Does the Amount of Injuries Affect the Final Ranking at The End of the Competitive Season in Football?

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ABSTRACT

The aim of this research is to determine whether a larger number of injuries in the team affects the final competitive achievement of clubs in the 1st Croatian Football League. Data on injuries in training and matches were collected using UEFA's Injury Study Questionnaire. 340 players (in all 10 clubs) participated in the research. The Chi-square test was used for non-parametric tests while logistic regression analysis was used to correlate the independent and dependent variables. The hypothesis that clubs with lower rankings will have statistically significant more injuries has not been confirmed ($p < 0.05$), but this difference (although not statistically confirmed) still exists between clubs that finished the championship at the top five compared to the low five clubs.

Keywords: injury prevention; football injuries; injury occurrence; injury type; specific training

INTRODUCTION

Daily high-intensity training, frequent travel, playing domestic and European leagues with the imperative of achieving results puts football players in a situation of high risk of injury. The possibility of injury to players increases exponentially as contact between players is an important feature in football (Andersen et al., 2003; Andersen et al., 2004; Kucera et al., 2005; Peterson et al., 2000)Methods: Football incident analysis (FIA. An injury in sports carries with it far-reaching consequences, both for the player and for the club, but also for society. For example, when a player is injured, the key question for the coach is when the same player can return to a full training load. The information is important for the club and the coach if it is an injury to an important player. In UEFA Champions League, the unavailability of players to participate in matches due to injuries averages 14%, with range between 5% and 20%, and lower placed teams injury rates are associated

with success in national and international competitions (Ekstrand, 2013). In addition to the huge cost that the injury brings to the club and the footballer, the injury of the player also calls into question the flow of the season, but also increases the risk of another, more serious injury. Injuries that are more serious and require an absence of more than 28 days should be taken with much more caution. One of the reasons is that in more than 50% of cases of such injuries, a repeated injury occurs, that is, an identical injury occurs in the same place. In such cases, apart from the great risk for the club that loses a large amount of money, there is also the risk of jeopardising the player's career (Junge et al., 2000). A footballer who suffered a minor injury will return in less than 7 days to a full training load (Lüthje et al., 1996)two out of three players were injured during the whole season. The injury incidence per 1000 playing hours among injured players and all players during games was higher than during practice, 14.2 vs. 11.3 and 2.3 vs. 1.8, respectively. The lower extremity was involved in 76% of the injuries. Thigh injuries were most frequent (22%. Injuries of a more serious type and that require an absence of more than 28 days should be taken with more caution because in more than 50% of cases of such injuries recurrence occurs, i.e. an identical injury occurs in the same place. Teams with more injuries throughout the season have lower result at the end of the season (Chalmers, 2002) and teams with fewer injuries end up in a better position at the end of the season while in other research opposite results were found (Dauty & Collon, 2011) This refers especially to teams that suffered a minor number of serious injuries (<28 days). Progress in injury prevention can only be achieved by directing research efforts towards understanding the implementation context of injury prevention, as well as expanding the existing evidence base on the efficiency and effectiveness of interventions.

Research aim is to determine whether the clubs in the 1st Croatian football league (1. CFL) that recorded a higher number of injuries in the competition season achieved a lower competition result (according to position in the table) and vice versa. It is hypothesised that football teams with higher incidence of injuries will be statistically significantly correlated with lower competitive result.

METHODS

Ethics committee approval

Prior to conduction of the research, a letter of intent was sent to the Croatian football federation with the tasks and goals of this research briefly explained. The Ethics Committee of the Faculty of Kinesiology, University of Zagreb has approved a study which is in line with ethical principles and requirements of the Declaration of Helsinki (96/2020).

Participants sample

The entity sample is 340 football players in all 10 clubs of the highest rank in football competition in Croatia. The average age of participants was 24.22±3.95, with maximum of 37 and minimum of 18 years. Participants' average weight was 79.54±8.43 kilograms with minimum body mass of 55 and maximum of 96 kilograms. Average height of the participants was 183.31±6.86, with minimum height of 159 and maximum of 203 centimetres.

Protocol

Data collection was carried out prospectively, where the person in charge of each club entered data into the database every two weeks. Data on exposure as well as the incidence of player injuries during training sessions and matches were recorded. In addition to exposure, data were collected on the anthropometric measurements of the participants, as well as on attitudes towards prevention programs and positive and negative factors on their implementation.

The research plan, way of participation of subjects from clubs was presented to leading club staff (directors / sports directors) in the first stage of the research. After management staff, plan of cooperation was agreed also with fitness trainers, medical doctors and physiotherapists in the club, who got familiar with a protocol for recording injuries in the "injury form" for training / matches. The protocol contained all the essential injury definitions so the research would be unified for each club equally. The used injury pattern was UEFA's Injury Study Questionnaire and it has been used in a prospective study for the past 15 years (Ekstrand et al., 2020). The form was already used and evaluated by the English Football Association, FIFA's Medical Assessment and Research Centre (F-MARC) and the Oslo Sports Trauma Research Centre (OSTRC), as well as other institutions. Questionnaire is based on consensus on the definition of injury (time loss), injury recurrence, injury severity and player exposure in training and matches. The form of injuries and the form for the football players' exposure was available on the website, where previously collected data for each team were added every seven days by person responsible for data entry.

Data analysis

After collected data for all the players and clubs, data processing was carried by statistical package software SPSS v.27. The Chi-square test was used for non-parametric tests to check association between top and low five clubs, while logistic regression analysis was used to determine correlation of the independent and dependent variables.

RESULTS

Significance levels of tested variables of Chi-square test ($p>0.05$) show no difference for clubs in top five and low five according to table placement in all observed variables. Looking at the total days of absence due to injuries between the top five clubs and low five clubs, the difference between them (74.8% vs. 25.2%) favours low five clubs (Table 1).

Table 1. Chi-square results of clubs in variable total days of absence

			Total days of absence		Total	p
			9 and more	1 - 8		
Clubs	Low 5 clubs	N	37	132	169	0.199
		%	82.2%	72.9%	74.8%	
	Top 5 clubs	N	8	49	57	
		%	17.8%	27.1%	25.2%	
Total		N	45	181	226	
		%	100.0%	100.0%	100.0%	

The values of logistic regression analysis ($p>0.05$) show no statistically significant association according to total number of absence days, i.e. a significant deviation for the observed clubs (Table 2).

Table 2. Logistic regression analysis results of top 5 and low 5 clubs

		Low 5 clubs N	Low 5 clubs %	Top 5 clubs N	Top 5 clubs %	p
Injured part of the body	Head / Face	20	11.7%	5	8.8%	0,548
	Shoulder / Clavicle	3	1.8%	0	0.0%	
	Upper arm	1	0.6%	0	0.0%	
	Forearm	1	0.6%	1	1.8%	
	Fist / Fingers	4	2.3%	0	0.0%	
	Neck	2	1.2%	0	0.0%	
	Chest / Ribs	3	1.8%	0	0.0%	
	Stomach	7	4.1%	7	12.3%	
	Lower back / Pelvis	9	5.3%	4	7.0%	
	Hip / Groin	18	10.5%	4	7.0%	
	Thigh	28	16.4%	9	15.8%	
	Knee	21	12.3%	8	14.0%	
	Lower leg / Achilles tendon	18	10.5%	7	12.3%	
	Ankle joint	28	16.4%	7	12.3%	
	Foot / Toes	8	4.7%	5	8.8%	
	Total	171	100.0%	57	100.0%	
Injury type	Brain concussion	4	2.4%	0	0.0%	0.692
	Fracture	4	2.4%	1	1.8%	
	Other bone injuries	4	2.4%	3	5.3%	
	Dislocation / Sublocation	5	3.0%	1	1.8%	
	Ligament sprain	22	13.3%	12	21.1%	
	Meniscus / Cartilage lesion	3	1.8%	0	0.0%	
	Muscle rupture / Stress	38	22.9%	14	24.6%	
	Tear	10	6.0%	6	10.5%	
	Tendon injury / Rupture	13	7.8%	5	8.8%	
	Tendinosis / Bursitis	5	3.0%	1	1.8%	
	Haematoma / Contusion	47	27.1%	13	22.8%	
	Cramps	9	5.4%	1	1.8%	
	Abrasion	0	0.0%	0	0.0%	
	Nerve injury	2	1.2%	0	0.0%	
	Dental injury	2	1.2%	0	0.0%	
	Total	171	100.0%	57	100.0%	
Injury occurrence	Training	49	28.7%	21	36.8%	0.232
	Match	122	71.3%	36	63.2%	
	Total	171	100.0%	57	100.0%	

Legend: N – total days of absence

Significance values of the regression coefficient are not statistically significant in the model with the analysed clubs and the total number of absence days (Table 3), therefore there is no correlation between the observed dichotomous variables and the associated independent variables.

Table 3. Logistic regression analysis results for variable total days of absence (1 to 8; 9 and more) of top 5 and low 5 clubs

		B	S.E.	Wald	df	Sig.	Exp (B)	95% C.I. for EXP (B) Lower	95% C.I. for EXP (B) Upper
Step 1[a]	Clubs	0.540	0.424	1.623	1	0.203	1.717	0.747	3.943
	Constant	1.272	0.186	46.750	1	0.000	3.568		

Legend: [a] – Variable(s) entered – clubs; B – Values for logistic regression, coefficients of the prediction variable of the dependent variable by the independent variable; S.E.– Standard errors related to coefficients; Wald – Wald value of the chi-square test; df – Degrees of freedom; Sig. – Significance value of the coefficient; Exp(B) – odds ratio predictor

DISCUSSION

Clubs ranked lower in the 1. CFL have a higher number of injuries during the preparation period and the competition season. From these results it can be concluded that clubs that finished the season lower ranked were more susceptible to injuries during matches but the same did not determine statistical significance ($p > 0.05$), with similar conclusions found in other studies (Dauty & Collon, 2011). This means that the hypothesis presented, which refers to clubs that implement fewer prevention programs and at the same time occupy lower positions at the end of the season, has not been confirmed According to this model, it cannot be concluded with certainty that in the next competitive season in the 1. CFL, the team with the most injuries will take the worst position at the end of the competition. Another important difference is where the injury occurred, a larger difference occurred in low five clubs (28.4% in training compared to 71.6% in matches) while in the top five clubs the difference was smaller (36.8% in training and 63.2% in matches). Clubs ranked lower reported concussion injury in 2.4% of cases, meniscus/cartilage lesion in 1.8%, nerve injury in 1.2% and dental injury in 1.2%, while clubs in the top five did not have these types of injury.

Clubs that finished the season lower part of the table do not have statistically significantly more injuries than teams that are at upper part of the table, which is not the case in previously mentioned research. Lower ranked clubs have a higher number of injuries in training and a lower number in matches compared to clubs that rank at the top with the opposite distribution. Thus, results direct the focus to an importance of prevention programs. Previous research has shown that teams that implement prevention programs (FIFA 11+) have significantly fewer injuries several times a week than teams that do not apply them (Bizzini et al., 2013; Clausen et al., 2014; Grooms et al., 2013; Impellizzeri et al., 2013; Owoeye et al., 2014)to understand whether this programme is an appropriate warm-up for football players. Results were compared with the literature using a meta-analytical approach. Twenty amateur male football players [mean age 25.5 (s ± 5.1. A smaller number of injuries was also found in this study for clubs from top five as they probably have a prevention program in some form. Whether this is due to better staff quality or quantity should still be researched in another study, but it helps teams to have better injury-free results than low five teams from research.

With extremely important obtained data, further programming of prevention programs crucial in reducing the number of player injuries, focus on injury problems, time of occurrence and the fact that research of this type has not yet been conducted can be considered as the strength of the study. The limitation of this study could be its duration (less than a year), as well as the time of conducting research during the Covid-19 viral pandemic, where at one point the competition part was interrupted. Without the constancy of the competition and with dominance of training regime, the dispersion of injuries and its number in trainings and matches differs from the European average. Also, for future research, it is necessary to determine the percentage of application of prevention programs in the 1. CFL so the obtained results can be more easily interpreted in relation to the competitive achievement.

CONCLUSION

Although it is not statistically significantly confirmed that clubs with lower rankings have more injuries, difference still exists between clubs that finished in the top five clubs in the championship compared to clubs which were ranked as low five clubs (which have more injuries in the season). Also, low ranked clubs don't have budgets like higher ranked clubs, and their medical staff is not expanded as in higher ranked clubs. Lower ranked clubs should consider expanding their medical and strength and conditioning departments to lower their injuries and consequently to have better results at the end of the season. Also, clubs that are ranked worse should conduct more education among players to raise the awareness of players towards injuries and how to reduce them to the smallest possible number. As this research was conducted on the entire CFL, the recommendation for clubs is to implement prevention programs with minor or major corrections that are needed for each club individually.

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