

Original Article

Effect of lockdown owing to COVID-19 on players' match statistics in Bundesliga

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Abstract:

Problem Statement:For the safety of athletes and fans, in March 2020 it was decided to suspend or cancel most European football leagues due to COVID-19. During the lockdown, athletes, like most of the population, had to stay at home, and team training was not an option. The football world has seen many discussions about the possible impact of the lockdown caused by COVID-19 on the physical condition and technical skills of players.**Approach:**this study is based on the Bundesliga (German top professional division) because it is one of the best football leagues in the world and was one of the first to resume play. Data from four fixture rounds played after the restart of 2019/2020 season were analysed and compared with the four fixture rounds immediately preceding the lockdown.**Study focuses on the first four fixtures rounds after the return, because during this period the effects of lockdown should be most visible. Purpose:** The purpose of the article is to describe the impact of the lockdown due to COVID-19 on players' match statistics following return to play.**Results:**The results indicate that after league resumption, players committed significantly more fouls and contested more aerial duels.This could be explained in three ways: compensation for decline in their running abilities,great willingness to play after the break or concentration on strength training during the lockdown.**Conclusions:**Despite some differences in match statistics after the lockdown it has to be stated that the Bundesliga clubs were able to manage this period quite well in terms of keeping their players in a good overall shape.

Key Words: football, match statistics, players, Bundesliga.

Introduction

The COVID-19 pandemic has hit the sports world exceptionally hard. On March 12th, 2020, most of the world's sporting activities were suspended due to the COVID-19 (ESPN, 2020). For the safety of athletes and fans, it was decided to postpone the largest sports events scheduled for 2020, including the Olympic Games, and some leagues were prematurely terminated altogether (e.g. football leagues in France, the Netherlands and Belgium). Until now, such decisions were made only as a result of military conflicts or very serious political crises. The European Club Association (ECA, 2020) has published a report which shows that the losses of European football clubs related to COVID-19 can be estimated at 3.6 billion EURO (1.5 billion in the 2019/2020 season and 2.1 billion in the season 2020/2021). All club revenue streams have been reduced, but the current situation has by far the greatest impact on matchday direct revenue, as stadiums in most countries are still closed to fans or can be only partially filled.

During the suspension of the competition, the athletes had to stay at home and train individually. The football world has seen many discussions about the possible impact of the lockdown caused by COVID-19 on the physical and technical quality of matches following return to play. Some initial assumptions regarding the impact on the functional condition of players at the initial stage of the lockdown period were that players might lose some functional readiness, and the game might be slower at least in the few opening weeks. These assumptions resulted from the fact that the players did not have as much time to prepare for the matches and the rest of the season, as they usually have.

When discussing the impact of the COVID-19 related break in competition, it is worth considering what factors affect a player's performance. It can be stated that player performance in matches is highly dependent on many factors, including: match importance, score, location, opposition, number of recovery days, tactical system (Paul, Bradley, & Nassis, 2015). It is also worth to add that football not only demands the physical readiness but also requires mental preparation. For example, mental fatigue is a complex issue that is influenced by many factors, such as: the development of the action in the game (e.g. minute of the game), the phase of the game (e.g. team possession), the athlete him or herself (e.g. their fitness and skill level), the opponent (e.g. fitness and skill level) and environment (e.g. temperature)(Paul et al., 2015). In football, the player should also understand the relationships existing between teammates, and also be aware of the possibilities of opponents actions (Reineke, Duda, & Fiedor, 2020). In normal circumstances players are able to complete a match in a reasonable physical

condition (Edwards & Noakes, 2009). It is also worth adding that sport performance depends on the ability of an athlete to produce and then sustain high levels of physical, technical, decision-making and psychological skills throughout competition (Knicker, Renshaw, Oldham, & Cairns, 2011). It should be emphasised that player performance is also affected by economic factors, including the salaries they receive (Torgler & Schmidt, 2007). Players who play better and better usually receive higher salaries, but also the mere fact of receiving or not receiving a raise can affect the form of a player (Metelski, 2015). Therefore, it can be said that the quality of a player's performance in a match depends on his physical and mental preparation, but also to some extent on economic factors (such as previously mentioned salary).

There are many different statistics in football, which to a certain point describe the match performance of the players. This study concentrates on those related to fitness, physicality and technical part of the game. It is also worth adding that in football, the interpretation of individual statistics could differ. The main statistic and the ultimate determinant of a successful football team are goals (which a team needs to score more of than their opponent in order to win a game). However, in order to score a goal a team usually has possession of the ball and yet the interpretation of this indicator is ambiguous (Jones, James, & Mellalieu, 2004). Individual statistics can also interact. For example lower level of overall distance covered is associated with higher number of goals suffered (Oliveira & Clemente, 2018). It is worth to add that sometimes even very good statistical results do not determine who won the game. Thus, a team can lose even after a good performance (i.e. high numbers of scoring opportunities, corners etc.) or win after a bad performance (Paul et al., 2015). Football is particularly susceptible to unpredictability and inherent match specificity and also performance indicators are influenced by player-opponent interactions (Mackenzie & Cushion, 2013). It should be also stated that a footballer's potential and skills are difficult to identify with a few single factors as it is a multi-faceted set of characteristics (Christensen, 2009). It is also worth adding that some statistical indicators – e.g. the distance covered during the match, are also influenced by the playing position (e.g. goalkeeper, midfielder, striker) (Kalapotharakos, Gkaros, & Vassiliades, 2020).

It was suspected that the break in the competition and the inability to train together as a team due to COVID-19 could have some impact on players performance in the Bundesliga. Research shows that 8-week detraining rapidly results in declines in athletic performance and health metabolic profiles, including reduced aerobic capacity, increased body fat and muscle loss (Liao, Sung, Chou, & Chen, 2016). In this study, match statistics from the Bundesliga were analysed. The Bundesliga is one of the best football leagues in the world (UEFA, 2020), and was also one of the first to return to play in Europe. The Bundesliga comprises 18 teams and operates on a system of promotion and relegation with the 2. Bundesliga. Seasons usually run from August to May. The Bundesliga is also the number one football league in the world in terms of average attendance (Bundesliga, 2019). The purpose of the article was to describe the impact of the lockdown due to COVID-19 on players' match statistics following return to play.

Material & methods

Procedure

Data used in this study was obtained from the official website of the Bundesliga (www.bundesliga.com/en/bundesliga). Four fixture rounds played after the restart (since 16th May 2020) of 2019/2020 season were analysed and compared with the four fixture rounds immediately preceding the lockdown, which were played in February-March. The main goal of the research was to check if the lockdown resulted in any changes to the players' match statistics in the initial period after the end of the lockdown. As has already been stated above, during the lockdown due to COVID-19 players had to stay at home and could not practice with the team as usually, so it could affect their match form. It seems, however, that with each match after the resumption of the league, players should progressively achieve their normal match level. Therefore, this study focuses only on the first four fixture rounds after the return, when the effects of lockdown should be most visible.

Statistical analysis

The study focused on the following football statistics: fouls made, duels won, aerial duels won, distance covered, sprints, intense runs, successful passes and crosses. The study also shows which teams, after return to play, had the greatest increases, and which had the greatest decreases in the case of the above-mentioned statistics. Microsoft Excel and IBM SPSS Statistics 26 programs were used to process the quantitative data of research.

Results

Data from Bundesliga matches shows that on average teams after the lockdown had more intense runs and sprints but covered slightly less ground than before the lockdown – 1.3km less per match in total. Despite these changes, productivity in terms of shots has remained at a similar level as prior to the lockdown (teams averaged 0.28 shot more pre-COVID-19). Another interesting aspect is that passing precision rose after COVID-19 lockdown, by almost a full percentage point. It is worth paying attention to the difference in the average number of fouls per match pre- and post-lockdown, as the difference is 2.34 and it is statistically significant as indicated by Student's t-test for independent samples $t(140) = -3.67$; $p = 0.000$. It has to be stated that after the

league games were resumed, the players began to foul more often. The number of aerial duels won also increased significantly, as shown by Student's t-test for independent samples $t(122) = -2.20$; $p = 0.004$. It means that after the lockdown, players contested more aerial duels. All analysed data is presented in Table 1.

Table 1. Comparison of players' match statistics before and after COVID-19 lockdown for all Bundesliga teams

Statistic per match	Pre-COVID-19	Post-COVID-19
Intense runs	709.04	712.13
Sprints	225.01	226.74
Distance covered (km)	116.91	115.61
Aerial duels won	19.84	24.78
Duels won	102.61	104.43
Fouls made	9.80	12.14
Crosses	9.21	8.89
Successful passes (%)	81.39	82.21
Shots	12.77	12.49

The study also attempted to answer two further questions: which Bundesliga teams recorded the greatest increases in the average match statistics, and which ones recorded the greatest decreases. Table 2 lists the greatest statistical increases, and Table 3 lists the greatest decreases comparing the period before and after the lockdown due to COVID-19:

Table 2. Clubs that statistics improved the most in the post-lockdown due to COVID-19

Statistic per match	Club	Value Pre-COVID-19	Value Post-COVID-19
Intense runs	FC Union Berlin	660.50	709.75
Sprints	SC Freiburg	183.00	211.75
Distance covered (km)	SC Freiburg	116.55	120.73
Aerial duels won	RB Leipzig	14.50	22.25
Duels won	Borussia Dortmund	97.50	113.50
Fouls made	FC Bayern Munich	6.00	10.75
Crosses	FSV Mainz	7.25	11.75
Successful passes (%)	FSV Mainz	73.50	83.00
Shots	Eintracht Frankfurt	10	16

Table 3. Clubs that statistics worsens the most in the post-lockdown due to COVID-19

Statistic per match	Club	Value Pre-COVID-19	Value Post-COVID-19
Intense runs	FC Köln	729.50	648.50
Sprints	Borussia Mönchengladbach	238.50	203.25
Distance covered (km)	RB Leipzig	119.73	113.27
Aerial duels won	SC Paderborn	21.50	14.75
Duels won	SC Paderborn	109.25	92.75
Fouls made	FC Augsburg	12.25	8.50
Crosses	FC Augsburg	8.50	5.25
Successful passes (%)	FC Schalke 04	83.25	77.50
Shots	SC Freiburg	14.25	10.00

It is evident that in some teams the values of certain match statistics have changed significantly within the analysed period. For example, Eintracht Frankfurt players improved the average number of shots per match by 6. FC Freiburg players, on the other hand, attempted 4.25 fewer shots per match after the return. It is also worth paying attention to the best team in the Bundesliga – FC Bayern Munich, whose players after the lockdown began to foul much more often (the average number of fouls per match increased by almost 80%). In turn, one of the six teams that started to foul less was FC Augsburg (on average 3.75 fouls less per game). It is also interesting that in some clubs, players demonstrated much better indicators of their physical shape post-lockdown. The best example is SC Freiburg, whose players increased the number of sprints by 16% and ran almost 4% kilometres more per match.

Discussion

In general, it can be said that most of the statistics under analysis in this study comparing pre- and post-COVID-19 lockdown were at a similar level, but some relatively significant differences could be found. First of all, the players after the break were committing more fouls (as indicated by Student's t test, $p=0,000$). The explanation for this may be that players were more aggressive because overall their running capabilities decline and they wanted to compensate for it with a hard game. It could also be explained that after the break from competition they were so eager to play that they exaggerated with brutality. Another option may be the fact that many players during the lockdown focused on strength training, which is relatively easy to do individually at home, and it can be linked with more physical play. A great many athletes during the lockdown uploaded photos

on their social media profiles to show their fans how they workout at home in these new circumstances, and most of these workouts were focused on building strength (Gwizdek, 2020; Powell & McVeigh, 2020). This latter reason could also be linked with the fact that after the lockdown the number of contested aerial duels also increased significantly.

Another interesting observation concerns the average percentage of successful passes, which increased after the lockdown. Is this down to the fact that players spent more time developing their individual technical qualities during lockdown? Or a different tempo of the game, which enabled more passing success rate, with fewer interceptions? Or, possibly, the lack of spectators in the stands meant that there was less pressure on players, leading to better passing precision on the field? This latter idea might be supported by the fact that the three teams with the worst passing success rate before the pause showed the largest increases in the % of successful passes made after the restart, in some cases jumping by almost 10% in quality. In total, despite some visible differences, it cannot be stated that they are statistically significant – as indicated by the Student's t-test for independent samples $t(140) = -0.79$; $p = 0.430$.

It is also worth noting that after the enforced pause the number of sprints and intensive runs had on average increased, but the distance covered by players was slightly lower. When discussing the topic of sprints and the distance covered by the players during a match, it should be added that after the lockdown, Bundesliga allowed five substitutes per match for the remainder of the 2019/2020 season (previously, only 3 substitutes were possible) (Uersfeld, 2020). It would have been interesting to see what the running distance would have been without the impact of the two additional substitutes, who were clearly levelling out the load and provided additional physical resources used by coaches to freshen their teams' performances in the latter stages of matches.

Overall, though, the main conclusion is that the Bundesliga clubs were able to manage their lockdown periods quite well in terms of keeping their players in a good overall shape, but nevertheless there still were some observable changes to the way the game was played out on the field, especially in the case of fouls and contested aerial duels.

Conclusions

The outbreak of the COVID-19 pandemic and enforced restrictions resulted in many discussions within the football world about the possible impact of this situation on the players. In this study, drawing on the example of one of the best football leagues in the world, the Bundesliga, it was decided to check whether the lockdown had an impact on the players' match statistics. By analysing the match statistics just before and after the lockdown, which took place during the 2019/2020 season, it was possible to reveal some interesting trends. Firstly, the players after the break were committing more fouls. This could be explained in three ways. The first is that players were more aggressive due to a decline in their running abilities and wanted to compensate for this by playing tougher. The second explanation could be that the players were so eager to play after the break that they sometimes exaggerated with brutality. The third option could be that many players during the lockdown focused on strength training, and this could also be associated with a more physical style of play. The last explanation may also be corroborated by the fact that after the lockdown the number of contested aerial duels also increased significantly. In summary, it can be said that despite some differences in match statistics after lockdown the Bundesliga clubs were able to manage this period quite well in terms of keeping the physical shape of their players and they did not lower their technical skills either.

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