Analysis of goal situations at the World Floorball Championship 2022

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ABSTRACT

Floorball is a collective ball game that is rapidly spreading throughout the world. Just like in other sports, it is important to monitor match statistics for more effective management of the training process. The aim of this study is to analyze the goal and shooting situations of floorball matches at the 2022 Men's Floorball World Cup. The results showed that in 48 matches the players shot a total of 5186 and a total of 588 goals were scored. Furthermore, it was found that the most productive period in the tournament was the third (34.9 %). The most goals were scored in the last five minutes of the match (11.05 %). The team that scored the first goal in 66.67 % of the matches won. The most goals are scored from inside the goal area (34.9 %) and in front of the goal area (27.9 %). The practical implication of this study is that floorball coaches must teach the team to defend well in the area in front of the goal and to cope with the situation when the team receives the first goal.

Keywords: Performance analysis, Floorball, World championship, Goals, Shots.

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INTRODUCTION

Floorball is a collective indoor ball sport that was officially created approximately 35 years ago. It is played for 60 minutes (3 periods of 20 minutes each) on a 40 x 20 m field bordered by a 0.5 m high fence. The team consists of a goalkeeper and 5 players in the field who have floorball sticks (the goalkeeper does not have a stick). The goal of the game is to get the ball into the goal more times than the opponent.

The International Floorball Federation was founded by the Swedish, Finnish and Swiss Floorball Federations in 1986. Since its inception, floorball has expanded rapidly, and the International Floorball Federation (IFF) currently has 78 member countries on all inhabited continents. The total number of registered members in 2020 was approximately 350,000, playing in 4,761 clubs. Sweden (approximately 105,000), Finland (approximately 51,000), and the Czech Republic (approximately 41,000) register the most players. The number of recreational players is estimated at around 3.5 million (IFF, 2020).

Monitoring various match statistics (e.g. number of shots on the opponent's goal, number of cross balls in soccer) is an important part of a coach's work. Analyzing the opponent or certain game situations can show the strengths or weaknesses of the opponent and thanks to this it is possible to create optimal tactics to defeat the opponent. These statistics have already been observed, for example, in baseball (Müller and Fadde, 2016), in golf (James, 2009), in handball (Saavedra et al., 2018), in field hockey (Boddington et al., 2003), in tennis (Reid et al., 2010), volleyball (Silva et al., 2013), soccer (Armatas et al., 2007).

Tracking various match statistics is the content of many studies, but for men's floorball, such statistics have not been processed much yet. The aim of this study is to analyze the goal and shooting situations of floorball matches at the 2022 Men's Floorball World Cup.

MATERIALS AND METHODS

All the floorball matches (48) from the final phase of men´s World Floorball Championship (WFC) 2022 were analyzed. The tournament was hosted by Switzerland between 5th November to 13th November. The data was obtained from the official Swiss Floorball Statistics website. The data analysis included use of descriptive statistics, Statistical data were reproduced with Absolute Frequency and Relative Frequency and presented in form of tables and figures.

The following performance indicators were analyzed:
1. The frequency of goal scoring per 20 minutes (1st period, 2nd period, 3rd period, extra time).
2. The frequency of goal scoring per 5 minutes (1st – 5th min.; 6th – 10th min.; 11th – 15th min.; 16th – 20th min., 21st – 25th min.; 26th – 30th min; 31st – 35th min.; 36th – 40th min, 41st – 45th min.; 46th – 50th min, 51st – 55th min.; 56th – 60th min extra time).
3. Influence of the first goal in the final score (win, drawn, loss).
4. Scoring area (pitch zones 1-9, figure 1).
5. Scoring situation (normal, power play/box play, penalty, without goalkeeper, empty netter).
6. Shoots + shooting area.
7. Percentage of shooting success.
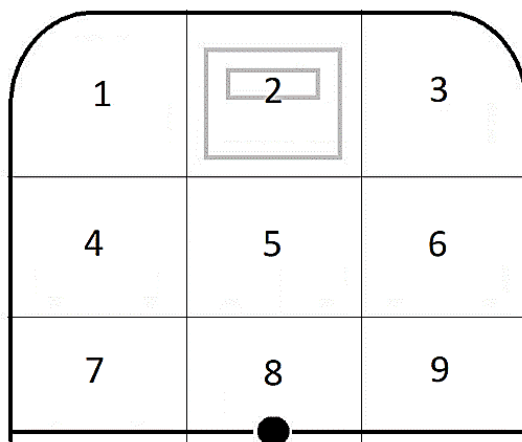8. Shoots on target.

Figure 1. Pitch zones.

RESULTS

A total of 588 goals were scored in the 48 matches of the WFC 2022. Of these, a total of 583 (99.1 %) goals were scored in regular time, 4 (0.7 %) goals in extra time and 1 (0.2 %) goal was recorded in the total score after the match, which was decided in penalty.

A total of 486 goals were scored in 5v5 play, a total of 86 goals on the power play or box play (74 powerplays, 12 boxes), 11 goals from penalty, 11 goals without a goalkeeper and 11 goals into an empty net. Some of these situations may have occurred at the same time, therefore their sum does not correspond to the total number of goals scored. Figure 2 shows the situation.
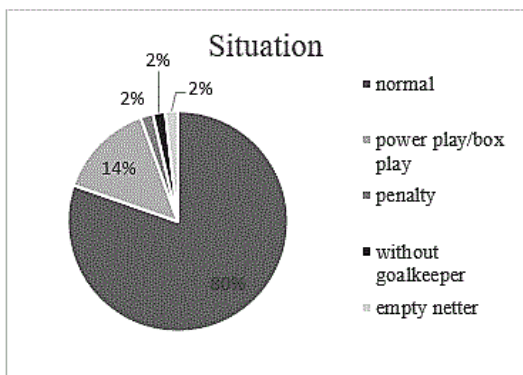

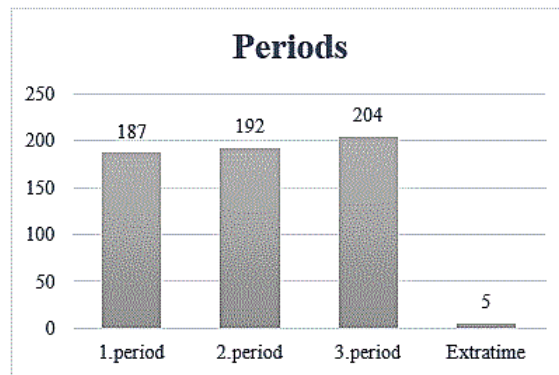Figure 2. Game situation when scoring a goal.

Figure 3. Frequency of goals scored in periods.

On the Figure 3 you can see the distribution of goals in individual periods of the match. Most goals were scored in the 3rd period (204, 34.69 %). For a more detailed analysis of the goal scoring time, the playing time was divided into 5minute segments.

In the Table 1 there is an overview of the frequency of goals in 5minute segments and their percentage representation. As can be seen from the relevant table, most goals were scored at the end of matches, i.e. in the last five minutes of the third period (11.05 %). On the contrary, the fewest goals are scored in the

opening five minutes of the match (5.95 %). In the remaining sections of the game, the goals are distributed almost evenly.

Table 1. Frequency of goals scored in 5minute intervals.

Period	Minutes	Goals	Percent (%)
1st period	1´-5´	35	5.95
	6´- 10´	48	8.16
	11´- 15´	52	8.84
	16´- 20´	52	8.84
2nd period	21´ - 25´	45	7.65
	26´ - 30´	52	8.84
	31´ - 35´	51	8.67
	36´ - 40´	44	7.48
3rd period	41´ - 45´	43	7.31
	46´ - 50´	50	8.50
	51´ - 55´	46	7.82
	56´ - 60´	65	11.05
Extra time	60' +	4	0.68
	penalty	1	0.17
Total		588	100

Furthermore, the influence of the first goal in the match on the overall result was examined. The Figure 4 shows the number of wins, losses and draws of the team that scored the first goal in the match. Out of a total of 48 matches, the team that scored the first goal won 32 matches (66.67 %), lost 9 matches (18.75 %) and drew 7 times (14.58 %).
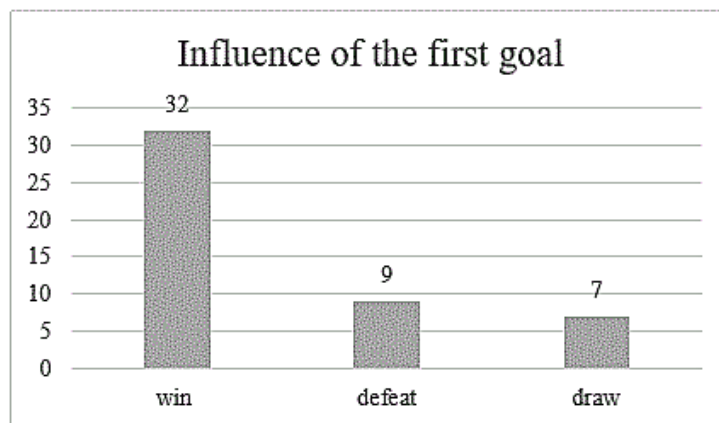

Figure 4. Influence of the first goal.

At the WFC 2022, players shot a total of 5186 times. For a more detailed analysis, the field was divided into 9 zones (Figure 1). Subsequently, the frequency and relative frequency of shots (Figure 5), shots on goal (Figure 6), scored goals (Figure 7) were examined in each part. Analysis of the positions showed that the most shots were fired from the position in front of the goal area (zone 2, 26.1 %) and from the area of the goal area (zone 4, 18.7 %). A minimum of shots were sent from the corners of the playing area (zone 1 and 3). Of the total number of 5186 shots, 2242 (43.23 %) were shot on goal. The rest of the shots were either

blocked or flew wide of the goal. More than half of the shots on goal flew from the area of the goal area (30.3 %) and from the area in front of the goal area (24.5 %).

111 (2.1 %)	971 (18.7 %)	140 (2.7 %)
908 (17.5 %)	1352 (26.1 %)	896 (17.3 %)
203 (3.9 %)	426 (8.2 %)	179 (3.5 %)

Figure 5. Number of shots from the zones of the pitch.

54 (2.4 %)	680 (30.3 %)	70 (3.1 %)
342 (15.3 %)	550 (24.5 %)	329 (14.7 %)
50 (2.2 %)	122 (5.5 %)	45 (2.0 %)

Figure 6. Number of shots on target from the zones of the pitch.

More than 60 % of all goals were scored from the same zones of the playing pitch, namely 34.9 % from the goal area (205 goals) and 27.9 % from the area in front of the goal area (164 goals). The total number of goals scored from pitch zones can be seen in Figure 7. The percentage of successful shots, i.e. shots that were sent to the goal and ended with a goal at the same time, is shown in Figure 8.

9 (1.5 %)	205 (34.9 %)	12 (2 %)
74 (12.6 %)	164 (27.9 %)	81 (13.8 %)
15 (2.4 %)	23 (3.9 %)	5 (0.8 %)

Figure 7. Number of goals from the zones of the pitch.

8.1 %	21.1 %	8.6 %
8.1 %	12.1 %	9.0 %
7.4 %	5.4 %	2.8 %

Figure 8. Successful shots.

DISCUSSION

A total of 588 goals were scored in 48 matches at the WFC 2022. It is more than at the WFC 2016, when 100 fewer goals were scored in 48 matches, i.e. 488 (Kauppi et al., 2018). Compared to the WFC 2012, however, the total number of goals scored is almost the same. At that time, a total of 582 goals were scored in 43 matches (Bykov, 2015). Converting to the average number of goals scored per match, we find that the highest average was at WFC 2012 (13.53), followed by WFC 2022 (12.25) and the lowest at WFC 2016 (10.16). An increasing or decreasing trend cannot be clearly determined from these three WFC, and a longer-term investigation would be needed.

When analysing the time of goal scoring, it was found that most goals were scored in the third period of the match (34.9 %), which coincides with the results from the WFC 2016, when 37 % of all goals were scored in the third period (Kauppi et al., 2018). The same happened at the Women's WFC 2019, when 34.7 % of all goals were scored in the third period (Bykov, 2022). On the contrary, in 2012 at the Men's WFC, the most goals were scored in the second third of the match, namely 34.7 % (Bykov, 2015). A more detailed analysis of the time distribution of goals showed that most goals were scored in the last five minutes of the match (11.05 %). The same happened at the WFC 2012 (10.6 %, Bykov, 2015), the WFC 2016 (12.1 %, Kauppi et al., 2018) and the Women's WFC 2019 (Bykov, 2022). From the above, it can be argued that most goals are scored at the end of the match. This may be due to the fatigue of the defending team or the increased motivation and activity of the team that must score a goal in order not to lose the match. Similar conclusions can be reached in other sports, e.g. at the football World Cup, most goals are scored in the last fifteen minutes (Armatas et al., 2007).

Scoring the first goal of the match proved to be a big advantage. The team that scored the first goal in 66.67 % of the matches won. However, this result is smaller than that found by Kauppi et al. (2018) at the WFC 2016. Back then, 75 % of the teams that scored the first goal of the match won the match. This is also seen as an advantage in other sports, e.g. in the 2019 FIFA Women's World Cup, up to 87 % of matches were won by the team that scored the first goal (Wang & Qin, 2020).

Similar to the presented research by Kauppi et al. (2018) examined the positions from which a goal is most often scored at the WFC 2016. Their research found that most goals are scored from inside the goal area (37 %, this research 34.9 %) and in front of the goal area (27 %, this research 27.9 %). This result was to be expected, because in the given spaces the player has an almost ideal distance from the goal and an almost ideal so-called shooting angle.

CONCLUSION

Floorball is a dynamic game that is rapidly spreading throughout the world. It already regularly has its men's and women's World Championship. The presented research deals with the Men's World Championship in 2022. The results showed that an increasing or decreasing trend in the total number of goals scored cannot be confirmed. For this, it would be advisable to do a more detailed analysis in future studies. Similar to other sports, it turned out that most goals are scored at the end of the game. The great influence of scoring the first goal on the overall result of the match was also shown. It would certainly be interesting to examine this influence from another point of view (e.g. psychological), which could be the subject of further studies.

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DISCLOSURE STATEMENT

No potential conflict of interest was reported by the author.

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