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## **The role of the Functional movement screen tests (FMS) in the prevention and prediction of sports injuries among soccer players case study for the (USM Algiers U21) team," first professional league "**

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### **Abstract:**

The study aims to highlight the role of the functional movement screen tests, as an indicator of prevention and prediction of injuries for (U21) soccer players.

The results showed, that there were more likely 26% of the players to get injured, and 74% were healthy without risk of infection. According to the (FMS) tests, there are sports injuries during the season, there are statistically significant differences between the injured and uninjured players in the FMS Functional movement screen tests in favor of the uninjured players.

**Keywords:** Functional movement screen tests; prevention and prediction of injuries; soccer.

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## 1. INTRODUCTION

"Sports performance has made remarkable and significant progress over the past few years in light of scientific and cognitive progress in various sports sciences and its branches" (Abdul Rahman Salama and others, 2021).

Where coaches and researchers, especially in the game of soccer seek to identify the positives of performance in order to enhance them, as well as identifying the negatives, which limit the progress of the level of technical and tactical performance during the match, and when we refer to matches or competitions, we mean all the factors related to performance, and with the development of the level of performance in the game, our clubs must keep pace with this development, by trying to remove all obstacles and factors that detract from it among these obstacles are the specter of injuries, despite the scientific development in the world of soccer, clubs suffer from the absence of players for long periods, and therefore the lack of their services and this is considered as an obstacle and an influencing factor on the performance of the team.

We also find that the science of tests and measurement has entered all areas of life, for the purpose of knowing the level, diagnosis, evaluation and sports injuries, there are many medical tests that are conducted on athletes to evaluate their health level according to the type of their sport, such as measurement of vital capacity, heart rate, blood pressure, oxygen consumption and functional movement screen (FMS) there are also many sports physical tests that determine and assess the physical efficiency of the athlete, such as ,Measuring muscle strength, ability, flexibility, speed , and these tests are a predictive indication of the player's level and his health and physical abilities (Mohammed, 2017, pp. 31-32).

There is a close relationship between this science Including tests and measures of physical fitness and stadium injuries, as the lack of these elements increases the chances of sports injuries for players and is an important preventive element, also measuring and testing muscle efficiency, joint flexibility, nerve and bone integrity, and the rest of the functional competencies of the injured player before returning to the stadiums protects and reassures him of his participation in the matches, and if the injury has side effects, this exposes it to multiply or become a chronic injury if the player participates in the matches before full recovery, we also advise the importance of conducting these checks and measurements on a regular basis (Ahmed, 2008, pp. 23-24).



Where the trained player is considered in a sound scientific manner in accordance with the rules and principles of the science of sports training and has integration in training the elements of his physical fitness, his injury rate is lower than that of the untrained in a sound scientific way.

Where we find for each player a special profile that must be taken into account according to his strengths and weaknesses, from this note, it is necessary to develop a preventive program compatible with the soccer activity and according to the special needs of the player and according to the previous injuries, The goal is to maintain the balance of the member so as not to create or develop some compensation that could lead to certain diseases in the short term (pre-season preparation period) or in the medium term (competition) (Dellal, 2013, p. 93).

As for the studies and scientific research on this topic, the researcher has noticed a few of them that were conducted on injured players in the Arab society in general and the Algerian society in particular, which tried to address the detection of the defect that could lead to the occurrence of the injury before it occurs by any means of testing and measurement, where the questionnaire and the interview were used only as a tool to determine the type of injury, and its location and the reasons for its occurrence, which gives unrealistic results because the player does not give the correct information for fear of exclusion from the formation of the team, this affects the performance of the team and the player with the possibility of exacerbating the injury, that is why we tried to use the Functional Movement Screen Test (FMS), to identify some indicators of injury in different areas of the body, before any injury occurs, this helps establish preventive training programs and monitor injuries during season, it should be noted, that injuries cannot be completely prevented, but the risks of their occurrence can certainly be reduced, and through the above, the following general question can be raised: does the functional movement screen tests (FMS) have a role in preventing and predicting sports injuries for (U21) soccer players?

### **Partial questions:**

- Are there players at risk of injury according to the FMS functional movement screen tests?
- Are there sports injuries during the season among soccer players (21U).
- Are there any statistically significant differences between injured and uninjured players in the functional movement screen (FMS) tests?

### **2.General hypothesis:**



-Functional movement screen (FMS) tests have an important role in preventing and predicting injuries in (U21) soccer players?

### **2.1. Partial Hypotheses:**

- There are players at risk of injury according to the FMS tests.
- There are sports injuries during the season that differ according to the type of injury and its location in the body for (21U) soccer players.
- There are statistically significant differences between injured and uninjured players in the functional movement screen (FMS) tests in favor of the uninjured.

### **3. Study objectives:**

- Recognizing the indicators of dyskinesia, including the number of players exposed to injury, through the (FMS) tests.
- Identify common sports injuries during the season, which vary according to their type and location of the body.
- Finding out whether the injured and uninjured players during the season were susceptible to injury in terms of the FMS tests.

### **4. Terminology of study:**

#### **4.1. The FMS or Functional Movement Screen:**

Is a standardized test of 7 functional movements developed by the American physiotherapist Gray Cook, the purpose of the FMS is to identify asymmetries and imbalances in the mobility and dynamic stability of the body. This is possible thanks to the 7 precise movements of the FMS which make it possible to bring out the weaknesses in the ankles, knees, hips, back and shoulders. The objective is then to correct the weaknesses and asymmetries of the body in order to optimize the biomechanics in order to prevent injuries and optimize performance, the test is intended for elite athletes or professional and amateur athletes (Gauthier and others, 2022).

#### **2.4. Injury prevention:**

The preventive and health level for athletes, one of the measures and indicators aimed at reducing injuries, therefore the prevention of injuries requires the presence of preventive exercises in many cases, Especially before the injury, where its effect appears through the performance of the preventive exercises that the player constantly performs because it increases the activity of blood circulation through the work of the muscles, as well muscle fiber hypertrophy and an increase in the number of joint motor units in effort, all of which leads to an increase in the strength of the muscles working on the joint (Abdul Nabi & Khalif Jaber, 2015, p. 32).

#### **Previous and similar studies:**

Study of: Grigorev, Semenova (2020): functional movement screen as a means of reducing injuries in fitness.

The use of functional movement screen aims to determine the potential risks of injuries and ways to reduce their number, the study was conducted on individuals aged 38-51 years who scored less than 14 in the FMS test (58 out of 200 people), the researcher concluded that the average score of the FMS test is 9.88 points out of 21, which means that there is a risk of injury after 3.5 months, a significant improvement has been achieved (with an average of more than 14 points) in the group that practices physical fitness, there was a decrease in the number of infections, the study confirmed the effectiveness of the use of the FMS test, as well as the use of the proposed exercises.

- Study of: Syafie and others. (2020) entitled: Examination of functional movement, early detection of the risk of injury to students in the sports class.  
- The aim of the study is to determine the risk of injury to students in the sports class using the (FMS) test, the research sample consisted of 32 male and female students of the seventh category of sports (20 males and 12 females) with an average of 14 years the research tool used was the functional movement screen test, with a degree of validity and reliability of 0.81, the results showed an imbalance of strength between the left and right muscles of the body, the use of functional movement testing (FMS) is important to reduce the possibility of injury to students in the sports class .

Study: Ghabbash Adel (2017) entitled: The Effectiveness of Physical Tests and Medical Analysis in Preventing Sports Injuries for soccer Players - A Case Study of USM Algiers Team (17-19 years) "First Level".

The study aimed to determine the level of physical preparation through a battery of preventive physical tests for soccer players, and highlight the importance of biological medical follow-up in order to prevent and maintain the health and safety of players and to identify the factors related to internal sports injuries and find ways to prevent them, the researcher used the descriptive analytical method on a sample of 24 soccer players under 19 years of age, first level, the most important results were: a higher percentage of muscle injuries and sprains (foot and knee), and the hamstring muscles were more susceptible to injury.

- Study: Marques, and others, (2017): Functional Movement Screen of Elite Soccer Players Aged 14-20

- The study aimed to provide a detailed description about the suitability of elite young soccer players aged 14-20 years on the FMS test battery. The descriptive



approach was used, on a sample of 103 soccer players from a Premier League club using an FMS test battery, the composite FMS score, individual test scores, and asymmetry were taken into account for analysis and a comparison was made between age groups, results The composite scores for FMS ranged from 9-16 points (median = 13 points) 82% of the athletes got 14 points in the composite test score 91% were rated in a failing group of 0-1 score at least in one test, half of the athletes performed Almost 48% weak, soccer players suffer from significant functional deficits, especially in deep squat testing and trunk stabilization, as well widespread left-right body asymmetry.

- Study: Ali and Mahmoud (2016) entitled: Lower limb injuries and their causes among soccer players in Lattakia clubs.

- This study is concerned with identifying the causes that lead to the occurrence of injuries to the lower extremity among soccer players in clubs in the city of Lattakia, in addition to the comparison between clubs in the city of Lattakia in terms of lower extremity injuries according to (type-risk classification-location-shape), a questionnaire was designed by the researcher and distributed to the players, the study sample included 43 male players in Lattakia city clubs, the most important results were: it was found that the most vulnerable places for injury are the knee joint with a rate of 31.08%, then the thigh with a rate of 29.72%, followed by the ankle with a rate of 24.32%, the most common injuries among players are muscle tears with a rate of 27.17%, then bruises by 19.56%, then ligament injuries by 16.30%, followed by tendon ruptures by 15.21%.

Study: Aseed and Mahmoud (2016) entitled: The most common sports injuries among soccer players in the Palestinian professional league  
The study aimed to identify the most prevalent sports injuries among soccer players in the Palestinian Professional League, in terms of the nature of the injury, the location of the injury, the type of injury, the severity of the injury, the number of injury times, the period of injury, the time of injury and the cause of injury according to the variable of experience, and the state of play, the player's participation, and the player's age. To achieve this, the study was conducted on a sample of 135 players from the Palestinian Professional soccer League, they were selected by stratified method from the study population, the most important results were: the most prevalent sports injuries among soccer players in the Palestinian professional league, according to the nature of the injury, was muscle injury with a frequency of 72 injuries, with a rate of 47.37%, While nerve injury was the least prevalent among players, with a rate of two injuries and a rate of 1.31%, and muscle tears were the most prevalent type of sports injuries, with a frequency of



50 injuries with a rate of 32.26%. Then muscle strain with a rate of 34 injuries with a rate of 21.93%, followed by bruises at a rate of 20 injuries at a rate of 12.90%, while dislocation and muscle contraction were the least prevalent types of sports injuries with a rate of 6 injuries and a rate of 3.88%.

#### 4. Research Methodology and Field Procedures:

##### 4.1. The method used in the study

The descriptive approach was used in a manner case study, through which the data of the phenomenon is collected with the intention of identifying and studying it and determining the current situation through analysis, because it studies the current reality as it is and thus finding solutions and suggestions, which is known as: “A precise perception of the interrelationships between society, trends, tendencies, desires, and perception so that it gives a picture of the reality of life, sets indicators and builds future predictions” (Lmtiwi, and others, 2021).

##### 4.2. Study population and sample:

The original community of U21 reserve team players represented the first national division by 20 clubs for the soccer season (2020-2021). The research sample consisted of 31 players from the USM Algiers, who were chosen by the intentional method, The reason for choosing USM Algiers is due to the good relationship with the technical staff and the availability of all means and capabilities that allow the application of examinations and follow-up of sports injuries during the season Through the integrated medical staff.

##### 4.3. Research sample properties:

**Table 1:** shows the values of the mean, standard deviation, skewness coefficient, and Shapiro-Wilk sig for measurements and tests for the research sample.

Measurements and tests	Measurements units	Mean	Standard deviation	Skewness coefficient	Shapiro-Wilk-sig
height	cm	176,0	6,27	0,180	0,54
The weight	kg	64,37	4,39	0,31	0,44
BMI	Kg/m	19,40	1,65	0,071	0,267
FMS	Degree	14,45	2,33	0,23	0,29

We note that the value of the skewness coefficient is between ( $-3, +3$ ), from which the sample elements are distributed normally.

It was also found through the statistical treatment of the total tribal raw results of the research sample using the Shapiro-Wilk test, as shown in the table that all



"sig" values, which ranged from 0.26 as the smallest value to 0.54 as the largest value, are smaller than the value of the significance level 0.05. This means that the data follow a normal distribution.

## **5. Fields of Study:**

### **5.1 Spatial Domain:**

Omar Hammadi Stadium, Boulogine Street, Algiers.

### **5.2. time domain:**

The duration of the study extended from: 9/29/2020 to 15/07/2021.

## **6. Study tools:**

- Impédancemètre microlife WS 80.
- Functional movement screen measuring tool (Gary Cook) and data recording form.

## **7. Study tests:**

### **1.7. Functional Movement Screen Test.FMS.**

An abbreviation of the term (Functional Movement Screening), its goal is to identify deficiencies in strength, movement, flexibility and stability for all joints through 7 tests to assess the functional performance of some basic patterns of players' movement, as well as to assess the dysfunction in the following areas: spine - shoulder joints - pelvis joint - knee joints - ankle joints - test scores range from 21 to zero, so that it predicts the risk of injury to the players, and its scores range from 1 to 3 degrees for each test, where the result is given 1 in the event of pain and if the examinee is unable to perform the movement, and the result is given 2 degrees if the examinee is able to complete the movement, but is compensated in one way or another, and the result is given 3 degrees if the examinee performs the movement correctly ,the scores for each test are combined and the maximum score (final result) out of 21 points, less than 14. The player is exposed to injury. The tester performs the test barefoot after a short warm-up period, with someone to help measure the results (Abdullah, Hussein,2015, pp 420-421).

The battery includes 7 functional tests:

- **Deep squat:** It allows determining the movement and stability of the hips and shoulders, controlling the position and stability of the pelvis, knees and ankles, and it is necessary to control the movement of the pelvis and abdomen for a complete and adequate formation of movement.
- Hurdle Steep:** Tests the mechanic of locomotion, observing stability and movement control with one leg position. Control of the pelvis and abdomen is



what allows full movement. It's a challenge for bilateral movement and stability of the hips, knees, and ankles.

**-In-Line Lunge:** Tests the mobility and stability of the pelvis, knee, ankle and foot, as well the flexibility of certain muscles such as the back.

**-Shoulder movement:** It measures the link or relationship between the shoulder and chest area, and the movement of the shoulders.

**-Active straight leg raise:** allows testing of active motion of the flexed hip, requires continuous monitoring of the body (abdominal girdle) throughout the test, ability to separate the lower extremities, athlete can have limitations in movement due to stiffness of the posterior muscles.

**-Trunk stability push up:** It is not a test of strength. Its purpose is to initiate a pushing movement without moving the spine or hips.

**-Rotary stability:** allows monitoring of the pelvis at multiple levels. In addition, the stability of the shoulder during movement of the upper and lower extremities together requires neuromuscular coordination as well as energy transfer through the trunk, as the test demonstrates weight transfer and reflex stability in the body as well as mobility.

**Fig 1:** Represents the FMS Functional Motion Screening Tests.

### How do you Assess Movement with the FMS?



### Scientific conditions of the instrument:

The meaning of stability is to ensure that approximately the same results will be obtained if the test is re-applied to the same group of individuals, This means that there is little influence of chance or random factors on the test results, and stability was obtained through the method of re-applying the test with an interval of one week between the two tests on a sample of 7 players from the same club who were subsequently excluded, in order to ensure that the test is able to measure the characteristic or phenomenon for which it was developed, we



calculated the subjective validity, which is the relationship between honesty and reliability, by calculating the square root of the reliability coefficient.

**Table 2:** shows the reliability and validity coefficient of the tests used.

Test	N	Stability coefficient	Honesty coefficient
FMS total screen score	7	0,761	0,872

It is evident from Table 2: that the study tests have a strong correlation coefficient between the test and its re-application, and this indicates the reliability of the test as well as for subjective validity.

**Statistical methods used in the study:**

The results were analyzed using Excel 2019 and spss 26, Through the following tests: Arithmetic mean, standard deviation, skewness coefficient, Shapiro-Wilk-test, T-test for two independent and Pearson's coefficient test.

**10. Presentation and analysis of the results:**

**1.10. Presentation and analysis of the results of the first hypothesis:**

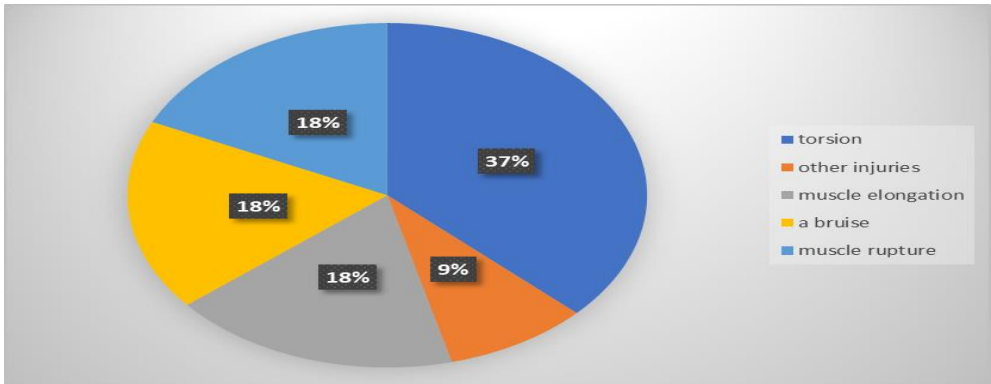
**Table 3:** Shows the number of players exposed and not at risk of infection in terms of FMS tests.

Injury	Number of players	$\bar{x}$	percentage
Vulnerable to injury	10	13	26%
Not prone to injury	21	15.14	74%

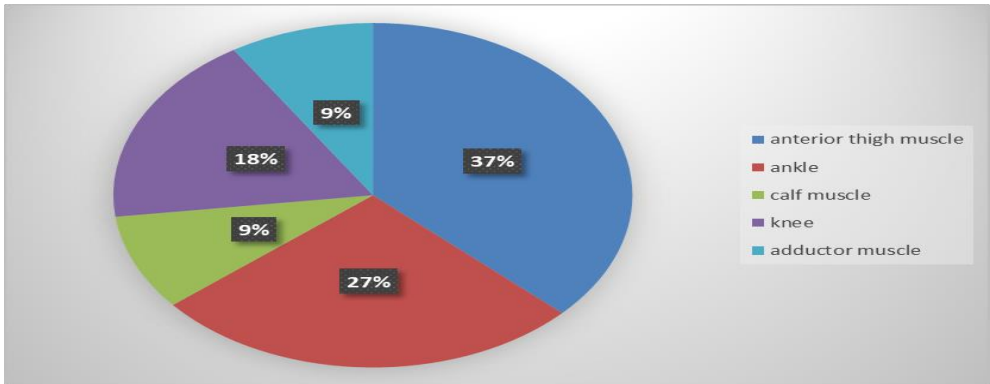
From Table 3, the number of healthy players without injury risk was 21, with an arithmetic mean in the FMS tests of 13, while the number of players at risk of injury was 10, with an arithmetic mean in the FMS tests of 15.14, where the final result in the FMS test is out of 21 points for 7 tests, under 14 degrees, the player is at risk of injury more than 14 degrees, the player is not vulnerable to injury, the proportion was 26% player at risk and 74% healthy without risk of injury.

**2.10. Presentation and analysis of the results of the second hypothesis:**

**Fig 4:** shows the percentage of sports injuries recorded for the USM Algiers team during the season 2020/2021.



**Fig 5** shows the distribution of muscle injuries according to their location in the body for the USM Algiers team during the season.



Through the results of sports injuries shown in Figure 4, we find that the highest percentage of injuries recorded for the sample was sprains by 37%, followed by muscle tears and bruises and muscle elongation by 18%. Other injuries such as wounds and digestive disorders were also recorded, which occupied 9% of the total injuries recorded for the USM Algiers team during the season.

Through the results shown in Figure 5, it was found that the anterior thigh muscles are more susceptible to injuries by 37%, then ankle injuries come in second place with 27%, then knee injuries by 18%, then adductor muscle injuries. And the calf muscle in the same proportion, which is 9%.

**10.3. Presentation and analysis the results of the third hypothesis:**

**Table 4:** shows the mean, standard deviation, and likelihood ratio (Sig) of a sample of injured and uninjured players in the total score of the FMS tests.



The test	Injured players		Uninjured players		SIG	Degree of freedom	Level of signification	Statistical index
	$\bar{x}$	s	$\bar{x}$	s				
Fms total screen score	13	2,7	15,14	1,82	0,01	0,05	30	statistically significant

Table 4 shows a comparison of the results of functional movement tests between injured and uninjured players, the arithmetic mean of the injured players was 13 and the standard deviation was 2,7. as for the uninjured players, the arithmetic mean was 15.14 and the standard deviation was 1.82 and this is confirmed by the value of the level of significance (Sig) which amounted to 0.01, which is more than the specified significance level 0.05, from which the alternative hypothesis was accepted and the null hypothesis was rejected, that is, there are differences between individuals The sample in the functional movement test (FMS) in favor of uninjured players.

### 11- Discussing the results of the study:

#### 11.2. Discussing the results of the first hypothesis:

There are players at risk of injury as per FMS test, it is clear from Table No. 3 the number of players at risk of injury, as it reached 10 players with an arithmetic average in the FMS tests of 13 and a percentage of 26%, while we find that 21 players from the total sample are not at risk of injury, with an FMS arithmetic mean of 15.4 and with a score of 74%, this answers the first research question, which is that there is a dysfunction in the various joints, By analyzing the performance method and the results of the 7 tests for the sample, Including: deficiency and inability of players who are vulnerable to injury in the movement and stability of the hips and shoulders, stability of the pelvis, knees and ankles, as it is necessary to control the movement of the pelvis and abdomen to obtain a complete and adequate formation of movement, as well the lack of flexibility in some muscles, such as the back muscle, Decreased ability to separate the lower extremities, where the athlete can suffer from limitations in movement due to stiffness of the back muscles and instability of the shoulder during the movement of the upper and lower extremities, as this requires neuromuscular coordination, these joints and muscles are predominant and important in the performance of the soccer player, especially the lower ones, and that the presence



of such a proportion of players susceptible to injury may lead to poor results and may expose the team to a real crisis with players falling into injuries, this, of course, leads to depriving the team of the efforts of these players for a period that may be for a long time if the dysfunction and motor dysfunction of the players are not treated before the competition,

According to Ahmed (2008) that measuring and testing muscle efficiency, joint flexibility, nerve and bone integrity, and the rest of the functional competencies of the injured player before returning to the stadiums protects and reassures him of his participation in the matches, and if the injury has side effects, this exposes it to multiply or become a chronic injury if the player participates in the matches before full recovery, and we also advise the importance of conducting these checks and measurements on a regular basis (pp. 23-24)

Including the FMS functional screening test because it tests almost all of these characteristics and the results of this test are consistent with a study (Syafei, and others, 2020) where the results showed that 56.25% of the students were identified at the risk of sports injuries, and the results also showed an imbalance of strength between the right and left body muscles. The study concluded that the use of Functional Movement screen (FMS) is important to reduce the possibility of students getting injured in the sports class.

And a study (Marques, and others, 2017) where high-performance young soccer players suffer from an important functional deficit, especially in the deep squat test and trunk stability, well as the spread of asymmetry between the right and left side of the body, according to the FMS test scores.

### **11.2. Discussing the results of the second hypothesis:**

- There are injuries during the season that vary according to the type of injury and its location in the body for (21U) soccer players.

The study showed that there are injuries that differ according to their type and location on the body, the highest incidence of injuries was: sprains at 37%, followed by muscle tears, contusions and elongation at 18%. Other injuries such as wounds and digestive disorders were recorded, which occupied 9% of the total injuries recorded for the USMA team during the competition, as for the distribution of muscle injuries according to their location in the body for the USM Algiers team during the season, it was found from Figure 5 that the anterior thigh muscles are more susceptible to injuries by 37%, then ankle injuries come in second place. By 27%, then knee injuries by 18%, then adductor and calf muscle injuries in the same percentage, which is 9%.



This is consistent with the findings of Ghabbash,(2017) about the high incidence of muscle injuries and sprain (foot and knee) and that the hamstring muscles are more susceptible to injury in soccer players.

The results of a study, Ali Nazim, and others, (2016) show that the most likely places for injury are the knee joint with 31.08%, then the thigh with 29.72%, followed by the ankle with 24.32% and that the most common injuries among players are muscle tears with 27.17%, then bruises with 19.56% and injuries ligaments 16.30% and tendon ruptures 15.21% (pp. 263-276).

According to Nilsson (2016), most injuries occur in the lower extremities and that the most affected anatomical area is the thigh muscles (rear and front quadriceps) by 26%, and the hip or belt area 33% (and the ankle 18% and it agrees with the study of the same researcher in 2011, the results also agree with the study of Ekstrand and others 2013, where he found that among the most common injuries are the posterior thigh injury 12.8%, the connective muscles 9.2%, the quadriceps femoris anterior 5%, and the calf muscle 4.5%, the ankle sprain 6.9% (Barthélémy, 2019, pp 77- 93).

The reason for the high incidence of sprains and muscle injuries in the lower extremities of the USM Algiers players, to the nature of the activity and effort, especially on the lower extremities, this is due to the fact that the muscles are the main tool for the requirements of sports performance, and any weakness at their level, especially in terms of physical and motor function, may be the direct cause behind these injuries, except for injuries resulting from contact with an opponent, the ball or any other object.

### **11.3. Discussing the results of the third hypothesis:**

There are statistically significant differences between injured and uninjured players in the Functional Movement Screen Test (FMS) in favor of the uninjured players.

The results of Table 4 showed that there were statistically significant differences between injured and uninjured players in the FMS test to examine functional movement in favor of the uninjured, according to Muhammad (2017) the test and measure of the efficiency of the muscles, joints, nerves and bones that were injured before returning to the stadium again to ensure their safety so that the injury does not recur, therefore, all levels of positive and negative movement should be tested after injury and before exercise. (p p 31-32).

The results agree with the study: Grigorev and Semenova, (2020), in which the researcher concluded that the average FMS test score is 9.88 points out of 21, which means that there is a risk of infection. After 3.5 months, a significant



improvement was achieved (with an average of more from 14 points) in the group practicing physical fitness, there was a decrease in the number of injuries, and from it the study confirmed the effectiveness of using the FMS test, as well the use of the proposed exercises. The same results were found in a study Syafei and others, (2020) and a study Marques and others, (2017).

The differences between injured and uninjured players in FMS functional screen tests are due to the fact that injured players have reduced mobility and stability in the hips, shoulders, pelvis, knees, and ankles, as well as muscle stiffness. Some muscles such as the back muscle and dyskinesia as a result of muscle stiffness before falling into the injury. This is confirmed by the average FMS test score of 13 for injured players. It's less than 14, so players are considered vulnerable to injury, while the average overall score in the FMS tests for uninjured players was 15. 14, which is an indication that uninjured players were not susceptible to injury.

## **12. Conclusion:**

Despite the great development in the world of soccer and the development of sports medicine, however, the infection rate is constantly increasing, among the obstacles and challenges facing the medical and technical staff is the specter of injuries, therefore, it is necessary to work to prevent the player from falling into it, by addressing the deficiencies, especially in terms of physical and motor function, after conducting the appropriate tests, soccer injuries often result from overuse, poor preparation and conditioning, and a lack of rest or inadequate warm-up, in addition, a soccer player needs special exercises that target muscular strength, endurance, flexibility, balance and full range of motion, this is a reality, especially in the case of injury to muscle groups, ligaments and tendons, also, measuring and testing muscle efficiency, joint flexibility, nerve and bone safety, and the rest of the functional competencies of the player before falling into injury protects and reassures him by treating the defect, we also advise the importance of conducting these checks and measurements periodically for all groups, especially with regard to the functional examination test for movement, as we find that the largest clubs in the world use the test even on the adult category to know the motor deficits of the joints and different muscles, and it is an indicator of the occurrence of injury, and the most prominent results of the study:

- The presence of players exposed to injury by 26% and healthy without a risk of injury by 74%, and this is according to the scores of the functional movement screen tests FMS among soccer players of class (21U).



- There are injuries during the season that vary according to the type of injury and its location in the body for soccer players (21U), where the highest percentage of injuries were: sprains by 37%, followed by muscle tears, bruises and muscle elongation by 18%, and other injuries were recorded 9% It was also found that the anterior thigh muscles are more likely to have injuries with 37%, then ankle injuries with 27%, then knee injuries with 18%, then adductor muscle and calf injuries in the same percentage, which is 9%.
- There are statistically significant differences between injured and uninjured players in FMS tests in favor of uninjured players.

**From the results of this study, the following can be suggested:**

- Application of functional examination tests for movement and for different age groups for their effective role in detecting dysfunction and functional motor deficits in different areas of the body at an early stage.
- Attention in training programs to focus on exercises based on strengthening and increasing flexibility, stability and balance for the areas of the body most susceptible to injury through the deficits observed in the FMS tests and for the various joints.
- The need to pay attention to the elements of physical fitness because of their importance in reducing the incidence of non-contact injuries.

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