*J. Appl. Environ. Biol. Sci.*, 5(10S)655-660, 2015



ISSN: 2090-4274
Journal of Applied Environmental and Biological Sciences
*www.textroad.com*

# The Study of Direct and Indirect Cost of Sport Injuries in Iranian Premier League women Soccer players

**[1]Karanian, Fatemeh, Daneshmandi, Hassan[2]**

[1]Sport Sciences (BSc, MSc), University of Guilan
[2]Associate Professor Sport sciences (BSc, MSc, Ph.D), University of Guilan

*Received: April 20, 2015*
*Accepted: June 15, 2015*

## ABSTRACT

The aim of this cross sectional study was to investigate the cost of sport injuries in premier Iranian soccer clubs in a two-year period.
**Methodology**: 70 random professional women soccer players with a mean of history play (6.7±3.3) voluntarily participated in this study. Data included demographic characteristics; sport injuries and all spent cost for them were collected by a questionnaire and a financial check list. Hawkins and Fuller's questionnaire (r=0.79), was used for gathering the internal and external risk factors of injuries. Cost injuries included direct and indirect costs spent to cure and to return a subject to play. Finally results analyses in order to anatomical body parts of players and Costs were compared in six clubs.
**Result**: total cost of 788,430 thousand $ with a mean of ( 131,344± 2,559 ) thousand $ included direct cost 40,386 thousand $ with a mean of(6,731±546 thousand $ ) per club and indirect cost 748,044 thousand $ with a mean (124,795±1,571 thousand $) per club were recorded, the rate of injury was estimated 11.5 injury per club.
**Conclusion**: the information and statistics of this study can be used by coaches, players and specially team managers for reducing injuries of players and consequently cost of it. Because most of the internal and external risk factors especially in knee joint injuries, with an appropriate planning and wise management, are identifiable and preventable, therefore, it can be lead to success and health keeping of soccer players. Emphasis on preventive strategies is the key to reduce the financial costs of clubs which is highlighted in this research.
**KEY WORDS:** injury cost, injury, sport management, soccer club

## INTRODUCTION

Statistics from the International Football Federation (FIFA), have reported that the number of people around the world who play soccer is one hundred and sixty-five million people which equals to four percent of the population of the Earth. In this report, the number of the people playing soccer in Iran isone million and eight hundred and six thousand, equivalent to 2.5 percent of the population, of which four hundred and fifty thousand people officially registered [1]. According to the same report, there are 301 thousand football clubs in the world and 120 football clubs in Iran [1]. Football is one of the most money-making industries in the world. Studying the Leagues of 23 country shows that about 14 million is spent for the players and, adding current costs, the obtained value is over 20 billion which equals the country's oil revenue for one year. From the perspective of financial management of large enterprises, clubs are economic institutions which their developments depends on increasing and maintaining the programmatic, physical possess, and in particular their human agents. Thus, protecting the health of players, as the basic capital of the clubs, is the main objective for the managers [2]. Because of the significant contracts of players, any ineffectiveness and absence of them can impose a significant cost to the club. Sports injuries, as the main obstacle for the players to play their roles, can cause direct and

*** Corresponding Author:** Karanian, Fatemeh, Sport Sciences (BSc, MSc), University of Guilan
Email: Haya.karane@yahoo.com

indirect losses. Therefore the managers of the clubs and their related factors should study the risk factors that cause injury on players and estimate the financial costs arising from them. Every football player faces a function limiting injury, at least once a year, and the treatment cost of any injury in football was estimated 150$[3]. Based on these two researches and assuming the results of the study can be generalized to the entire football community, we can say, using a simple mathematical relation, that there is at least 39, 750 billion$ of financial loss from injury in football players per year in the world. Having the data on the injury costs and analyzing the effective factors of their increase or decrease, preventive programs can be designed and provided [4]. The purpose of such researches, like this study, is to properly manage the incidents in order to reduce the economic losses of clubs and to maintain and enhance physical and mental health of players in a longer period. There has not been any systematic research about such costs in Iran since now. Therefore, the aims of this study are collecting and reporting the incidence of injuries and its risk factors, emphasizing on providing data about financial losses resulting from direct and indirect costs in Iran soccer clubs, and demonstrating the relationship between some of the important variables.

## MATERIALS AND METHODS

This retrospective and cross-sectional study was done during years of in 88 - 90 Iran women's premier league competitions. The Statistical society was included 10 clubs of Premier League of the country;of which, using available and simple random sampling, 6 clubs were selected and 70 players were studied. The modified questionnaire Hawkins and Fuller (r= 0.79) was used to collect the risk factors and their prevalence (2) and the check list of costs was used for the financial information. In this study, direct costs included medical and nonmedical costs incurred by the club and the player, and indirect costs included the costs and financial losses of the club resulting from absence of player, which was collected on the basis of the number of absence days associated with the cost of daily losing players [5]. Data related to injuries was collected in collaboration with the medical staff and using the injury report forms available in the player's files in clubs, as well as referring to certain sports medical clinics in which players treated. Figures related to the direct medical costs were collected and completed according to the financial data available in clubs and also having players and related health centers complete the related check lists. To ensure the accuracy of the costs presented, the researcher also visited doctors and specialists and estimated the amount of medical expenses according to the type and severity of injury and compared them with the presented figures. Indirect costs that incurred clubs for injured players were calculated according to the number of absence days and using the following formula:

Days absent from practice (play) × cost of a day due to the loss of players [5]

The data from the questionnaires was summarized and classified in the form of tables and graphs using descriptive statistics. The research hypothesis was evaluated using the Pearson correlation test and F test(ANNOVA) and post hoc tests, at a significance level (05/0 = P). For data analysis SPSS (ver16) was used.

## RESULTS AND DISCUSSION

**Table1. Distribution of subjects on the basis of membership of the studied Clubs.**

| CLUB | Percent | ParticipantsNumber |
|---|---|---|
| Isfahan's Mobarakeh | 14.5 | 10 |
| Shensa | 14.5 | 10 |
| Parisa | 15.9 | 11 |
| Bandar Anzali's Malavan | 17.4 | 12 |
| Esteghlal Tehran | 21.8 | 15 |
| Bushehr | 14.5 | 10 |
| Unanswered | 1.4 | 2 |
| Total | **100** | **70** |

**Table2. Duration of absence from exercise (in months), according to the club**

| Club | SD | Average | Participants Number |
|---|---|---|---|
| Isfahan's Mobarakeh | 3.70 | 3.90 | 10 |
| Shensa | 1.08 | 2.90 | 10 |
| Parisa | 2.72 | 3.11 | 11 |
| BandarAnzali's Malavan | 2.22 | 4.10 | 12 |
| EsteghlalTehran | 2.73 | 2.41 | 11 |
| Bushehr | 2.32 | 2.45 | 10 |

**Tabl3. Treatment duration (in months), according to the club**

| Club | SD | Average | Participants Number |
|---|---|---|---|
| Isfahan's Mobarakeh | 2.90 | 4.54 | 10 |
| Shensa | 2.41 | 2.76 | 10 |
| Parisa | 2.50 | 3.42 | 11 |
| BandarAnzali's Malavan | 1.71 | 4.00 | 12 |
| Esteghlal Tehran | 2.52 | 3.50 | 11 |
| Bushehr | 1.85 | 2.90 | 10 |

**Separating the costs on the basis of clubs**

**Direct costs**: These costs include the cost of injuries treatment that was calculated in two parts, the hospital and non-hospital costs.

Table 4. Distribution of direct costs on the basis of the club (thousand dollars)

| CLUB | Total | minimum | maximum | Average | Participants Number |
|---|---|---|---|---|---|
| Isfahan's Mobarakeh | 502 | 18 | 135 | 50 | 10 |
| Shensa | 594 | 8 | 167 | 59 | 10 |
| Parisa | 621 | 26 | 132 | 56 | 11 |
| BandarAnzali'sMalavan | 786 | 9 | 136 | 71 | 12 |
| Esteghlal Tehran | 977 | 4 | 253 | 89 | 11 |
| Bushehr | 368 | 14 | 98 | 37 | 10 |

Table 4 shows that Esteghlal Tehran, with an average cost of 89 thousand dollars for each injury and a total cost of 977 thousand dollars, has incurred the largest medical costs. While Bushehr club, with an average cost of 37 thousand dollars and a total cost of 368 thousand dollars in direct costs has located on the last rank.

**Indirect costs**

The other part of the costs is indirect cost which was calculated for each player on the basis of the contract amount and the number of absence days of exercise due to injury. In this study, the indirect cost has been estimated 749 thousand dollars.

Table 5. Distribution of indirect costs on the basis of club (thousand dollars)

| CLUB | Total | minimum | maximum | Average | Participants Number |
|---|---|---|---|---|---|
| Isfahan'sMobarakeh | 11,206 | 538 | 2,529 | 1,020 | 10 |
| Shensa | 5,530 | 67 | 1,914 | 554 | 10 |
| Parisa | 16,118 | 0 | 4,621 | 1,467 | 11 |
| Bandar Anzali's Malavan | 10,988 | 60 | 1,525 | 916 | 12 |
| Esteghlal Tehran | 11,497 | 56 | 2,990 | 766 | 11 |
| Bushehr | 10,442 | 0 | 3,559 | 1,043 | 10 |

Table 5 shows that Parisa club, with an average cost of 1,467 thousand dollars for each injury and a total cost of 16,118 thousand dollars, incurred the highest indirect costs. While Shensa club, with an average cost of 554 thousand dollars and a total cost of 5530 thousand dollars, in the indirect costs is allocated to the lowest cost.

**Total cost**

Table 6. Distribution of total cost on the basis of club (thousand dollars)

| CLUB | Total | The average cost for each player |
|---|---|---|
| Isfahan's Mobarakeh | 11,715 | 1,112 |
| Shensa | 6,149 | 613 |
| Parisa | 16,736 | 1,523 |
| BandarAnzali's Malavan | 11,788 | 1,065 |
| Esteghlal Tehran | 12,480 | 1,097 |
| Bushehr | 10,806 | 1,080 |

Table 6 shows that in total cost, Parisa club with an average cost of 1,523 thousand dollars for each injury and a total cost of 16,736 thousand dollars, incurred the largest cost of injuries to players. While Shnsa club with an average cost of 613 thousand dollars and a total cost of 6,149 thousand dollars, incurred the lowest cost intotal cost.

**Conclusion**

The comparison between clubs showed that in total cost, the highest cost is for Parisa club and then, respectively, Esteghlal Tehran, Bandar Anzali's Malavan, Isfahan's Mobarakeh, Bushehr and Shensa clubs the lowest cost to highest. Two reasons can be identified for the high costs, one is the high amount of player's contracts that affect the indirect cost, and the other is the amount of direct cost. According to the amount of direct and indirect costs and comparing them among the clubs, the reason of the high costs of the club can be explained. Thus higher amounts of direct cost are reported respectively for the clubs Esteghlal Tehran, Bandar Anzali sailor, Parisa, Shensa, Mobarakeh Isfahan, and Bushehr while higher amounts of indirect cost are reported for Parisa and then the clubs Esteghlal Tehran, Isfahan Mobarakeh, Malavan Bandar Anzali, Bushehr and club Shensa, respectively. A significant point is that some clubs, by providing facilities such as specialist medical staff, special contracts with rehabilitation and massage centers, professional care after injury and better facilities, in addition to doing regular screening for preventing and reducing the severity of the injury, they provide better and more definite treatment in the event of injury[6]. This in turn reduces the cost arising from injury. Although the provision of these facilities is a cost to the club, but considering the fact that many of the investments are viable and not just consumable, and also the allocation of costs arising from injuries, especially for higher level clubs which employ more professional players with more contracts amounts, it can increase profitability and reduce financial losses. In this study, the clubs had a longer history and were more reputed and thus had more professional players, despite the lower number of recorded injuries, allocated the higher cost (Mobarakeh Isfahan, Bandar Anzali Malavan, Parisa). This could be due to the high amount of player's contracts, which influenced the indirect cost. Clubs ranking in indirect cost represents this mater. The closer a player is to elite and professional level, in addition to imposing a heavier contract amount to the club, she undertakes the cost of the more complete and advance preventive and therapeutic equipments and supplies by herself. These include a range from protective equipments to physiotherapists and private clinics and also medical interventions in addition to supplementary treatment, such as water treatment [7], which could increase the costs. It seems that such a phenomenon is seen in the premier and more reputed clubs with more professional players which can be found in the descriptive results of this research.

In soccer, because of its nature, more injuries accrue in lower extremity, particularly in knees. The same result was reported in a soccer woman player [8].The highest rate of injuries was reported for lower extremities too (85/7). By use of more appropriate protective equipment and training programs, the

severity of the injury and thus the costs of it is reduced. Francisco et al (2000) showed that shin guards made of compressed air in comparison with plastic articles are more effective in reducing force on shin and knee [9]. Angybrstsn et al (2008) also showed that proper balance training could reduce the incidence of knee injury [10]. In recent years, toward preventive strategies in soccer, some programs, called +11, have been designed and applied by FIFA with the aim of reducing risk factors. Despite the high potential risk for a knee injury in soccer players, no protection has been used, while players in some other sports such as basketball and volleyball use knee supportive prosthesis. However, if by use of such guidelines, we reduce the incidence of injury or its severity, in addition to save a mark able amount of costs related to injury, we also guaranty a longer safe life for player.

There was a significant relationship between the history playing and the costs. It is necessary to point out the difference between the number of injury and costs arising from injury. Previous researches also suggested that players with a longer playing history are less likely to get injured. Peterson et al (2000) conducted a study on 264 male soccer players and showed that the players with lower level of skill and experience have been injured twice more than more experienced players [11]. Chvmyak (2000), Aynklr et al (1996), Zhang and colleagues (2011) reported in their study that the incidence of injury in high-level and more experienced players is higher [12]. It appears that more proper training, higher physical fitness, more experience and skills in self-care practices, and also awareness of the more negative consequences of injury in players with longer playing history rather thanless experienced players, are the reasons of less incidence of injury in these players [13]. On the other hand, players with longer playing history have more experience and skills, and are more valuable for their clubs, and therefore their contracts are also more costly. Thus, players with more experience, if injured, impose more costs than less experienced players on their clubs.

The data of this research make it possible to acquire and analyze data related to the profit and loss of the country's soccer clubs and provide the need for designing preventive programs. Because many traumatic factors, especially in knee injuries, and exclusively, in meniscus injuries and injuries of anterior cruciate Ligament (ACL) , are identifiable, reducible, and sometimes omissible from the environment, non-collision mechanisms which can be implemented by the club manager through the study of designing preventive strategies and effective factors and significantly reduce financial and human losses.

## REFERENCES

1. http://www.fifa.com/worldfootball/allplayers.html.
2. Hawkins R, Fuller C, (1999). A prospective epidemiological study of injuries in four English professional football clubs. Br J Sports Med 33:196-203.
3. Hawkins RD, Hulse MA, Wilkinson C, Hodson A, Gibson M, (2001). The Football Association medical research program.an audit of injuries in professional football, Br J Sports Med; 35:43-47.
4. Meerding WJ, Mulder S. (2006). Incidence and costs of injuries in The Netherlands. European Journal of Public Health 2006;10:1093.
5. Cumps E, Verhagen E, Annemans L, Meeusen, (2008) Injury rate and socioeconomic costs resulting from sports injuries in Flanders: data derived from sports insurance statistics 2003, British J Sports Med; 42:767-772.
6. Daneshmandi H, Karanian F, Hematinezhad MA, Rahnama N (2013). Sport Injuries Cost on Anatomical body parts In Premier Iranian Soccer League. Iranian Journal of Sports Medicine;10:69-88.
7. Dvorak J, Junge A, Grimm K, Kirkendall D. (2007). Medical report from the 2006 FIFA World Cup Germany. British Journal of Sports Medicine;41:578-581.

8. Giza E, Mithofer K, Farrell L, Zarins B, and Gill T.(2005). Injuries in women professional soccer. British Journal of Sports Medicine:39:212-216.
9. Jack Hickey, Anthony J Shield, Morgan D Williams, David A Opar (2014). The financial cost of hamstring strain injuries in the Australian Football League. Br J Sports Med 2014;48:729-730.
10. Engebresten A, Myklebust G, Holme I, Engebresten L, Bahr R, (2008). Prevention of Injuries Among Male Soccer Players. Am J Sports Med; April, 1-9.
11. Peterson L, Junge A, Chomiac J, et al, (2000). Incidence of football injuries and complaints in different age groups and skill-level groups. Am J Sports Med; 28 (Suppl):S51-S57.
12. Junge A, Lamprecht M and etc(2011).Countrywide campaign to prevent soccer injuries in Swiss amateur players. Am J Sport Med; Jan;39(1):57-63.
13. Deehan D, Bell K, McCaskie A, (2007). Adolescent musculoskeletal injuries in a football academy, Journal of Bone and Joint Surgery; 89,(1),5-8.