply What is useful for physical education teachers and those responsible for this vital sector in order to develop strategies that fit and serious health challenges.

### **1-3 Research Objectives:**

- 1- Learn about the degrees and standard levels of the physical efficiency index with ages (16-17) years and according to the academic levels.
- 2- Identify the values of the BMI with the standards of the International Health Organization of ages (16-17) years and according to the academic levels.
- 3- Compared and classified the BMI classification and according to the academic levels of the International Health Organization standards.

### **1-5 Research Areas:**

- 1-5-1 Human Domain: Students of some schools in North Basra, ages (16-17) for the academic season 2021-2022
- 1-5-2 Times field: from 2/11/2021 and to 21/1/2022
- 1-5-3 Spatial area: School courtyards and halls

**Keywords:** Reference standards; physical efficiency ; World Health Organization .

## **2 - Research Methodology**

**2-1 Research Approach:** The researcher used the descriptive curriculum in the survey method to suit it the nature of the research and the aim of the study.



## 2 - 2 Sample Research:

The research community consists of schools north of Basra Governorate for the preparatory stage, which amounted to (18) schools that represented the research community, then the researcher chose a sample of these schools and its number (10) represented a percentage of (55.56%). The total students of these ten schools were (3500). A student, then the researcher chose a random sample amounting to (1110) students from the number of (3500).

## 2-3 The devices and tools used in the research:

Scientific sources and references and the Internet

- 1- Medical Libra number (3)
- 2- Calculator (1)
- 3- Time hour (3)
- 4- A tape measuring (2) with a listed board to measure the jump distance
- 5- Tests and measurement
- 6- Personal interviews

## 2 - 4 measurements and tests used in the research

**First:** Physical measurements

The length of the search sample was measured by a bar (cm) and weight b (kg) by the medical scale. The time age of each student was recorded according to the three stages under study, and thus we have data for all members of the sample in length, weight and age.

**Second:** Measuring the distance of the vertical jump (Sargent - test)

**The purpose of the test:** measuring the muscle capacity of the two men

**Test description:** The laboratory stands on one side of the two sides of the wall, together with together the ground after you hold the middle finger, the chalk powder and the hand facing the wall raises his hand up and touches his hand the painting on the wall and leaves a thurst on the plate in the highest place up to his hand, then bend the knees and the arms weighted To take the maximum fog force



up by pushing the ground with the feet and putting another mark in the highest place of the mechanism of jumping up and keeping the integrity of his body.

**Devices and tools:** a flat and high wall whose height is no less than (3.5 m), and a plate listed by (cm) installed on the ground with a height of no less than (2 m) from the ground, chalk.

**Registration:** The laboratory gives three attempts to record the best attempt, and that is from calculating the distance by (cm) between the mark recorded by the laboratory from the touch of the plate from standing on the ground and from the touch of the painting from the vertical jump to the highest possible point.

**Third:** Measurement of physical efficiency: Physical efficiency was measured in light of the following equation:

$$\text{Physical efficiency} = \text{Weight (kg)} \times \text{jump distance} / \text{length (cm)}$$

#### **Fourth: The International BMI (BMI):**

Body Mass Index was measured in light of the following equation:

$$\text{BMI} = \text{weight (kg)} : \text{length box (meter)}$$

For example: If one of the sample members reached its mass (75) kg and the length of (1.65) meters, the body mass index is = (75) kg: (1.65) meters = 27.57 kg/m<sup>2</sup>

Table (1) Explains the criteria of the BMI, classification and risk degree issued by the World Health Organization.

Body mass Index	classification	degree health risks
<b>Less than 18.5</b>	<b>thin</b>	<b>Limited</b>
<b>From 18.5-24.9</b>	<b>Appropriate</b>	<b>Low</b>
<b>From 25 - 29.9</b>	<b>Increase in weight</b>	<b>Medium</b>
<b>From 30 - 34.9</b>	<b>obesity</b>	<b>High</b>
<b>From 35 - 39.9</b>	<b>High obesity</b>	<b>very high</b>
<b>40 and more</b>	<b>Excessive</b>	<b>High to farthest limit</b>



## 2-5 The Main Experience|:

After preparing the devices and tools, the implementation of the experiment started on 10/15/2016, where the measurements and tests were carried out for the research requirements for the three academic stages, and ended 10/1/2017, as the researcher sponsored the procedures for testing and measurement according to the required conditions, and with the presence of the assistant work team.

As the modified normative degree in the sequence = the computational milieu (+) is the fixed amount (Margaret. J): 1981 )

( **Fixed amount = x5 vertical normative deviation/ 50**)

## 3- Presenting and Discussing the Results:

3-1 View and analyze the results of measurements and tests for (length, mass, jumping distance), physical efficiency results and body mass index according to the academic levels.

Table (2) shows measurements and tests for both length, mass and jumping distance at the research sample

NO	Measurements and tests	Educational level					
		16-17 YEAR		16-17 YEAR		16-17 YEAR	
		x-	S -+	x-	S -+	x-	S -+
1	Length with (cm)	144.35	5.44	148.15	8.9	155.12	8.82
2	Weight B (kg)	55.30	6.20	62.41	4.28	69.20	4.73
3	The jumping distance (cm)	25.33	5.65	28.10	4.25	31.23	5.29

Table (3) shows measurements and tests for both physical efficiency and body mass index and according to the academic levels

16-17 YEAR						
No	Measurements and tests	x-	S -+	S d - +	Maximum	Minimum
1	Physical efficiency (kg /cm <sup>2</sup> )	10.5	1.53	0.64	15.18	6.44
2	Body mass Index( kg/m <sup>2</sup> )	26.58	4.69	0.55	35.55	18.30
16-17 YEAR						
1	Physical efficiency (kg /cm <sup>2</sup> )	13.12	1.72	0.33	16.20	8.50
2	Body mass Index( kg/m <sup>2</sup> )	28.49	4.35	0.42	38.10	19.50
16-17 YEAR						
1	Physical efficiency (kg/ cm <sup>2</sup> )	12.44	1.88	0.39	18.78	9.20
2	Body mass Index( kg/m <sup>2</sup> )	28.83	4.15	0.40	37.30	19.44



Table (4) shows the standard levels and proportions prescribed for them in the natural distribution curve, raw grades and standardized degrees in a relay and number of students, and the percentage of each level in the physical efficiency test

Levels	Raw grades	Standard grades in a sequence	Students No	Percent
Very good (11.987)	18.15-15.24	100-81	0	%0
Good (23.362)	15.09-12.18	80-61	75	%20.27
Middle (29.47)	12.03-9.12	60-41	210	56.75%
Accept (23.362)	8.97-6.06	40-21	84	%22.70
Weak (11.987)	6.06-3.00	20-1	0	%0

Table (5) shows the standard levels and proportions prescribed for them in the natural distribution curve, raw grades and standardized degrees in a relay and number of students, and the percentage of each level in the physical efficiency test

Levels	Raw grades	Standard grades in a sequence	Students No	Percent
Very good (11.987)	21.04-17.77	100-81	0	%0
Good (23.362)	17.6-14.33	80-61	80	%21.62
Middle (29.47)	14.16-10.89	60-41	205	55.40%
Accept (23.362)	10.72-7.45	40-21	85	%22.9
Weak (11.987)	7.28-4.01	20-1	0	%0



Table (6) shows the standard levels and proportions prescribed for them in the natural distribution curve, raw grades and standardized degrees in a relay and number of students, and the percentage of each level in the physical efficiency test

Levels	Raw grades	Standard grades in a sequence	Students No	Percent
Very good ( 11.987)	22.52-18.94	100-81	0	%0
Good ( 23.362)	18,76-15.18	80-61	77	%20.81
Middle (29.47)	15.00-11.42	60-41	212	57.29%
Accept ( 23.362)	11.24-7.66	40-21	81	%21.89
Weak (11.987)	7.48-3.90	20-1	0	%0

The researcher attributes the reason for the difference and contrast between the members of the research sample in obtaining different degrees in the results of the physical efficiency test, that the latter depends on three important variables, namely (body mass, the distance of vertical jump, the length of the laboratory), it was found by measuring the body mass and the jumping distance vertical was not at the level required for the academic stages under study and research, which negatively reflected on the values of physical efficiency, as this requirement depends on the work done and the muscle mass, especially the strength of the muscles of the lower limbs.

(Sari Ahmed Hamdan and Norman Abdel -Razzaq: 2001) stressed that there is a "positive relationship between physical efficiency and the type of activity practiced and the individual cannot master some of the kinetic capabilities that are allocated in the event of a decrease in the level of physical efficiency."

This was confirmed by (Mohamed Sobhi Hassanein: 2001) that one of the goals of physical education is "implanting healthy and valuable habits to prevent wrong habits and develop physical qualities and natural skills to improve the level of body efficiency.

Studies have indicated that sport of its various types and its various pods is that "it plays a major role during the growth stages, especially if the activities are



chosen and distributed to these stages in line with the nature and characteristics of each stage. (Samir Muhammad and others: 2008)

The researcher believes that the physical efficiency test has secreted a state of varying levels in the ability of the research sample members, as well as the statement of individual differences, according to the academic stages.

(Muhammad Hassan Allawi & Muhammad Nasr al -Din Radwan :2000) indicated in this regard, "The standard levels indicate how the actual performance of the individual is that comparing the individual's degree to the standard of degrees of a group of individuals does not indicate what should be the degree of the individual, but it only shows us how the individual performed the test When compared to others of the same level

Because of the importance of this requirement and its association with the health of the individual, the sources emphasized that physical competence is a "expense connection with many vital areas such as intelligence and achievement, social and physical maturity, good strength and human production, physical and mental health, adaptation, delaying fatigue and early stress (Muhammad Subhi: 1999)

Table (7) shows the evaluation of the body mass index, classification and the degree of risk for the academic stages according to the standards of the World Health Organization

Body mass Index		Less than 18.5	From 18.5 -24.9	From 25 -29.9	From 30 - 34.9	From 35 - 39.9	More 40
classification		thin	Appropriate	Increase in weight	obesity	High obesity	Excessive obesity
degree health risks		Limited	Low	Medium	High	very high	High to farthest limit
Educational level 16-17 YEAR N= 370	Number of students	50	70	180	55	15	0
	percent	%13.51	%18.91	%48.64	%14.86	%4.045	%5
	General M	26.58					
	classification	Increase medium in weight					
Educational level 16-17 YEAR N= 370	Number of students	43	72	182	56	17	0
	percent	%11.62	%19.45	%49.18	%15.13	%4.59	%0
	General M	28.49					
	classification	Increase medium in weight					
Educational level 16-17 YEAR N= 370	Number of students	40	64	186	60	20	0
	percent	%10.81	%17.29	%50.27	%16.21	%5.40	%0
	General M	28.83					
	classification	Increase medium in weight					





Through what was exposed in Table (7) it is noted that students' evaluation of the (academic stages) according to the World Health Organization standards that the largest number and the vast percentage were indicating weight gain, which constitutes an average degree of health risk in light of the aforementioned criteria, as well as the existence of Numbers of students are classified between obesity and high obesity, which are indicators of health risks that increase the possibility of risk that results from respiratory fitness and physical composition, as well as increasing pressure on the joints and skeletons that are one of the most important causes of the spine and various body joints, In addition to many dangerous diseases of the ag. (Mahfouz Faleh Hassan: 2010) indicated that "the body mass index, whenever it is ideal and healthy, is due to a positive impact on the health and safety of the individual and reduce the possibility of the risk that may result on body systems due to physical or excessive in obesity, and on the other hand that the mass is Muscle, which is characterized by muscle growth and consistency in the whole body, will return a positive effect on the functions and responses of the body. What organizes this (Hazza bin Muhammad Al -Haza: 2005) that the last classification of the American Association of Sports Medicine puts "physical composition as one of the elements of physical fitness associated with health, strength, preserving the health of the body and reducing the risk, we must pay attention to physical composition, which is one of its important indicators is the muscle mass." From here - the researcher sees - the sample does not approach the ideal weight according to the standards of the World Health Organization due to the lack of care in the creation of strategies that seek to raise the situation physical and health in various fields, including the school milieu that constitutes the basic stone in the progress of peoples, as well as the lack of attention of means The media in this aspect, which leads to a lack of family culture in the aforementioned aspects. The developed countries have singled out special projects aimed at raising the health and physical level. In "France, a project conducted by the Ministry of Youth, Sports and Recreation, as well as in Canada, Germany, Bulgaria, Thailand, Sweden, includes projects To raise the level of physical fitness associated with health (| Muhammad Subhi Hassanein: 2001) . It is worth noting (Gaytone and Hall: 1997) that the muscular system (body mass)



"contributes to the functions of stinging in the body, through its responsibility for the mechanism of movement and the transition from the location of the other, and without that the whole body and its functions are exposed to damage and sabotage and thus severe damage to human health "

#### **4- Conclusions and Recommendations**

##### **4-1 Conclusions**

1- Finding standard degrees and levels to test the physical efficiency of (the study stages) covered by the study, which is a digital function to compare the performance of the individual and the group to which he belongs.

2- There was a difference and difference between the members of the research, and the (academic levels) in obtaining different degrees, as the number and the greatest percentage of the research sample were within the level (average), and this is evidence of the natural distribution according to digital values and statistical treatments for the results of the test.

3- It appeared that the evaluation of the BMI with a classification (weight gain) and the degree of health risk is moderate in the bone ratio.

4- It was reached that the degree of high health risk and not (the academic levels) were in a few proportions, while the limited health risks were lower.

##### **4- 2 Recommendations**

1- Approving the grades and standard levels to test physical efficiency as local internal companies) to rule at the level of students of ages (16-17) years, and then the possibility of knowing the level in light of comparison with standard or ideal companies.

2- Adopting the standards of the World Health Organization to detect the health level and for all levels of study.

3- Attention and weight control of (students 'mass and the extent of approaching the ideal weight because of its positive effect on the body's strength, health and physical efficiency of the level of students.



4- The necessity of establishing a specialized center that is based, and limits obesity rates, according to strategies adopted by institutions related to education and health, and spreading cultural awareness among members of society.

5- Conducting a study to detect health and physical damages, as objective evaluation indicators of physical or physiological characteristics of other age groups.

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#### Appendix ( 1)

Table ( 8) shows raw grades and normative grades to test physical efficiency with ages (16-17) in the year of fixed amount (0.153)

Raw grades	Standard grades	Raw grades	Standard grades	Raw grades	Standard grades	Raw grades	Standard grades
1	3.00	26	6.82	51	10.65	76	14.47
2	3.15	27	6.98	52	10.80	77	14.63
3	3.30	28	7.13	53	10.95	78	14.78
4	3.46	29	7.28	54	11.11	79	14.93
5	3.61	30	7.44	55	11.26	80	15.09
6	3.76	31	7.59	56	11.41	81	15.24
7	3.92	32	7.74	57	11.57	82	15.39
8	4.07	33	7.89	58	11.72	83	15.54
9	4.22	34	8.05	59	11.87	84	15.70
10	4.38	35	8.20	60	12.03	85	15.85
11	4.53	36	8.35	61	12.18	86	16.00
12	4.68	37	8.51	62	12.33	87	16.16
13	4.83	38	8.66	63	12.48	88	16.31
14	4.99	39	8.81	64	12.64	89	16.46
15	5.14	40	8.97	65	12.79	90	16.62
16	5.29	41	9.12	66	12.94	91	16.77
17	5.45	42	9.27	67	13.10	92	16.92
18	5.60	43	9.42	68	13.25	93	17.07
19	5.75	44	9.58	69	13.40	94	17.23
20	5.91	45	9.73	70	13.56	95	17.38
21	6.06	46	9.88	71	13.71	96	17.53
22	6.21	47	10.04	72	13.86	97	17.69
23	6.36	48	10.19	73	14.01	98	17.84
24	6.52	49	10.34	74	14.17	99	17.99
25	6.67	50	10.53	75	14.32	100	18.15



Table (9)

It shows raw grades and normative grades to test physical efficiency with ages (16-17) in the year of fixed amount (0.172)

Raw grades	Standard grades	Raw grades	Standard grades	Raw grades	Standard grades	Raw grades	Standard grades
1	3.90	26	8.60	51	13.30	76	14.47
2	4.09	27	8.79	52	13.49	77	14.63
3	4.28	28	8.98	53	13.68	78	14.78
4	4.41	29	9.17	54	13.87	79	14.93
5	4.65	30	9.36	55	14.06	80	15.09
6	4.84	31	9.53	56	14.24	81	15.24
7	5.03	32	9.73	57	14.43	82	15.39
8	5.22	33	9.92	58	14.62	83	15.54
9	5.41	34	10.11	59	14.81	84	15.70
10	5.6	35	10.3	60	15.00	85	15.85
11	5.78	36	10.48	61	15.18	86	16.00
12	5.97	37	10.67	62	15.37	87	16.16
13	6.16	38	10.85	63	15.55	88	16.31
14	6.35	39	11.05	64	15.75	89	16.46
15	6.54	40	11.24	65	15.94	90	16.62
16	6.72	41	11.42	66	16.12	91	16.77
17	6.91	42	11.61	67	16.31	92	16.92
18	7.10	43	11.80	68	16.50	93	17.07
19	7.29	44	11.99	69	16.69	94	17.23
20	7.48	45	12.18	70	16.88	95	17.38
21	7.66	46	12.35	71	17.06	96	17.53
22	7.85	47	12.55	72	17.25	97	17.69
23	8.04	48	12.74	73	17.44	98	17.84
24	8.23	49	12.93	74	17.63	99	17.99
25	8.42	50	13.12	75	17.82	100	18.15



Table (10)

It shows raw grades and normative grades to test physical efficiency with ages (16-17) in the year of fixed amount (0.188)

Raw grades	Standard grades	Raw grades	Standard grades	Raw grades	Standard grades	Raw grades	Standard grades
1	4.01	26	8.31	51	12.61	76	16.91
2	4.18	27	8.48	52	12.78	77	17.48
3	4.35	28	8.65	53	12.95	78	17.25
4	4.52	29	8.82	54	13.72	79	17.42
5	4.7	30	9.00	55	13.3	80	17.6
6	4.87	31	9.17	56	13.47	81	17.77
7	5.04	32	9.34	57	13.64	82	17.94
8	5.21	33	9.51	58	13.81	83	18.11
9	5.38	34	9.58	59	13.98	84	18.28
10	5.56	35	9.86	60	14.16	85	18.46
11	5.73	36	10.03	61	14.33	86	18.63
12	5.90	37	10.20	62	14.50	87	18.80
13	6.07	38	10.37	63	14.67	88	18.97
14	6.24	39	10.54	64	14.84	89	19.14
15	6.42	40	10.72	65	15.02	90	19.32
16	6.59	41	10.89	66	15.19	91	19.49
17	6.76	42	11.06	67	15.36	92	19.65
18	6.93	43	11.23	68	15.53	93	19.83
19	7.10	44	11.40	69	15.70	94	20.00
20	7.28	45	11.58	70	15.88	95	20.18
21	7.45	46	11.75	71	15.05	96	20.35
22	7.52	47	11.92	72	16.22	97	20.52
23	7.79	48	12.09	73	15.39	98	20.86
24	7.96	49	12.26	74	16.56	99	20.85
25	8.14	50	12.44	75	16.74	100	21.04