Original Article

Solving the "back-pass" situation by selected soccer goalkeepers at the 2019 UEFA European U21 Championship

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Abstract
The aim of this study was to expand knowledge about the frequency and success rate of solving the game situation called "back-pass" by selected soccer goalkeepers at the 2019 UEFA European U21 Championship. We also tried to determined whether there were significant differences in the success rate of individual solutions for the "back-pass" situation. The research group consisted of goalkeepers (n = 16) of all national teams that participated in all matches (n = 21) at the 2019 UEFA European U21 Championship. The main method of data acquisition has been the method of indirect observation by using video recording. Based on the number rate of successfully and unsuccessfully implemented game activities, we expressed as a percentage the success rate of goalkeepers in solving the "back-pass" situation. We used the Z-test Calculator for 2 Population Proportions to determine the statistical significance of the differences between the success rate of individual solutions for the "back-pass" situation. Goalkeepers solved the "back-pass" situation a total of 618 times (14.7 per match) with the success rate of 85.11%. We found a statistically significant difference in success rate between the passing the ball up to 20 m and the passing the ball over 20 m ($p < 0.01$), and also between the way the passing the ball up to 20 m and the kick by the first touch ($p < 0.01$). The results of this study indicate increasing rate and the importance of successful solution of the "back-pass" situation by soccer goalkeepers. The solving of the game situation called "back-pass" by goalkeepers during the match makes up in most cases 1/3 of their entire individual game performance.
Key words: soccer, goalkeeper, "back-pass" situation, offensive individual game activities

Introduction

The goalkeeper in soccer is a specific player function since this player has an exceptional and very important role in the team (Liu et al. 2011; Seaton & Campos 2011; Padulo et al. 2015; Montesano 2016; Ajamil et al. 2018; Carp et al. 2018; Ibrahim et al. 2019; Szwarc et al. 2019). His technical-tactical and physical activity is different from that of the players on the field. Besides, a goalkeeper performs different roles in the defensive and offensive phase. Obetko et al. (2019) consider this function as critical because it has a significant impact on the team's result in the match.

As the goalkeeper's player function has a specific position, unlike other players on the field, he performs in the match also specific individual game activities which are characteristic only for him. One of them is the solution of the game situation called "back-pass".

Several studies dealing with the game performance of goalkeepers in soccer show that the proportion of offensive game activities against defensive activities is 59% to 74% (Holienka et al. 2017; Honz 2017; Pažitka 2017; Babic & Holienka 2018; Čechovič 2018; Babic et al. 2019; Honz & Cepková 2019; Pažitka 2019; Babic 2020b; Babic et al. 2020; Rak 2020; Babic 2021). There are studies in which was this ratio even more in favor of offensive game activities, the ratio was from 75% to 78% (Adamovič 2015; Peráček et al. 2017; Čechovič 2018; Holienka et al. 2018; Babic 2019; Křížek 2020), which means that only ¼ of goalkeeper´s game activities were related to his primary task that is to prevent a goal.

Increased demands on goalkeepers in the offensive game phase directly proportionally increase the demands on their success rate. This can often affect the game performance of the entire team and the result of the match too (Kristiansen et al. 2011; Zerf et al. 2017a, 2017b; Ajamil et al. 2018; Babic 2020b). Nowadays, goalkeepers have to participate to a large extent in the offensive phase with other team players and try to find a constructive solution of "back-pass" situations or other parameters of building up and leading an attack (Babic et al. 2019).

Several authors have found out that the frequency of solving the "back-pass" ranges on average from 7.8 to 17.9 times per match and the success rate ranges on average from 70.9% to 92.7% (Adamovič 2015;

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Holienka et al. 2017; Pažitka 2017; Peráček et al. 2017; Babic & Holienka 2018; Čechovič 2018; Holienka et al. 2018; Babic et al. 2019; Pažitka 2019; Babic 2020a, 2020b; Babic et al. 2020; Křížek 2020).

Materials and Methods

The aim of the research has been expanding knowledge about the frequency and success rate of the solution of the game situation called "back-pass" by selected goalkeepers at the 2019 UEFA European U21 Championship. We also tried to find out whether there will be significant differences in the success of individual ways of solving the „back-pass" situation.

Our research group consisted of goalkeepers (n = 16) of all national teams who participated in all matches (n = 21) at the 2019 UEFA European U21 Championship. The total number of observed matches was 42. The average age of goalkeepers was 22.4 ±0.7 years.

Table 1 Basic information about monitored goalkeepers at the 2019 UEFA European U21 Championship

Goalkeeper	Height [cm]	Weight [kg]	Calendar age	Team
Kamil Grabara	195	80	20.4	Poland
Nordin Jackers	187	72	21.8	Belgium
Alex Meret	190	84	22.2	Italy
Unai Simón	190	86	22.0	Spain
Boris Radunović	194	84	23.0	Serbia
Alexander Schlager	184	77	23.3	Austria
Alexander Nübel	193	86	22.7	Germany
Daniel Iversen	190	83	21.8	Dennmark
Ionuț Radu	188	70	22.0	Romania
Josip Posavec	190	80	23.3	Croatia
Dean Henderson	188	85	22.3	England
Paul Bernardoni	190	78	22.1	France
Antonio Sivera	184	75	22.8	Spain
Ortwin De Wolf	190	82	22.1	Belgium
Dragan Rosic	189	80	22.6	Serbia
Ivo Grbić	195	83	23.3	Croatia

The main method of data acquisition has been the method of indirect observation by using video recording. We proceed from the systematics of the goalkeeper's game activities according to the research by Babic & Holienka (2019). First of all, we recorded the number of successful and unsuccessful implemented game activities by each goalkeeper. During this evaluation we used signs +/-. With a "+" sign we marked a successfully implemented game activity. It was an activity which was implemented correctly from both technical and tactical point of view. With a "-" sign we marked an unsuccessful game activity, which means it was implemented incorrectly from both technical and tactical point of view. Based on the number rate of successfully and unsuccessfully implemented game activities, we expressed as a percentage the success rate of goalkeepers in solving the "back-pass" situation.

To determine the statistical significance of the differences between the success rate of individual methods of solving the „back-pass" situation, we used the test called Z-Score Calculator for 2 Population Proportions.

Results
Frequency and success rate of solving the game situation "back-pass"

In all matches, the goalkeepers solved the "back-pass" situation a total of 618 times (14.7 per match) with a success rate of 85.11%. By passing the ball up to 20 m they solved this situation 355 times (8.5 per match) with a success rate of 98.59%. By passing the ball over 20 m they solved back-pass a total of 185 times (4.4 per match) with a success rate of 65.94% and by kicking the ball by the first touch 78 times (1.9 per match) with a success rate of 69.23%.

Table 2 Frequency and success rate of solving the "back-pass"situation

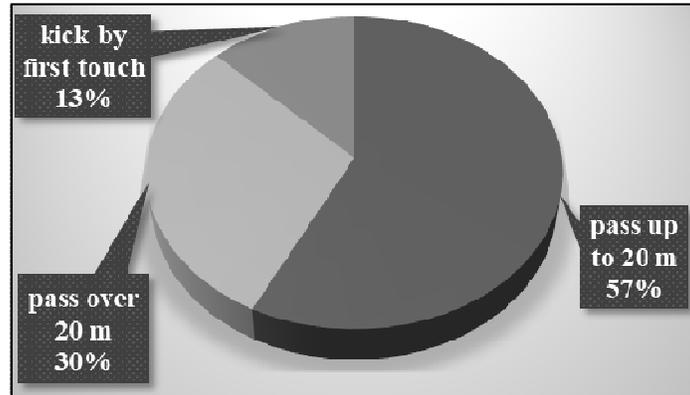| "back-pass" situation	total frequency	average per match	success rate
build up attack (pass up to 20 m)	355	8.5	98.59%
build up attack (pass over 20 m)	185	4.4	65.94%
kick by the first touch	78	1.9	69.23%
∑	618	14.7	85.11%

Figure 1 Percentage of the frequency of different solutions of the "back-pass" situation

The way of solving the "back-pass" by passing the ball up to 20 m represented the most numerous part of all monitored methods - 57%, the second most numerous way was passing the ball over 20 m (30%) and the least numerous way was kicking by the first touch (13%).
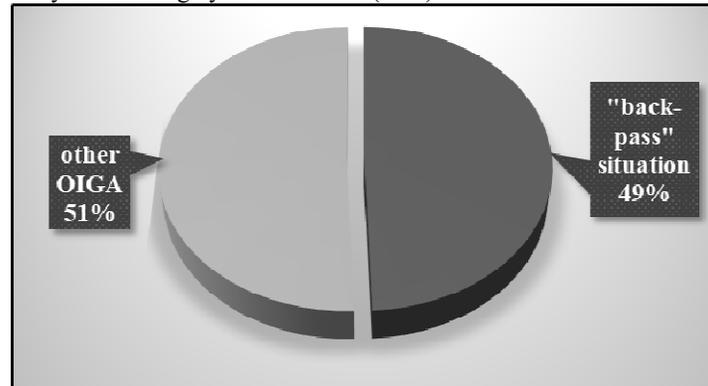

Figure 2 Percentage share of different solutions of the "back-pass" game situation on the implemented offensive game activities

Compared to other offensive individual game activities (OIGAs), the "back-pass" game situation represented up to 49%. The remaining OIGAs comprised 51%.
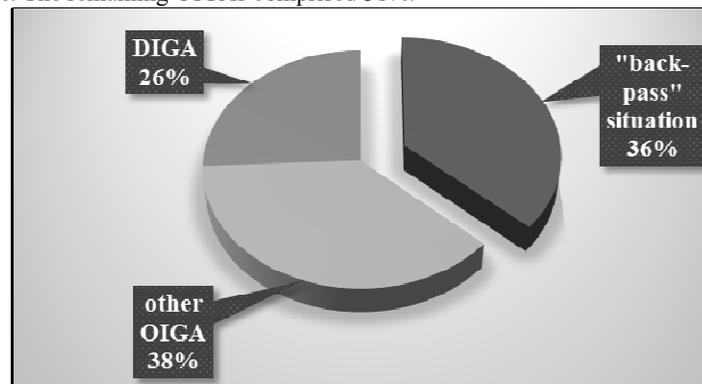

Figure 3 Percentage share of different solutions of the "back-pass" game situation on all implemented game activities

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Compared to all game activities was the game situation "back-pass" represented by up to 36%. Other OIGAs accounted for 38% and deffensive individual game activities (DIGAs) accounted for only 26%.

Comparison of the success rate of different ways of solving the "back-pass" game situation
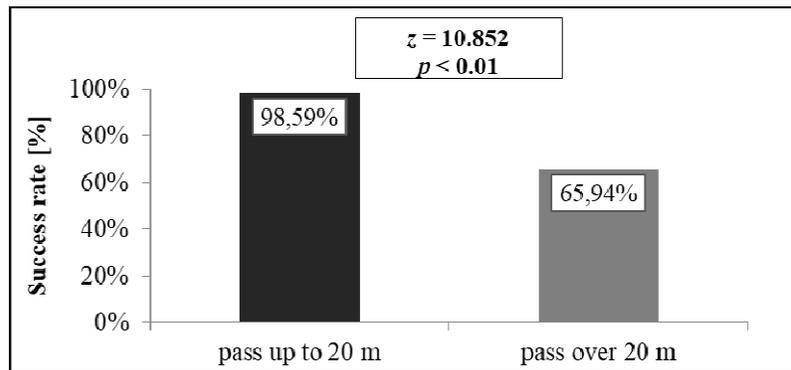

Figure 4 Comparison of the success rate of different ways of solving the "back-pass" game situation by passing the ball up to 20 m and passing the ball over 20 m

We found a statistically significant difference in the success rate of solving the "back-pass" situation between the passing the ball up to 20 m (98.59%) and the passing the ball over 20 m (65.94%), $z = 10.852$; $p < 0.01$.
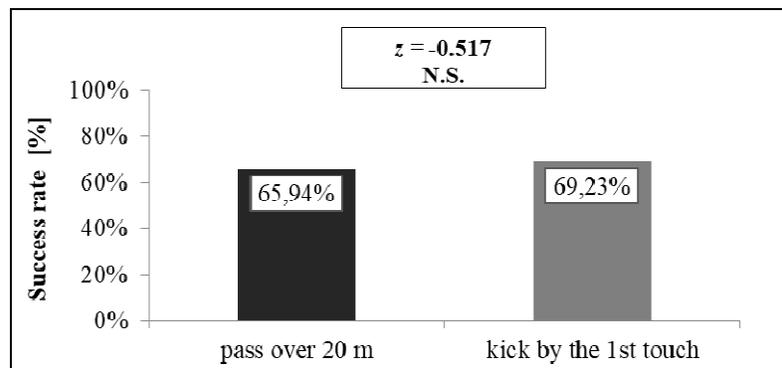

Figure 5 Comparison of the success rate of different ways of solving the "back-pass" situation by passing the ball over 20 m and kicking by the first touch

We did not find a statistically significant difference in the success rate of solving the "back-pass" situation between the passing the ball over 20 m (65.94%) and the kicking by the first touch (69.23%), $z = -0.517$; N.S.
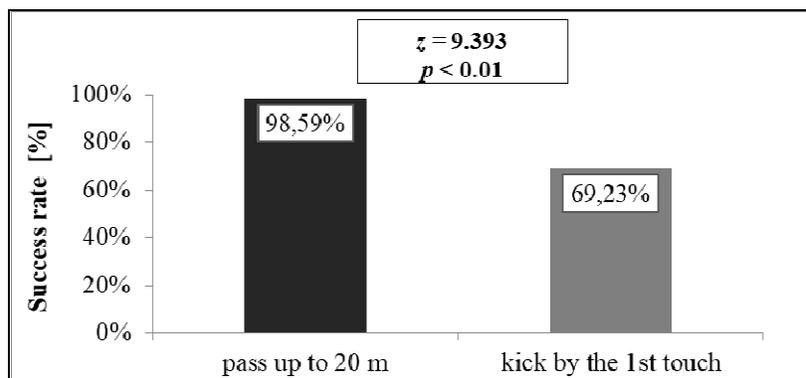

Figure 6 Comparison of the success rate of different ways of solving the "back-pass" game situation by passing the ball up to 20 m and kicking by the first touch

We found a statistically significant difference in the success rate of solving the "back-pass" situation between the passing the ball up to 20 m (98.59%) and the method of kicking it by the first touch (69.23%), $z = 9.393$; $p < 0.01$.

Discussion

The frequency of solving the "back-pass" game situation has recently increased and the demands placed on the quality of its implementation are also higher. Teams often use goalkeepers as the first players to start an attack, or goalkeepers participate in it with other players. Analyzes by some authors (Peráček et al. 2017; Čechovič 2018; Babic 2020b; Babic 2021) prove that the lowest success rate among offensive game activities is achieved by goalkeepers when solving a "back-pass" game situation.

This is also confirmed by the results of our research. We found that the goalkeepers achieved success rate of 85.11%, and there are also significant differences in the success rate of the individual methods. The passing of the ball up to 20 m (98.59%) was significantly ($p < 0.01$) more successful than the passing of the ball over 20 m (65.94%), as well as the first touch by kick (69.23%). Babic (2020a) also found similar differences in the success rate of individual ways of solving the "back-pass" situation. The success rate of the ball being passed up to 20 m was 95.20%, of the ball being passed over was 75.06% and by the first touch it was 79.17%. Babic (2021) found in his research similar success rate and states that the success rate of individual methods can be influenced mainly by the goalkeeper's level of technical skills, the distance to which the goalkeeper plays the ball and whether he is under time and space pressure, or more precisely under his opponent's pressure. Significant differences in the success rate of playing the ball with foot depending on the distance are also confirmed by the findings from the 2019 European U19 Championship (UEFA 2019a). These showed that with increasing distance, the success rate of playing the ball with the foot decreases, which is related to its difficult implementation. While the success rate of playing the ball to short or medium distance ranged from 80% to 91%, the average success rate of long-distance ball playing (more than 40 m) was only 64%. However, the frequency of this method is lower too. For example also at the 2019 European U17 Championship (UEFA 2019b) the goalkeepers preferred to play short or medium distance.

In more detailed research dealt with the solution of the game situation "back-pass" Holienka et al. (2017). They found out that it was represented by up to 56% in offensive game activities and by 33% in all game activities. In the study written by Babic et al. (2019) represented the solving of „back-pass" situation 40% of offensive game activities and 30% of all game activities. Similar results can be also found in other analyzes (Pažitka 2017; Peráček et al. 2017; Babic & Holienka 2018; Čechovič 2018; Holienka et al. 2018; Babic 2019; Pažitka 2019; Babic 2020a, 2020b; Křížek 2020), namely it ranges from 32% to 53% against other offensive game activities. These authors also found that the ratio to all implemented game activities ranges from 24% to 39%, so it can make up to 1/3 of the goalkeeper's game performance in a match.

Conclusions

We managed to confirm the fact that offensive game activities have a dominant representation in the goalkeeper's game during the match. We can also point out the increasing number and importance of success rate of solving the "back-pass" game situation. However, there are several different schools for goalkeepers
in the world that prefer the importance of different game activities of goalkeepers. The solving of the game situation called "back-pass" by goalkeepers during the match makes up in most cases 1/3 of their entire individual game performance. In some cases, this number is even slightly higher (up to 39%). We also found that there
are significant differences in the success rate of different ways of solving the "back-pass" situation.

Based on the results of our research, in training practice we recommend:
- to pay increased attention to the analysis of the solution of the game situation "back-pass" by the goalkeepers in a match,
- to pay increased attention to training and improving the solution of the game situation "back-pass" in the training process of goalkeepers,
- to focus in the training process, when practicing and improving the solution of the game situation "back-pass", mainly on those ways of solving it, in which goalkeepers achieve a lower percentage of success rate (passing the ball over 20 m, kicking by the first touch).

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