

# Evaluation of Injuries in Professional Turkish Football Players



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## ABSTRACT

**Aim:** It is important to evaluate the injury patterns and anatomic localization of the injuries according to the playing position for the prevention of injuries and reduction of injury cost in football which is the most popular in the world. The purpose of this study was to evaluate the injury pattern and anatomical localization of injuries.

**Method:** The injury pattern was evaluated with a questionnaire with the participation of 510 football players playing for the teams attending the First and Second Professional Turkish Leagues.

**Result:** For different playing positions abrasions were 64.55-85.42%, muscular strains were 52.06-64.58%, joint sprains were 19.58-49.37% and fractures were 2.58-6.39% present. Regardless from the playing position lower extremity injuries were the most common injuries detected (60.5%).

**Conclusion:** It was suggested that these data would be helpful for the reduction of injury risks and the costs besides with proper onsite precautions.

**Key words:** Football, injury, anatomical localizations

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## Profesyonel Türk Futbolcularında Travmanın Değerlendirilmesi

**Amaç:** Dünyada en popüler olan futboldaki yaralanma miktarının azaltılması ve yaralanmaların önlenmesi için oyun pozisyonuna göre yaralanmaların anatomik lokalizasyonu ve yaralanma şekillerinin değerlendirilmesi önemlidir. Bu çalışmanın amacı, Türkiye Birinci ve İkinci Profesyonel Futbol Liglerine devam eden takımlarda oynayan futbolcularında yaralanmaların anatomik lokalizasyonu ve yaralanma şekillerinin değerlendirilmesiydi.

**Metod:** Futbol yaralanmaları 510 futbolcunun katılımıyla ve anket yöntemiyle yapıldı.

**Bulgular:** Farklı oyun pozisyonları için, yıpranmalar %64.5-85.4, kas zorlanmaları %52.-64.5, eklem burkulmaları %19.5-49.3 ve kırıklar %2.5-6.3 idi. Oyun pozisyonuna bakmaksızın alt ekstremité yaralanmaları en genel yaralanmalar olarak saptandı (%60.5).

**Sonuç:** Uygun ve yerinde alınan önlemlerle birlikte yaralanma riski ve miktarlarının azaltılması için bu bilgilerden yararlanılması önerilir.

**Anahtar kelimeler:** Futbol, yaralanma, anatomik lokalizasyon

### INTRODUCTION

Football is one of the most popular sports branches in the world (1,5,10,14). Approximately, 200 million individuals play football, 200.000 of them play professionally (10). Especially when professional football is considered this popularity creates a big financial effect (17).

It is known that the risk of the injury of footballers is very high (2,9,11). It is stated that the risk of injury in professional football is approximately thousand times higher than industrial occupations which are accepted as being high risky (1). It is estimated that every elite male footballer is exposed to injury which limits the performance at least one time throughout a year (10). The effects of injuries and previous injuries can affect the performance of the player (2). Because of the injuries, there are some economic casualties who are listed as follows: Increase of the health expenses, decrease in the club incomes because of the absence of first preference players, decrease of price in certificate of good service of wounded players, decrease in the club success (17). Taking into account these factors it is evident that the type of the injury, anatomical localization of it, playing position of the footballer is important not only to prevent the injuries but also for treatment.

The aim of this study was to determine the injured part of the body, the type of the footballers' injury and to evaluate the relationship between the type of the injury and the playing positions.

### MATERIALS AND METHODS

In 2005-2006 Season, totally 510 professional male soccer players who consisted of 48 goalkeepers, 194 defender players, 189 mid-field players and 79 forward

players who played in 1st and 2nd Turkish Professional Soccer Leagues, agreed to participate in this study. This investigation included injuries of players in one season. Before the study, informed consent in accordance with the club administrators and cooperation were established with the sanitary staffs of each team. The players were informed about these investigation by written documents and verbally. Recorded registration forms and reports of formal competitions and trainings in last season were observed. According to available reports; age, sex, player positions, time of injuries, type of injuries, and grade of injuries and anatomical region of injuries were questioned. Another questionnaire was arranged for representing injuries of attendance players in respect of demographic information and player positions. This questionnaire was applied to players by club doctors in the last week of season.

SPSS for Windows was used for analysis of investigation. Answers of each question in questionnaire were calculated with respect to percent amount of injury types and anatomical region and finally all percent values were discussed according to player position.

### RESULTS

It was detected that the goalkeepers had 85.42% abrasions, 64.58% muscular strains. The defenders complained 83.51% abrasions, 52.06% muscular strains. Mid-field players had 64.55% abrasions, 53.44% muscular strain whereas forward players had 77.2% abrasions, 58.23% muscular strains and 53.17% lacerations (Table 1, Figure 1). It was determined that goal keepers attended this study had 83.3% foot, 51.03% leg injuries whereas the defenders had 66.5% foot, 51.03% leg injuries and mid-field players had 54.5% foot injuries. Forward players

**Table 1.** Types of injuries according to playing positions

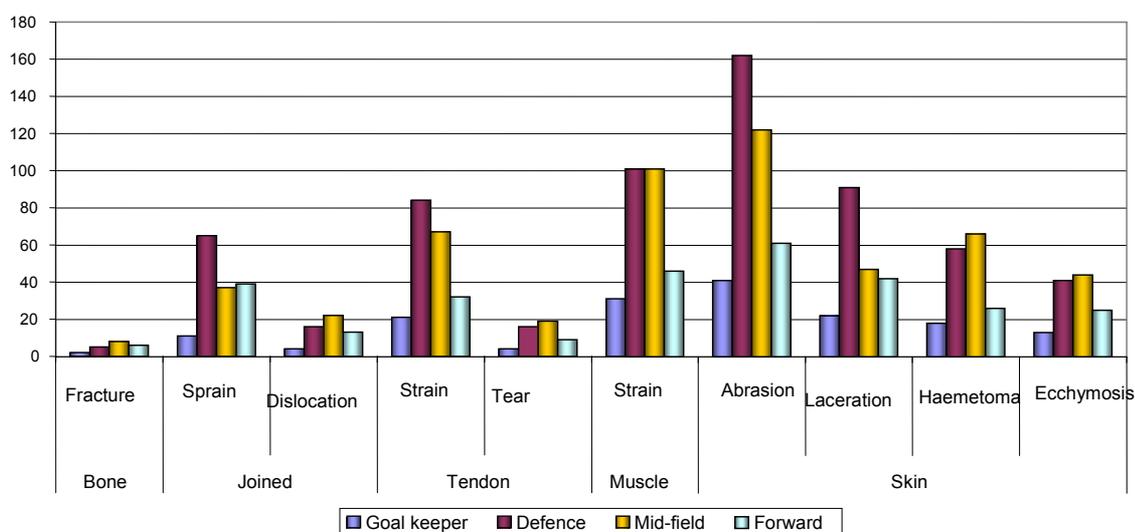
Injury Types		Goal keeper		Defense		Mid-field		Forward	
		Yes	%	Yes	%	Yes	%	Yes	%
Bone	Fracture	2	4.2	5	2.58	8	4.23	6	6.39
Joint	Sprain	11	22.92	65	33.51	37	19.58	39	49.37
	Dislocation	4	8.33	16	8.25	22	11.64	13	16.46
Tendon	Strain	21	43.75	84	43.3	67	35.45	32	40.51
	Tear	4	8.33	16	8.25	19	10.05	9	11.39
Muscle	Strain	31	64.58	101	52.06	101	53.44	46	58.23
Skin	Abrasion	41	85.42	162	83.51	122	64.55	61	77.22
	Laceration	22	45.83	91	46.91	47	24.87	42	53.17
	Haematoma	18	31.5	58	29.9	66	34.92	26	32.91
	Ecchymosis	13	27.08	41	21.13	44	23.28	25	31.65

had 75.95% foot, 55.7% knee, 53.17% leg injuries (Table 2, Figure 2). Of 48 goal keepers joined the study 167 sport injuries were detected. Injuries concerning lower extremity were more frequent in goal keepers (61.08%). Lower extremity injuries were detected 59.79% in 194 defenders attended the study, whereas lower extremity injuries were 60.11% in 189 mid-field players and 61.87% in forwards (Table 3, Figure 3). Lower extremity injuries were found to be more frequent regardless of playing position. 1638 injuries are detected among the 510 players who participated the study. 7.45% of these injuries were related with head-neck, 25.03% were related with upper extremity, whereas 7.02% were in trunk and 60.5% were in lower extremity (Table 4).

## DISCUSSION

The aim of this investigation was questioned injuries of players during the formal competitions and trainings in last one season, were time of injuries, type of injuries, anatomical regions and grade of injuries according to player positions.

In the study of Cromwell et al. (4) which was conducted on 107 Welsh professional players 77% of the injuries were found to be located in the lower extremity. It was detected that most of these injuries were located in ankle region, mainly soft tissue type. In the study of Hawkins et al. (6), in which the injury localization was evaluated 87% of them were located in the lower ex-

**Figure 1.** Injury types according to playing positions

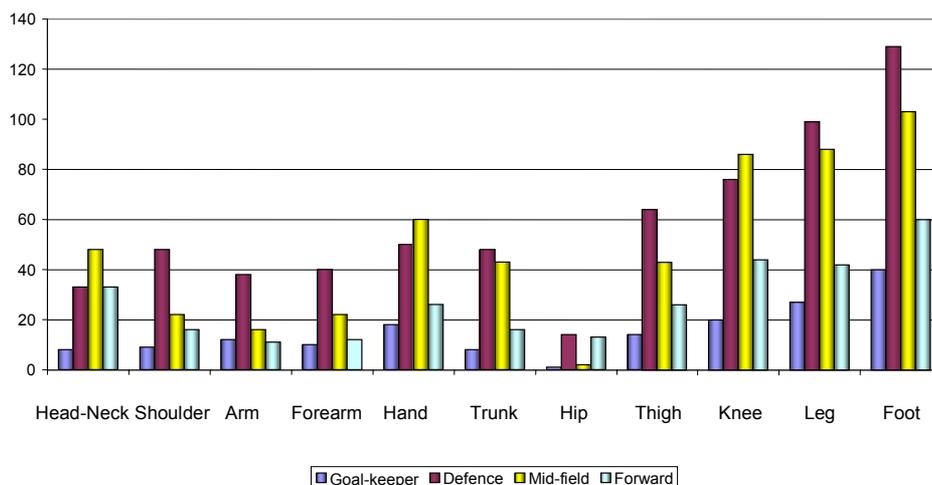
**Table 2.** Distribution of injuries according to playing positions depending on anatomical localizations

Anatomical Location	Goal-keeper		Defender		Mid-field		Forward	
	Yes	%	Yes	%	Yes	%	Yes	%
Head-Neck	8	16.7	33	17.01	48	25.4	33	41.77
Upper Extremity								
Shoulder	9	18.75	48	24.74	22	11.64	16	20.25
Arm	12	25	38	19.59	16	8.47	11	13.92
Front Arm	10	20.8	40	20.62	22	11.64	12	15.19
Hand	18	37.5	50	25.77	60	31.75	26	32.91
Trunk	8	16.7	48	24.74	43	22.75	16	20.25
Lower Extremity								
Hip	1	2.08	14	7.22	2	1.06	13	16.46
Thigh	14	29.17	64	32.99	43	22.75	26	32.91
Knee	20	41.7	76	39.18	86	45.5	44	55.7
Leg	27	56.25	99	51.03	88	46.56	42	53.17
Foot	40	83.3	129	66.5	103	54.5	60	75.95

trémities. Woods et al. (17) found that 77% of the injuries were related with lower extremities. In the study of Adamczyk (1), it was stated that the most effected part of the body was lower extremities regarding with sports injuries. In our study, when the whole study group was considered 60, 5% of the injuries were found to be in lower extremity (Table 4). When the playing positions were considered 59, 79%-61, 87% of the injuries was detected in lower extremities (Table 3). The results obtained in our study were found to be lower than those of Cromwell et al. (4), Hawkins et al. (6) and, Woods et al. (17). In our study although the percentage of lower extremity injuries were found to be lower than the results of Adamczyk (1), the lower extremity being the most af-

fected part of the body was in accordance. Cromwell et al. (4) found that the most injured part in the lower extremity was ankle. In our study, it was determined that ankle injuries were more frequent with 54, 5-83, 3% in different playing positions (Table 2). These findings support the study of Cromwell et al. (4). In our study it was stated that foot and ankle's injuries were found to be higher in goalkeepers and forwards.

In the study of Yoon et al. (15) which was performed on 401 Asian footballers; it was found that 18,5% of the injuries were in knees, 17,3% of them were between knee and ankle, and 14,2% were related with ankles. The most frequent type of injury was found to be con-



**Figure 2.** Distribution of injuries according to playing positions depending on anatomical localizations

**Table 3.** Total injuries in different playing positions according to anatomical localizations

Anatomical localization	Goal-keeper		Defender		Mid-field		Forward	
	Yes	%	Yes	%	Yes	%	Yes	%
Head-Neck	8	4.79	33	5.16	48	9.01	33	11.04
Upper Extremity	49	29.34	176	27.54	120	22.51	65	21.74
Body	8	4.79	48	7.51	43	8.07	16	5.35
Lower Extremity	102	61.08	382	59.79	322	60.41	185	61.87
Total	167	100	639	100	533	100	299	100

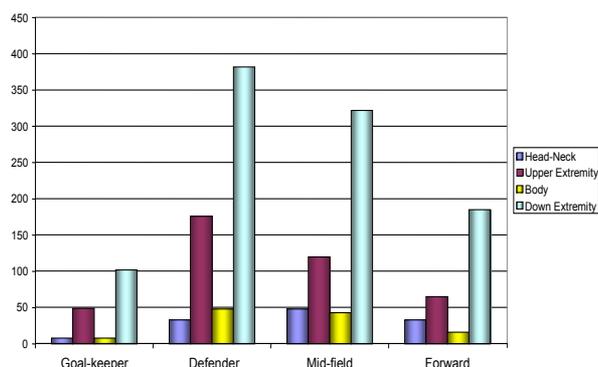
tusion whereas sprain was more serious. In our study, regarding different playing positions knee injuries were 39, 18-55, 7% (Table 2). Leg injuries were detected 46, 56-56, 25% (Table 2). These results are higher than those of reported by Yoon et al. (15). In our study, the most frequent injuries detected were skin abrasions and muscular strains. Also it was stated that sprains were less frequent and forwards were the ones who most complained about this kind of injury. The differences detected between the results of Yoon et al. (15) may be due to the differences in questionnaires and terminology regarding the injuries.

In the study of Cromwell et al. (4) it was stated that 33% of soft tissue injuries were in knees, 16% were in tendons. In our study, muscle injuries were found to be 52, 06%-64, 58% (Table 1) and it's higher than the results of Cromwell et al. (4). Similarly, in our study tendon injuries were 35, 45%-43, 75% (Table 1) and were higher than the results stated by Cromwell et al. (4).

In the study of Hawkins et al. (6) in which the injuries reported from 91 professional football clubs during two

seasons 6030 injuries were detected. It was stated that 37% of these injuries were muscular strains, 19% were ligamentous sprains, 7% were muscular sprains and 4% were fractures. Skin abrasions were reported to be only 3 times within all the injuries. In our study, skin abrasions were 64, 35-85, 42% depending on the playing position (Table 1) and this result higher than results of Hawkins et al. (6). In our study, muscular strain and tendon strains were also found to be higher than the findings of Hawkins et al. (6) (Table 1). Our results regarding fractures were found to be similar with those of Hawkins et al. (6) (Table 1).

In the study of Woods et al. (17) in which the preseason injuries in England professional football league were evaluated 23% of 6030 injuries were in thigh, 17% were in knee, 17% were in ankle, 12% were in leg, 6% were in foot and toes, 2% were in hip and 3% were in upper extremity. In our study, the thigh injuries of goal keepers, defenders and forwards were found to be higher than those reported by Woods et al. (17) whereas the injuries of mid-field players were in accordance with the results of Woods et al. (17). When all the playing positions were considered our results were higher than those stated by Woods et al. (17). When the type of the injury was considered Wood et al. (17) reported that 37% of the injuries were muscular strains, 7% were mus-

**Figure 3.** Total injuries according to different anatomical localizations**Table 4.** Total injuries according to anatomical localizations

Anatomical Localization	n	%
Head-Neck	122	7.45
Upper-Extremity	410	25.03
Trunk	115	7.02
Lower Extremity	991	60.5
Total	1638	100

cular contusions, 5% were tendon injuries and 5% were fractures. In our study muscular strains were 52, 06-56, 58% and higher than the results of Woods et al. (17). The percentage of tendon injuries and fractures were also found to be higher in our study. The differences between the two studies may originate from different questionnaires used in these studies.

In the study of Chomiak et al. (3) in which 398 football players participated, 686 injuries were reported during one year. 16% of these injuries were reported to be serious. 30% were joint sprains, 16% were fractures, 15% were muscle strains, and 12% were ligament ruptures. 29% of these injuries were in knee. In our study joint sprains were 19.58% and 49.37% regarding different playing positions. Our results were higher than those reported by Chomiak et al. (3). In our study fractures were found to be lower than those reported by Chomiak et al. [3] whereas strains were found to be higher. Injuries regarding knee were also found to be higher regarding different playing positions.

In the study of Hawkins (7) which was performed on 4 professional English football teams, it was stated that among the 391 injuries which had occurred during the matches 37% of them were strains, 21% were sprains, 4% were fractures and 2% were lacerations. 23% of these injuries were in thigh, 12% were in leg, 7% were in foot, 6% were in trunk, 3% were in head, 2% were in upper extremity and 3% were in the hip. The percentage of muscle strains detected in our study (Table 1) was found to be higher than the results of Hawkins (7). The percentage of sprains among the goalkeepers and midfielders was similar to those stated by Hawkins (7) whereas it was higher among other playing positions. The percentage of fractures in our study was similar to the results that have been reported by Hawkins (7). On the other hand, the percentage of lacerations was higher than their findings (Table 1). In our study, the lower extremity injury rate and the body injury rate were similar to results of Hawkins (7). However in our study, the percentage of head and neck injuries was higher and the percentage of upper extremity injury was 12 times.

In the study of Adamczyk (1), it was stated that the most frequent injuries among adult footballers were sprains (%27,6-35) strains (%10-47) and contusions (%8,3-21,3). In our study the percentage of sprains that are detected among the goalkeepers, defenders and mid-fielders were similar to the results of Adamczyk (1), however

the percentage of sprains among the forwards was higher. Besides, muscular strains detected in our study were much higher. In the study of Adamczyk (1), it was stated that head, vertebral column, trunk injuries were more frequent compared to upper extremity injuries, however the percentage of upper extremity injuries was higher than trunk and head and neck injuries in our study.

It was stated in the literature that more than 75% of the injuries among the footballers were strains, sprains and contusion type injuries. It was also reported that lower extremity injuries constituted 60-85% of the injuries among footballers and knee joint and then ankle joint were being the most affected joints (12). Similarly, in our study the percentage of strain and sprain type injuries were found to be higher (Table 1). As it has also been stated by Rahmana (12), lower extremity injuries were the most frequent injury type in our study. Knee, ankle and foot injuries among these lower extremity injuries were more frequent similar to those stated by Rahmana (12) (Table 2).

In the study of Walden et al. (16), it was stated that 87% of time lost injuries affected the lower extremity and thigh being the most affected part (23%). In our study the most frequent injuries were again lower extremity injuries (Table 2). Although the thigh injuries among the mid-fielders were similar to the results of Walden et al. (16) the percentage of thigh injuries among other positions was higher (Table 2).

In the study of Inklaar et al. (9), it was stated that the most frequently injured body parts were thigh (23%), knee (22%) and ankle (23%). It was also stated that distribution of injured body parts was not related with age. In our study, although percentage being different among players in different positions, thigh, knee, foot-ankle injuries was more frequent. In addition leg injuries were also frequent (Table 2). It was stated that the most frequent injury types were sprains (31%), contusions (28%) and strains (19%) (9). In our study, although the percentages were different according to playing positions strains, tendon injuries and sprains were stated to be more frequent. However abrasions were detected to be more frequent. The reason for this may be due to different conditions of playing fields. Inklaar et al. (9) stated that sprain and strain injuries generally occurred in the same type and same body part and caused footballers' continuous sufferings. In our study, high frequencies of these types of injuries can be explained with the re-

peated injuries regarding the same body part.

In the study of Hoy et al. (8) in which 646 male, 69 female footballers participated it was stated that the most frequently injured parts were joints (49%) and skin lesions (30%) were reported to be the second frequent type of injuries. Fractures were detected 18% and distributed equally within upper and lower extremities. In our study, the percentage of joint injuries of forwards were similar to those stated by Hoy et al. (8) whereas it was lower for other playing positions (Table 1). In our study, it was evident that skin lesions were the most frequent injury type for all playing positions (Table 1). Besides percentage of fractures were lower than the results of Hoy et al. (8) (Table 1).

In the study of Schmidt-Olsen et al. (13) which was performed on 496 male footballers aged between 12-18 years, it was stated that most of the injuries occurred in lower extremities (70%), especially in knee (26%) and ankle (23.1%). In the same study head and neck injuries reported to occur 1.2%, upper extremity injuries reported to occur 10.3% and back problems constituted 14% of those injuries. Fractures were reported to exist only 4%, most of which were related with upper extremities. Fractures supposed to occur as the young players were aware of the way to fall down (13). In our study it was evident that although being at low rates, most of the injuries occurred at lower extremities (Table 4). Besides, our results regarding head and neck injuries and upper extremity injuries were higher than those of Schmidt-Olsen et al. (13). Considering the fractures, our results were said to be similar to the results of Schmidt-Olsen et al. (13) (Table 1).

In conclusion, for different playing positions abrasions were 64.55-85.42%, muscular strains were 52.06-64.58%, joint sprains were 19.58-49.37% and fractures were 2.58-6.39% present. Regardless from the playing position lower extremity injuries were the most common injuries detected (60.5%).

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