Injury characteristics in Norwegian Male professional football: A comparison between a regular season and a season in the pandemic

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ABSTRACT

The Coronavirus Disease-19 (COVID-19) pandemic forced the Norwegian male premier league football season to reschedule, reducing the fixture calendar substantially. Previous research has shown that a congested match schedule can affect injury rates in professional football. Therefore, we aimed to investigate whether the Norwegian premier league teams suffered more injuries in the match congested 2020 season than the regular 2019-season.

We invited all teams having participated in both seasons to export their injury data. Only teams that used the same medical staff to register injuries in both seasons were included, and to maximise data comparability between seasons, we applied a time-loss injury definition only.

Eight of 13 teams agreed to participate and exported their injury data. The 2020 season was 57 days shorter than the 2019 season. The match injury incidence differed insignificantly (incidence rate ratio 0.76 (0.48 to 1.20; $p=0.24$) in the 2020 season compared to the 2019 season. Furthermore, we found no differences in the number of injuries, days lost to injury, matches missed to injury, or injury severity.

We present the first injury data from a complete post-lockdown professional football season. We could not detect any differences between the two seasons, suggesting the congested match calendar in the 2020 season is a safe alternative in future seasons.

INTRODUCTION

Following the world-wide spreading of the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) and the subsequent Coronavirus Disease-19 (COVID-19), all sports in Norway suddenly stopped in mid-March 2020. Consequently, the 2020 Norwegian male premier league that was scheduled to start on the 4th of April was postponed until the 16th of June, thus shortening the fixture calendar by 49 days.

To fully recover from football matches, players need a recovery period of up to 72 hours.^{1,2} Resuming match play before players are fully recovered may lead to them playing with decreased muscular function,³ muscle tissue damage⁴ and mental fatigue.⁵ Previous research has shown that injury risk can be affected when matches are congested into shorter periods.⁶⁻¹⁰ Research examining match congestion effects on injury rates has used many different thresholds and definitions. Matches played with four or fewer recovery days had higher injury rates than matches with six or more recovery days.⁹ Injury rates also increased when matches were played in succession with three days of recovery,⁶ when teams had five days or less recovery⁸ and when teams had three days or less recovery.⁷ Furthermore, Howle et al¹⁰ found an increase in injury rates in weeks with more than one match and in seasons containing periods of match

congestion. Contrary to these findings, Carling et al¹¹ found no difference in injury rates in periods of match congestion (8 matches in 26 days). The first study examining the effect of rescheduling the fixture calendar due to COVID-19 was the German Bundesliga observing an increase in match injury incidence following a lockdown period compared to the pre-lockdown match period.¹²

It is unknown whether this also happened in Norwegian male premier league football following the COVID-19 lockdown period is unknown. To inform federations and league organisations, technical and medical staff in future planning of match and training schedules, an investigation of the effect of match congestion on the 2020 season injury rates is warranted. Therefore, this study aimed to investigate seasonal differences in injury characteristics between the 2019 and the 2020 seasons.

METHOD

This longitudinal descriptive study compared the injury characteristics in two seasons in the Norwegian male premier league (Eliteserien). All teams that participated in both the 2019 and 2020 (N=13) seasons were invited. We included teams that, in their own club setting, had recorded injuries with a reliable method, using the same medical staff to register injuries in both seasons. Towards the end of the 2020-season, we contacted each team's medical coordinator to introduce them to the study and inquire about their injury registration routines. All players with a first-team contract in 2019 and/or 2020 were invited. The study was reviewed by the Norwegian School of Sport Sciences' Ethical committee and approved by the Norwegian Centre for Research Data (896416). All eligible players signed written informed consent before the study start. We prepared this study according to the International Olympic Committee (IOC) consensus statement on methods for recording and reporting on epidemiology data in sport, and the STROBE Extension for Sports Injury and Illness Surveillance.¹³

Data collection

All data were anonymised by the team's responsible medical staff member and exported to the principal investigator (TDL) via email or post. Six teams manually extracted injury data from the medical records and/or their data records, whereas two teams exported data directly from their Athlete Monitoring System (AMS). When organising the data into comparable spreadsheets, the principal investigator had video or telephone consultations with each of the teams' medical coordinators to ensure that all data were comparable across the two seasons and to exclude any data recording errors.

Injury

An injury was defined using a time-loss definition.^{13,14} We ensured that all team's had used the same interpretation. All reported that they used the same criteria for return to play, i.e. when a player was cleared for full participation in either team training or match play. The number of days injured starting from the day after the onset of the injury (i.e. the first potential absence from team training activity) until the return to full participation was considered days lost to injury and used to calculate injury incidence and injury burden. When analysing the injury burden, all days lost to injury were assigned to the month the injury was registered (i.e. an ACL injury in January 2019 would be attributed 300 days lost to injury and 30 matches missed in January). Injury severity was calculated based on the number of days lost per injury and categorised as recommended in the IOC consensus statement.¹³ Availability was calculated as the average percentage of players available for match selection. If a player was absent due to a reason other than an injury, the player was removed from the available player's calculation. The absence of players was expressed using the average percentage of players that were absent from training or match due to injury or illness.

Exposure

We used data from the Football Association of Norway to record each teams' match exposure. All match exposures were calculated as *11 players X 90 minutes – minutes missed from red cards*, and we included league matches for the match exposure analysis. Since only three teams reported training exposure data, we excluded this data from the analyses.

Data analyses

Continuous data are presented as mean (standard deviation; SD). Incidence was calculated in R¹⁵ using the *epiR*-package¹⁶ (script and data available as supplementary data, #1). Incidence was expressed as the number of injuries per 1000 hours of exposure. Injury burden was expressed as the sum of all days off caused by injury. When analysing between season-difference in incidence and the number of injuries, a Poisson regression was used. The analysis was performed in R using the *sandwich*¹⁷ and *msm*¹⁸ packages (script and data available as supplementary data, #2) and was reported with robust standard errors.¹⁹ To analyse the difference in the number of days lost and matches missed due to injury, a one-sample t-test was used for the average of the team's seasonal difference in Stata (V.15.3- StataCorp LLC, College Station, Texas, USA) using the t-test-command (script and results available as supplementary data, #3). We did not analyse monthly seasonal differences on either injury parameter

Results

We recorded 3461 and 3462 hours of match exposure from the 2019 and the 2020 seasons, respectively. A total of 506 injuries were recorded (Table 1), of which 183 occurred during match play. In total, we found 13 963 days lost and 1469 matches missed due to injury.

Participants and exposure

The 2019-season started on the 31st of March and ended on the 1st of December, lasting 246 days. Due to Covid-19 restrictions, the 2020-season was postponed from the scheduled start on the 5th of April until the 16th of June and ended on the 22nd of December, reducing the planned match period from 238 to 189 days (Figure 1). The average number of recovery days between matches was 7.5 and 5.5 days in 2019 and 2020, respectively. However, the number of recovery days differed vastly between periods within both seasons, especially in game week 1 to 12 and 25 to 29 in 2020 (Figure 1).

Eight of 13 eligible teams agreed to participate (Figure 2). These teams had on average 26 players in their squad, and we included 213 players in the 2019 season and 208 in the 2020 season, giving a total of 412 player-seasons. Of the five teams that declined participation, two teams reported they had not registered injury data appropriately. One team had changed athlete management system (AMS) and felt they did not have comparable data. One team reported they did not have resources to organise and export the data and one team declined without providing any reason.

Injury incidence

The number of all injuries ranged from one team reporting seven injuries in the 2019 season to another team reporting 88 injuries in the 2020 season. There were in total 14 more injuries recorded in the 2020 season than in the 2019 season (1.05, Confidence Interval; CI 0.54 to 2.04; $p=0.88$; Table 1).

Match injury incidence

We recorded 104 match injuries in the 2019 season and 79 match injuries in the 2020 season (Table 1). There was a large between-team discrepancy in match injury incidence (Table 2), ranging from 4.04 per 1000h to 48.54 per 1000h. The total match incidence was 7.23 per 1000h lower in 2020 (22.82 per 1000h; CI 18.07 to 28.44; Incidence Rate Ratio; IRR 0.76) than in 2019 (30.05 per 1000h; CI 24.55 to 36.41), however, this was not a significant difference (Table 2).

The match incidence did not appear to follow a distinct pattern in either of the seasons (Figure 3).

Injury burden

We found no difference in the number of injuries (0.94, CI- 0.49 to 1.8; $p=0.84$), days lost to injury (-15.57 (CI -273.49 to 242.35; $p=0.89$), or matches missed (4.28 (CI -32.26 to 40.83; $p=0.78$) between the two seasons (Table 1, Figure 4).

Availability

The average training availability was 84.1% and 85.9% in the 2019 and the 2020 seasons, respectively. The average match availability was 86.6% in the 2019 season and 88.2% in the 2020 seasons. Thus, we found no significant differences between the two seasons for neither training nor match availability.

Injury severity

In the 2020-season, there were slightly fewer days lost to injury ($n=6995$ – $n=6881$). The injury severity seems to follow a similar distribution in both seasons, approximately 1/3 of the number of injuries are distributed in each of the categories mild, moderate and severe (Table 3).

Discussion

We present the first published data from a complete post-lockdown professional football season. This study aimed to compare potential differences in the injury patterns in one regular season and one congested season in Norwegian male professional football. The planned congested match schedule raised concerns among players and coaches related to match load and injury risk; however, as there was no increase in injuries in 2020, players' and coaches' were unjustified.

Match injury incidence

The match injury incidence was higher compared to previous studies from the Norwegian male premier league.²⁰ Bjørneboe et al found an overall increase in match injury incidence from 2002 to 2007, the increase found then is likely to have continued.²⁰ The match injury incidence in this study is comparable with findings from the comprehensive UEFA Champions League injury audit (23 per 1000h).²¹ Our results (30 per 1000h and 23 per 1000h,

respectively) are slightly lower than the match injury incidence of 36 per 1000h reported by López-Valenciano et al²² in a meta-analysis of 40 studies in professional male football.

We did not observe a between-season difference, even though the 2020-season was played with an average of two fewer recovery days between matches. Previous studies examining the effect of a congested match schedule have reported increased⁶⁻¹¹ and unchanged^{23,24} injury rates. Most of these studies have investigated whether shorter periods of matches congestion lead to increased injury risk compared with match periods with more recovery days in between.^{6-9,11,23,24} We compared two complete seasons where one had 5.5 and the other had 7.5 average recovery days between matches, making a direct comparison with most previous study difficult. One exemption, however, is the study by Howle et al,¹⁰ who compared three full seasons and found that the season with congested match periods had higher injury rates. This was not in line with our results. Despite the 2020 season having 5.5 recovery days on average, many match periods were even more congested (Figure 1). For instance, following a positive COVID-19 test in one team, the team was quarantined for ten days not allowed to any scheduled team training. Immediately following the quarantine period, the team played five matches in 13 days, resulting in three match injuries.

One study has compared injury rates before and after the COVID-19 pandemic lockdown, only. Seshadri et al¹² reported a threefold increase in injury rate when the German Bundesliga resumed playing after two months in lockdown. The study compared the seven rounds played after lockdown with the 26 rounds played pre-lockdown. Whereas, in our study, we compared two complete seasons and the lockdown period happening in the season-break in between the two seasons. Furthermore, the Bundesliga teams had only ten days of team training and no friendly matches before resuming match play.²⁵

Due to the pandemic, the Norwegian male premier league preseason was interrupted after two months (mid-March), then players being allowed to train in small cohorts of five from mid-April to mid-May. After mid-May, normal-proximity team training and friendly matches were allowed for four weeks before the season started in mid-June. The four week period of regular preseason preparation in the Norwegian premier league is likely to have mitigated some of the injury risk.²⁶

In an attempt to decrease the individual match load on the players', teams were permitted five substitutions in the 2020-season, compared to three in the 2019-season.²⁷ This affected the number of substitutions, as the average number of substitutions increased by 0.8 per match (2.8 in 2019, 3.6 in 2020) in the teams participating in this study. Moreover, this rule change has enabled teams rotating players to manage the load of players individually based on risk of injury, likely contributing to mitigating some of the injury risk in the 2020-season.

Availability, injury severity and injury burden

Periods of match congestion can lead to a decrease in weekly training load,²⁸ and thus expose players to injury during training affecting the overall number of injuries. We recorded an average training (84% and 86%, respectively) and match availability (87% and 88%, respectively), similar to the previously reported training availability (88%) and match availability (88%) by Ekstrand et al.²¹ We did not find any differences in days lost to injury between the two seasons. In periods of match congestion, the same number of days lost to injury would mean more matches missed than in a normal period (i.e. a two-week absence in mid-June would result in zero matches missed in 2019 and five matches missed in 2020). This was not the case in our study, neither regarding matches missed due to injury or match availability.

Methodological considerations

What constitutes a 'recordable event' is arguably one of the most critical methodological factors in sports injury and illness surveillance studies.²⁹ In this study, we used data from the teams' injury surveillance systems, and differences in perception of what constitutes a recordable event could explain the large inter-team variation. Surveillance data from different data recorders are not necessarily comparable,³⁰ and therefore, we only compared each team's data with their own data. We chose to use a time-loss definition as it is considered the most reliable definition, because full participation in training or match play is relatively easy to measure, and is considered reliable across recorders.³¹ There are, however, a large number of injury problems that do not lead to reduced participation, which are overlooked using the time-loss definition.^{29,32,33}

One major limitation in this study is the lack of training exposure data. This was not made accessible by the teams, and therefore, we were prevented from calculating the recommended metrics of the overall incidence and injury burden per 1000 hours in this study.^{13,34} Consequently, we cannot be sure that our results of the overall number of injuries arise due to differences in exposure. Furthermore, only using one season as a baseline for what is "normal" is a limitation injury rates will vary from season to season.^{23,35} Hence, we cannot be sure that the 2019-season is a correct measure of a regular Norwegian premier league season.

Our findings are not necessarily comparable to the top-elite leagues in Europe. A regular competitive season in the Norwegian premier league involves an average of ~4.6 matches per month from April to November. This is lower than top-level teams in international leagues who play approximately six matches per month for ten months.⁷ However, these findings may inform practice for leagues having similar schedules.

Perspectives

Despite the limitations of this study, our results can inform federations and league organisations in scheduling competitive season setup. The rule change implemented due to the pandemic which allowed five substitutions per match enabled teams to incorporate and improve rotation strategies. This may have mitigated an increased injury risk due to match congestion. We think this should be considered when planning seasons with unexpected or unusual high match congestion in the future. Our findings are especially applicable for leagues playing a similar amount and frequency of matches.

Based on the data from this study, playing a more match congested calendar congestion is safe, using safety measures such as an increased allowance of substitutions.

Contributions

Contributed to conception and design: TDL, JB, BC, TEA

Contributed to acquisition of data: TDL, JB, CT, MB, DT, AB, TGL, CW, EM

Contributed to analysis and interpretation of data: TDL, JB, CT, MB, DT, AB, TGL, CW, EM, BC, TEA

Drafted and/or revised the article: TDL, JB, CT, MB, DT, AB, TGL, CW, EM, BC, TEA

Approved the submitted version for publication: TDL, JB, CT, MB, DT, AB, TGL, CW, EM, BC, TEA

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Data and Supplementary Material Accessibility

All data are available at <https://osf.io/f8dc9/>

REFERENCES

1. Silva JR, Rumpf MC, Hertzog M, et al. Acute and Residual Soccer Match-Related Fatigue: A Systematic Review and Meta-analysis. *Sports Medicine*. 2018;48(3):539-583.
2. Nédélec M, McCall A, Carling C, Legall F, Berthoin S, Dupont G. Recovery in soccer: part I - post-match fatigue and time course of recovery. *Sports Med*. 2012;42(12):997-1015.
3. Fatouros IG, Chatzinikolaou A, Douroudos II, et al. Time-Course of Changes in Oxidative Stress and Antioxidant Status Responses Following a Soccer Game. *The Journal of Strength & Conditioning Research*. 2010;24(12).
4. Ascensão A, Rebelo A, Oliveira E, Marques F, Pereira L, Magalhães J. Biochemical impact of a soccer match — analysis of oxidative stress and muscle damage markers throughout recovery. *Clinical Biochemistry*. 2008;41(10):841-851.
5. Coutts AJ. Fatigue in football: it's not a brainless task! *Journal of Sports Sciences*. 2016;34(14):1296-1296.
6. Dellal A, Lago-Penas C, Rey E, Chamari K, Orhant E. The effects of a congested fixture period on physical performance, technical activity and injury rate during matches in a professional soccer team. *Br J Sports Med*. 2015;49(6):390-394.
7. Bengtsson H, Ekstrand J, Hägglund M. Muscle injury rates in professional football increase with fixture congestion: an 11-year follow-up of the UEFA Champions League injury study. *British journal of sports medicine*. 2013;47(12):743-747.
8. Bengtsson H, Ekstrand J, Waldén M, Hägglund M. Muscle injury rate in professional football is higher in matches played within 5 days since the previous match: a 14-year prospective study with more than 130 000 match observations. *British Journal of Sports Medicine*. 2018;52(17):1116.
9. Dupont G, Nedelec M, McCall A, McCormack D, Berthoin S, Wisloff U. Effect of 2 soccer matches in a week on physical performance and injury rate. *Am J Sports Med*. 2010;38(9):1752-1758.
10. Howle K, Waterson A, Duffield R. Injury Incidence and Workloads during congested Schedules in Football. *Int J Sports Med*. 2020;41(02):75-81.
11. Carling C, McCall A, Le Gall F, Dupont G. The impact of short periods of match congestion on injury risk and patterns in an elite football club. *British Journal of Sports Medicine*. 2016;50(12):764.
12. Seshadri DR, Thom ML, Harlow ER, Drummond CK, Voos JE. Case Report: Return to Sport Following the COVID-19 Lockdown and Its Impact on Injury Rates in the German Soccer League. *Frontiers in Sports and Active Living*. 2021;3(38).
13. Bahr R, Clarsen B, Derman W, et al. International Olympic Committee consensus statement: methods for recording and reporting of epidemiological data on injury and illness in sport 2020 (including STROBE Extension for Sport Injury and Illness Surveillance (STROBE-SIIS)). *British Journal of Sports Medicine*. 2020;54(7):372.

14. Fuller CW, Ekstrand J, Junge A, et al. Consensus statement on injury definitions and data collection procedures in studies of football (soccer) injuries. *Br J Sports Med*. 2006;40(3):193-201.
15. Team RC. R: A language and environment for statistical computing. *R Foundation for Statistical Computing, Vienna, Austria* 2020.
16. Sergeant MSaE. epiR: Tools for the Analysis of Epidemiological Data. <https://CRAN.R-project.org/package=epiR> Accessed.
17. Zeileis A. Object-oriented Computation of Sandwich Estimators. *Journal of Statistical Software; Vol 1, Issue 9 (2006)*. 2006.
18. Jackson C. Multi-State Models for Panel Data: The msm Package for R. *Journal of Statistical Software; Vol 1, Issue 8 (2011)*. 2011.
19. Zeileis A, Köll S, Graham N. Various Versatile Variances: An Object-Oriented Implementation of Clustered Covariances in R. *Journal of Statistical Software; Vol 1, Issue 1 (2020)*. 2020.
20. Bjørneboe J, Bahr R, Andersen TE. Gradual increase in the risk of match injury in Norwegian male professional football: A 6-year prospective study. *Scandinavian Journal of Medicine & Science in Sports*. 2014;24(1):189-196.
21. Ekstrand J, Spreco A, Bengtsson H, Bahr R. Injury rates decreased in men's professional football: an 18-year prospective cohort study of almost 12 000 injuries sustained during 1.8 million hours of play. *British journal of sports medicine*. 2021.
22. López-Valenciano A, Ruiz-Pérez I, Garcia-Gómez A, et al. Epidemiology of injuries in professional football: a systematic review and meta-analysis. *British journal of sports medicine*. 2020;54(12):711-718.
23. Carling C, Orhant E, LeGall F. Match Injuries in Professional Soccer: Inter-Seasonal Variation and Effects of Competition Type, Match Congestion and Positional Role. *International journal of sports medicine*. 2010;31(04):271-276.
24. Carling C, Le Gall F, Dupont G. Are Physical Performance and Injury Risk in a Professional Soccer Team in Match-Play Affected Over a Prolonged Period of Fixture Congestion? *Int J Sports Med*. 2012;33(01):36-42.
25. ESPN. Bundesliga back from coronavirus lockdown: No fans; awkward social distancing; Bayern, Dortmund cruise. <https://www.espn.in/football/german-bundesliga/story/4095678/bundesligas-return-from-coronavirus-lockdown-no-fansplenty-of-injuries-and-awkward-social-distancing>. Published 2020. Accessed 25.05.21.
26. Ekstrand J, Spreco A, Windt J, Khan KM. Are Elite Soccer Teams' Preseason Training Sessions Associated With Fewer In-Season Injuries? A 15-Year Analysis From the Union of European Football Associations (UEFA) Elite Club Injury Study. *The American Journal of Sports Medicine*. 2020;48(3):723-729.

27. Association FldF. Temporary amendment to Law 3.
<https://resources.fifa.com/image/upload/temporary-amendment-to-law-3.pdf?cloudid=h8hiqfty8d9nrwdltru>. Published 2020. Accessed 24.05.21.
28. Anderson L, Orme P, Di Michele R, et al. Quantification of training load during one-, two- and three-game week schedules in professional soccer players from the English Premier League: implications for carbohydrate periodisation. *Journal of Sports Sciences*. 2016;34(13):1250-1259.
29. Clarsen B, Bahr R. Matching the choice of injury/illness definition to study setting, purpose and design: one size does not fit all! *British Journal of Sports Medicine*. 2014;48(7):510.
30. Wik EH, Materne O, Chamari K, et al. Involving research-invested clinicians in data collection affects injury incidence in youth football. *Scandinavian Journal of Medicine & Science in Sports*. 2019;29(7):1031-1039.
31. Orchard J, Hoskins W. For Debate: Consensus Injury Definitions in Team Sports Should Focus on Missed Playing Time. *Clinical Journal of Sport Medicine*. 2007;17(3):192-196.
32. Hodgson L, Gissane C, Gabbett TJ, King DA. For Debate: Consensus Injury Definitions in Team Sports Should Focus on Encompassing all Injuries. *Clinical Journal of Sport Medicine*. 2007;17(3).
33. Cross M, Williams S, Kemp SPT, et al. Does the Reliability of Reporting in Injury Surveillance Studies Depend on Injury Definition? *Orthopaedic Journal of Sports Medicine*. 2018;6(3):2325967118760536.
34. Bahr R, Clarsen B, Ekstrand J. Why we should focus on the burden of injuries and illnesses, not just their incidence. *British Journal of Sports Medicine*. 2018;52(16):1018.
35. Klein C, Luig P, Henke T, Platen P. Injury burden differs considerably between single teams from German professional male football (soccer): surveillance of three consecutive seasons. *Knee surgery, sports traumatology, arthroscopy : official journal of the ESSKA*. 2020;28(5):1656-1664.

TABLES

Table 1 Number of match injuries, all injuries, total days lost due to injury and matches missed for the 2019 and the 2020 seasons

Team	Match injuries			All injuries			Total days lost			Matches missed		
	2019	2020	Change	2019	2020	Change	2019	2020	Change	2019	2020	Change
1	4	2	-2	7	9	2	387	362	-25	40	47	7
2	18	10	-8	63	87	24	752	995	243	70	100	30
3	24	17	-7	71	44	-27	2300	1745	-555	204	126	-78

4	21	17	-4	38	44	6	771	1037	266	95	116	21
5	11	15	4	18	30	12	516	540	24	46	72	26
6	15	8	-7	30	24	-6	1205	1057	-148	116	105	-11
7	11	10	-1	19	21	2	1105	1191	86	99	134	35
8	N/A	N/A		N/A	N/A		N/A	N/A		67	32	-35
X / Sum	104	79	-25	246	260	14	7036	6927	-109	737	732	-5

Table 2 Match injury incidence in the 2019 and the 2020 seasons.

Team	Match injury incidence				
	2019	2020	Change	Incidence rate ratio	p-value
1	8.09 (2.2 - 20.72)	4.04 (0.49 - 14.61)	-4.05		
2	36.36 (21.55 - 57.47)	20.21 (9.69 - 37.16)	-16.16		
3	48.54 (31.01 - 72.22)	34.34 (20.01 - 54.99)	-14.20		
4	42.42 (26.26 - 64.85)	34.43 (20.06 - 55.13)	-7.99		
5	22.29 (11.13 - 39.89)	30.39 (17 - 50.12)	8.10		
6	30.39 (17 - 50.12)	16.16 (6.97 - 31.84)	-14.23		
7	22.22 (11.09 - 39.76)	20.22 (9.69 - 37.18)	-2.00		
8	N/A	N/A			
Average	30.05 (24.55 - 36.41)	22.82 (18.07 - 28.44)	-7.23	0.76 (0.48-1.20)	0.24

Table 3 Number of injuries and total days lost due to injury categorised by their severity

Category (days)	Number of injuries			Total days lost to injury		
	2019	2020	Diff	2019	2020	Diff
Slight (0)	0	1	1	0	0	0
Mild (1-7)	90	96	6	313	295	-18
Moderate (8-27)	87	93	6	1294	1449	155
Severe (>28)	69	70	1	5388	5137	-251
All	246	260	14	6995	6881	-114

FIGURES

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FIGURE CAPTIONS

Figure 1 Distribution of matches in the Norwegian male premier league in the 2019 and 2020 seasons. One line represents the main match day for each round. The number represents the game week number.

Figure 2 Flowchart of teams invited to participate in the study and the information obtained from the teams that were included. Thirteen teams were eligible as they were part of both the 2019 and 2020 campaigns.

Figure 3 Timeline of monthly match injury incidence across the 2019 and the 2020 seasons

Figure 4 Timeline of the monthly number of injuries (A), days lost due to injury (B) and matches lost due to injury (C) across the two seasons, 2019 and 2020.

Figure 5 Training (A) and match (B