

NOTATIONAL ANALYSIS OF TOP UKRAINIAN KARATE FIGHTER STANISLAV HORUNA'S MATCHES IN WKF COMPETITIONS

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Abstract: The aim of this research was to conduct a video analysis of WKF matches featuring Stanislav Horuna, focusing on all match parameters that influenced his victories and defeats. The essence of this research is to analyze and compare the results achieved by this fighter and his opponents. The sample that was analyzed as part of this research consisted of top WKF kumite matches of Stanislav Horuna. More precisely, 12 fights from 2012-2020 in the senior - 75kg category are included. All variables were registered and tracked within each bout, using Lince multi-platform sports analysis software (Lince_1.21 version). The monitored variables were: the time of the action, the technique used during the attack or counterattack, the guard during the implementation of the scoring techniques, the type of points achieved and their frequency, the number and type of penalties received, the outcome of the match (winner and non-winner), the effectiveness of the techniques (scoring and non-scoring). By analyzing 12 matches of the Ukrainian fighter, it was recorded that the total number of his attacks was 203, and that 20 actions were goals (efficiency 9.85%). Gyaku zuki jodan was his the most common punch technique. On the other hand, the total number of all attacks by his opponents was 173, of which 20 were hits (efficiency 11.56%). This case study confirmed that by applying the score analysis of the matches of the top karate player Stanislav Horuna it can contribute a lot to the development of the way of fighting at the top level.

Keywords: Stanislav Horuna, WKF competitions, Karate performance, Ukraina

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Introduction

Karate is a form of martial art, a sport and a system of self-defense (Nakayama, 1978). In the form of sports, this skill is based on agonistics and competitions. The most famous and globally recognized federation in karate sport is the WKF (World Karate Federation). It was created in 1990 and it is the only karate organization that is accepted by the International Olympic Committee. The constant need of coaches to improve the performance of their competitors, especially in the "kumite" discipline, confirms the importance of notational analyzes of karate matches. Also, the fact that karate has become an Olympic sport since 2020 further motivates competitors to improve their quality and place themselves at the Olympic Games. Although karate has been excluded from the program of the 2024 Olympic Games, there is still a good chance that it will be included again in the future, giving practitioners an extra incentive to improve. A detailed analysis of karate matches provides essential information about many parameters on which success depends. These parameters are: techniques of attack and defense, attitudes, place of placing the blow, time of realization of the attack, behavior of fighters in different spatial and temporal situations, number of achieved points, number of realized penalties, total number of attempted and realized actions. Many authors have dealt with this type of analysis.

Researchers (Kapo & Kajmović, 2006; Koropanovski et al., 2008; Sertić et al., 2012; Vidranski et al., 2015) have found through the analysis of elite karate matches that the most common punch was *gyaku zuki*, and therefore it was the most effective. In the work of authors (Tabben et al., 2015; Alinaghipour et al., 2020), based on the results, it has been proven that the most applied hand punch among male and female individuals was *kizami zuki jodan*. Through detailed analysis of a large number of matches, Vidranski (2011) concluded in his study that *ipon* was the most frequently scored point. It was also found that victory achieved during regular match time was the most common. Ramasamy et al. (2014) analyzed karate matches and found that the percentage of successful counterattack with hands and legs was significantly higher among match winners. In the research conducted by Kurtović (2013), an analysis of attacking techniques concluded that *jodan* techniques were far more prevalent than *chudan* techniques. In their work, authors Laird et al. (2009) found that besides hand techniques, leg techniques were also significantly more applied in matches by winners. In a case study analyzing 20 matches of Rafael Aghayev in elite WKF competitions, it was concluded that the dominant hand technique for scoring points was *gyaku zuki*, while the most common leg technique was *mawashi gery chudan* (Birt, 2015).

Based on the authors' findings, there is a very small number of case study researches related to notation analysis of matches of a single karate competitor. Also, there is no

research tracking and analyzing the karate matches of Stanislav Horuna, an elite Ukrainian WKF karate fighter.

Therefore, the aim of this research was to conduct a video analysis of WKF matches featuring Stanislav Horuna, focusing on all match parameters that influenced his victories and defeats. The essence of this research is to analyze and compare the results achieved by this fighter and his opponents.

Methods

Research sample

The sample that was analyzed as part of this research consisted of top WKF kumite matches of Stanislav Horuna. Specifically, 12 fights from 2012-2020 in the senior - 75kg category are included, namely: 1 world, 2 European, 7 matches from the 1st Premier League, 1 match from the World Karate Games and 1 match from the European Karate Games. As part of these matches, 3 finals and one semi-final were analyzed, as well as one match for the bronze medal. Horuna is currently one of the best fighters in the senior - 75kg category, which is one of the strongest in the sport of karate. This is confirmed by the fact that it is one of the most massive categories in terms of the number of competitors, as well as the fact that some of the best karate fighters such as: Rafael Agajev and Luigi Busa are currently fighting in it. This Ukrainian karate player is currently holder of: a gold medal at the World Games, a gold medal at the European Games, a bronze medal at the World Championships, as well as two silver and three bronze medals at the European Championships.

Sample variables and method of data collection

The paper used the method of observation and detailed analysis of each individual kumite match. After collecting the video footage, the winning and non-winning karateka variables were registered and tracked within each bout, using Lince multi-platform sports analysis software (Lince_1.21 version). After that, all data were processed in Excel (Microsoft Excel, version 2010), and the type was finally transferred and tabulated in Word (Microsoft Word, version 2010). The monitored variables were: the time of the action, the technique used during the attack or counterattack, the guard during the implementation of the scoring techniques, the type of points achieved and their frequency, the number and type of penalties received, the outcome of the match (winner and non-winner), the effectiveness of the techniques (scoring and non-scoring). The examined variables are presented in Table 1.

Table 1. Display of monitored variables

CRITERION	CATEGORY
1. Fighter	1. Winner, 2. Non-winning.
2. Action time	1. 0-60 sond., 2. 60-120 sond, 3. 120-180 sond, 4. 180-240 sond. (the final), 5. 10 sond. till the end.
3. Efficiency	1. Point, 2. No points, 3. Penalty.
4. Score	1. Ipon, 2. Nihon, 3. Sanbon.
5. Penalty	1. Chukoku, 2. Keikoku, 3. Hansoku chui, 4. Hansoku, 5. Shikkaku.
6. Guard	1. Left, 2. Right, 3. Clinch.
7. Type of action	1. Attack, 2. Counter-Attack.
8. Techniques	KZj, KZc, GZj, GZc, UUj, MGj, MGc, MWGj, MWGc, AMWGj, UMWGj, AUMWGj, USMWGj, USMWGj, AYGj, AYGc, AB, NWZ.

Legend: **Ipon** - one point, **Nihon** - two points, **Sanbon** - three points, **Chukoku** - first warning, **Keikoku** - sond warning, **Hansoku chui** - third warning, **Hansoku** - penalty and disqualification from the match, **Shikkaku** - penalty and disqualification from the competition, **KZj** - kizami zuki jodan, **KZc** - kizami zuki chudan, **GZj** - gyaku zuki jodan, **GZc** - gyaku zuki chudan, **UUj** - uraken uchi jodan, **MGj** - mae gery jodan, **MGc** - mae gery chudan, **MWGj** - mawashi gery jodan, **MWGc** - mawashi gery chudan, **AMWGj** - ashi mawashi gery jodan, **UMWGj** - ura mawashi gery, **AUMWGj** - ashi ura mawashi gery jodan, **USMWGj** - ushiro mawashi gery jodan, **USMWGc** - ushiro mawashi gery chudan, **AYGj** - ashi yoko gery jodan, **AYGc** - ashi joko gery chudan, **AB** - ashi barai, **NWZ** - nage waza.

Data processing

A descriptive method was used to process the obtained data. Data are expressed in nominal and percentage values for each analyzed match separately.

Results

Based on the collected and processed data, Table 2 shows all the obtained parameters for each individual match. The efficiency of scoring actions realized as part of attacks and counterattacks by Horuna and its opponents is also shown in percentage.

Table 2. Obtained parameters for each individual match in the senior - 75kg category

FIGHTERS, TOURNAMENT AND YEAR	THE WINNER	NON-WINNING	ALL TECHNIQUES OF THE WINNER	ALL THE TECHNIQUES OF THE NON-WINNING
			name of the technique, type of action, guard and time of implementation	name of the technique, type of action, guard and time of implementation
1. Stanislav Horuna vs Ko Matsuhisa <i>WKF World Championship Paris 2012.</i>	Ko Matsuhisa 1. <u>Attack (a) and counterattack (ca):</u> attacks 10, counterattacks 3. 2. <u>Efficiency (% of scoring actions), technique, time of scoring and guard):</u> 23.08% , out of 13 actions 3 scoring: I) (KH) Ipon, GZj, 60-120 s., left. II) (a) Nihon, MWGc, 60-120 s., right, III). (a) Sanbon, AUMWGj, 120-180 s., left. 3. <u>Penalties number:</u> 3 penalties from the 2nd category: - chukoku, keikoku, hansoku chui.	Stanislav Horuna 1. <u>Attack (a) and counterattack (ca):</u> 16 attacks, 3 counterattacks. 2. <u>Efficiency (% of scoring actions), technique, time of scoring and guard):</u> 5.26% , out of 19 actions 1 scoring: I) (a) Sanbon, NWZ, 120-180 s., clinch; 3. <u>Penalties number:</u> 1 penalty from the 2nd category : - chukoku (2. cat.), - chukoku (1. cat.).	Ko Matsuhisa 1. KZj, (a), right, 0-60 s., 2. UMWGj, (a) clinch, 0-60 s., 3. MGc, (a), left, 0-60 s., 4. <u>GZj, (ca), left, 60-120 s.,</u> 5. UMWGj, (a), right, 60-120., 6. AB, (a), left, 60-120 s., 7. <u>MWGc, (a), right, 60-120 s.,</u> 8. GZj, (a), left, 120-180 s., 9. UMWGj, (a), clinch,120-180s., 10. KZc, (a), left, 120-180 s., 11. <u>AUMWGj, (a),left,120-180 s.,</u> 12. AYGc (a), left, 120-180 s., 13. AUMWGj (ca), left,120-180 s.	Stanislav Horuna 1. AMWGj, (ca),left, 0-60 s., 2. USMWGj, (ca),left, 0-60 s., 3. KZj, (ca),right, 60-120 s., 4. AB, (a), left, 60-120 s., 5. AUMWGj, (a), right,60-120 s., 6. AUMWGj, (a), right,60-120 s., 7. KZj, (a), left, 60-120 s., 8. AYGj, (a), right, 60-120 s., 9. AB, (a), right, 60-120 s., 10. AB, (a), left, 120-180 s., 11. MWGc, (a), right, 120-180 s., 12. USMWGj, (a), left,120-180 s., 13. <u>NWZ, (a), clinch 120-180 s.,</u> 14. NWZ, (a), clinch 120-180 s., 15.AUMWGj,(a), clinch120-180s., 16. NWZ, (a), clinch 120-180 s., 17. USMWGj, (a), left, 10 s. Left, 18. USMWGj, (a), right,10 s. Left, 19. USMWGj, (a), left, 10 s. Left.
2. Rafael Aghayev vs Stanislav Horuna,	Rafael Aghayev 1. <u>Attack (a) and counter attack (ca):</u> attacks 11,	Stanislav Horuna 1. <u>Attack (a) and counter attack (ca):</u> 18 attacks ,	Rafael Aghayev 1. GZj, (a), right, 60-120 s., 2. GZj, (a), right, 60-120 s., 3. GZj, (ca),right, 60-120 s.,	Stanislav Horuna 1.UMWGj, (a), left, 0-60 s., 2. AB, (a), right, 0-60 s., 3. AMWGj, (a), right, 0-60 s.,

1. Premier League Final Tiananmen 2013.	counterattacks 2. 2. Efficiency (% of scoring actions), technique, time of scoring and guard): 15.38%, out of 13 actions 2 scoring: I) (a) Sanbon, UMWGj, 60-120 s., clinch. II) (a) Ipon, GZj, 180-240 s., right. 3. Penalties number: 1 penalty from the 2nd and one from the 1st category: - chukoku (2. cat.), - chukoku (1. cat.).	2 counterattacks. 2. Efficiency (% of scoring actions), technique, time of scoring and guard): 0%, out of 20 actions 0 scoring. 3. Penalties number: 3 from the 2nd category: - chukoku, keikoku, hansoku chui.	4. GZj, (a), right, 60-120 s., 5. UMWGj, (a), clinch, 60-120 s., 6. GZc, (a), right, 60-120 s., 7. NWZ, (ca), left, 120-180 s., 8. GZj, (ca), right, 120-180 s., 9. KZj, (a), left, 120-180 s., 10. GZj, (a), right, 120-180 s., 11. MWGc, (a), left, 120-180 s., 12. KZj, (a), left, 120-180 s., 13. GZj, (a), right, 180-240 s.	4. NWZ, (a), right, 0-60 s., 5. MWGc, (a), right, 60-120 s., 6. GZc, (ca), left, 60-120 s., 7. NWZ, (a), left, 60-120 s., 8. KZj, (a), right, 60-120 s., 9. NWZ, (a), right, 60-120 s., 10. UMWGj, (ca), left, 60-120 s., 11. USMWGj, (a), left, 120-180s., 12. AB, (a), right, 120-180 s., 13. NWZ, (a), right, 120-180 s., 14. AMWGj, (a), right, 120-180 s., 15. NWZ, (a), left, 120-180 s., 16. KZj, (a), left, 120-180 s., 17. MWGc (a), left, 120-180 s., 18. GZj (a), right, 120-180 s., 19. AMWGj, (a), left, 10 s. Left, 20. KZj, (a), left, 10 s. Left.
3. Stanislav Horuna vs Luigi Busa, WKF European Championship final, Tampere 2014.	Luigi Busa 1. Attack (a) and counter attack (ca): attacks 5, counterattacks 0. 2. Efficiency (% of scoring actions), technique, time of scoring and guard): 40%, out of 5 actions 2 scoring: I) (a) Ipon, UU, 120-180 s., right. II) (a) Ipon, GZj, 180-240 s., right. 3. Penalties number: 3 penalties from the 2nd category: - chukoku, keikoku, hansoku chui.	Stanislav Horuna 1. Attack (a) and counter attack (ca): 8 attacks, 3 counterattacks. 2. Efficiency (% of scoring actions), technique, time of scoring and guard): 9.09%, out of 11 actions 1 scoring: I) (ca) Ipon, GZc, 120-180 s., left 3. Penalties number: 2 from the 2nd category: - chukoku, keikoku.	Luigi Busa 1. KZj, (a), right, 120-180 s., 2. GZj, (a), right, 120-180 s., 3. UUj, (ca), right, 120-180 s., 4. GZj, (a), right, 120-180 s., 5. GZj, (a), right, 120-180 s.	Stanislav Horuna 1. MWGc, (a), left, 0-60 s., 2. KZj, (a), right, 60-120 s., 3. USMWGc, (a), left, 120-180 s., 4. GZj, (a), right, 120-180 s., 5. AMWGj, (ca), right, 120-180 s., 6. GZc, (ca), left, 120-180 s., 7. MWGc, (a), left, 10 s. Left., 8. GZc, (ca), left, 180-240 s., 9. MWGc, (a), left, 10 s. Left., 10. USMWGj, (a), right, 10 s. Left., 11. NWZ, (a), clinch, 10 s. Left.
4. Davy Dona vs Stanislav Horuna, 1. Premier League, Paris Open 2014.	Stanislav Horuna 1. Attack (a) and counter attack (ca): attacks 20, counterattacks 1. 2. Efficiency (% of scoring actions), technique, time of scoring and guard): 9.52%, out of 21 actions 2 scoring: I) (ca) Ipon, GZj, 0-60 s., left. II) (a) Ipon, KZj, 60-120 s., right. 3. Penalties number: 1 penalty from the 2nd category: - chukoku.	Davy Dona 1. Attack (a) and counter attack (ca): 17 attacks, 4 counterattacks. 2. Efficiency (% of scoring actions), technique, time of scoring and guard): 0%, out of 21 actions, 0 scored. 3. Penalties number: 3 from the 2nd category: - chukoku, keikoku, hansoku chui.	Stanislav Horuna 1. GZj, (ca), left, 0-60 s., 2. AB, (a), left, 0-60 s., 3. MWGc, (a), left, 0-60 s., 4. AMWGj, (a), left, 0-60 s., 5. MWGc, (a), clinch, 0-60 s., 6. AB, (a), left, 0-60 s., 7. MWGj, (a), clinch, 0-60 s., 8. MWGj, (a), clinch, 60-120 s., 9. AB, (a), right, 60-120 s., 10. KZj, (a), right, 60-120 s., 11. USMWGj, (a), left, 60-120 s., 12. KZj, (a), right, 60-120 s., 13. NWZ, (a), clinch, 60-120 s., 14. MWGc, (a), left, 60-120 s., 15. AMWGj, (a), right, 120-180 s., 16. USMWGj, (a), left, 120-180 s., 17. NWZ, (a), clinch, 120-180 s., 18. MWGj, (a), right, 120-180 s., 20. USMWGj, (a), left, 120-180 s., 20. KZj, (a), left, 120-180 s., 21. NWZ, (a), clinch, 120-180 s.,	Davy Dona 1. AMWGj, (a), left, 0-60 s., 2. GZj, (ca), left, 0-60 s., 3. GZj, (ca), left, 0-60 s., 4. MWGc, (a), left, 60-120 s., 5. KZj, (a), right, 60-120 s., 6. GZj, (a), left, 60-120 s., 7. MWGj, (ca), left, 60-120 s., 8. NWZ, (a), clinch, 60-120 s., 9. NWZ, (a), clinch, 120-180 s., 10. GZj, (a), clinch, 120-180 s., 11. GZj, (a), clinch, 120-180 s., 12. KZj, (a), left, 120-180 s., 13. GZj, (a), left, 120-180 s., 14. MWGc, (a), clinch, 120-180 s., 15. MWGc, (a), left, 120-180 s., 16. NWZ, (a), clinch, 120-180 s., 17. KZj, (a), clinch, 120-180 s., 18. GZj, (ca), left, 120-180 s., 19. GZj, (a), left, 120-180 s., 20. MWGc, (a), left, 120-180 s., 21. MWGj, (a), clinch, 10 s. Left.

5. Stanislav Horuna vs Ali Asghar Asiabari, <i>World Karate Games in Wrocław 2017.</i>	Stanislav Horuna <u>1. Attack (a) and counter attack (ca):</u> attacks 15, counterattacks 7. <u>2. Efficiency (% of scoring actions), technique, time of scoring and guard):</u> 9.52%, out of 21 actions 2 scoring: I) (ca) Ipon, GZj, 120-180 s., right. II) (a) Sanbon, USMWGj, 120-180 s., left. <u>3. Penalties number:</u> 1 penalty from the 2nd and one from the 1st category: - chukoku (2. cat.); - chukoku (1. cat.).	Ali Asghar Asiabari <u>1. Attack (a) and counter attack (ca):</u> 17 attacks, 2 counterattacks. <u>2. Efficiency (% of scoring actions), technique, time of scoring and guard):</u> 10.53%, out of 19 actions 2 scoring: I) (a) Ipon, KZj, 0-60 s., left. II) (a) Ipon, KZj, 0-60 s., left. 60-120 s., left. <u>3. Penalties number:</u> 1 penalty from the 2nd and one from the 1st category: - chukoku (2. cat.); - chukoku (1. cat.).	Stanislav Horuna 1. AMWGj, (ca),right, 0-60 s., 2. KZj (ca),left, 0-60 s., 3. AB, (a), right, 0-60 s., 4. MWGc, (a), right, 0-60 s., 5. GZc, (ca),right, 0-60 s., 6. AB, (a), right, 0-60 s., 7. GZc, (ca),left, 60-120 s., 8. AMWGj, (a), left, 60-120 s., 9. AB, (ca),left, 60-120 s., 10. GZj, (ca),right, 60-120 s., 11. UMWGj, (a), left, 60-120 s., 12. MWGc, (a), left, 60-120 s., 13. GZj, (a), right, 60-120 s., 14. GZj, (a), right, 60-120 s., 15. AB, (a), left, 120-180 s., 16. GZj, (ca), right, 120-180 s., 17. UMWGj,(a), left, 120-180 s., 18. GZj, (a), right, 120-180 s., 19. GZj, (a), left, 120-180 s., 20. USMWGj, (a), left, 120-180 s., 21. KZj, (a), left, 10 s. Left.	Ali Asghar Asiabari 1. AMWGj, (a), left, 0-60 s., 2. KZj, (a), left, 0-60 s., 3. AMWGj, (ca), left, 0-60 s., 4. AB, (a), left, 0-60 s., 5. MWGc, (a), right, 0-60 s., 6. GZc, (a), left, 60-120 s., 7. KZj, (a), left, 60-120 s., 8. AB, (a), left, 60-120 s., 9. KZj, (a), left, 60-120 s., 10. MWGc, (a), right, 60-120 s., 11. KZj, (a), left, 60-120 s., 12. KZj, (a), left, 120-180 s., 13. AMWGj, (a), left, 120-180 s., 14. AMWGj, (a), left, 120-180 s., 15. KZj, (a), left, 120-180 s., 16. KZj,(a), left, 120-180 s., 17. GZj, (a), left, 120-180 s., 18. MWGj, (a), right, 120-180 s., 19. MWGj, (a), left, 10 s. Left.
6. Enes Garibović vs Stanislav Horuna, <i>European Championshi, Novi Sad 2018.</i>	Stanislav Horuna <u>1. Attack (a) and counter attack (ca):</u> attacks 7, counterattacks 6. <u>2. Efficiency (% of scoring actions), technique, time of scoring and guard):</u> 7.69%, out of 13 actions 1 scoring: I) (a) Ipon, GZj, 0-60 s., right. <u>3. Penalties number:</u> 2 penalties from the 2nd category: - chukoku, keikoku.	Enes Garibović <u>1. Attack (a) and counter attack (ca):</u> 22 attacks, 2 counterattacks. <u>2. Efficiency (% of scoring actions), technique, time of scoring and guard):</u> <i>noena u zapò:</i> 0%, out of 24 actions 0 scoring. <u>3. Penalties number:</u> 2 penalties from the 2nd category: - chukoku, keikoku.	Stanislav Horuna 1. GZj, (a), right, 0-60 s., 2. GZj (a), clinch, 0-60 s., 3. AUMWGj, (ca),right, 0-60 s., 4. GZj, (ca),right, 120-180 s., 5. KZj, (a), right, 120-180 s., 6. KZj, (ca),left, 120-180 s., 7. UMWGj, (a), clinch,120-180 s., 8. MWGc, (a), right, 120-180 s., 9. NWZ, (a), clinch, 120-180 s., 10. USMWGj, (ca), left,120-180 s., 11. KZj, (ca), right, 120-180 s., 12. GZj, (ca), left, 10 s. Left, 13. GZj, (ca), right, 10 s. Left.,	Enes Garibović 1. KZj, (a), left, 0-60 s., 2. GZj, (a), left, 0-60 s., 3. GZj, (ca),left, 60-120 s., 4. GZj, (a), left, 60-120 s., 5. KZj, (a),left, 60-120 s., 6. GZj, (a), left, 60-120 s., 7. GZj, (a), left, 60-120 s., 8. UGc, (a), left, 60-120 s., 9. GZj, (ca),left, 60-120 s., 10. KZj, (a),left, 60-120 s., 11. GZj, (a), left, 60-120 s., 12. GZj, (a), right, 60-120 s., 13. UGc, (a), left, 120-180 s., 14. KZj, (a), left, 120-180 s., 15. MWGc, (a), left, 120-180 s., 16. GZj,(a), left, 120-180 s., 17. MWGc, (a), left, 120-180 s., 18. GZj, (a), left, 120-180 s., 19. KZj, (a), left, 120-180 s., 20. MWGc, (a), left, 120-180 s., 21. GZj, (a), left, 120-180 s., 22. UGc, (a), left, 10 s. Left, 23. GZj, (a), left, 10 s. Left, 24. MWGj, (a), left, 10 s. Left.
7. Stanislav Horuna vs Rafael Aghayev, <i>WKF final of the European Games in Minsk 2019.</i>	Stanislav Horuna <u>1. Attack (a) and counter attack (ca):</u> attacks 7, counterattacks 6. <u>2. Efficiency (% of scoring actions), technique, time of scoring and guard):</u> 10.52%, out of 19 actions 2 scoring: I) (a) Ipon, GZj, 120-180 s., right. II) (a) Sanbon, USMWGj, 120-180 s., right. <u>3. Penalties number:</u> 0 penalties.	Rafael Aghayev <u>1. Attack (a) and counter attack (ca):</u> 9 attacks, 1 counterattacks. <u>2. Efficiency (% of scoring actions), technique, time of scoring and guard):</u> 0%, out of 10 actions 0 scoring. <u>3. Penalties number:</u> 2 penalties from the 2nd category: - chukoku, keikoku.	Stanislav Horuna 1. KZj, (a), right, 0-60 s., 2. AUMWGj (a), clinch, 0-60 s., 3. MWGc, (a), left, 60-120 s., 4. KZj, (a), right, 60-120 s., 5. GZj, (a), right, 120-180 s., 6. AB, (a), right, 120-180 s., 7. USMWGj,(a), right, 120-180 s., 8. NWZ, (a), left, 120-180 s., 9. GZj, (ca),right, 180-240 s., 10. KZj, (a), right, 180-240 s., 11. KZj, (a), right, 180-240 s., 12. UMWGj, (a), left,180-240 s., 13. GZj, (a), right, 180-240 s., 14. KZj, (a), right, 180-240 s., 15. USMWGj,(a), left, 180-240 s., 16. AUMWGj,(ca), right, 180-240s., 17. MWGc, (a), right, 180-240 s., 18. USMWGj,(a),left,180-240 s., 19. KZj, (ca),left, 180-240 s.	Rafael Aghayev 1. KZj, (a), right, 0-60 s., 2. GZj, (a), right, 0-60 s., 3. MWGc, (a), left, 0-60 s., 4. KZj, (ca),left, 120-180 s., 5. KZj, (a), right, 120-180 s., 6. GZj, (a), right, 120-180 s., 7. AB, (a), left, 120-180 s., 8. MWGc, (a), left, 120-180 s., 9. KZc, (a), right, 120-180 s., 10. NWZ, (a), right, 10 s. Left.

8. Yassine Souri vs Stanislav Horuna 1. Tokyo Premier League 2019, bronze medal match	Stanislav Horuna 1. <u>Attack (a) and counter attack (ca):</u> attacks 10, 0 counterattacks. 2. <u>Efficiency (% of scoring actions), technique, time of scoring and guard):</u> 10%, out of 10 actions 1 scoring: I) (a) Sanbon, USMWGj, 10 сек до κ, left. 3. <u>Penalties number:</u> 2 penalties from the 2nd category: - chukoku, keikoku.	Yassine Souri 1. <u>Attack (a) and counter attack (ca):</u> 3 attacks, 4 counterattacks 2. <u>Efficiency (% of scoring actions), technique, time of scoring and guard):</u> 0%, out of 7 actions 0 scoring: 3. <u>Penalties number:</u> 3 penalties from the 2nd category: - chukoku, keikoku, hansoku chui.	Stanislav Horuna 1. UMWGj, (a), left, 0-60 s., 2. GZc (a), left, 0-60 s., 3. AB, (a), left, 60-120 s., 4. MWGj, (a), left, 60-120 s., 5. MWGc, (a), left, 120-180 s., 6. NWZ, (a), clinch, 120-180 s., 7. AB, (a), left, 120-180 s., 8. GZc, (a), left, 10 s. Left, 9. MWGc, (a), left, 10 s. Left, 10. USMWGj, (a), left, 10 s. Left.	Yassine Souri 1. AMWGj, (ca),right, 60-120 s., 2. GZc, (ca),right, 120-180 s., 3. AMWGj,(ca),right,120-180 s., 4. AMWGj, (a), right, 60-120 s., 5. GZj, (ca),right, 10 s. Left, 6. GZj, (a), right, 10 s. Left, 7. AMWGj, (a), right, 10 s. Left.
9. Ken Nishimura vs Stanislav Horuna, Semi finals 1. Premier League, Paris 2019	Ken Nishimura 1. <u>Attack (a) and counter attack (ca):</u> attacks 8, counterattacks 2. 2. <u>Efficiency (% of scoring actions), technique, time of scoring and guard):</u> 10%, out of 10 actions 1 scoring: I) (a) Sanbon, AUMWGj, 120-180 s., clinch. 3. <u>Penalties number:</u> 3 penalties from the 2nd category: - chukoku, keikoku, hansoku chui.	Stanislav Horuna 1. <u>Attack (a) and counter attack (ca):</u> 12 attacks, 0 counterattacks. 2. <u>Efficiency (% of scoring actions), technique, time of scoring and guard):</u> 0%, out of 12 actions 0 scoring. 3. <u>Penalties number:</u> 2 penalties from the 2nd category: - chukoku, keikoku.	Ken Nishimura 1. USMWGj, (ca), left, 0-60 s., 2. AMWGj (a), right, 60-120 s., 3. GZj, (ca), left, 120-180 s., 4. KZj, (a), left, 120-180 s., 5. GZj, (a), left, 120-180 s., 6. KZj, (a), left, 120-180 s., 7. AUMWGj, (a), clinch, 120-180s., 8. GZj, (a), left, 120-180 s., 9. AMWGj,(a), right, 120-180 s., 10. KZj, (a), left,10 s. Left.	Stanislav Horuna 1. AB, (a), left, 0-60 s., 2. MGc, (a), right, 0-60 s., 3. AB,(a), right, 0-60 s., 4. MWGj, (a), left, 60-120 s., 5. AB, (a), right, 120-180 s., 6. MWGc, (a), right, 120-180 s., 7. GZj, (a), right, 120-180 s., 8. AB, (a), left, 120-180 s., 9. AYGe, (a), right, 10 s. Left, 10. USMWGj,(a), right,10 s. Left, 11.MWGc, (a), left, 10 s. Left, 12. AMWGj, (a), left, 10 s. Left.
10. Stanislav Horuna vs Ali Ashgar Asiabari, 1. Premier League, Rabat 2019.	Stanislav Horuna 1. <u>Attack (a) and counter attack (ca):</u> attacks 11, counterattacks 9. 2. <u>Efficiency (% of scoring actions), technique, time of scoring and guard):</u> 35%, out of 20 actions 7 scoring: I) (ca) Ipon, GZj, 0-60 s., left, II) (ca) Ipon, GZj, 60-120 s., left, III) (a) Sanbon, USMWGj, 60-120 s., left, IV) (ca) Ipon, GZj, 120-180 s., left, V) (a) Ipon, GZj, 120-180 s., left, VI) (ca) Ipon, GZj, 10 s. Left, left, VII) (ca) Ipon, GZj, 10 s Left, left. 3. <u>Penalties number:</u> 0 penalties.	Ali Ashgar Asiabari 1. <u>Attack (a) and counter attack (ca):</u> 16 attacks, 2 counterattacks. 2. <u>Efficiency (% of scoring actions), technique, time of scoring and guard):</u> 33.33%, out of 18 actions 6 scoring: I) (a) Ipon, KZj, 0-60 s., left, II) (a) Ipon, KZj, 60-120 s., left, III) (a) Ipon, KZj, 60-120 s., left, IV) (a) Ipon, KZj, 120-180 s., left, V) (a) Sanbon, AMWGj, 120-180 s., left, VI) (a) Ipon, KZj, 10 s Left., left. 3. <u>Penalties number:</u> 1 penalty from the 2nd category: - hansoku chui.	Stanislav Horuna 1. AB, (a), right, 0-60 s., 2. AUMWGj (ca),left, 0-60 s., 3. AMWGc, (a), left, 0-60 s., 4. MWGc, (a), left, 0-60 s., 5. GZj, (ca),left, 60-120 s., 6. MWGc, (a), right, 60-120 s., 7. USMWGj, (ca),right, 60-120s., 8. GZj, (ca),left, 60-120 s., 9. AYGe,(a), right, 60-120 s., 10. AB, (a), left, 120-180 s., 11. USMWGj, (a), right, 120-180s., 12. GZj, (ca), right, 120-180 s., 13. GZj, (a), right, 120-180 s., 14. GZj, (ca), clinch, 120-180 s., 15. GZj, (ca), right, 10 s. Left, 16. AUMWGj,(ca),right, 10 s Left, 17. GZj, (ca),clinch, 10 s. Left, 18. NWZ, (a), left, 10 s. Left, 19. GZj, (ca),right, 10 s. Left, 20. KZj (a), right, 10 s. Left.	Ali Ashgar Asiabari 1. KZj, (a), left, 0-60 s., 2. KZj, (a), left, 0-60 s., 3. MWGc, (ca),right, 0-60 s., 4. AB, (a), left, 60-120 s., 5. KZj, (a), left, 60-120 s., 6. KZj, (a), left, 60-120 s., 7. AMWGj, (a), left, 60-120 s., 8. NWZ, (ca),left, 0-60 s., 9. KZj, (a), left, 120-180 s., 10. MWGj, (a), left, 120-180 s., 11. AMWGj, (a),left, 120-180 s., 12. AB, (a), left, 10 s. Left, 13. KZj, (a), left, 10 s. Left, 14. KZj, (a), left, 10 s. Left, 15. AMWGc, (a), left, 10 s. Left, 16. AMWGj, (a), clinch, 10 s. Left, 17. KZj, (a), left, 10 s. Left, 18. KZj, (a), right, 10 s. Left.

11. Scott Thomas vs Stanislav Horuna, <i>1. Premier League, Dubai 2019.</i>	Scott Thomas <u>1. Attack (a) and counter attack (ca):</u> 11 attacks, 2 counterattacks. <u>2. Efficiency (% of scoring actions), technique, time of scoring and guard):</u> 15.38%, out of 13 actions 2 scoring. I) (a) Ipon, GZj, 0-60 s., left. II) (a) Ipon, KZj, 120-180 s., right. <u>3. Penalties number:</u> 1 penalty from the 2nd category: - chukoku.	Stanislav Horuna <u>1. Attack (a) and counter attack (ca):</u> 13 attacks, 4 counterattacks. <u>2. Efficiency (% of scoring actions), technique, time of scoring and guard):</u> 0%, out of 17 actions 0 scoring. <u>3. Penalties number:</u> 0 penalties.	Scott Thomas 1. AMWGj, (a), left, 0-60 s., 2. GZj (a), left, 0-60 s., 3. MWGc, (a), right, 60-120 s., 4. KZj, (a), right, 60-120 s., 5. MWGc, (a), right, 60-120 s., 6. KZj, (ca), right, 60-120 s., 7. GZj, (a), right, 120-180 s., 8. KZj, (a), right, 120-180 s., 9. AB, (a), right, 120-180 s., 10. KZj, (a), right, 120-180 s., 11. MWGc, (a), right, 120-180 s., 12. GZj, (a), right, 120-180 s., 13. GZj, (ca),right, 10 s. Left.	Stanislav Horuna 1. MWGc, (a), right, 0-60 s., 2. GZj, (ca),left, 0-60 s., 3. AB,(ca),left, 0-60 s., 4. AB, (a), right , 0-60 s., 5. USMWGj, (a), right, 60-120 s., 6. GZc, (ca),left, 60-120 s., 7. GZj, (a), right, 60-120 s., 8. GZc, (a), left, 60-120 s., 9. KZj, (a), right, 120-180 s., 10. MWGc, (a), right, 120-180 s., 11. MWGc, (a),right, 120-180s., 12. GZj,(ca),left, 120-180 s., 13. MWGc, (a), right, 10 s. Left, 14. MWGc, (a), right, 10 s. Left, 15. MWGc, (a), left, 10 s. Left, 16. GZj, (a), right, 10 s. Left, 17. USMWGj, (a), right, 10 s. Left.
12. Abdelaziz Abdalla vs Stanislav Horuna, <i>Serie A, Santiago 2020.</i>	Abdelaziz Abdalla <u>1. Attack (a) and counter attack (ca):</u> 18 attacks, 2 counterattacks. <u>2. Efficiency (% of scoring actions), technique, time of scoring and guard):</u> 10%, out of 20 actions 2 scoring: I) (ca) Sanbon, AUMWGj, 120-180 s., left. II) (a) Ipon, GZj, 10 s., Left., left. <u>3. Penalties number:</u> 3 penalties from the 2nd category: - chukoku, hansoku chui (2. cat.); - hansoku chui (1.cat.).	Stanislav Horuna <u>1. Attack (a) and counter attack (ca):</u> 6 attacks, 14 counterattacks. <u>2. Efficiency (% of scoring actions), technique, time of scoring and guard):</u> 15%, out of 20 actions 3 scoring: I) (ca), Ipon, KZj, 60-120 s., right. II) (ca), Ipon, GZj, 60-120 s., right, III) (ca), GZj, 10 s. Left., right. <u>3. Penalties number:</u> 1 penalty from the 1st category and 3 from the 2nd category: - chukoku, keikoku, hansoku chui (2. cat.); - keikoku (1. cat.).	Abdelaziz Abdalla 1. GZj (a), left, 0-60 s., 2. KZj (a), left, 0-60 s., 3. GZj (ca),left, 60-120 s., 4. KZj, (a), left, 60-120 s., 5. GZc (a), left, 60-120 s., 6. KZj, (a), left, 60-120 s., 7. KZj, (a), left, 120-180 s., 8. GZj (a), left, 120-180 s., 9. KZj, (a), left, 120-180 s., 10. AUMWGj,(a),left,120-180 s., 11. GZj (a), left, 120-180 s., 12. GZj, (a), left, 120-180 s., 13. GZj, (a), left, 120-180 s., 14. GZj, (a), left, 120-180 s., 15. KZj, (a), left, 120-180 s., 16. GZj, (a), left, 120-180 s., 17. AUMWGj, (ca), left, 120-180 s., 18. KZj, (a), left, 10 s., Left, 19. GZj, (a), left, 10 s., Left, 20. GZj, (ca),left, 10 s., Left.	Stanislav Horuna 1. AUMWGj, (ca),right, 0-60 s., 2. AUMWGj, (ca),right, 0-60 s., 3. AB, (a), right, 60-120 s., 4. NWZ, (a), left, 60-120 s., 5. AUMWGj, (ca),right, 60-120s., 6. MWGc, (a), right, 60-120 s., 7. GZj, (ca), left, 60-120 s., 8. AB, (ca),left, 60-120 s., 9. KZj, (ca),right, 60-120 s., 10. AB, (a), right, 60-120 s., 11. AYGc, (ca),right, 120-180 s., 12. GZj, (ca),right, 120-180 s., 13. GZj, (ca),right, 120-180 s., 14. KZj, (a), left, 120-180 s., 15. AUMWGj,(ca),right,120-180 s., 16. AUMWGj,(ca),right,120-180 s., 17. GZj, (ca), right, 120-180 s., 18. AUMWGj,(ca),right,120-180 s., 19. GZj, (a), right, 120-180 s., 20. GZj, (ca), right, 10 s. Left.

Legend: (a) - attack; (ca) - counterattack; cat - category; left - left guard; Left - time remaining until the end of the match; s. - second.

The table clearly shows all the analyzed parameters, as well as the efficiency of the scoring actions of Stanislav Horuna and his opponents. By analyzing 12 matches of the Ukrainian fighter, it was recorded that the total number of his attacks was 203, and that 20 actions were goals. This means that its overall efficiency was 9.85%. On the other hand, the total number of all attacks by his opponents was 173, of which 20 were hits. This means that their efficiency was 11.56%. If we look at the gyaku zuki jodan technique and compare the shots placed and realized in all matches, the table shows that the total number of attempts by Horuna was 35, of which 12 shots were scored, which is 34.28% efficiency. By observing the guard from which scoring techniques were performed, it was established that both guards were used (9k right and 11k left). When it comes to leg technique, all the points scored were performed in the area

of the jodan, and as for the time of performance, they were all performed in the sond half. Looking at the punishments in table 2, it is clearly seen that the total number of punishments awarded to the Ukrainian fighter was 16, of which the largest number is from the 2nd category. More precisely, they are mostly rewarded for inactivity in the fight, as well as for pulling and pushing in the clinch. A percentage comparison of all the actions of Horuna and its opponents individually in each match is also presented (Table 3).

Table 3. Percentage comparison of scoring attacks between Horuna and his opponents, as well as a comparison of realized attack techniques

Fighters, tournament and year	Realized scoring techniques		Total number of points scored in the match	The percentage efficiency of realized scoring techniques
	Horuna	Matsuhisa		
1. <i>Stanislav Horuna vs Ko Matsuhisa, WKF World Championship Paris 2012.</i>	1. NWZ- Sanbon	1. GZj- Ipon 2. MWGc- Nihon 3. AUMWGj-Sanbon	Horuna= 3 Matsuhisa= 4	Horuna: 1. NWZ= 33.33%, 3(at), 1(r); Matsuhisa: 1. GZj= 50%, 2(at), 1(r); 2. MWGc= 100%, 1(at), 1(r); 3. AUMWGj= 50%, 2(at), 1(r).
2. <i>Rafael Aghayev vs Stanislav Horuna, 1 Premier League Final Tiananmen 2013.</i>	1. /	1. UMWGj- Sanbon 2. GZj- ipon	Horuna= 0 Aghayev= 4	Horuna: 1. / Aghayev: 1. UMWGj=100%, 1(at), 1(r); 2. GZj=14.28%, 7(at), 1(r).
3. <i>Stanislav Horuna vs Luigi Busa, WKF European Championship final, Tampere 2014.</i>	1. GZc- Ipon	1. UUj- Ipon 2. GZj- Ipon	Horuna= 1 Busa= 2	Horuna: 1. GZc= 50%, 2(at), 1(r); Busa: 1. UUj=100%, 1(at), 1(r); 2. GZj=33.33%, 3(at), 1(r).
4. <i>Davy Dona vs Stanislav Horuna, 1. Premier League, Paris Open 2014</i>	1. GZj- Ipon 2. KZj- Ipon	1. /	Horuna= 3 Dona= 0	Horuna: 1. GZc= 100%, 1(at), 1(r); 2. KZj= 33.33%, 3(at), 1(r); Dona: 1. /.
5. <i>Stanislav Horuna vs Ali Asghar Asiabari, World Karate Games in Wroclaw 2017.</i>	1. GZj- Ipon 2. USMWGj-Sanbon	1. 2x KZj- Ipon	Horuna= 3 Asiabari= 2	Horuna: 1. GZj= 16.66%, 6(at), 1(r); 2. USMWGj= 100%, 1(at), 1(r); Asiabari: 1. KZj= 28.57%, 7(at), 2(r).
6. <i>Enes Garibović vs Stanislav Horuna, European Championship, Novi Sad 2018.</i>	1. GZj- Ipon	1. /	Horuna= 3 Garibović= 0	Horuna: 1. GZj= 20%, 5(at), 1(p); Garibović: 1. /.
7. <i>Stanislav Horuna vs Rafael Aghayev, WKF finals of European players in Minsk 2019.</i>	1. GZj- Ipon 2. USMWGj- Sanbon	1. /	Horuna= 4 Aghayev= 0	Horuna: 1. GZj= 33.33%, 3(at), 1(r); 2. USMWGj= 33.33%, 3(at), 1(r); Aghayev: 1. /.

8. <i>Yassine Sekurei vs Stanislav Horuna</i> 1. Tokyo Premier League 2019, bronze medal match	Horuna	Sekurei	Horuna= 3 Sekurei= 0	Horuna: 1. <i>USMWGj</i> = 100%, 1(at), 1(r); Sekurei: 1. /.
	1. <i>USMWGj</i> - Sanbon	1. /		
9. <i>Ken Nishimura vs Stanislav Horuna</i> , semi-final 1. Premier League, Paris 2019.	Horuna	Nishimura	Horuna= 0 Nishimura= 3	Horuna: 1. / Nishimura: 1. <i>AUMWGj</i> = 100%, 1(at), 1(r).
	1. /	1. <i>AUMWGj</i> - Sanbon		
10. <i>Stanislav Horuna vs Ali Ashgar Asiabari</i> , 1. Premier League, Rabat 2019	Horuna	Asiabari	Horuna= 9 Asiabari= 8	Horuna: 1. <i>GZj</i> = 75%, 8(at), 6(r); 2. <i>USMWGj</i> = 100%, 1(at), 1(r); Asiabari: 1. <i>KZj</i> = 55.55%, 9(at), 5(r); 2. <i>AMWGj</i> = 33.33%, 3(at), 1(r).
	1. 6x <i>GZj</i> - Ipon 2. <i>USMWGj</i> - Sanbon	1. 5x <i>KZj</i> -Ipon 2. <i>AMWGj</i> - Sanbon		
11. <i>Scott Thomas vs Stanislav Horuna</i> , 1. Premier League, Dubai 2019.	Horuna	Scott	Horuna= 0 Scott= 2	Horuna: 1. / Scott: 1. <i>GZj</i> = 25%, 4(at), 1(r); 2. <i>KZj</i> = 25%, 4(at), 1(r).
	1. /	1. <i>GZj</i> - Ipon 2. <i>KZj</i> - Ipon		
12. <i>Abdelaziz Abdalla vs Stanislav Horuna</i> , Serie A, Santiago 2020.	Horuna	Abdalla	Horuna= 3 Abdalla= 4	Horuna: 1. <i>KZj</i> = 50%, 2(at), 1(r); 2. <i>GZj</i> = 33.33%, 6(at), 2(r); Abdalla: 1. <i>AUMWGj</i> = 50%, 2(at), 1(r); 2. <i>GZj</i> = 10%, 10(at), 1(r).
	1. <i>KZj</i> - Ipon 2. 2x <i>GZj</i> - Ipon	1. <i>AUMWGj</i> - Sanbon 2. <i>GZj</i> - Ipon		

Legnd: at - attempt, r - realized.

Based on table 3, it can be concluded that of all the realized scoring techniques of Stanislav Horuna, gyaku zuki jodan was the most common. Specifically, 12 out of a total of 20 realized were achieved with this hand attack, which makes up 60% of all scoring actions. It can also be seen that 18 out of 20 techniques were placed in the jodan region, which represents 90% of all placed shots. Of the kicks, the main scorer was ushiro mawashi gery jodan, which accounted for 100% of all scoring kick techniques. If you look at the opponents, it is concluded that the most frequent shot in all 12 matches was kizami zuki jodan, with 8 points from 20 actions made, which is 40%. When we talk about the type of actions performed by Horuna, it can be seen from the table that of the 20 achieved, 9 were in the form of a attack, and 11 were in the form of a counterattack. From table 2, it can be clearly seen that the most frequent point of Horuna was ipon, which was achieved in 15 actions. Sanbon techniques were implemented in 5 cases, while there wasn't a single nihon. Observing the tabulated results, out of 12 fights, Horuna triumphed in 6, which represents 50% efficiency.

Discussion

Based on the results obtained, it was observed that Stanislav Horuna's most effective shot was the giaku zuki yodan, and his opponents' kizami zuki jodan, which generally agrees with the results of the research carried out by many authors (Kapo & Kajmović, 2006; Koropanovski et al., 2008; Sertić et al., 2012; Tabben et al., 2015; Alina-ghipour et al., 2020). Through detailed video analysis, it was observed that these shots have a very short execution time, as well as a rectilinear path of movement, which makes these techniques difficult to defend and therefore effective. Also, the biomechanical requirements of these strikes are not demanding, given that they are straight manual techniques, so the energy consumption during their execution is minimal. On the other hand, when we talk about scoring with the leg techniques of the Ukrainian karateka, it was observed that ushiro mawashi gery jodan was very successful. This is a particularly interesting fact that was not found in other research. Usually the most effective leg techniques are mawashi gery (Birt, 2015) and ura mawashi gery. Observing this movement, it can be seen that its execution requires significantly more skill, energy and time than when performing straight hand strikes. The reason for this is the circular amplitude of movement, as well as the rotation of the entire body by 180°, which is achieved when performing this technique. If we talk about the Action time parameter, the most actions were realized in the last minute of the match, especially in the final 10 seconds (atoshi baraku). High pressure from the losing fighter is the main cause of these attacks, and this is the last chance to change the score before time runs out. By observing the guard from which the techniques were performed, it can be seen that Horuna uses the left and right guard almost equally, which only speaks to the quality of this karate fighter. It was observed that the opponent's guard, as well as the spatial situation on the field, had a great influence on which guard to use. Based on the results that speak of the punishments received, it was confirmed that the total number of punishments awarded to this karate player was 16, of which their size was due to inactivity in the match. Almost all inactivity penalties are added in the first minute of the match. That it is justified by the fact that at the beginning of the match one evaluates and examines the opponent, and at the same time avoids hasty mistakes. In all matches it was done that Horuna very often in the clinch position used the technique of naga waza (throwing with final scoring), which can be clearly seen in table 2. Only in one match was there a scoring with this attack, although he often managed to carry out the technique to the end with a slight delay in the realization of the scoring shot. Also, in addition to the grip during the execution of the throw, there is pulling and pushing, which are not allowed.

Strengths and limitations

This is the first case study that analyzed Stanislav Horuna as the top ranked karateka in Ukraine. The main limitation of this study is the fact that a larger number of matches should be analyzed and thus obtain even more reliable and objective results based on a larger sample. Therefore, it can be a proposal for some further research of this type.

Conclusion

This case study confirmed that by applying the score analysis of the matches of the top karate player Stanislav Horuna in prestigious competitions with top fighters, it can contribute a lot to the development of the way of fighting at the top level, but also to observation the bad and good sides of all applied combat parameters. By analyzing the variables: time of action, type of action, efficiency, penalty, guard, technique and results, it can be concluded that the most effective techniques were hand punches, as well as that the counterattack is a very effective tool of achieving points and intercepting opponents. The most hesitation was at the beginning of the matches, and the most action was in the last minute of the fight. Also, the most common point was Ipon.

The obtained results and conclusions can be extremely important information for many trainers and young fighters who aim to become top karate fighters.

Conflict of interests

The authors declare no conflict of interest.

Author Contributions

Conceptualization: AS. Investigation: AS, SĐ. Theoretical framework: SĐ. Data curation: RP, IK. Resources: AS, IK. Writing – original draft: AS, SĐ, RP. Writing – review & editing: IK. All authors have read and agreed to the published version of the manuscript.

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