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Has the COVID-19 pandemic affected injury in football? Example of a professional football team

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ABSTRACT

Aims: Events that cause a state of isolation, such as a pandemic, and affect the training status of athletes can lead to loss of performance and increased risk of injury. The aim of this study was to compare the injuries of football players faced with the isolation and lack of training caused by COVID-19 and an intense match tempo after stress and uncertainty between pre- and post-pandemic seasons.

Methods: Injury follow-up data (number, time, severity, type, location, tissue of interest, side, mechanism, rule violation, and recurrence) of a professional football team in Turkey for the 2019-2020, 2020-2021, and 2021-2022 seasons were analysed.

Results: Data were analysed from 38 male athletes with a mean age of 28±4.55 (19-38). In the 2019-2020 season, there were a total of 23 injuries, which increased after the pandemic. With a tighter match schedule, there were 31 injuries in the 2020-2021 season and 51 in the 2021-2022 season. The injury rate per match also increased to 0.53, 0.70, and 1.08, respectively. Injury severity, location of injury, tissues involved ($p<0.05$), mechanism of injury, and rules violations ($p<0.001$) were significantly different between seasons.

Conclusion: The isolation period caused by the pandemic and the tight match schedules affected injury rates per match and injury characteristics. It was observed that these effects continued in the post-pandemic period with the contribution of the continuation of isolation rules and the rule changes made for the new season.

Keywords: COVID-19, pandemic, football, injury

INTRODUCTION

The novel coronavirus (COVID-19), which emerged in China in December 2019, is defined as a respiratory disease that can be fatal. COVID-19 infection was recognized as a pandemic by the World Health Organization (WHO) on March 11, 2020, due to its high rate of spread. Social distancing and isolation policies have been implemented worldwide to slow the spread of infection. Both global and local sporting events such as the European Football Championship, Tokyo 2020 Olympic Matches have also been suspended or cancelled indefinitely as of February 2020.[1] In Turkiye, football leagues were postponed until an indefinite date with a decision taken on March 19, 2020 (at the end of the 26th week of the 2019-2020 season).[2] As a result, the athletes had to pause their training or continue unsupervised because of the precautions.[3] Three months after the league was postponed, the spread of the infection slowed down, and the Turkish Football Federation (TFF) decided to continue league matches on June 12, 2020. The players had to complete the remaining matches after a three-month break. In 2019, after a 12-week end-of-season break between May and August, the 2019-2020 season started, and a three-week break was given between December and January within the season. After 8 postponed matches were played, a 7-week end-of-season break was given and then the 2020-2021 season was started under post-pandemic conditions. There was no break for this season and the schedule was tighter. We thought that all these conditions could force the football players to return after the pandemic and affect them in terms of injuries.

Reducing the risk of injury is the main part of the regular training programme in addition to the mental and physical preparation for sports competitions.[4-6] From the opposite perspective, detraining can be defined as the reduction or complete cessation of exercise frequency, intensity, or duration in the regular training routine of athletes. Detraining circumstances result in the loss of

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activity in the neuromuscular and cardiovascular systems that are obtained from regular training, such as the maintenance of physiological gains and performance characteristics. It can also lead to a decrease in strength, speed, flexibility, and endurance, which are critical to body composition and performance in competition. Consequently, all detraining processes become a predisposing risk factor for musculoskeletal injuries.[1,7-9] Perez et al.[10] found that football-specific actions such as acceleration/deceleration, change of direction, and sprinting were found to be difficult to perform under stay-at-home protocols, even though the athletes were supported by home training exercises. However, when the new season began after the quarantine, matches were scheduled at shorter intervals than usual so that the leagues could be completed on time. Professional football players went through three months of rest during the pandemic period, after which their schedule changed and they faced a tight season. To minimize the negative impact of the new season after quarantine, training and in-match arrangements were made in some countries. The decision to increase the number of in-match substitutions from three to five was one of the new changes implemented in many countries.[10,11]

The social and psychological impact, combined with quarantine and lack of training, can lead to performance loss and increased risk of injury.[9] Soft tissue injuries are known to increase when athletes return to sports after lockouts, and these are examples of the potential impact of a pandemic-induced isolation period.[9,12] Various analyses of the impact on injury rates in professional sports also show that the COVID-19 pandemic is causing increases in injury rates and changes in injury patterns.[13-15] In contrast, it was noted that the increase in injuries in the new season after the pandemic was prevented by the training strategies of the football clubs and some in-match rules. 10 Although there are data on this topic from many different countries, there are no data from Turkiye. This research attempted to compare the results of the pre-pandemic and post-pandemic seasons in terms of injury risk in football players who, after a period of lack of training, were faced with the uncertainty and stress caused by the pandemic, using a professional football team in Turkiye as an example.

METHODS

The study was designed as a cross-sectional descriptive study conducted at the Super League Football Club. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Ethics committee approval of the study was obtained from the Ethics Committee of Gazi University (Date: 26.04.2021, Decision No: E.80609). Informed consent was obtained from the players to use injury tracking data for the 2019-2020, 2020-2021 and 2021-2022 seasons.

Data collecting

All injuries were diagnosed, classified, and recorded by the same medical staff throughout the seasons. This football club routinely monitors performance and injury data. The data obtained as a result of this monitoring is objectively recorded in digital media. Injury data is categorised weekly, monthly, and annually in an Excel file. Within the scope of the research, the injury data within the period requested by the researchers were separated and anonymised by the club's medical team and sent to the principal investigator as an excel file. Injury data were available prospectively for the 2021-2022 season and retrospectively for the other seasons. After the break due to the announcement of the pandemic in the 2019-2020 season, the remaining 8 matches of the local league and 2 matches of the Union of European Football Associations (UEFA) Europa League were not included.

Injuries were grouped according to whether they occurred during the match or during training. The injury rates of the athletes per match were calculated as the number of injuries/number of matches.

In addition to the overall injury incidence, we also focused on a detailed analysis of typical football injuries. The injury severity were classified as minor if participation to the matches interrupted for less than 1 week, injuries requiring more than 1 week but less than 1 month of absence as moderate, and injuries requiring more than 1 month of absence as major injury.16 The type of injuries was classified as soft tissue injury, fracture and other. The side of the injury, anatomical site and related tissue were recorded in detail. In addition, the mechanism of injury was recorded as contact and noncontact. Whether the injury occurred as a result of a rule violation and the party who committed the rule violation were recorded. The presence of recurrence was also recorded by medical staff.

Statistical Analysis

Data were analysed using IBM SPSS Statistics Standard Concurrent User Version 24 (IBM Corp., Armonk, New York, USA). Categorical variables were expressed as percentages. Categorical analysis of nominal data was performed using the Chi-square test. A p-value less than 0.05 was considered statistically significant.

RESULTS

Data were analysed from 38 male athletes with a mean age of 28±4.55 (19-38). When the last 3 football seasons were examined it was found that 43 matches were played in the 2019-2020 season, 44 matches in the 2020-2021 season, and 47 matches in the 2021-2022 season. The injury rate per match had increased to levels of 0.53, 0.70, and 1.08, respectively. In the comparison between seasons, there were significant differences in the rates of injury severity, injury location, injured tissue ($p<0.05$), injury mechanism, and rule violation ($p<0.001$). Table presents the comparison of injury data for seasons.

Table Compare injury data by season

		2019-2020 Season	2020-2021 Season	2021-2022 Season	p
		Total number of injuries (%)			
Injury time	Training	10 (43.5)	12 (38.7)	16 (31.4)	0.569
	Match	13 (56.5)	19 (61.3)	35 (68.6)	
Injury severity	Minor	8 (34.8)	22 (71)	34 (66.7)	0.036*
	Moderate	11 (47.8)	5 (16.1)	14 (27.5)	
	Major	4 (17.4)	4 (12.9)	3 (5.9)	
Injury type	Sprain	3 (13)	6 (19.4)	11 (21.6)	0.315
	Strain	13 (56.5)	15 (48.4)	34 (66.7)	
	Fracture	1 (4.3)	2 (6.5)	1 (2)	
	Other	6 (26)	8 (25.8)	5 (9.8)	
Injury location	Foot	2 (8.7)	0	0	0.014*
	Ankle	1 (4.3)	4 (12.9)	7 (13.7)	
	Calf	3 (13)	2 (6.5)	6 (11.8)	
	Knee	4 (17.4)	5 (16.1)	6 (11.8)	
	Thigh	13 (56.5)	11 (35.5)	16 (44,4)	
	Hip	0	3 (9.7)	2 (3.9)	
	Groin	0	3 (9.7)	13 (25.5)	
	Lumbal	0	2 (6.5)	0	
	Shoulder	0	1 (3.2)	1 (2)	
Injured tissue	Muscle	15 (65.2)	17 (54.8)	33 (64.7)	0.039*
	Tendon	0	1 (3.2)	3 (5.9)	
	Tendon bone junction	1 (4.3)	1 (3.2)	0	
	Capsule	2 (8.7)	2 (6.5)	1 (2)	
	Limatchnt	1 (4.3)	6 (19.4)	12 (23.5)	
	Bone	1 (4.3)	2 (6.5)	2 (3.9)	
	Aponeurosis	0	2 (6.5)	0	
	Meniscus	3 (13)	0	0	
Injured side	Left	13 (56.5)	14 (45.2)	22 (43.1)	0.793
	Right	10 (43.5)	17 (54.8)	27 (52.9)	
	Bilateral	0	0	1 (2)	
Injury mechanism	Noncontact	13 (56.5)	21 (67.7)	48 (94.1)	<0.001*
	Contact	10 (43.5)	10 (32.3)	3 (5.9)	
Rule violation	No	14 (60.9)	26 (83.9)	50 (98)	<0.001*
	Yes	0	2 (6.5)	1 (2)	
	Opponent	9 (39.1)	3 (%9.7)	0	
Recurrence	Yes	1 (4.3)	3 (9.7)	1 (2)	0.290
	No	22 (95.7)	28 (90.3)	50 (98)	

Most of the injuries happened during the matches. Moderate injuries were more common in the pre-pandemic season (47.8%), while minor injuries were more common after the pandemic (71%) and post-pandemic seasons (66.7%). Although strain was the most common type of injury in all seasons, this rate decreased by 8.1% in the pandemic season and increased by 10.2% in the post-pandemic season. The thigh was the most injured area in all three seasons, but this rate decreased in the pandemic season.

While there were no lumbal injuries in the pre-pandemic and post-pandemic seasons, back injuries occurred at a rate of 6.5% in the pandemic season. Also while there were no groin injuries in the pre-pandemic period, its' rate had increased during (9.7%) and after the pandemic period (25.5%).

The muscle was the most injured tissue in all seasons, but the rate decreased in the pandemic season. While the contact injury rate was 43.5% in the 2019-2020 season, it decreased to 32.3% in the pandemic and 5.9% post-pandemic season. On the other hand, non-contact injuries were observed to increase at the opposite rate. And while rule violation was the least in the pre-pandemic season (60.9%), it was the highest in the post-pandemic season (98%). The recurrence rate (9.7%) was higher during the pandemic season. Table presents the comparison of injury data for seasons.

DISCUSSION

Using a professional football team in Turkiye as an example, this study compared injury data from the pre and post-pandemic seasons in football players who faced isolation, new season and match rules, uncertainties and stress brought by the pandemic. It is the first study to compare the injuries of a football team in the Turkish Super League before and after the COVID-19 season. As the 2020-2021 matches, all of which coincided with the pandemic period, were held with a tighter schedule, an increase in the number of injuries and injury rate per match was expected. This rate increased during the pandemic and continued to increase after the pandemic.

Many experts in the literature have predicted that injuries will increase after the pandemic returns to the league.[1,7] However, some studies conducted during this period have also shown that injuries can be reduced when returning to the season after isolation and quarantine.[17,18] Bisciotti et al.[1] stated that after the COVID-19 pandemic, in returning to the season in football, important problems such as loss of performance, increased risk of injury, and the consequences of systemic changes may be encountered due to the lack of training brought about by social isolation measures. Mannino et al.[19] on the other hand stated that injuries increased in the 2020-2021 season affected by the pandemic, and the reason for this could be a tight fixture. The results of this study also support this situation. On the contrary, Lorentsen et al.[20] reported that there was no difference between seasons in terms of injury severity, number of days lost, or number of missed matches, and that a tight match schedule could be a reliable alternative for future seasons, based on the data they obtained from 8 football teams. Increasing the number of substitutions during the match from three to five with the decisions taken by the International Association of Football Federations (FIFA) has also been stated as another factor that may be effective in reducing the incidence of injury during the pandemic period.[17]

Seshadri et al.[14] stated that the rate of injury per match increased. Krutsch et al.[17] stated that the injuries of football players in the German league did not increase with the return after the pandemic rather the injury rates decreased. They stated that the reason for this was the effect of continuing the training and albeit individually. Although this seems to affect the injuries positively, the training conditions that each player has for their home environment may not be sufficient. Although the players in our study also train at home during the break, it is seen that this does not have a positive contribution to the process. Therefore, the effects of individual or home training in this process are controversial.

In a study conducted with the players in the Italia Serie A-League, the most moderate injuries were seen in the pre-pandemic and post-pandemic seasons.[21] Similarly, in our study, while moderate injuries were higher before the pandemic, minor injuries were more common during and after the pandemic. Considering the mechanism of injury, non-contact injuries had increased. This increase may affect the severity of the injury and cause more minor injuries.

While hip injuries were more common before the pandemic, knee injuries were more common in matches played after isolation according to Krutsch et al.[17] Hip injuries were the most common injury in all three seasons in the current study.

This was followed by the groin, knee, and calf regions. Therefore, in the periods played with tight fixtures, more positive results can be obtained in terms of injury rates by evaluating and following complex regions such as hips, groin, knees, and calves in terms of injury risk. In the study of Seshadri et al.[14] muscle injuries were seen in German football league players mostly when returning to football after quarantine. Similarly, in our study, the most common injury was muscle injury every season, while this rate was less in the pandemic season. However, there was an increase again in the post-pandemic season. We think that the reason for this situation may be the result of the reflection of the injury of the muscle groups that were forced in the pandemic to the next season.

Limitations

To our knowledge, this study was the first one to compare the injuries of a football team in the Turkish Super League in the pre-and post-COVID-19 season. And this is a strength of our study. This research, which was conducted with data from a Super League-level team from Turkiye, supports these results from the literature. But our study has also limitations. The main limitation of our study is the analysis of results specific to a single team. Another limitation is that the number of studies we can discuss our study is limited. We recommend that the results be supported by studies involving more football teams. It should also be considered that football will not only be affected by the specified evaluation parameters but may be affected by many factors such as stress factors, technical teams, medical teams, training methods, season-specific goals, and success situations.

CONCLUSION

The rate of injuries per match had increased thorough and after the pandemic seasons. The detraining caused by the isolation period from the pandemic and tight match fixtures may be the ones to blame for this outcome. Also between the pre and post-pandemic seasons the rates of injury severity, injury location, injured tissue, injury mechanism, and rule violation differed significantly.

ETHICAL DECLARATIONS

Ethics Committee Approval

The study was carried out with the permission of Ethics Committee of Gazi University (Date: 26.04.2021, Decision No: E.80609).

Informed Consent

All patients signed and free and informed consent form.

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

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Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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