

The correlation relationship between psychological stress and starting speed in the 100-meter race for third year students of athletics speciality

العلاقة الإرتباطية بين التوتر النفسي وسرعة الإنطلاق في سباق 100 متر لدى طلاب السنة الثالثة تخصص ألعاب القوى

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**Abstract :** The purpose of this study is to determine the relationship between the psychological stress and the speed of departure of the runners in the race of 100 meters, by studying the relation between the post-physiological stress and the cognitive and psychological stress with the speed of departure. This study was applied to the third-year students who specialized in athletics, and they were 15 runners and were chosen by the intentionally method. In order to achieve the objectives of the study, the descriptive approach was used which considered as the most suitable approach to the subject of the study, and a physical test was used as tools for the study to measure the starting speed of 30 meters, in addition to the tonometer as the best and most effective method to verify the problematic we gave, where it was found that there is a relationship between the stress and the starting speed in a 100-meter runners, and based on this results, the researchers recommend focusing on psychological preparation and preparing runners for a significant period of time before the competition.

**Keywords:** Psychological Stress – Starting Speed - Race 100 meters.

**المخلص :** تهدف هذه الدراسة إلى تحديد العلاقة بين التوتر النفسي وسرعة الانطلاق لدى العدائين في سباق الـ 100 متر، من خلال معرفة العلاقة بين بعد التوتر الفيزيولوجي وبعد التوتر المعرفي والنفسي مع سرعة الانطلاق، وتم تطبيق هذه الدراسة الميدانية على طلاب السنة الثالثة تخصص ألعاب القوى وكان عددهم 15 عدائنا وتم اختيارهم بالطريقة القصديّة، ولتحقيق الوصول إلى أهداف البحث تم استخدام المنهج الوصفي لاعتباره المنهج الأكثر ملائمة لموضوع الدراسة وتم استخدام كأدوات للدراسة اختبار بدني لقياس سرعة الانطلاق 30 متر بالإضافة

# The correlation relationship between psychological stress and starting speed in the 100-meter race for third year students of athletics specialty

لمقياس التوتر باعتباره أنجع الطرق للتحقق من الإشكالية التي قمنا بطرحها، حيث تم التوصل إلى أن هناك علاقة بين التوتر وسرعة الانطلاق لدى عدائي 100 متر، وعلى أساس لنتائج يوصي الباحثون بالتركيز على التحضير النفسي وتهيئة وإعداد العدائين قبل المنافسة بمدة زمنية معتبرة.  
- الكلمات المفتاحية : - التوتر النفسي - سرعة الإنطلاق - سباق 100 متر.

## 1. Definition of search:

### 1.1. Introduction and problematic of study:

The psychological stress is one of the most important problems faced by most athletes, which has several negative consequences such as dissipating physical energy and denying moments of enjoyment in exercise. Psychological stress can also weaken the self-confidence of the athlete when he has a belief and thinking that he is incompetent, and internal conflict can cause physical injury, often a major reason for early disdains or deportation. (Rateb. A, 1997, p272). It can be also considered as an important psychological factor that can be observed through an individual's behaviour in response to new sportive situations during the skilled performance of the lesson. Moreover, the progress in the athletic level is just functional and psychological adaptations that occur in the inner ready. Consequently, the individual's functional abilities increase, which vary in degree of influence depending on the nature of each activity, time of practice and style of performance in the 100 meters race, which is the anxiety that results in competition situations (match). It is directly connected to the sports field, as it the sports coach and player in the sports competition situations because of the certain features of these situations, such as winning, defeat, success or failure according to the concept of (Spielberger). It can happen to the individual in any situation of public life, which the individual has threatened (Hamada 1998). So, through the above study we can pose the following problem: Is there a

relationship between stress and speed of the 100 meters race for third-year students who specialize in athletics?

The problem can be divided into the following partial questions:

1- Is there a relationship between the effects of concomitant physiological stress (facial redness, breathing difficulty, and headache) and the speed of the 100 meters race in third year students who specialize in athletics?

2- Is there a relationship between the effects of concomitant cognitive stress (forgetfulness, weak concentration, distraction) and the speed of the 100-meter race in third-year students specializing in athletics?

Is there a relationship between the effects of concomitant psychological stress (anxiety, fear, increased sensitivity, sleep disorders) and the speed of the 100-meter race in third-year students specializing in athletics?

## **1.2. The general and Partial hypotheses:**

### **1.2.1. The general hypothesis:**

There is a relationship between stress and speed of the 100 meters race for third-year students who specialize in athletics

#### **1.1.1. Partial hypotheses:**

1- There is a relationship between the effects of concomitant physiological stress (facial redness, breathing difficulty, headache) and the speed of the 100-meter race in third year students specializing in athletics.

2- There is a relationship between the effects of concomitant cognitive stress (forgetfulness, weak concentration, distraction) and the speed of the 100-meter race in third-year students specializing in athletics.

3- The effects of the concomitant psychological stress (anxiety, fear, increased sensitivity, sleep disorders) and the speed of the start-up in the 100-meter race are related to the third year's athletics.

### **1.2. Importance of search:**

The importance of any study is the importance of the topic we are dealing with, and the importance of our research is the following elements:

- 1- Evaluation of the accompanying of physiological level of competition that is representing in facial redness, difficulty of breathing and headache in students and attempt to convert negative energy into positive energy;
- 2- Evaluation of the knowledge level of forgetfulness, weak focus and distraction of students and assess it before formal competitions;
- 3- Assess the psychological level of students, which is anxiety, fear, increased sensitivity and sleep disorders, and try to correct some concepts about competition.

### **1.3. Aim of the search:**

Each study has a goal or purpose that makes it of scientific value and the objective of the study is why we have prepared this study and our study aims to:

- 1- Knowledge of the relationship between physiological stress and the speed of the 100 meters race in third-year students, specialization of athletics.
- 2- Knowledge of the relationship between cognitive stress and speed of the 100-meter race in third-year students specializing in athletics.
- 3- Knowledge of the relationship between stress and speed of the 100 meters race in the 3rd year students of the athletics specialty.

### **1.4. Determination of terms and concepts:**

#### **- Stress:**

The concept of stress is derived from Latin and used in French in the sense of stretching and takes several concepts according to time and place: Aggressive, hard, strong, pressure, disease, disability and weakness, adaptation and convenience.

McGrath tried during the 1990s (exactly in 1998) to explain the concept of stress in the light of four considerations as follows:

- 1- The social and physiological environment surrounding an individual imposes some important goals required of the individual's achievement.
- 2- It is the individual who understands the nature of these objectives and then tries to make decisions about how to respond to its achievement.
- 3- The response responds in order to accomplish the goal.
- 4- Individual responses consequences. (Osama Kamel Rateb, 1998, p, 13).

- **Athletics:**

Qassem Hassan Hussein defines it as the common link between sports events such as walking, running, throwing and shooting, where the game law is in force for the shortest period and the distance or the high rate of events. (Qassem Hassan Hussein, 1998, p, 95).

- **100meters speed race:**

The 100 meters race is aimed at taking the distance in the shortest possible time as the racer looks for the best achievement, to get to the maximum speed possible and keep it to the finish line. And whatever distance we can calculate the average speed from the length of the step multiplied by its frequency. (Tahechi Abderrahman, 2016, p, 84)

2. **Search procedures:**

The methodological framework for research is an important aspect that no researcher can abandon, and there is a strong relationship between the subject and the methodology. In order to establish a systematic, structured work, all aspects and actions taken during the study process need to be clarified so that the research is objective. The information contained therein makes it easier for the information to understand and interpret the results.

### 2.1. The survey

The survey is a process performed by the researcher before the beginning of the field work and also, the survey of the conditions surrounding the phenomenon that the researcher wants to study and to identify the most important hypotheses that can be developed and subject to scientific research. We studied a survey of the sample study in the track of athletics.

### 2.2. The approach:

The approach is the path to the desired goal or the invisible thread that leads the search from its beginning to its end in order to reach the results. (Mohamed, 1980, p, 42) it is also known as that set of general rules and regulations that are being developed to reach acceptable facts about phenomena of interest to researchers in various fields of human knowledge (Abidat , 1999, p 35).

#### - Descriptive approach:

In our study, we relied on the analytical descriptive approach and this test did not happen arbitrarily but rather as an inevitable consequence of the nature of the topic, so the descriptive approach is: "A method of systematic scientific analysis and interpretation to reach specific symptoms of a particular social situation, social problem or population. (Dhenibat, 1995, pp 129, 130).

In addition, Research methods vary in research depending on the problem and objectives of research, also according to the needs for research, researchers can follow different scientific approaches. In this sense, given the nature of our topic, "the correlation between stress and speed of the 100-meter race for third-year students, the athletics specialty, Institute of physical and Sports Sciences and techniques of Bouira", We considered that we would rely on the descriptive approach to fit the current nature of the study.

### 2.3. Variables of search:

From the study title and the hypotheses developed can determine the current study variables as follows:

- **Independent variable:** is the agent the researcher is addressing to change to check its relationship to the dependant variable in question. In our study, the independent variable is the stress.
- **Dependant variable:** is the phenomenon that exists, or changes when a variable researcher applies or changes (Ahmad Ali, 1999, p, 74). And it is a variable whose value depends on the effect of the values of other variables. Because each time you make some adjustments to the values of the independent variable, it will appear on the dependant variable. (Salary, 1999, p, 219) in our study, the dependant variable is the speed of the 100-meters race.

### 2.4. The Society:

The Society is considered as a group of individuals or sampling units for which data will be collected, which may be a group of people within a country, a population of a particular province or city (Mouhamed Abdelhamid, 2010, p 82). This definition allows us to define our current study society in all third-year students who specialize in athletics at the Institute of physical and Sports Sciences and techniques at the University of Bouira.

### 2.5. The sample:

"The sample is part of the study society from which field data are collected and is considered part of the whole meaning that a group of society members are taken and represented by the research society" (Zerouati, 2007, p 334). It can be also defined as a partial group of the study society is selected in a particular way and studied, and therefore used and disseminated to the entire society of the original study) .

To achieve accurate and objective results, we have tested the search sample in the narrative way, representing 15 students from the Institute of physical Science and Technology at the University of Bouira, which specializes in athletics.

#### 2.6. Fields of search:

In order to address hypotheses and reach results that serve the objectives of the study, we have identified fields for research:

- **The human field:** includes the number of individuals who have completed or completed their studies, in all third year students, the athletics department of the Institute of physical and Sports Sciences and techniques of the University of Bouira.
- **The field of space:** In our research, we have seen the field study of the track field of athletics at the Rabeh Bittat stadium in the Bouira.

#### 2.7. Tools of search:

In our research, we used a 30-meter run speed test in addition to the scale form for measuring stress for Dr. Ahmed Abu Saad (Saad, 2011, pp, 70-72) as the best and most effective way to check the problem we have raised. It also makes it easier for us to collect information from hypotheses.

The scale is defined as: A tool for obtaining facts, data and information, and this data is collected by means of a scale by the development of the question form. Among the advantages of this method is that it is an economy in effort and time and contributes to the acquisition of sample data at the very least by providing the conditions for rationing of honesty, stability and objectivity (Ahmad Ali, 1999, p, 203.205)



### 2.7.1. The truthfulness of the scale:

sincerity or the truthfulness is one of the conditions and scientific attributes of a good test, because it means "the test measures what was put in order to measure it and does not measure anything else" (Bahi, 1999).

For the truthfulness of the scale, we gave it to a group of professors arbitrators, Where our study questionnaire was judged by professors and doctors from the Institute of Sciences and Techniques of Physical and Sports Activities in Bouira, therefore it was modified by changing some questions and removing others, as well as adding some questions suggested by the professors, , and thus the scale is characterized by truthfulness.

### 2.7.2. Stability of the scale:

the one who gives a similar results or the same results if it applied more than once in similar circumstances (Amer, 2005, p, 45). By experimenting the scale on the expeditionary study sample, we concluded to prove its stability. Cronbach's alpha = 64.

**Table 1. Represents the value of Cronbach's alpha to measure the stability**

Cronbach's alpha value	Number of individuals
0,640	15

From the table, we can say that the scale is valid for field application on the main sample.

## 2.8. statistical methods:

No researcher can dispense with statistical methods and ways whatever the type of study that he is doing, whether it is social, psychological, economic or other studies, as the statistical methods are what provides the accurate objective description, since the researcher cannot rely on observation alone, but relying on

Statistics leads the researcher to the right method and the correct and honest results, as well as, the statistical methods also aim to try to reach a significant quantitative indicators that help the researcher to analyze and objectively explanation of the results and judge them, also enables us to classify the data that are collected and translated objectively.

In our research, the following statistical methods were used:

- 1- Arithmetic Medium (S-) (Ibrahim, 2001, p, 137)
- 2- Standard Deviation (AS) (Ibrahim, 2001, p, 171)
- 3- Correlation coefficient (Pearson) (Ibrahim, 2001, p, 185)

## **2.9. Statistical conclusion:**

- If the value of  $r$  Pearson is less or greater than zero here we can say that there is a direct or inverse relationship and the closer we get more and more to the value of 1 or -1 the strength of the relationship increases.
- If the value of  $r$  Pearson equals zero, we say that there is no relationship, and this is rare to happen.

## **3. Presentation, analysis, and discussion of the results:**

### **3.1. Presentation, analysis, and discussion of the results of the first hypothesis:**

#### **➤ Hypothesis transcript:**

There is a relation between the accompanying physiological stress effects (redness of the face, difficulty breathing, headache) and speed of departure in the 100m race for the third-year students specializing in athletics.

To statistically treat this hypothesis, we applied the Pearson Relationship Test, which is the most effective test to calculate the relationship between two variables, after ensuring the equinocial normal distribution of the sample.

**Table 2. The relationship between the physiological effects accompanying to the stress (redness of the face, difficulty breathing, headache) and speed of departure in the 100m race for the third-year students specializing in athletics.**

statistical significance	moral significance	significance level	degree of freedom	R Pearson	standard deviation	arithmetic mean	
significant	0,327	0.05	15	-0,126	0,62983	4,3866	starting speed
					5,0634	22,066	the physiological effects

From Table 2, we note that the arithmetic mean of the physiological effects accompanying to the stress (redness of the face, difficulty breathing, headache) (22,066) and the standard deviation (5,0634) and the arithmetic mean of the starting speed in a 100-meter race (4, 3866) with a standard deviation of (0.62983) at the degree of freedom (15) and the significance level is 0.05. and as for the value of R Pearson (-0.126), and the value of the moral significance was (0.327), and since Pearson's value is not equal to zero we can say that there is a weak inverse relationship, and we can say that these results are a result of distraction and poor focus during the competition, and therefore we are able to say that the first hypothesis has been achieved.

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3.2. Presentation, analysis, and discussion of the results of the second hypothesis:

➤ Hypothesis transcript:

There is a relation between the cognitive effects accompanying to the stress (forgetfulness, poor concentration, attention distraction) and speed of departure in the 100m race for third year students specializing in athletics.

To statistically treat this hypothesis, we applied the Pearson Relationship Test, which is the most effective test to calculate the relationship between two variables, after ensuring the equinoctial normal distribution of the sample.

**Table 3. The relationship between the cognitive effects accompanying to the stress (forgetfulness, poor concentration, attention distraction) and speed of departure in the 100m race for third year students specializing in athletics.**

statistical significance	moral significance	significance level	degree of freedom	Pearson	standard deviation	arithmetic mean	
significant	0,34	0.05	15	-0,116	0,62983	4,3866	starting speed
					6,8916	29,7333	the cognitive effects

From Table 3, we note that the arithmetic mean of the cognitive effects accompanying to the stress (forgetfulness, poor concentration, attention distraction) (29,73333) and the standard deviation (6,8916) and the arithmetic mean of the starting speed in a 100-meter race (4, 3866) with a standard

deviation of (0.62983) at the degree of freedom (15) and the significance level is 0.05. and as for the value of R Pearson (-0.1116), and the value of the moral significance was (0.34), and since Pearson's value is not equal to zero we can say that there is a weak inverse relationship, and we can say that these results are a result of distraction and poor focus during the competition, and therefore we are able to say that the second hypothesis has been achieved.

**3.3. Presentation, analysis, and discussion of the results of the third hypothesis:**

➤ **Hypothesis transcript:**

There is a relation between the psychological effects accompanying to the stress (Anxiety, fear, hypersensitivity, sleep disturbances) and speed of departure in the 100m race for third year students specializing in athletics.

To statistically treat this hypothesis, we applied the Pearson Relationship Test, which is the most effective test to calculate the relationship between two variables, after ensuring the equinoctial normal distribution of the sample.

**Table 4. The relationship between the psychological effects accompanying to the stress (Anxiety, fear, hypersensitivity, sleep disturbances) and speed of departure in the 100m race for third year students specializing in athletics.**

statistic al significance	moral significance	significance level	degree of freedom	Pearson	standard deviation	arithmetic mean	
significant	0,33	0.05	15	0,122-9	0,62983	4,386667	starting speed
					7,7662	35,2000	the psychological effects

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From Table 4, we note that the arithmetic mean of the psychological effects accompanying to the stress (Anxiety, fear, hypersensitivity, sleep disturbances) (35,2000) and the standard deviation (7,7662) and the arithmetic mean of the starting speed in a 100-meter race (4,386667) with a standard deviation of (0,62983) at the degree of freedom (15) and the significance level is 0.05. and as for the value of R Pearson (-0.1229 ), and the value of the moral significance was (0.33), and since Pearson's value is not equal to zero we can say that there is a weak inverse relationship, and we can say that these results are a result of distraction and poor focus during the competition, and therefore we are able to say that the second hypothesis has been achieved.

From the obtained results recorded in Tables (2), (3) and (4), and since that the three hypotheses have been achieved, we can say that the general hypothesis that says "there is a relationship between stress and speed of departure in the 100-meter race for third year students specializing in athletics" Have been fulfilled

### **4. Conclusion**

The study of this topic is extremely important, as the relationship between psychological and mental aspects and physical performance in competitions in various sports in general and the 100-meter race in particular has become one of the requirements that coaches should be aware of and its data and thus raise the level and athletic achievement.

Through our study, which was not accidental or random, but by the feeling of a problem and through our direction to the training world we wanted to shed light on the relationship between stress and the speed of starting of the runners of 100 meters through 3 dimensions represented by the physiological stress, cognitive stress dimensions and psychological stress dimensions, by offering a special measure for stress measurement and the 30-meter test to measure the

starting speed of third year students of athletics represented in a sample of 16 runners students, and in the light of all theoretical and applied data in the research, and after presented and analyzed the results and based on the study we have done which confirmed the validity of the proposed hypotheses, we came to the conclusion that the stress has a serious impact on the starting speed of runners. Through our study, which was not accidental or random, but by the feeling of a problem and through our direction to the training world we wanted to shed light on the relationship between stress and the speed of starting of the runners of 100 meters through 3 dimensions represented by the physiological stress, cognitive stress dimensions and psychological stress dimensions, by offering a special measure for stress measurement and the 30-meter test to measure the starting speed of third year students of athletics represented in a sample of 16 runners students, and in the light of all theoretical and applied data in the research, and after presented and analyzed the results and based on the study we have done which confirmed the validity of the proposed hypotheses, we came to the conclusion that the stress has a serious impact on the starting speed of runners.

#### **5. Recommendations:**

At the end of this study, and in the light of the results that have been reached, discussed, and interpreted, we can propose the following recommendations:

- ✓ the necessity of paying attention to the psychological aspect of athletes because of its great importance in the results of competitions.
- ✓ The necessity of making similar research to enrich the subject and know the new developments taking place in the state of psychological sports
- ✓ doing similar researches in the 100-meter race because this race does not receive much attention from researchers.

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- ✓ Giving great importance to the retrieval methods before, after and during the sport competitions
- ✓ The necessity to pay attention to the psychological and social aspect of athletes and follow them off the field.
- ✓ Trainers should be familiar themselves with the psychological aspect and attend special seminars and forums to increase their knowledge in this field.
- ✓ Reconciliation between psychological and physical preparation and programming it within the training scheme.
- ✓ Provide permanent advices to athletes, especially those the younger categories, about the necessity of early and adequate sleep, good eating and continuous stimulation.



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