

## **Factors Leading to Sport Injuries in the Lebanese Premier League Players: A Cross-Sectional Study**

**Shaib Moustafa<sup>1</sup>, Shokeir Ali<sup>2</sup>, Takkoush Khalil<sup>3</sup>, Bannout Jad<sup>4</sup>, Jaafar Zeinab<sup>5</sup>, Haidar Hassan Khodor<sup>6</sup>, Hassane Kheir eddine<sup>7</sup>**

<sup>1,2,3,4</sup> PT, Private Center of Physical Therapy, Beirut, Lebanon.

<sup>5</sup> PT, MS, DPT, Beirut Center for Physical Therapy, Beirut, Lebanon.

<sup>6</sup> MD, PhD, Lebanese University, Hadath, Beirut, Faculty of Public Health.

<sup>7</sup> PT, MS, DPT, Bloomy Physical Therapy and Wellness Center, Baghdad, Iraq.

### **ABSTRACT**

**Background:** Soccer is the most popular sport worldwide, and soccer-related injuries are very common, they have a substantial impact on individual's financial and economic costs, as well as its effect on the national and international health quality.

**Objective:** To increase the awareness about the factors that lead to sport injuries for the Lebanese Premier League Football.

**Method:** A cross sectional study, consists of, 72 Players that have been enrolled and filled a survey after getting access from the Lebanese Football Association. These surveys have been categorized as (Demographics, Players' lifestyle, Professional career, and Previous medical history).

**Result:** 30.56% of Lebanese players work alongside playing football. Moreover, the majority of players switch shoes twice per season only. Furthermore 75% of the players were previously more prone to injuries, and 16.17% of the injuries were a ligamentous injury. Finally, most of the Lebanese stadiums are of artificial grass putting players at a high risk of injury.

**Conclusion:** Different factors affect the rate of injury. Mainly, the lack of proper warming up and cooling down period.

**KEYWORDS:** External Risk Factors- Internal Risk Factors - Football injuries- Lebanese Premier League- Prevention.

### **ARTICLE DETAILS**

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### **I. INTRODUCTION**

Sport is an activity involving physical exertion and skill in which an individual or a team competes against another or others for entertainment.

The latest world cup held in Russia in the year 2018 shows a breaking record watched event with 3.572 billion people, that's more than half of the population of the world. (FIFA) Nevertheless, the state officials in Russia claim the World Cup will add \$26 billion to \$31 billion to the national economy. Arkady Dvorkovich, Russia's former deputy prime minister, also claimed that preparations have already added about \$14 billion to the country's GDP, as well as about 220,000 jobs.

Internal risk factors that may predispose an athlete to injury can include: Age, sex, BMI, physical fitness, anatomy, etc.

When an athlete is exposed to external risk factors they are susceptible to injury, external factors may include: protective equipment, environment, light, sports factors, etc. (Bahr and Krosshaug 2005).

Participating in sports is also associated with an inherent risk of sustaining injury. Due to no specific studies done recently considering the injury's risk; About half of professional football players retire from football due to an injury (Drawer and Fuller, 2001), and professional football players run an increased risk for long-term consequences such as early-onset osteoarthritis in the hip and knee joints (Lindberg et al., 1993; von Porat et al., 2004). However, the downside for the beautiful game is the injuries. According to a study done in the Dutch premier soccer league showed that the injuries were

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most likely in lower limbs (82.9%), knee injuries absence from field ranges 45 days, and the most common diagnosis was muscle/tendon injury of the lower extremities (32.9%) (Janine Stubbe et al. 2015). Furthermore, according to a study report the 24 champions league teams reported 845 injuries, 341(40%) considered as training injuries and 504(60%) due to matches.

Recently, several preventive measures to injuries such as warming up, cooling down, stretching, environment, hydration and nutrition, protective equipment, technique, injury reporting and taping.

According to FIFA in 2019, Lebanon has 50 professional players in Lebanese division 1 league. It contains 12 teams, and each team squad limit is 35 players, the transfer windows open in summer July 9 – 11 September and fall 24-31 December.

New York times stated that the World Bank ranked Lebanon's crisis as the world's 3<sup>rd</sup> worst socio-economic crisis since mid-1800s in terms of its effect on living standards. The Lebanese currency has lost more than 90 percent of its value since fall 2019 which affected the quality of life and standards of this country. The Covid-19 pandemic has also affected the Lebanese football due to the lock down for about 1 year that affected player's performance, the numbers of attendees in the have been decreased gradually due to problems in transportation as well as the financial status that have become worse during and after the pandemic. In the hopes of giving one of the best World Cup events ever and the first World cup hosted in the Middle east in 2022, Qatar held the Arab Cup in 2021 to test the applicability of the football stadiums, which featured 16 teams and included Lebanon. Despite being eliminated in the group stage, Lebanon received \$750,000, which was used for the development of Lebanese teams and some facilities. (Chaudhry. BR. 2021 December 1).

After considering the injuries affecting the Lebanese football community, lack of studies on the relationship between the Lebanese football and the injury rate. So, the aim of this study is to shed the light on the factors that lead to sports injuries in the first Lebanese football league in order to raise awareness and promote the game.

## II. MATERIALS AND METHODS

A cross sectional study was carried out in the Lebanese premier league during the 2021/2022 season, after getting access from the Lebanese Football Association. A survey that includes 41 questions divided into several parts (Demographics, Player's lifestyle, Professional career, and Previous medical history) was required to be fulfilled by the players themselves before the training course starts, and members of this study were available for any inquires. The study was approved by the ethical committee of Global University, Beirut.

The following inclusion criteria were used: Age between 17 and 43 years old, Males, Lebanese Premier league players, and Medically cleared to participate in sport activities. On the other hand, the following exclusion criteria were used: Females, Amateur Football players, retired football players, not included in the 2021/2022 season, and non-cooperative players.

Upon going to the Lebanese premier league teams training facilities and asking their players to fill out the surveys, a total of 72 players were provided us accordingly: Al Safa Fc (16), Al Ahed FC (15), Shabeb Al Sahel (14), Al Akha' FC (11), Shabeb Al burj (10), and Al Hekmeh FC (6).

## III. RESULTS AND STATISTICAL ANALYSIS:

### III.1. Data Distribution:

All 72 players were included in the study. All data were calculated using SPSS (version 23.0). The mean value of age was  $25.1389 \pm 5.65512$  SD (age ranged between 17 and 43 years). The age was divided into 2 groups with 58.33% (age between 17-25) and 41.67% (age between 26-43). The level of education categorized into 4 groups: 1st group: elementary (6.94%), 2nd group: Secondary (20.83%), 3rd group: high school (16.67%), 4th group: university (55.56%). Moreover, 69.44% of the Lebanese football players rely on football as their only income, whereas 30.56% work alongside playing football. From those that have a second occupation 12.50% work less than 6 hours, 9.72% work between 6-8 hours, 1.38% work more than 12 hours. Regarding the sleeping pattern of players, it was distributed into 4 categories: 1st category: 2.78% sleep 4-6 hours, 2nd category: 36.11% sleep 6-8hrs, 3rd category: 54.17% sleep 8-10 hours, 4th category: 6.94% sleep 10-12 hours. The football experience of the players regarding the years played is divided into 3 groups: 1st group got 43.06% (5-8 years of football experience), while 2nd and 3rd groups (9-12 years and more than 15 years) got 40.28% and 16.67% respectively. The rate of previously injured players was 75% and the other 25% weren't, furthermore 22.22% had a recurrent injury either in the same site or in a different one, while 77.78% didn't suffer from another injury, The types of injuries were classified with 21.51% with no injury, 11.83% represent ankle sprains, 15.05% represent pubalgia, 15.05% are for fractures and dislocations, 5.38% appear as Meniscus and knee inflammation, 16.13% cover the ligamentous injuries, 1.08% had concussions, and finally 13.98% represent athletes with muscle tear. The percentage of smokers and alcohol consumers were the same with 9.72% whereas nonsmokers and non-alcoholic players were 90.28%. A 16.67% of the players have sexual intercourse before 24 hours of a game, whereas 83.33% don't. Covid-19 got 72.22% of Lebanese football players while the 27.78 weren't infected by the virus, 34.72% of Lebanese football players that suffered from covid-19 affected their performance, and 65.28% didn't affect their performance

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### III.2. Statistical Tests: “Chi-Square Tests”:

**Table 1:** Relation between “age” and injury occurrence.

	Value	df	Asymptomatic Significance (2-sided)
<b>Pearson Chi-Square</b>	10.075 <sup>a</sup>	3	.018
<b>Likelihood Ratio</b>	11.635	3	.009
<b>Linear-By-Linear Association</b>	9.357	1	.002
<b>N of Valid cases</b>	72		

**Table 2:** Relation between “Working hours” and injury occurrence.

	Value	df	Asymptomatic Significance (2-sided)
<b>Pearson Chi-Square</b>	2.421 <sup>a</sup>	4	.659
<b>Likelihood Ratio</b>	2.865	4	.581
<b>Linear-By-Linear Association</b>	1.449	1	.229
<b>N of Valid cases</b>	72		

**Table 3:** Relation between “Sleeping Pattern” and injury occurrence.

	Value	df	Asymptomatic Significance (2-sided)
<b>Pearson Chi-Square</b>	4.403 <sup>a</sup>	3	.221
<b>Likelihood Ratio</b>	4.386	3	.223
<b>Linear-By-Linear Association</b>	3.133	1	.077
<b>N of Valid cases</b>	72		

**Table 4:** Relation between “Number of shoes/season” and injury occurrence.

	Value	Df	Asymptomatic Significance (2-sided)
<b>Pearson Chi-Square</b>	3.901 <sup>a</sup>	2	.142
<b>Likelihood Ratio</b>	4.024	2	.134
<b>Linear-By-Linear Association</b>	1.459	1	.227
<b>N of Valid cases</b>	72		

**Table 5:** Relation between “Covid-19” and injury occurrence.

	Value	df	Asymptomatic Significance (2-sided)	Exact Sig. (2-Sided)	Exact Sig. (1-sided)
<b>Pearson Chi-Square</b>	1.477 <sup>a</sup>	1	.224		
<b>Continuity Correction</b>	.831	1	.362		
<b>Likelihood Ratio</b>	1.416	1	.234		
<b>Fisher’s Exact Test</b>				.239	.180
<b>Linear-By-Linear Association</b>	1.456	1	.228		
<b>N of Valid cases</b>	72				

**Table 6:** Relation between “weather’s condition playtime” and injury occurrence.

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	Value	df	Asymptomatic Significance (2-sided)	Exact Sig. (2-Sided)	Exact Sig. (1-sided)
<b>Pearson Chi-Square</b>	.686 <sup>a</sup>	1	.408		
<b>Continuity Correction</b>	.000	1	1.000		
<b>Likelihood Ratio</b>	1.170	1	.279		
<b>Fisher's Exact Test</b>				1.000	.560
<b>Linear-By-Linear Association</b>	.676	1	.411		
<b>N of Valid cases</b>	72				

**Table 7:** Relation between “Warm-Up duration” and injury occurrence.

	Value	df	Asymptomatic Significance (2-sided)	Exact Sig. (2-Sided)	Exact Sig. (1-sided)
<b>Pearson Chi-Square</b>	5.122 <sup>a</sup>	1	.024		
<b>Continuity Correction</b>	3.429	1	.064		
<b>Likelihood Ratio</b>	4.467	1	.035		
<b>Fisher's Exact Test</b>				.038	.038
<b>Linear-By-Linear Association</b>	5.051	1	.025		
<b>N of Valid cases</b>	72				

**Table 8:** Relation between “Price of shoes” and injury occurrence.

	Value	df	Asymptomatic Significance (2-sided)	Exact Sig. (2-Sided)	Exact Sig. (1-sided)
<b>Pearson Chi-Square</b>	3.396 <sup>a</sup>	1	.065		
<b>Continuity Correction</b>	2.274	1	.132		
<b>Likelihood Ratio</b>	4.160	1	.041		
<b>Fisher's Exact Test</b>				.095	.058
<b>Linear-By-Linear Association</b>	3.349	1	.067		
<b>N of Valid cases</b>	72				

**Table 9:** Relation between “Preventive training techniques” and injury occurrence.

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	Value	df	Asymptomatic Significance (2-sided)	Exact Sig. (2-Sided)	Exact Sig. (1-sided)
<b>Pearson Chi-Square</b>	.322 <sup>a</sup>	1	.570		
<b>Continuity Correction</b>	.036	1	.850		
<b>Likelihood Ratio</b>	.341	1	.559		
<b>Fisher's Exact Test</b>				.719	.433
<b>Linear-By-Linear Association</b>	.317	1	.573		
<b>N of Valid cases</b>	72				

### IV. DISCUSSION

Sport is an activity involving physical exertion and skill in which an individual or a team competes against another or others for entertainment.

This study intended to exhibit the factors that lead to the increase in the rate of football injuries in the Lebanese premier league, using a survey. 72 players of 6 teams filled the survey that included questions regarding different factors. The risk factors for football injuries will be discussed for the first time in terms of personal surveys filled by professional players in Lebanon. This will open new horizons in the field of preventative techniques that can be introduced to the teams' programs.

#### Type of field:

The majority of the grass in training facilities & stadiums in Lebanon, according to our survey, is Artificial, whereas the fields in other countries that are part of the premier league use a natural turf. As an example, the "Camp Nou", home field of the European team Barcelona, uses natural grass, which is maintained before the beginning of each season, offering a better grip and a more stable surface, thus conferring the ideal conditions for playing football (FC Barcelona official website, 2021). This shows that the type of field plays may have an impact on the rate of injuries in Lebanese football league.

Alongside the usage of artificial grass, the majority of players consented that there is no proper maintenance and insufficient care from the Lebanese Football Association in providing the suitable amount of money to improve and evolve the stadiums, which may increase the risk of injuries on artificial grasses.

#### Weather effect:

According to the results of our survey, the rate of injuries in Lebanese football is greater in athletes that played during winter and fall compared to those who played in a more stable weather. Out of the 70 players that participated in competitions during unstable weather, 52 got injured.

According to Seleznow in 2020 October 16, artificial turf fields are not affected all significantly by cold weather only if its directly exposed to rain or ice. Thus, it performs just as well and provide the same kind of playing surface as in warm weather.

In Lebanon, the majority of the stadiums are not covered so any climate change may affect the quality of the turf which in turn increase the exposure athletes to injuries.

#### Types of injuries:

A study done regarding injury types and rates by UEFA Euro 2016 recorded that 55% of all injuries recorded were muscular, while in this study it came after ligamentous injuries, with 16.13%. UEFA showed that the percentage of non-contact match injuries is increasing which could be a sign of fatigue, that may affect the both ligaments and muscles. On the contrary, the percentage may be resulted due to the direct and harsh contact on the players as well as the improper quality of the artificial grass used in games which it can result in these injuries.

Whereas, the highest rate of injury recorded a 16.13% in ligaments (ACL, MCL), followed by both pubalgia and fractures/dislocations with a percentage of 15.05% each. This also showed that the problem in Lebanon is mainly may not be the fatigue that players face caused by matches and trainings, but it can be the direct contact and the bad grass quality.

#### Sleeping pattern:

Through the results of the cross table, sleep is one of the factors that increase the rates of injury. The result showed us that the ratio is 1.92 is greater than 1, so sleeping for a short period of time will increase the injury rate of Lebanese players. As most studies outside Lebanon state, sleep has a significant role in the rate of injuries and players' performance. One of the studies was published in 26 June 2021 by Filipe Manuel Clemente et al., after collecting data from 32 studies about soccer players from different

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populations, shows that impaired sleep will cause an increase in injury rate mostly musculoskeletal injuries as shown by Gouttebarge et al in 2019.

### Post Covid-19 Contamination:

Nowadays, covid-19 is one of the highest factors that increase the rate of injuries in the world. Due to the results Lebanese teams are some of hundred teams and players that were affected negatively after being contaminated with covid-19. Most of the players that were added to the results reported in the survey that after they get back from covid-19 contamination they feel some pain and hard breathing in games or training. Whereas, according to a study done Maximiliane Thron in 5 July 2021 in the German Bundesliga to examine the physical match performance and injury occurrence before and after the COVID-19 break during the 2019/2020. The results show no effect on the injury rate where it was the same 25 match days before and 9 after break, but the effect in Bundesliga was mostly on the performance of the players in the game.

### Warm Up:

After analyzing the results, there are 18 players that are not injured; 13 who warm up more than 20 minutes and 5 who warm up less than 20 min. On the contrary, the highest number of injuries was in 54 players, 4 who warm up for <20 minutes and 50 who do it for 20min>. The result indicates that the relation between warming up and the rate of injury in Lebanese league is not caused by duration time, but it is in the type and techniques followed by the team players for pre-training and pre-match warm ups. A study done by Assuman Nuhu et al. in 24 May 2021 comparing between 12 controlled teams (317 players) doing the usual warm up, and 12 other teams (309 players) depending on the warm up before and after games in Rwanda league division 2 in Africa showed a 52% injury rate during 7 months in the intervention group and 63% in the control group. This states that warming up and using the good techniques before games help in the reduction of football injuries.

### Player's Shoes:

The results regarding the number of shoes changed per season and the price of each show that the shoes of the player is one of the factors that decrease the rate of injuries. Also, the increase in the number of shoe changing per player as well as buying the good shoes in terms of price, brand, and quality, combined will lead to a decrease in the number of injuries. Kosta König stated in his advertisement on 16 March 2021 that Lionel Messi, one of the most known players and the best in the world, has worn three pairs of cleats in the 2020/21 season. These shoes are the modifications of the Adidas Nemeziz 19.1 boots with a cost of approximately \$225. The type of shoes and rate of changing lead to a low number of his injuries. According to data provided by data transfermarkt, Lionel Messi has been injured or ill 32 times in his career. Only six of his injuries have made him miss more than a month of action and more than five games out.

Concerning Lebanon, most Lebanese players pay with their own money for every shoes they use. So, they change their shoes few times per year due to low salaries afforded to them, leading to an increased risk of sustaining an injury.

### Limitations:

The results of this study must be considered to its limitations. First, no previous studies were encountered concerning Lebanese Football to sustain our results. Moreover, some teams' administrations were still rigorous in terms of agglomerations due to the Covid-19 pandemics, thus it was tougher to contact the athletes.

As well, we were unable reach Al-Ansar team, which were planning to travel outside the country in order to participate in the Asian competition.

It is important to be mentioned that we faced difficulties in transportation, which prevented our access to some teams due to the long distance from the capital Beirut, as reaching them required from one to two hours, such as the Tripoli and Tadamon Sour teams. As for the Al-Nejmeh team, we contacted a player in the club, and he replied, due to the presence of a new technical director and, they weren't able to participate in the survey since it would disturb the efficacy of their training.

Moreover, our time was limited due to academic reasons, and also the season was ending so the players would leave for vacation.

## V. CONCLUSION AND RECOMMENDATIONS

Football is the most admired game worldwide and considered as one of the sports that increases the injury rates. As a conclusion, different factors affect the rate of injuries in Lebanese premier league including the lack of proper warm up and cooling down

The most effective techniques are the preventive exercises that should be taken more seriously from the warm up all the way to the cool down stage, with the excessive training hours and the high injury rate during training. With proper reinforcement and muscle balance which also might decrease the risk of injuries. The people in charge in the Lebanese Football Association and teams should take these factors into consideration for the sake of the athletes.

For future studies, it is recommended to include a greater number of players in order to shed more light on these injuries and to continue in a detailed manner by building a protocol to prevent injuries in the Lebanese Football players.

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