

# Evaluating Physical Fitness Components for Secondary School Students in Jordan

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**Abstract** It is almost impossible for a person to enjoy good health without practicing a minimum of sports activity. The human body was not created to remain inactive. It needs a certain amount of physical activity so that it does not become atrophy and wither. Indeed, exercising regularly has beneficial effects on a person's physical and mental condition, making him healthy and happy. There is no doubt that not exercising and following a sedentary lifestyle lead to negative effects on health, and therefore this study came, which aims to evaluate some elements of physical fitness among Secondary school students in Jordan by comparing these elements between males and females. To achieve the objectives of the study, an experimental approach was used, which includes a pre-and post-test that applied to a random sample (200 in total) of Secondary school students in Jordan, including (100) male students and (100) female students, in the first semester of the academic year (2022-2023). The study reached a set of results, the most important of which is the lack of development, both in the characteristic of the explosive power of the feet among members of the study sample and in the characteristic of elongation and flexibility for both sexes. The study also found that there was a development in the characteristic of speed in a proportional, statistically significant manner for both sexes and an improvement in the characteristic of the strength of the muscles of the arms for males only.

**Keywords** Evaluating, Flexibility, Speed, Physical Fitness, Physical Education, Secondary Stage

## **1. Introduction**

In the modern era, the world has witnessed tangible development at various levels and in social, technological, scientific and other fields, and this development has been reflected in many fields of life, including the sports field, as sports play a major role in the lives of people, as it is the effective tool in directing people towards the right paths. It is an essential element in the development of society. It has a major impact on the lives of students, and it is an integral and essential part of the educational process. Practicing sporting activities of all kinds and forms is one of the factors that help the development of children and youth in all physical, mental and other aspects [1-3].

Evaluation in the school field and the field of physical education is considered a scientific means to achieve educational and pedagogical goals. It includes determining the levels of students, their achievements and rates of progress in all the experiences provided by the educational institution to the student, the degree of their achievement and interaction, and the extent to which the programs achieve their goals [1];[4]. Knowing the level of physical

fitness of students in any educational institution means developing the correct sports plans and curricula to improve the physical level of students and thus raise their level of achievement [1-2].

There is no doubt that physical preparation is one of the most important components of athletic success, which depends mainly on developing one's general and specific physical qualities. Since physical fitness is the basis upon which the possibility of practicing various sports activities is built, it must build special physical fitness and advance basic skills and game plans, and without it, the possibility of achieving these dimensions becomes difficult and may even be impossible [2].

Therefore, it is necessary to develop physical qualities such as strength, speed, endurance, flexibility, and agility, and their components - power endurance, speed endurance, and strength characterized by speed - and the exchange of their influence on one another. Therefore, developing, improving, and developing physical qualities means laying the foundation for teaching the art and plans of most sports skills as quickly as possible [5-6].

General fitness depends on performing exercises that lead to the general development of physical qualities while building specific fitness for an athlete depends on performing special exercises, as physical exercises and games are among the most important means that lead to developing physical fitness and increasing the efficiency of internal systems.

Following are the physical characteristics that must be known and evaluated in students:

#### 1. Table:

It is a basic and important physical characteristic for most sports events and games, and it is one of the important indicators that determine the athlete's general condition. It is defined as "the athlete's ability to perform skillfully and artistically to a high degree and for a long period" [2], and we understand table tennis as the athlete's technical and tactical performance while consistently using their strength and speed. The condition remained throughout the match without a drop in level or feeling of fatigue. There are various means to develop the ability to develop the ability to exercise, including exercises and games such as running, organized games, wrestling with a colleague, swimming, and walking, as well as exercises characterized by intensity and continuity. This ability can also be developed by choosing appropriate exercises that are performed through continuous training, which is the best training method for developing this ability in the athlete [7].

#### 2. Strength:

Strength is considered a basic physical attribute and is important for most sports games and events due to its relationship with other physical attributes, as it greatly affects the growth and development of the rest of the physical attributes, especially in games and events that require the use of muscular strength in addition to other

physical attributes. Some scholars believe, such as Barrow and Mack the importance of muscular strength is that it is "one of the dynamic factors of motor performance and is also the reason for progress in performance." The amount of force in motor performance depends on the amount of resistance, its continuity, and the formation of the training program [7].

Strength is defined as "the ability of a muscle or a group of muscles to overcome an external resistance or group of resistances."

If we consider that muscle development is one of the aspects of attention to the athlete's physical fitness, then there is another aspect that appears, which is the athlete's strength training and rapid strength, so strength training goes in three directions: -

- i. General strength training: It helps to maintain the strength of the entire muscular system by using various strength exercises to develop all types of mobile or static strength.
- ii. Multifaceted and directed strength training: It helps to build the strength of the main muscles that bear the main load during performance.
- iii. Special strength training: It is used to build muscle strength that endures together with the rest of the main performance characteristics.

#### 3. Speed:

Speed in all sports and events depends on the rapid exchange and coordinated coordination of neuromuscular action, which results in sequential movements linked to appropriate force, in addition to its connection to agility, compatibility, and endurance [8].

Types of speed:

Accordingly, speed is an important and required characteristic in sports, and this characteristic is of various types:

- a. Transitional speed: It is the absolute speed of the athlete's body moving from one point to another as quickly and in the shortest possible time. This is what we observe in all types of running in track and field games and other sports.
- b. Responsiveness: It is represented by the time force between the instruction and the beginning of the movement, that is the period between the appearance of a specific stimulus and the beginning of the response.
- c. Movement speed: It is the speed of one or more parts of the body in the fastest possible time and the shortest possible time, and it is the speed that characterizes the type of movements, as this speed is responsive according to external stimuli or situations.

#### 4. Flexibility:

The degree of flexibility varies from one event to another and from one athlete to another according to the anatomical and physiological capabilities of each of them and the motor skills required by each game or event. This

depends on the ability of the tendons, ligaments and muscles of the athlete's body to elongate and extend, and we understand flexibility as the ability of the tendons and ligaments of the athlete's muscles. Muscle works in performing the technique and tactics of the game to achieve the desired goal. Flexibility is also an important factor in increasing the strength and speed of performing the athlete's movements. Weak flexibility negatively affects the general motor performance and speed in the athlete's ability to perform and master motor skills, as well as increases the risk of sports injuries [9].

There are many research studies related to the current study, which were referred to, such as the study of Qazaqza et al. [10], which aimed to identify the level of physical fitness among seventh-grade students of Jordanian and Syrian nationalities and the factors affecting it. The study sample consisted of (90) students. For males, the experimental method was used, which consisted of semi-structured tests and interviews, and the study found that there were statistically significant differences in the tests (running 100 meters, flexibility, grip). The study also found that there were no statistically significant differences in the test (30-second push-ups).

The study of Mahmoud [8] aimed to study the level of physical fitness for first-year students at the College of Performance at the University of Baghdad in Iraq. The study was applied to (300) male and female students, and the descriptive approach was used in addition to the use of sports tests. The study concluded that the students from the central region excelled in the speed test over the students from the northern and southern regions, but in general, it is characterized by a slow pace. In addition, the students from the northern region excelled in the broad jump test of stability and the abdominal test, and in the table tennis test, the students from the southern region showed superiority over the students from the central and northern regions. The study of Muhammad, Sati, and Abdul-Wahab [11] also aimed to evaluate the level of some elements of physical fitness for students of the Teachers College at Al-Mustansiriya University in Iraq. The study was applied to (315) male and female students, and the descriptive approach was used. The study concluded that the students' physical level was better. Of the female students, in addition, the speed test for both genders, was at an acceptable level.

### 1.1. Study Problem and Hypotheses

The subject of the study revolves around the framework of the educational aspect, which takes evaluation as an indicator that sheds light on pedagogical and educational cases and phenomena to assess their weight and issue judgments on them. The problem of the study comes in that planning and setting goals for any program should develop the capabilities of individuals, and it is not enough whether these capabilities are (physical, motor, behavioral, or social relations), as the process of sports education at this stage of

study goes beyond that to the stage of implementation and follow-up, and it is then revealing the reality and level of individuals and the effectiveness of the established program and the extent to which it achieves the goals set for it. Therefore, the problem revolves around the lack of physical evaluation for secondary school students to know the effect of practical lessons in developing their physical fitness.

Accordingly, the researchers assume the following:

- i. Practical lessons work to develop some physical characteristics, to a relatively small extent, for secondary school students in Jordan.
- ii. The physical fitness of male students develops better than that of female students at the same stage.

### 1.2. The Importance of Studying

Given the importance of evaluation in this field, the researchers did not make an effort to produce this research to diagnose the students' physical reality and outline the criteria that are used to determine the strengths and weaknesses in the physical characteristics that they possess as a result of the impact of the practical lessons on them.

### 1.3. Objectives of the Study

The study aims to:

- i. Know the effect of practical lessons on developing the physical qualities of male and female secondary school students in Jordan.
- ii. Identify the development of the level of physical fitness among students and compare it between males and females.

### 1.4. Study Limitations

The study is determined as follows:

- a. The human field: - The study was applied to secondary school students in Jordan, which are the first year of secondary school and the second year of secondary school.
- b. Temporal scope: - The study was implemented in the period from 10/1/2022 until 11/15/2022.
- c. Spatial field: - The study was applied in indoor and outdoor school playgrounds.

## 2. Method and Field Procedures

Different methods included in this study are as follows.

### 2.1. Study Approach

Since the study aims to evaluate physical fitness components for secondary school students in Jordan. The experimental research method was used due to its suitability to the nature of the problem and the study.

## 2.2. Study Population and Sample

The study population consisted of all secondary school students in Jordan in the first and second years of secondary school. The study sample consisted of (200) male and female students, including (100) male and (100) female students, in the first semester of the academic year (2022-2023), who were selected by a simple random method to implement the study.

## 2.3. Study Tools

A set of mathematical tests was constructed to conduct the current study, where reference was made to previous relevant studies [4, 10, 11, 12, 13, 14], where the following tests were constructed:

1. Ran test 60 meters measure maximum speed:

This test is as follows: The student stands behind a line drawn on the ground and when the signal is given, he runs as fast as he can for a distance.60 meters where it crosses another line drawn on the ground is the end of the distance, and the time for this distance is calculated in seconds and its parts.

2. Stable broad jump test to measure the explosive strength of the lower extremities:

This test is as follows: The student stands behind a drawn line in front of a sand pit (broad jump pit) and stands as far as possible. The distance is measured in meters and centimeters for two attempts, the highest attempt being taken.

3. Medical ball throwing test to measure arm strength:

This test is as follows: The student stands in front of a line drawn on the ground and has a medicine ball weighing 3.5 kg in his hand. It is thrown from a standing position and over the head as far as possible. It is measured in meters and centimeters for two attempts and is taken for one attempt.

4. Ran test (800 meters for males and 400 meters for females to measure stamina:

This test is as follows:

The students run a distance (measured in advance) and the time of each male and female student for the mentioned distance is recorded in minutes and seconds.

5. Test of bending the torso forward on the legs to measure flexibility:

This test is as follows:

Each male and female student stands on a numbered bench and bends the torso forward while keeping the legs extended and records the number reached by the fingers of the hand so that the number is zero at the level of the bench and decreases if it is above the level of the bench and increases by degrees if it is below the level of the bench.

## 2.4. Application Tests

The pre-practical tests were applied to members of the study sample in the period between (9-20-2022) and (9-23-2022), that is, before the actual application of the test. For seven days, the results were recorded in special tables, after which the researchers let the sample members be exposed to the components of the practical study (which included arena and field lessons, basketball, handball, and physical fitness), which started from the date (10-1-2022) until (15-11-2022), where post-tests were conducted on them to know the effectiveness of the practical lessons in influencing the members of the study sample from a physical standpoint and in developing physical qualities, as these tests are considered an indicator of the development or decline of physical fitness among the students.

## 2.5. Test Application Tools

A set of tools was used to ensure the success of the test application. The physical equipment prepared for this purpose is:

- Various tools and devices (medicine balls + bench (numbered bench) + (measuring tape).
- Practical tests that were explained previously.
- Sources and references.
- Observation and experimentation

## 2.6. Validity and Reliability of Tests

### 2.6.1 Honesty:

The researchers used a standardized test battery that included testing that was constructed, to ensure its validity and suitability to the sample of the current study, the researchers presented the battery to a group of experts specialized in the field of physical education, including university professors, educational supervisors specialized in physical education, and teachers from the field, whose role was to ensure the suitability of the test. For its application, it measures what is intended to be measured.

All of them individually agreed on the validity of the battery and its suitability for the study sample. Thus, the researchers obtained the moral validity of the test battery.

### 2.6.2 Stability:

To ensure the stability of the tests, the researchers applied the test battery to (20) male and female students from the same study population but from outside its sample, and who were chosen randomly. The tests were applied to them and re-applied again, with a difference of (7) days and under the same conditions, and then they were extracted. The reliability coefficient for the two tests (first and second) of the battery, whose score was (92%), is a high-reliability coefficient, which indicates the stability of the test. The test also had an objective character when the test was applied to the experimental

sample and it was understood by all members of the sample, in addition to the fact that the ease of its application does not require a long period; Note that this sample was not included in the final research sample.

### 2.6.3 Statistical Methods Used:

The researchers used the following statistical methods:

- Arithmetic mean and standard deviation: This is to identify the differences between male and female students in the study tools used, which are the five aforementioned physical fitness tests.
- T-test for independent groups to calculate the significance of the differences between the study variables, if any.
- Simple correlation coefficient (Pearson correlation) to calculate the validity of the internal consistency of the study tool, which is represented by the five tests mentioned previously.
- Cronbach's alpha coefficient to calculate the reliability coefficient of the study tools, which are represented in the five tests used in the previously mentioned study.

## 3. Study Results and Discussion

View and analyze test results:

### 3.1. 60 Meter Running Test

When looking at Table 1, it is clear that the arithmetic means for JAR60 meters/ Males for the pre-test reached (11.54) with a standard deviation of (0.58), while the arithmetic means for the post-test reached (10.64) with a standard deviation of (0.66). When using the (t) test for matched samples, the calculated (t) value appeared (3.58) when compared with the value of (T) Tabular (3.27) under the level of significance (0.01) and with a degree of freedom (31). The calculated mean was greater than the tabulated one, and thus the difference was significant and in favor of the post-tests for males. As for females, the table shows (1) the arithmetic means of the pre-test, which amounted to (12.64). With a standard deviation of (0.75), while the arithmetic mean of the post-test was (11.84)

with a standard deviation of (0.49). When using the (t) test, the calculated (t) value appeared (2.46), and when compared to the tabulated (t) value (3.27) and below the significance level (0.01). With a degree of freedom (31), the calculated T was greater than the tabulated one, and thus the difference is significant and in favor of the post-tests for females as well. The researchers attribute the reason for these significant differences in the relatively little development of speed among students to the fact that speed-running activities are included in most practical lessons such as (basketball, handball, and track and field games), so the impact of these lessons on the development of speed among students appears.

### 3.2. Stand-Up Broad Jump Test

When reviewing Table 2, it becomes clear that the arithmetic means for the effectiveness of the standing broad jump for males for the pre-test was (3.57) with a standard deviation of (0.55), while the arithmetic means for the post-test was (4.18) with a standard deviation of (0.71). When using the t-test, and the calculated (t) value appeared (2.24). When compared to the tabulated (t) value (3.48) and below the level of significance (0.01) and with a degree of freedom (28), the calculated value was smaller than the tabulated one, and thus the difference is random (non-significant) and in favor of the pre-tests for males, this means that there is no development in the broad jump test from standing still for males and through the testator females, the same effectiveness appears by looking at Table 2. The arithmetic mean for the pre-test was (2.64) with a standard deviation of (0.75), while the arithmetic mean for the post-test was (2.97) with a standard deviation of (0.69), and when compared to the tabular (t) value (3.48). Below the level of significance (0.01) with a degree of freedom (28), the calculated one was smaller than the tabulated one, so the difference is not significant and is in favor of the pre-tests for females. This means that there is no development in the explosive power characteristic of the legs in females. The researchers believe that the lack of development of the explosive strength of the legs for secondary school students is due to not giving enough time to exercises to develop this attribute among students during practical lessons.

**Table 1.** The arithmetic means, standard deviations, and the calculated and tabulated (t) value of A60 meter test

The test		Tribalism		Dimensionality		Calculated T value	Tabular value	Indication
		Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation			
60-meter test	Males	11.54	0.58	10.64	0.66	3.58	3.27	Moral
	Females	12.64	0.75	11.84	0.49	3.46		Moral

**Table 2.** The arithmetic means, standard deviations, and the calculated and tabulated (t) value of A Static broad jump test

The test		Tribalism		Dimensionality		Calculated T value	Tabular value	Indication
		Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation			
Static broad jump test	Males	3.57	0.55	4.18	0.71	2.24	3.48	Insignificant
	Females	2.64	0.75	2.97	0.69	1.96		Insignificant

**Table 3.** The arithmetic means, standard deviations, and the calculated and tabulated (t) value of A Medicine ball throwing test

The test		Tribalism		Dimensionality		Calculated T value	Tabular value	Indication
		Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation			
Medicine ball throwing test	Males	8.89	0.74	9.54	0.73	4.14	4.78	Moral
	Females	7.45	0.70	8.21	0.65	2.45		Insignificant

### 3.3. Throwing the Medicine Ball over the Head Test

When looking at Table 3, it is clear that the arithmetic mean of the medicine ball throwing test for males, pre-test, was (8.89) with a standard deviation of (0.74), and the arithmetic mean of the post-test was (9.54), with a standard deviation (0.73). When using the t-test for symmetrical samples, it appeared The calculated (t) value (4.14) and when compared to the tabulated (t) value (4.78) and below the level of significance (0.01) and with a degree of freedom (32), the calculated value was greater than the tabulated one, and thus the differences are significant and in favor of the dimension/males, and this is an indication of the development of the strength characteristic of the muscles of the arms. The stem is for males. As for the female tests for the same effectiveness, Table 3 shows us the arithmetic mean of the pre-test, which reached (7.45) with a standard deviation of (0.70), while the arithmetic mean of the post-test reached (8.21), with a standard deviation of (0.65), and when using the (t-test), the calculated (t) value appeared (2.45), and when compared to the tabulated (t) value (4.78), below the level of significance (0.01) and with a degree of freedom (32), the calculated (t) was less than the tabulated (t) and thus the difference is random (non-significant) and in favor of Pretests: this is another indication of the lack of development of arm muscle strength in females, as practical lessons did not develop this trait.

### 3.4. 800-meter Running Test for Male Students and

### 400-meter Running Test for Female Students

Through Table 4, it is clear to us that the arithmetic mean for the male 800-meter running effectiveness for the pre-test was (5.64) with a standard deviation of (0.58), and the arithmetic mean for the post-test was (4.87) with a standard deviation of (0.61), and when using the t-test a value appeared The calculated (t) was (2.92), and when compared to the tabulated (t) value (1.98) and below the level of significance (0.01) and with a degree of freedom (30), the calculated (t) was less than the tabulated (t) and thus the difference was random (non-significant) and in favor of the pre-tests. This is an indication of the lack of development of the trait of forbearance in males, and this means that the practical lessons did not help in developing the trait of forbearance in males, and this result fulfills the hypothesis of the study.

From the 400-meter running tests for females, Table 4 shows us the arithmetic mean of the pre-test, which was (3.58) with a standard deviation of (0.76), while the arithmetic mean of the post-test was (2.95), with a standard deviation of (0.58). When using the (t-test), the value of (t) appeared. The calculated (2.77) and when compared to the tabulated (t) value (1.98) and below the level of significance (0.01) and with a degree of freedom (30), the calculated (t) was less than the tabulated (t) and thus the difference is (non-significant) and in favor of the pre-tests, it is an indication of the trait of persistence that also did not develop in females, which fulfills the hypothesis of the study, as the practical lessons did not develop this trait in female students.

**Table 4.** The arithmetic means, standard deviations, and the calculated and tabulated (t) value of 800- meter and 400- meter running test

The test		Tribalism		Dimensionality		Calculated T value	Tabular value	Indication
		Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation			
Test ran 800 meters and 400 meters	Males	5.64	0.58	4.87	0.61	2.92	1.98	Insignificant
	Females	3.58	0.76	2.95	0.58	2.77		Insignificant

**Table 5.** The arithmetic means, standard deviations, and the calculated and tabulated (t) value of A Flexibility test

The test		Tribalism		Dimensionality		Calculated T value	Tabular value	Indication
		Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation			
Flexibility test	Males	-12	0.42	-9	0.51	1.82	1.25	Insignificant
	Females	-10	0.57	-5	0.50	2.12		Insignificant

### 3.5. Flexibility Test

When observing Table 5, it becomes clear that the arithmetic means for the flexibility test for males and the pre-test reached (-12) with a standard deviation of (0.42), and the arithmetic mean for the post-test reached (-9) with a standard deviation of (0.51). When using the t-test for matched samples, a value appeared. The calculated (t) value (1.82) and when compared to the tabulated (t) value (1.25) and below the level of significance (0.01) and with a degree of freedom (22), the calculated (t) appeared greater than the tabulated (t) and in favor of the pre-tests. Thus, the difference is random, and this means no development. The trait of flexibility in males and the ineffectiveness of practical lessons in developing this trait in males. Table 5 shows the female tests for the trait of flexibility, where the arithmetic mean for the pre-test is (-10) with a standard deviation of (0.57), while the arithmetic mean for the post-test is (-5) with a standard deviation of (0.50). When using the t-test, it appears the calculated (t) value (2.12) and when compared to the tabulated (t) value (1.25) and below the level of significance (0.01) and with a degree of freedom (22), the calculated (t) was less than the tabulated (t) and thus the difference is random (non-significant) and in favor of the tests. Tribalism, which indicates the lack of development of the trait of flexibility for females as well, is what proves the futility of the process of developing this trait among female students.

## 4. Discussion of the Results

It is clear from the above that there is development in some students' physical characteristics and a lack of development in others, and this results from the inadequacy of practical lessons, in addition to the lack of interest of teachers in developing the physical fitness elements of students, but rather more interest in developing the basic skills for each game and neglecting to develop the physical

fitness elements. Among students, characteristic of muscular strength is one of the characteristics that require auxiliary means when taught, such as external resistance and exercises that require the body to participate in special positions. This result is generally consistent with the findings of the studies [8, 16, 17].

Due to the lack of focus on developing this characteristic during practical lessons and being satisfied only with developing the skills specific to each game or activity, therefore, relative differences appeared in the development of some elements of physical fitness for secondary school students, and this is what fulfilled the first hypothesis of the study, which says that practical lessons work to develop the physical qualities of students relatively. This was better for male students than for female students, which fulfills the second hypothesis of the study. This result is generally consistent with the findings of the studies [8, 11, 14, 18, 19, 20]. Through this, it becomes clear to the researchers that those in charge of the school educational process, which is represented by the Jordanian Ministry of Education through the various education directorates, must reconsider the vocabulary of the practical curriculum for secondary school students. The rest of the stages are to prepare the students properly physically.

## 5. Conclusions

From the previous results, we conclude the following:

- Lack of development of explosive power in the feet among members of the study sample and for both sexes.
- Lack of development of elongation and flexibility for both sexes.
- There was a relatively significant, statistically significant improvement in speed for both sexes.
- There has been a development in the strength of the arm muscles for males only.

- Practical lessons for secondary school students are not sufficient to develop the capabilities and skills of these students.
- The practical lessons did not focus on developing the basic qualities that constitute a group of physical fitness components.

## 6. Recommendations and Proposals

- i. Ensure an increase in physical education classes and introduce a practical lesson that develops students' fitness and prepares them physically to practice all activities at all educational levels, whether primary or secondary.
- ii. Conduct similar studies for other educational levels.

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