Analysis of the game performance of the ice hockey team in the senior category

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ABSTRACT

The aim of this work was to analyze the game performance of the UMB Hockey Team during the 2024/2025 season in the European University Hockey League (EUHL). The goal was to identify key statistical indicators that influence the outcome of a match, specifically the goal difference. The analysis included data from 19 games — 11 from the regular season and 8 from the playoffs. Data were collected through indirect observation and systematic recording of game statistics. The monitored indicators were: shots on goal, shooting accuracy, face-off success rate, power play success, penalty kill success, blocked shots, lost pucks, and gained pucks. The results showed that the team averaged 46.4 shots on goal per game, with a shooting accuracy of 12.88%. The power play success rate was 28.06%, while the penalty kill success rate reached 93.81%, indicating strong offensive and defensive performance. Regression analysis revealed that shooting accuracy was the only statistically significant variable affecting the goal difference ($p < 0.05$). This was confirmed in both the simpler model ($R^2 = 0.76$) and the more complex model ($R^2 = 0.78$). A 1% increase in shooting accuracy significantly raised the predicted goal difference. In conclusion, the thesis highlights the importance of tracking and analyzing performance indicators in ice hockey. The findings provide practical recommendations for coaches, especially the need to focus on improving shooting efficiency, which proved to be the most decisive factor in match outcomes.

KEYWORDS: analysis, performance in games, ice hockey, senior category, UMB Hockey Team

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INTRODUCTION

Ice hockey is one of the most popular and at the same time most demanding team sports in the world. It combines speed, strength, technique, and tactics, requiring players not only to be physically prepared but also capable of rapid decision-making and effective teamwork. With the increasing level of competition and professionalization of sport, greater emphasis is placed on detailed monitoring and evaluation of game performance. This process enables a better understanding of a team's strengths and weaknesses, which is essential for effective planning of the training process and preparation for competitive matches.

At present, various statistical methods are frequently used in sport, providing objective data on the performance of individual players

as well as the entire team. Statistical analysis is an important tool that allows monitoring not only basic indicators such as the number of goals or assists, but also more complex game situations, for example faceoff efficiency, power-play performance, or the number of puck recoveries and turnovers. Based on these data, coaches can better understand the dynamics of the game, identify key success factors, and adapt tactics and training to the specific needs of the team.

The aim of this paper is to analyze the game performance of the UMB Hockey Team in the EUHL competition during the 2024/2025 season, based on selected statistical indicators obtained through indirect observation of matches. The paper is divided into a theoretical and a practical part. The theoretical section focuses on the examined issues, adolescence as an important period for athlete development, the characteristics of ice hockey, and the possibilities of evaluating game performance using statistical methods. The practical section is focused on the collection and analysis of statistical data from 19 matches, where the influence of individual indicators on the final goal difference of the team is examined using regression analysis.

The use of statistical analysis in the evaluation of game performance represents an innovative approach that enables not only the quantification of individual and team performance but also the identification of key factors of success. We believe that the results of this analysis will provide valuable insights for the coaches of the UMB Hockey Team, which can be applied in planning the training process and improving game strategies. At the same time, this study contributes to the development of statistical methods applied in university ice hockey and sports analytics in general.

AIMS

The aim of the paper was to analyze the game performance of the UMB Hockey Team in the EUHL league during the 2024/2025 competitive season using the method of indirect observation and statistical data in the evaluation of game performance.

H1: The number of shots on goal by the UMB Hockey Team will exceed 30 in every match.
H2: The shooting efficiency of the UMB Hockey Team will be higher than 10% throughout the entire season.

H3: The faceoff success rate of the UMB Hockey Team will exceed 50% in at least half of the matches played.

H4: The power-play efficiency of the UMB Hockey Team will be higher than 25% throughout the season.

H5: The penalty-killing efficiency of the UMB Hockey Team will exceed 80% during the 2024/2025 season.

H6: The average number of blocked shots by the UMB Hockey Team will be at least 10 per match.

H7: At least one of the monitored statistical indicators will have a statistically significant effect on the goal difference ($p < 0.05$).

METHODOLOGY

The game performance of the team was analyzed in 19 matches during the 2024/2025 competitive season, including the playoffs, of the UMB Hockey Team. In evaluating game performance, statistical indicators inspired by official NHL game statistics were used and analyzed. The examined indicators included shots on goal, shooting efficiency, faceoff efficiency, power-play and penalty-killing efficiency, blocked shots, puck losses, and puck recoveries. From the official statistics, hits were replaced by penalty-killing efficiency, and penalty minutes were replaced by shooting efficiency.

During the 2024/2025 competitive season, the UMB Hockey Team played 12 matches in the regular season, consisting of 6 home and 6 away games. One match was awarded by forfeit. In the playoffs, the team played 8 matches, finished in first place, and became champions of the European University Hockey League. The team also participated in the inaugural University Cup organized under the Slovak Ice Hockey Federation, where they played 3 matches and won the competition for the first time in its history.

During the 2024/2025 season, the team roster consisted of 30 players: 15 forwards, 10 defensemen, and 5 goaltenders. The main research method used in the paper was indirect observation. This method was applied due to the availability of video recordings obtained from publicly accessible platforms such as YouTube, as well as from the SportContract application, which focuses on game analysis in elite hockey and is accessible only to coaches and players of the respective teams for reviewing matches, shifts, and performance analysis.

A total of 19 competitive matches played by the UMB Hockey Team during the 2024/2025 season, between September 2024 and April 2025, were observed. During the observation, data from available sources were recorded into tables and diagrams for eight statistical indicators: shots on goal, shooting efficiency, faceoff efficiency, power-play efficiency, penalty-killing efficiency, blocked shots, puck losses, and puck recoveries.

RESULTS

	UNIZA	Gyor	UHT	KE	NR	UNIZA	KE	NR	TN	TN	Gyor	KE	KE	KE	Gyor	Gyor	Gyor	Gyor	Gyor
Shots on goal	44	57	35	33	40	59	37	41	43	43	43	52	47	56	42	41	51	35	53
Shooting accuracy %	13,60%	15,80%	5,70%	24,20%	17,50%	10,20%	8,10%	12,20%	4,70%	14%	4,70%	32,70%	12,80%	8,90%	7,10%	17,10%	11,80%	2,90%	20,80%
Face-off win %	54,30%	56,50%	42,10%	40%	37,80%	56,50%	45,90%	41,80%	47,80%	42,20%	51,90%	61,40%	51,90%	55,90%	53,40%	60%	54,10%	47,90%	60,70%
Power play efficiency %	0%	16,70%	0%	50%	100%	40%	33,30%	20%	14,30%	33,30%	0%	60%	22,20%	0%	16,70%	40%	66,70%	0%	20%
Penalty kill efficiency %	100%	85,70%	100%	100%	100%	75%	100%	100%	75%	100%	100%	100%	100%	66,70%	100%	100%	80%	100%	100%
Blocked shots	4	4	6	6	5	4	10	5	4	8	4	8	8	10	9	9	6	11	8
Giveaways	6	12	13	9	10	14	13	6	5	11	7	7	7	6	9	8	6	9	6
Takeaways	9	11	10	10	12	14	14	11	4	7	3	8	8	8	9	9	14	11	14
Win	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	0	1
Goal differential	5	7	2	8	6	5	2	1	-2	4	1	16	5	2	-1	7	3	-3	11

Figure 1 Statistical indicators of matches in the regular season of the UMB Hockey Team during the 2024/2025 competitive season (Source: Author's own)

Figure 1 presents all statistical indicators that were recorded during the competitive season using the method of indirect observation. Above, the regular season and the playoff phase of the competition were evaluated separately, including their mutual comparison. This section focuses on the overall evaluation of the team's game performance using graphical methods and analyses. In addition to the eight main indicators, the dataset was supplemented with information on match outcomes (win) and goal difference, which served as the basis for the subsequent regression analysis.

Five out of six hypotheses were confirmed. In the regression analysis, two models were analyzed. From the perspective of statistical significance, shooting efficiency (%) proved to be the most relevant indicator in both models, reaching a value of $p < 0.05$ in both analyses. In the second analysis, the p-value was even slightly lower, further supporting its explanatory power. Other variables, such as shots on goal, faceoffs, power-play efficiency,

and penalty-killing efficiency, remained statistically insignificant in both models, although some of them reached p-values close to the threshold of significance. Hypothesis H7 was confirmed, as it was assumed that at least one of the monitored statistical indicators would have a statistically significant effect on the goal difference ($p < 0.05$).

CONCLUSIONS

Based on the findings of this analysis, the following recommendations were proposed for the team's coaches:

- To continue the training process with a focus on shooting drills, with the primary objective of increasing finishing efficiency and goal scoring.
- Despite the high effectiveness of power-play situations, it is recommended to continue dedicating attention to this aspect and to train it more frequently in order to further improve team efficiency.
- To maintain an aggressive and fast offensive style of play during matches, which has proven successful and contributes to puck recovery and the creation of scoring opportunities.
- To systematically work on faceoffs from the beginning of the season, as training of this activity was introduced only in the second half of the competitive period, which positively influenced match results.
- Although the team often limited opponents' shooting opportunities, resulting in a lower number of blocked shots, it is recommended to place greater emphasis on blocking even seemingly harmless shots, as these occasionally led to dangerous situations or goals.
- To devote greater attention to selected statistical indicators throughout the season and to analyze them regularly, enabling timely identification of areas for improvement and appropriate adjustments to the training plane.

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