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ΕΡΕΥΝΗΤΙΚΗ ΕΡΓΑΣΙΑ

The injury profile of professional football players A three-season prospective cohort study

OBJECTIVE To investigate the injury profile of the players of a professional Greek football team that competes in the domestic Greek and European leagues. **METHOD** An observational prospective study was carried out at the club soccer performance laboratory, involving a total of 123 professional football players. Data were collected over three consecutive seasons, 2015/2016, 2016/2017 and 2017/2018, on 38, 41 and 44 subjects/players, respectively. Their injuries were recorded and assessed, and the clinical injury and rehabilitation rates were estimated. **RESULTS** The recorded injury prevalence according to season was 78.9% in 2015/2016, 73.2% in 2016/2017 and 75% in 2017/2018, and the mean number of injuries per injured player was 2.6, 1.9, and 2.5, respectively ($p > 0.05$). The clinical incidence was lower in 2016/2017 with 1.39 injuries/player compared with 2.05 injuries/player in 2015/2016 and 1.89 in 2017/2018. The injury incidence in 2016/2017 was 83 injuries/1,000 match exposure hours compared with 137 in 2017/2018 ($p < 0.05$). Rehabilitation days were also recorded, and the highest mean was 49.1 days/injured player in 2015/2016, compared with 18.6 in 2016/2017 and 20.9 in 2017/2018 ($p < 0.05$). The mean rehabilitation days per injury decreased in the third season, from 18.9 days in 2015/2016 to 8.3 days in 2017/2018 ($p < 0.05$). The highest prevalence of “major/severe” injuries (50%) was also recorded in 2015/2016, decreasing significantly in the 2017/2018 season, as did the incidence of lower limb injuries ($p < 0.05$). **CONCLUSIONS** Without major changes between the three seasons, about 8 in 10 professional soccer players were affected by injuries, reflecting the high level of competitive demands with a high risk of injury during the football season. Monitoring of injuries will provide the basis for preventive strategies.

Injury registration systems have been implemented as a matter of routine at international football championships during the Federation of International Football Associations (FIFA) World Cup contests since 1998 and in the Union of European Football Associations (UEFA) European Championships since 2004.¹

Because of the physical, semi-contact nature and the fast pace of the sport, injuries are regular occurrences among professional soccer players, ranging from 12 to 35.5 injuries/1,000 hours of matches, and from 1.5 to 7.6 injuries/1,000 hours of practice in various different leagues across the world.² Muscular injuries in particular are one of the major problems of football players and account for

20–37% of all time-loss injuries in men’s football at the professional level.^{3,4} Of these injuries, the majority (35%) are muscle strains, followed by ligament injuries (18%) and hematoma due to contusions (17%).^{3–5} Most of the reported muscle injuries occurred in the major muscle groups of the lower extremities (92%), with the hamstrings being involved in 37%, the adductors in 23%, the quadriceps in 17% and the calf muscles in 13% of cases.⁴ On average, a player sustains 0.6 muscle injuries per season. A squad of 25 football players can thus expect about 15 muscle injuries per season.⁵

The successful top clubs in each country play several matches in domestic leagues and cup contests, but also in

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Χαρακτηριστικά τραυματισμών επαγγελματιών αθλητών ποδοσφαίρισης: Προοπτική μελέτη τριών συνεχόμενων αγωνιστικών περιόδων

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the Champions League or for the UEFA Cup, thus increasing the players' match exposure and entailing a higher risk of injury.^{6,7} In the past decade, epidemiological studies on football injury have been conducted in the leagues of many European countries, including England, Sweden, France, Iceland and Norway.^{8–12} Ultimately, knowledge about, and application of appropriate injury-prevention programs, along with the availability of medical care and its quality may strongly influence the incidence of football-related injuries.¹³

A number of studies investigating injury risk and injury patterns in professional football players have been conducted over one season or during specific tournaments, but only a few published studies have included data from two or more consecutive seasons, and thus little is known about the variation of the injury profile of professional players between seasons.⁵ No previous study has investigated injury incidence and injury risk factors and profiles among elite football players in Greece over one to three consecutive seasons.

The aim of the current study was to investigate the injury characteristics of elite professional football players competing in the Greek National and European Leagues, and to describe the variations in injury incidence according to the month and the season, and between three consecutive seasons.

MATERIAL AND METHOD

Participants

This study was based on data collected from a cohort of professional football players from one Greek team (Olympiacos Football Club) during the 2015/2016, 2016/2017 and 2017/2018 football seasons. The players who participated in the study were either: (a) Part of the team's pre-season preparation phase (June to August of each season); (b) football players who joined the team later in the season due to transition, transfer or being on loan during the Christmas break (December–January of each season); (c) players who had minutes of active participation in official or friendly matches; and (d) players registered on the team roster for the official matches of the domestic Greek National League matches, National Cup and European League (Champions League qualification or UEFA Europa League groups).

Data were collected from 38 football players who met the above criteria in the 2015/2016 season, 41 in the 2016/2017 season and 44 in the 2017/2018 season, of which 8 players participated in all three seasons. Specifically, 23 players provided data in both the 2015/2016 and 2016/2017 seasons, and 18 players in both the 2016/2017 and 2017/2018 football seasons. The study was approved by the institutional ethics board and written informed

consent was obtained from each player at the beginning of each season for use of personal data. Detailed information on the study is provided in earlier reports.^{14,15}

Measurements and records

At the beginning of each season (2015/2016, 2016/2017 and 2017/2018) the height (cm), weight (kg) and body mass index (BMI, kg·m⁻²) of each player was measured using the same procedure. The weight was measured on calibrated digital scales (Seca 861; Seca, Hamburg, Germany) to the nearest 0.1 kg; the height was measured to the nearest 0.5 cm with a wall mounted stadiometer (Seca 225; Seca), with the players barefoot. BMI was calculated by dividing weight by height, squared (kg·m⁻²). For players participating in more than one season's data collection, the mean value of their weight and age was used. Each player's nationality, field position, and active minutes of playing football were recorded.

Injury definitions

All injuries which hindered the player from full participation in training or match play¹⁶ were recorded by the team medical staff (physiotherapist; orthopedic surgeon). The player was considered injured during the period until the medical practitioners allowed full participation in training and availability for match selection. Injuries were categorized according to severity, based on the number of days of absence from practice/matches: minimal (1–3 days), minor (4–7 days), moderate (8–28 days) and major/severe (28+ days).^{17,18} All injuries were monitored until the final day of rehabilitation.

The location of the injury was defined according to the following general categories: head/neck, upper limbs, trunk, and lower limbs, while the type of injury was classified as fracture/bone stress, joint (non-bone)/ligament, muscle/tendon, contusion, laceration/skin injury, central/peripheral nervous system injury, and other.¹⁸ For the purposes of the study, all injuries were confirmed by the team medical doctor using diagnostic imaging. The mechanism of injury was classified as traumatic, i.e., resulting from a specific and identifiable event and characterized by acute onset, or overuse injury, defined as a pain syndrome of the musculoskeletal system with insidious onset and without any known trauma that might have produced the symptoms.^{7,17,18}

Statistical analysis

The data were analyzed using the Statistical Package for the Social Sciences software (IBM SPSS, version 25.0, 2017, IBM Corp, Armonk, NY). The frequency distribution or overall indices of descriptive characteristics of the players were derived. For comparison between the three seasons, the prevalence of injuries and the relevant 95% confidence interval (95% CI) were estimated with bootstrap techniques. The rates of clinical incidence were estimated as the sum of injuries per total number of players, expressed as

the risk of injury for each player at the beginning of the season. The 95% CIs were estimated based on proposals by Knowles and colleagues.¹⁹ The injury incidence and corresponding 95% CIs were assessed as injuries per 1,000 match-playing exposure hours.²⁰ For rehabilitation, the mean days per injured player and mean days per injury were estimated. The estimate of mean days per injury was based on the differentiation of players and injuries between the three seasons, standardizing the relevant indices. The differences in the prevalence and severity of the injuries between the three seasons were compared using Chi-square (χ^2) tests, specifically homogeneity and linear-by-linear association tests.

RESULTS

The characteristics of the study participants are shown in table 1. In the three seasons, the number of participants was $v_{2015/2016}=38$, $v_{2016/2017}=41$ and $v_{2017/2018}=44$, with a mean age of $24.6 (\pm 4.6)$, $24.8 (\pm 4.5)$ and $24.2 (\pm 4.2)$ years, respectively. The average BMI was $22.7 (\pm 1.4)$, $22.6 (\pm 1.3)$ and $22.7 (\pm 1.5)$ $\text{kg}\cdot\text{m}^{-2}$, respectively. The percentage of players of Greek ori-

gin was 39.5% in 2015/2016, 39% in 2016/2017 and 36.4% in the 2017/2018 season. The majority of the players were midfielders (52.6%, 41.5% and 43.2%, respectively in the three seasons). The mean time of active participation in football matches, in all kinds of competition (Greek National League, Champions League-UEFA League, and Greek Cup matches) was over 1,200 minutes.

Table 2 shows the injury profile of the players. The highest prevalence of injured players was observed in 2015/2016 with 78.9% (95% CI: 69.4, 94.4) and the lowest in 2016/2017 with 73.2% (95% CI: 64.1, 87.2) and in 2017/2018 the prevalence was 75% (95% CI: 70.0, 92.5). One injury only was sustained by 20%, 40% and 33.3% in each season, respectively and the total number of injuries was 78, 57 and 83 in the three seasons. The maximum number of injuries sustained by a player per season was 7, recorded in 2017/2018 for one player (3%). The mean number of injuries per injured player ranged from 1.9 to 2.6, with no significant difference between seasons ($p>0.05$). The incidence of injuries was significantly lower in 2016/2017 with 1.39 injuries/player (95% CI: 1.25, 1.53) compared with 2.05 in 2015/2016 (95% CI: 1.92, 2.18), and 1.89 in 2017/2018 (95% CI: 1.76, 2.01). Injury incidence was also lower in 2016/2017 with 83 injuries/1,000 hours (95% CI: 66, 103) compared with 137 in 2017/2018 (95% CI: 115, 161). The greatest number of days in rehabilitation was recorded in 2015/2016 with 1,474 days. The mean number of days of rehabilitation per injured player was significantly higher in 2015/2016 with 49.1 days/injured player (95% CI: 32.1, 68.9) compared with 18.6 in 2016/2017 (95% CI: 12.0, 27.9) and 20.9 in 2017/2018 (95% CI: 13.5, 28.8). The mean number of days in rehabilitation per injury was also higher in 2015/2016 (18.9; 95% CI: 11.6, 26.2) than in 2016/2017 (9.8; 95% CI: 5.5, 14.1) or 2017/2018 (8.3; 95% CI: 5.7, 10.9). The highest prevalence (50%) of "major, severe injuries" was also observed in the 2015/2016 season, compared with the other three categories, "moderate", "minor" or "minimal" ($p=0.007$). A significant decrease in the prevalence of major injuries to 23.3% and 27.3% was observed in the following seasons, 2016/2017 and 2017/2018, respectively ($p=0.003$). The distribution of injuries per month and season is illustrated in the spider chart shown in figure 1. The highest number of injuries in the 2017/2018 season was recorded during the first months of the preparation phase (July to August) and during competition time in September to October, surpassing the corresponding periods of the two previous seasons (2015/2016 and 2016/2017). Injuries in the 2015/2016 season were more frequent in January and May compared with the other seasons.

Table 1. Characteristics of professional football players in a major league Greek team in the seasons 2015/2016, 2016/2017 and 2017/2018.

	Seasons (Mean±SD)		
	2015/2016	2016/2017	2017/2018
Players (number)	38	41	44
Age (years)	24.6±4.1	24.8±4.5	24.2±4.2
Weight (kg)	75.0±6.0	74.7±6.2	75.7±6.9
Height (m)	1.82±0.06	1.82±0.07	1.83±0.08
Body mass index ($\text{kg}\cdot\text{m}^{-2}$)	22.7±1.4	22.6±1.3	22.7±1.5
Nationality/region			
Greece	15 (39.5)*	16 (39.0)	16 (36.4)
Europe	11 (28.9)	12 (29.3)	17 (38.6)
Latin America	7 (18.4)	8 (19.5)	4 (9.1)
Africa	5 (13.2)	4 (9.8)	5 (11.4)
Asia	-	1 (2.4)	2 (4.5)
Position			
Goalkeeper	3 (7.9)	4 (9.8)	6 (13.6)
Defender	6 (15.8)	7 (17.1)	8 (18.2)
Wingback	5 (13.2)	8 (19.5)	7 (15.9)
Midfielder	20 (52.6)	17 (41.5)	19 (43.2)
Forward	4 (10.5)	5 (12.2)	4 (9.1)
Minutes playing	1,272 [1095]**	1,424 [1,150]	1,298 [1,206]

SD: Standard deviation

Players include all players at the beginning of each season and or transfers during each season

Values are: *n (%); **Mean [median]

Age and body measurements were obtained at the beginning of each season

Table 2. Injury profile of professional football players in a major league Greek team in the seasons 2015/2016, 2016/2017 and 2017/2018.

		Season		
		2015/2016	2016/2017	2017/2018
<i>Players</i>	n	38	41	44
	Injured	30	30	33
	% (95% CI)	78.9 (69.4, 94.4)	73.2 (64.1, 87.2)	75.0 (70.0, 92.5)
<i>Injuries</i>	One	6 (20.0%)	12 (40.0%)	11 (33.3%)
	Two	13 (43.3%)	13 (43.3%)	9 (27.3%)
	Three	4 (13.3%)	2 (6.7%)	4 (12.1%)
	Four	2 (6.7%)	2 (6.7%)	6 (18.2%)
	Five	4 (13.3%)	1 (3.3%)	1 (3.0%)
	Six	1 (3.3%)	–	1 (3.0%)
	Seven	–	–	1 (3.0%)
	Sum of injuries	78	57	83
	Mean number of injuries (95% CI)	2.6 (2.1, 3.1)	1.9 (1.5, 2.3)	2.5 (2.0, 3.0)
	Median	2.0	2.0	2.0
<i>Clinical incidence</i>	Rate* (95% CI)	2.05 (1.92, 2.18)	1.39 (1.25, 1.53)	1.89 (1.76, 2.01)
<i>Injury incidence</i>	Rate** (95% CI)	115 (95, 138)	83 (66, 103)	137 (115, 161)
<i>Rehabilitation</i>	Sum of days	1474	559	689
	Mean days per injured player (95% CI)	49.1 (32.1, 68.9)	18.6 (12.0, 27.9)	20.9 (13.5, 28.8)
	Mean days per injury (95% CI)	18.9 (11.6, 26.2)	9.8 (5.5, 14.1)	8.3 (5.7, 10.9)
<i>Severity of injuries</i>	Minimal (1–3 days)	–	5 (16.7%)	7 (21.2%)
	Minor (4–7 days)	2 (6.7%)	6 (20.0%)	6 (18.2%)
	Moderate (8–28 days)	13 (43.3%)	12 (40.0%)	11 (33.3%)
	Major, severe (28+ days)	15 (50.0%)	7 (23.3%)	9 (27.3%)
	p-value***	0.007	0.276	0.618

95% CI: 95% confidence interval

* Injuries per total number of players (sum of injuries: n)

** Injuries per 1,000 match-playing exposure hours

*** Chi-square (χ^2) tests of homogeneity. A significant decrease in rates of "major, severe" injuries was also found between the three seasons: p-value: 0.003 (χ^2 , linear-by-linear association)

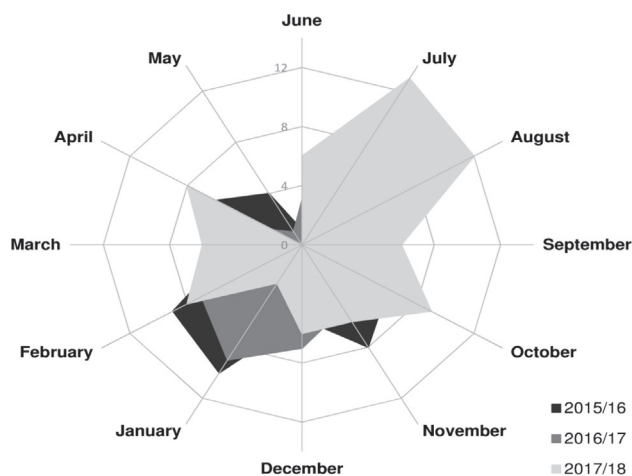
**Figure 1.** Distribution of injuries professional football players in a major league Greek team (n=218) per month and season.

Table 3 presents the distribution of injuries by location, type, mechanism and recurrence. Concerning the location of the injury, a higher prevalence (89.7%) was recorded in the lower limbs in 2015/2016 compared with 84.2% in 2016/2017 or 77.1% in 2017/2018 (p-trend: 0.031). Regarding the type of injury, 80.8% were recorded in muscles/tendons in 2015/2016, with fewer in 2016/2017 (70.2%) and 2017/2018 (67.5%) (p-trend: >0.05). The lowest prevalence of traumatic injuries (64.2%) was observed in the 2017/2018 season and the lowest of overuse injuries was 35.8% (p-trend: >0.05). A significant difference was observed in the recurrence of injuries between the three seasons, with a reduction in the prevalence of recurrence in 2017/2018 compared with the 2015/2016 season (8.4% vs 19.2%, p-trend: 0.042).

Table 3. Distribution of injuries in professional football players in a major league Greek team in three seasons.

Injuries		2015/2016		2016/2017		2017/2018		p-value
		n	%	n	%	n	%	
<i>Location</i>	Neck, head	0	–	2	3.5	5	6.0	0.031
	Upper limbs	1	1.3	1	1.8	3	3.6	0.322
	Trunk	7	9.0	6	10.5	10	12.0	0.527
	Lower limbs	70	89.7	48	84.2	64	77.1	0.031
<i>Type</i>	Fracture/bone stress	1	1.3	3	5.3	5	6.0	0.134
	Joint (non-bone)/ligament	17	21.8	14	24.6	20	24.1	0.734
	Muscle/tendon	63	80.8	40	70.2	56	67.5	0.059
	Contusions	0	–	0	–	0	–	–
	Laceration/skin injury	0	–	0	–	0	–	–
	Central/peripheral nervous system	0	–	0	–	1	1.2	–
	Other	0	–	1	–	5	6.0	0.019
<i>Mechanism</i>	Traumatic	57	73.1	41	71.9	52	64.2	0.224
	Overuse	21	26.9	16	28.1	29	35.8	
<i>Recurrence</i>	Non-recurrence	45	57.7	42	73.7	48	57.8	0.988
	Early	18	23.1	9	15.8	28	33.7	0.114
	Late	15	19.2	6	10.5	7	8.4	0.042

"Other" includes two cases of "common cold-flu" in the 2017/2018 season with 1 and 2 days of rehabilitation (placed in the "neck, head" category)

Chi-square (χ^2) tests (linear-by-linear association)

DISCUSSION

The present study investigated the injury profile of professional football players competing in National Greek and European matches over three consecutive seasons. The principal finding based on injury prevalence was that this profile remained largely unchanged or, based on specific indices, improved over the course of the three years. The prevalence of "major/severe" injuries was highest (50%) in the 2015/2016 season and significantly lower in the 2017/2018 season, as were injuries to the lower limbs, and also the mean number of rehabilitation days per injured player and per injury. Another important finding of this study was that the rate of clinical incidence, which was 2.05 injuries per player in 2015/2016, decreased significantly in the next season (2016/2017), but increased again in 2017/2018. The match injury incidence was unexpectedly high in all seasons. These findings suggest that the collection of data for several consecutive seasons (more than 5 seasons) is needed to better observe the development of specific trends over time, to screen for specific areas of concern and to formulate injury prevention hypotheses.⁵

Prevalence and nature of injuries

The principal finding of this study was the high prevalence

of injuries, which affected 8 in 10 of the professional football players in every recent season. On average, each elite football player of this Greek team sustained approximately two injuries in the competitive season, a rate similar to that recorded for the players of other top European League teams (1.3–2.5 injuries); it is reported that 50 injuries per season are to be expected for a team size of 25 players.^{5,7,10} In the present study, the mean number of days per injury causing an absence of more than one week was 9.8 days in 2016/2017 and 8.3 days in 2017/2018, but that number had been double in 2015/2016, with 18.9 mean days per injury. This may be explained by the higher number of major, severe injuries (28+days, 50%) sustained during the 2015/2016 season compared with the other two seasons. The average number of days lost due to injury in this study was in agreement with the study conducted in 7 professional football league teams in Hong Kong, which reported 7.6 days.²¹ The injury incidence in soccer players has been reported to be high in 19 studies; it is estimated that between 65% and 82% of players will sustain at least one injury during a season. These findings are consistent with the rate of approximately two injuries per year for the players in the present study.^{22,23}

Previous studies using a similar methodology in Europe, the United States, Asia and South Africa have reported a

match injury incidence of 14.5–88.9/1,000 hours.^{5,21,24,25} In the present study, the match injury incidence during the three seasons (2015/2016, 2016/2017 and 2017/2018) was higher, but follows the trend of greatly increased injury risk during football matches reported by Bayne and colleagues.²⁶ All the reviewed studies followed the international consensus on data collection procedures in epidemiological studies of football injuries recommended by FIFA and UEFA,^{10,16,27} and were consistent for all the studies. In a study performed on the Swedish national team, the injury incidence was found to be 30.3 injuries per 1,000 match hours, which is significantly lower than the findings of the present study.⁷ The differences in injury risk between professional Greek team players and other professional football players may be explained by differences in the competition level and in the league system, an explanation also reported in a recent study that noted that teams from northern Europe had significantly higher incidences of overall and training injury than teams from southern Europe.²⁰ The high number of injuries during matches may reflect the greater intensity of the matches, due to the extremely competitive nature of the Champions League and UEFA league matches that the study team played in each season. Further studies are needed to confirm this finding.

Injury description

The results of the present study were in agreement with literature reports that more than 75% of all injuries affect the lower extremities, mainly the thigh, knee, lower leg and ankle.^{7,10} In other studies, the proportion of overuse injuries varied between 31% and 35%,^{4,5,22} similarly to the findings presented here; in all three consecutive seasons the overuse injuries were within the same range. Most of the injuries in this study were non-recurrent; the non-recurrence rate of 74% for the 2016/2017 season was higher than that reported in the literature.^{12,28}

Injury severity

Many of the injuries in the present study were classified as major/severe. In total, 50% of the injuries recorded were rated as major/severe in 2015/2016 and caused more than 28 days of absence from football. These findings are consistent with studies showing that injuries of major severity are most common in the professional football population,^{5,10,12} however in the present study the percentage is higher than the 30% reported. This discrepancy could be the result of the playing level of the football players, the frequency of matches and the training program.^{5,7,12} A professional male football team can expect 8 major/severe injuries per sea-

son, while 15 major/severe injuries were recorded in this study in the 2015/2016 season. It can be speculated that the high risk of lower limb injuries reflects the high intensity of modern professional football. Most of the injuries in all three consecutive seasons were traumatic in origin. Improvement in the rehabilitation process was recorded in this study, as the average days per injury decreased significantly over the three-year period (from 18.9 in 2015/2016 to 8.3 in 2017/2018). A structured rehabilitation program during the training sessions, based on a routine functional eccentric-overload precaution program, appeared to have reduced the average number of days of absence per injury. In addition, however, the prevention of injuries should be the main goal of all club medical teams, as it appears that many of the injuries (about 1 in 3) are avoidable.

Injury distribution per month/season

The highest number of injuries occurred in the first two months of the pre-season preparation period in 2017/2018 compared with the two other seasons studied (2015–2017). The injury risk increased again in January–February, in the second half of the season. A study of a professional league showed that match injuries were high at the start of the competitive season in August, as observed in the present study for the 2017/2018 season, due to a possible discrepancy in physical fitness between teams, because of varying lengths of pre-season preparation.¹² In studies from Sweden and Switzerland, the highest injury rate occurred at the start of the season, as in the present study.²⁹

One of the limitations of this study was the absence of recording of the training session load and match load. Frequent recording would have provided more information on each player, establishing specific load-fatigue relationships for each, in the search for the appropriate proportion for each player. It would be important for future researchers to include such observations in the prediction of injury risk. The study recorded the match exposure in official minutes of playing in a professional Greek football team. Because of lack of data on the exact hours of training per player, it was not possible to determine the injury incidence according to training exposure time.

The conclusions drawn from this study do not necessarily apply to all professional footballers, as many other factors that affect the injury burden should be taken into consideration, such as coaching staff, training methodology, medical services, environmental conditions, the level of football required for national/European leagues, etc.³⁰ It would also be important to include the exposure and injuries sustained during national team play. This is

evident from the present study, where approximately half of the players of the study team were exposed to international duties and 4% of all injuries occurred under these circumstances.⁷ An important strength of the present study is that the same team of physiotherapists assessed all injuries in the three seasons, reducing the risk of observer differences, miscalculations and errors in the injury protocol. Another strength was the homogeneity of the three-season prospective cohort study, with all the players being in the same team and sharing the same coaches and medical staff. The study was conducted with a professional football team which has dominated the domestic Greek League for the last 20–25 years, has competed in the most successful tournament in Europe, the European Champions League, and is the highest ranked Greek team in the UEFA ranking, occupying the 21st place in Europe. To date, this is the first study to report on the frequency and type of injuries sustained by professional footballers within the team, and in Greece in general. It highlights the consequences of injury for the team, the medical and coaching staff, and, of course, for the footballers themselves, and suggests that these findings could be used to devise ways to predict and prevent injuries and to minimize their consequences and rehabilitate the players quickly. The absence of similar studies in Greece on professional football teams makes the authors' conclusions difficult to compare, but it is hoped that this study will encourage other teams to initiate and publish similar studies on this important issue that will further help the teams predict and handle injuries effectively. Concerning the factors

that consistently proved to be the most important in the present study (i.e., the recurrence of injury and the days of rehabilitation), future studies should include more risk factors and exploration of mechanisms of the most common muscle injuries in more detail, in order to generate ideas for preventive measures.⁵

This study reported for the first time that injuries affected almost 8 in 10 of elite professional footballers competing for a Greek team in all three consecutive seasons since 2015, and confirmed the high level of competition demands in football and the risk of injury during the preparation and competition season. The highest prevalence (50%) of "major/severe" injuries was recorded in 2015/2016, but this number was significantly lower in the 2017/2018 season. Regarding distribution of injuries per month-season, the highest number of injuries in the 2017/2018 season were clustered in the first months, namely in the preparation phase and during the early part of the competition season, in September–October. In an effort to reduce the overall number of injuries, preventive intervention should become a focus by enforcing strict rules during the matches and encouraging fair play conditions.

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ΠΕΡΙΛΗΨΗ

Χαρακτηριστικά τραυματισμών επαγγελματιών αθλητών ποδοσφαίρισης: Προοπτική μελέτη τριών συνεχόμενων αγωνιστικών περιόδων

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ΣΚΟΠΟΣ Η διερεύνηση των χαρακτηριστικών των τραυματισμών αθλητών μιας επαγγελματικής ομάδας ποδοσφαίρισης ελληνικού πρωταθλήματος 1ης κατηγορίας (Super League) που συμμετέχει σε εγχώριες και ευρωπαϊκές διοργανώσεις. **ΥΛΙΚΟ-ΜΕΘΟΔΟΣ** Διεξήχθη μελέτη παρατήρησης προοπτικού χαρακτήρα από εργαστήριο αθλητικής απόδοσης και εργομετρικής αξιολόγησης επαγγελματικής ομάδας ποδοσφαίρισης, περιλαμβάνοντας συνολικά 123 αθλητές. Τα δεδομένα τους συγκεντρώθηκαν για τρεις διαδοχικές περιόδους (2015/2016, 2016/2017 και 2017/2018) και αφορούσαν σε 38, 41 και 44 αθλητές, αντίστοιχα. Οι τραυματισμοί τους καταγράφηκαν και αξιολογήθηκαν, εκτιμώντας τον επιπολασμό τους, καθώς και τους ρυθμούς κλινικής επίπτωσης και αποκατάστασης των αθλητών. **ΑΠΟΤΕ-**

ΛΕΣΜΑΤΑ Ο επιπολασμός των τραυματισμών καταγράφηκε ως 78,9% για την αγωνιστική περίοδο 2015/2016, 73,2% για την περίοδο 2016/2017 και 75% για την περίοδο 2017/2018, αντίστοιχα, ενώ ο μέσος αριθμός τραυματισμών ανά τραυματισμένο αθλητή ήταν 2,6, 1,9 και 2,5 ($p > 0,05$), αντίστοιχα. Η κλινική επίπτωση ωστόσο ήταν μικρότερη το 2016/2017, με 1,39 τραυματισμούς/παικτή, σε σχέση με το 2015/2016, που βρέθηκε 2,05, ενώ το 2017/2018 ήταν 1,89. Η επίπτωση τραυματισμών ανερχόταν σε 83 τραυματισμούς/1.000 ώρες επίσημων παιχνιδιών σε σχέση με 137 το 2017/18 ($p < 0,05$). Στις ημέρες αποκατάστασης από τους τραυματισμούς, ο υψηλότερος μέσος όρος καταγράφηκε το 2015/2016 με 49,1 ημέρες/τραυματισμένο αθλητή, ενώ οι αντίστοιχοι μέσοι όροι για τις περιόδους 2016/2017 και 2017/2018 ήταν 18,6 και 20,9 ($p < 0,05$). Ο μέσος όρος ημερών αποκατάστασης ανά τραυματισμό μειώθηκε σημαντικά στην τρίτη αγωνιστική περίοδο, από 18,9 ημέρες το 2015/2016 σε 8,3 το 2017/2018 ($p < 0,05$). Βρέθηκε ακόμα υψηλός επιπολασμός (50%) των «σοβαρών/πολύ σοβαρών» τραυματισμών το 2015/2016, ο οποίος μειώθηκε σημαντικά την περίοδο 2017/2018, καθώς επίσης και οι τραυματισμοί κάτω άκρων ($p < 0,05$). **ΣΥΜΠΕΡΑΣΜΑΤΑ** Χωρίς μεταβολές στις τρεις περιόδους, σχεδόν 8 στους 10 επαγγελματίες αθλητές ποδοσφαίρου φάνηκε να επηρεάζονται από τραυματισμούς, στοιχείο που αντανάκλα το υψηλό επίπεδο των επαγγελματικών τους υποχρεώσεων και την ανάγκη διαχείρισής τους για τη μείωση του κινδύνου τραυματισμού που διατρέχουν σε κάθε αγωνιστική περίοδο.

Λέξεις ευρητηρίου: Αποκατάσταση τραυματισμού, Επαγγελματίες αθλητές ποδοσφαιριστές, Κάτω άκρα, Περιστατικό τραυματισμού, Τραυματισμός

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