

## SPARING AND SELF-DEFENSE – ASSESSMENT OF COACHES’ THEORETICAL KNOWLEDGE

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**Abstract.** Successful performance and high sports achievements in sport depend on the various aspects of sports training - physical, technical, tactical, and psychological training. On the other hand, a good knowledge of the sports regulations is extremely important for successful performance in sports competitions. The aim of the present study is to assess the knowledge of coaches related to the sparing and self-defense of Taekwon-do. **Methodology:** The study was carried out in April – May 2020. The study involved 38 Taekwon-do coaches (38.44±9.52 years) with different sports experience and degree from 15 local Taekwon-do clubs in Bulgaria. The online form test contains a total of 32 questions (4 personal and 28 specialized questions). **Results:** The largest accumulation of values (most coaches) received a result in the range of 17-31 points (81.58% of all tested). Most tasks have very good discrimination ( $0.40 \leq DP \leq 0.80$ ). The calculated difficulty  $P$  of the questions used is in the range of 55-90%. **Conclusion:** Empirical data show that the test has good statistical characteristics and can be used to assess the theoretical knowledge of coaches about the sports regulations. The data obtained from the pedagogical experiment give grounds to claim that the level of knowledge of Taekwon-do coaches are at different levels. The regular use of a test to assess knowledge related to the rules of competition will increase the knowledge of coaches and reduce missed matches at critical moments.

**Keywords:** coach, education, evaluation, Taekwon-do

### Introduction

Taekwon-do is a martial art developed in Korea by General Choi Hong-hi. In the second half of the 20th century, Taekwon-do was adapted for sports competition by the International Taekwon-do Federation. Taekwon-do is a Korean martial art that resembles karate but also employs a wide range of acrobatic kicking moves (Baginska et al., 2022). It is considered an integrated exercise that includes a variety of physical activities, physical skills, and psychological and social functions to improve trainees’ health in diverse dimensions (Son, Yang, 2022). Taekwon-do actions involve high-intensity bouts of short duration (1-3 seconds), performed in a limited area with rapid changes of direction. The matches consisted of three rounds (2-minutes each with one minute of rest) (Avci, Celik, 2023). In addition to the importance of agility in Taekwon-do, explosive strength and specific Taekwon-do agility are important. Taekwon-do-specific agility is required to quickly perform all-out technical-tactical movements in multidirectional planes by maintaining dynamic balance, speed, and precision, maintaining, and controlling correct body positions while quickly changing direction through a series of movements.

Taekwon-do is the martial art and combat sport in which quick decisions are made in response to stimulus such as the opponent's direct attack or opening (Gréhaigne et al., 1995). But in combat like Taekwon-do be able analyze the efficiency of response from a tactical perspective (Menescardi et al., 2019). Based on the abovementioned choosing a correct action to make a tactical decision during the competition and identifying the tactical response to

predict the response to the action must have knowledge of the different tactical options (Son et al., 2020).

ITF Taekwon-do competitions include five different disciplines – pattern, sparring, special technique, power test and self-defense (Poliszczuk et al., 2016). The competitor can choose whether to compete in all disciplines or to choose only one or two of them (Ilieva-Sinigerova, Konchev, 2021).

The often-hostile nature of spectators during a sporting event makes it easy for referees to make mistakes. Due to the constant decision-making and the mistakes, they can make, they are often criticized for their decisions by competitors, coaches, and spectators (Guillén, Feltz, 2012). Maintaining composure and making the right decision in adverse situations is of utmost importance (Nabilpour et al., 2020). Wrong refereeing decisions can lead to scoring a point, stopping the game at a crucial moment or to an undeserved victory (Michaluk, 2009). Misjudgments lead to loss of self-esteem and high levels of stress and anxiety. Regular training reduces mistakes and negative consequences of taking one (Crust, Azardi, 2010; Crust, Clough, 2005).

The aspiration to improve and reduce the human factor in the refereeing process provokes periodic changes and updating of the international competition regulations in all sports. Among the novelties and facilitations in ITF Taekwon-do are specialized software to automatically calculate referee scores, as well as the ability to submit video protests, which are limited to a few key situations (ITF, 2021).

The new technologies and rule changes have surely influenced the nature of competitions, and coaches and players should embrace new match tactics and strategies in response to the new point system (Cho et al., 2020).

The knowledge that coaches must possess is no longer limited to technical elements and tactics. The competition rules require a quick reaction in controversial moments from the coaches, for which a very good knowledge of the competition rules is also necessary.

## **Purpose**

The aim of the present study is to assess the knowledge of coaches related to the sparring and self-defense of Taekwon-do.

## **Methodology**

The study was carried out in April – May 2020. The study involved 38 Taekwon-do coaches ( $38.44 \pm 9.52$  years) with different sports experience and degree from 15 local Taekwon-do clubs in Bulgaria.

After the beginning of the Covid-19 pandemic, the training process was suspended for an indefinite period. The measures that the Bulgarian Taekwon-do ITF Federation took at that time were: sharing training videos (on YouTube), sending materials with theory, and regularly conducting tests on theory material. For their part, sports clubs conducted online training through various platforms, shared training videos, materials, and prepared programs.

Taekwon-do was a martial art and apart from the sports and competition part, great attention was paid to the theory as well. This was also included in the degree promotion exam syllabus. Participation in the tests was voluntary and there was a limit to the number of attempts (just once). At the beginning of each test, the specific requirements for completing it were indicated,

as well as a minimum number of points for successfully passing the test. All participants provided written informed consent.

The test for coaches was created using the Google forms software and contained a total of 32 questions (4 personal and 28 specialized questions - closed questions with one or more than one correct answer). The variant of the questions used was marking the correct answer. There was no feedback on each question whether the answer was right or wrong.

Among the advantages of the chosen electronic option for checking the theoretical knowledge of athletes, coaches and judges are: reduced time and simplification of the procedure for checking the tests and setting an objective assessment that does not depend on the personal attitude or bias of the examiner. We find a disadvantage in the impossibility of checking higher levels of the material learned.

The main stages that were observed are: defining the goal, developing the questions and individual test variants, compiling and testing the first variant, analyzing the questions and tasks, deriving norms and developing methodological guidelines for using the test. In the electronic version of the test, there is a key with the correct answers and the function for automatic checking of the results is activated. Questions are closed to avoid difficulty in verification.

In the blanks of all included tests for athletes, coaches and judges, questions with the choice of more than one correct answer (distractor) are assigned a higher number of points for indicating a completely correct answer (2, 3 or more points). This approach was chosen to give more incentive to the participants. In the subsequent a posteriori analysis, the recommendation of experts in the field to give equal weight to all questions (1 point) was followed in order to be able to properly analyze the results. Another recommendation of experts in the field is to include more tasks from the specific theoretical area in order to increase the relative share and weight of the material in the total amount of measured final results.

The questions in each test cover material that has already been learned and that examinees have had sufficient time to learn and consolidate.

The variety of questions that are included in the tests measures not only the level of theoretical knowledge of the examinees, but also provokes their thinking activity of a creative nature (associations, combinatorics, logic, improving memorization, etc.).

Mathematical and statistical methods: descriptive statistics, quantitative and qualitative analysis were applied. Data were statistically analyzed with SPSS and MS Excel.

## **Results**

The "sparing" discipline is incredibly and extremely attractive to the competitors and the audience. The discipline requires complex development and knowledge from both athletes and coaches. The game is very dynamic and the tactical instructions from the coach must be changed sometimes not in seconds, but in hundredths of a second. The coach must observe the game of his competitor as well as the opponent to build the right tactics and give the appropriate guidance. The correct awarding or not of points scored by both competitors is reported on the electronic scoreboard and the score is constantly changing. In the same way, an indicator of awarded penalties or minus points is written on the scoreboard, but also given with a gesture

signal when the game is stopped by the referee. All these components must be monitored by the coach during the whole match and in the meantime the correct instructions should be given to the athlete. The protests that can be made during the meeting by the coach are time-limited according to the specific situation and in case of delay, a protest cannot be submitted. The alternative option remains a formal paid protest, which also has a specific procedure and time limit after the meeting ends that must be followed.

The "self-defense" discipline is a team discipline that contains choreography and mandatory elements that must be included. Omitting a mandatory requested element, starting the actual performance later than scheduled, or completing the entire choreography in less than 40 seconds or more than 60 seconds is penalized with the deduction of 2 points for a maximum of 2 seconds' delay.

An official protest is submitted up to 5 minutes after the end of the meeting. A video protest is submitted during or immediately after the end of the meeting (if the situation was at the end of the meeting), and the specific reasons for which video protests can be submitted are regulated. The opportunity to review covers up to 5 seconds of the relevant action that is supposed to be the protest. If the coach cannot specify the situation and the reason for his protest, he will not be respected. When the situation is specified, but it turns out that the protest is not justified, the coach loses his right to protest until the end of the match. This fact is extremely important, because in the case of an unfounded first protest and a protest situation arises in the continuation of the match, the winner of the match may actually turn out to be the loser.

On the other hand, poor knowledge of the competition regulations in many cases contributes to controversial decisions or conflict situations. It is necessary for all participants - referees, coaches, and competitors - to know the competition regulations. For this reason, tests were also organized on basic questions related to specific situations in the competition rules, in which coaches and competitors were allowed to take part.

The study included coaches representing all age groups and gender in ITF Taekwon-do. The data presented in (Table 1) showed the average values for age and obtained test results.

Table 1. *Mean values of coaches'*

<b>Indicator (n=38)</b>	<b>Min</b>	<b>Max</b>	<b>R</b>	<b>Mean±SD</b>	<b>V</b>	<b>Kur.</b>	<b>Skew.</b>
<b>Age</b>	18	48	30	25.7±8.3	32.28	1.480	1.039
<b>Degree</b>	1	6	5	2.5±1.48	59.2	0.785	-0.178
<b>Result</b>	7	27	20	20.23±4.69	23.18	0.289	-0.815

*Critical value of Kurtosis (0,748) and Skewness (1,465)*

The test holds closed questions with different numbers of distractors. 38 coaches from 16 sports clubs in Bulgaria took part in the research. 28 closed questions will be analyzed. Due to the specificity of the material under consideration, the qualitative analysis of the included questions will be divided into two parts - sparring and self-defense.

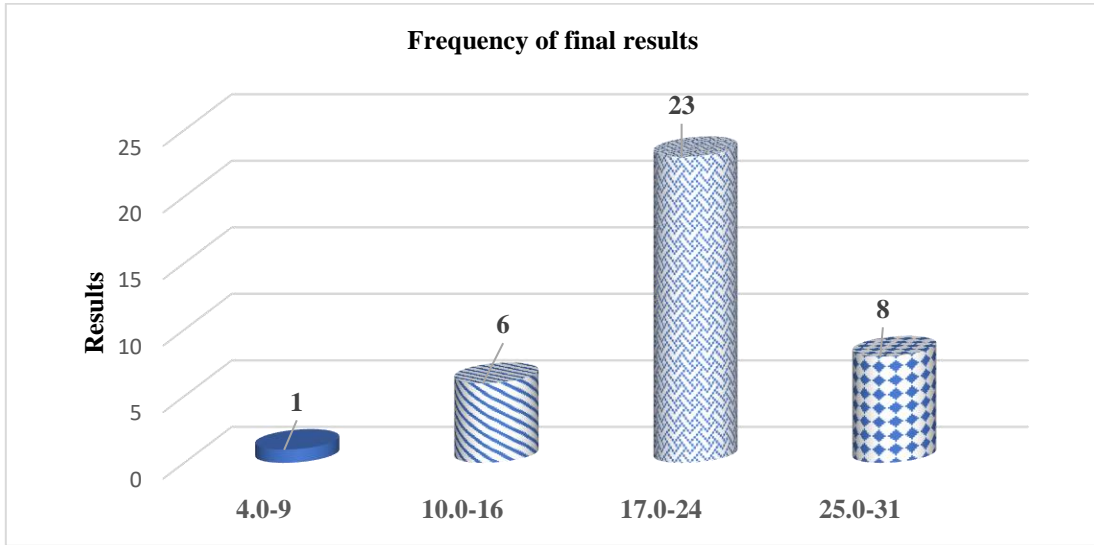


Figure 1. Final results

The lowest score obtained is 7 points and the highest score is 28 points. After reviewing the individual results, it was found that none of the coaches received the maximum score on the test. It was estimated that 81.58% of the final scores were in the range of 17–31 points (Figure 1).

Aposteriori analysis was applied to calculate the difficulty index of the test questions. The test contained a variety of questions with different numbers of distractors.

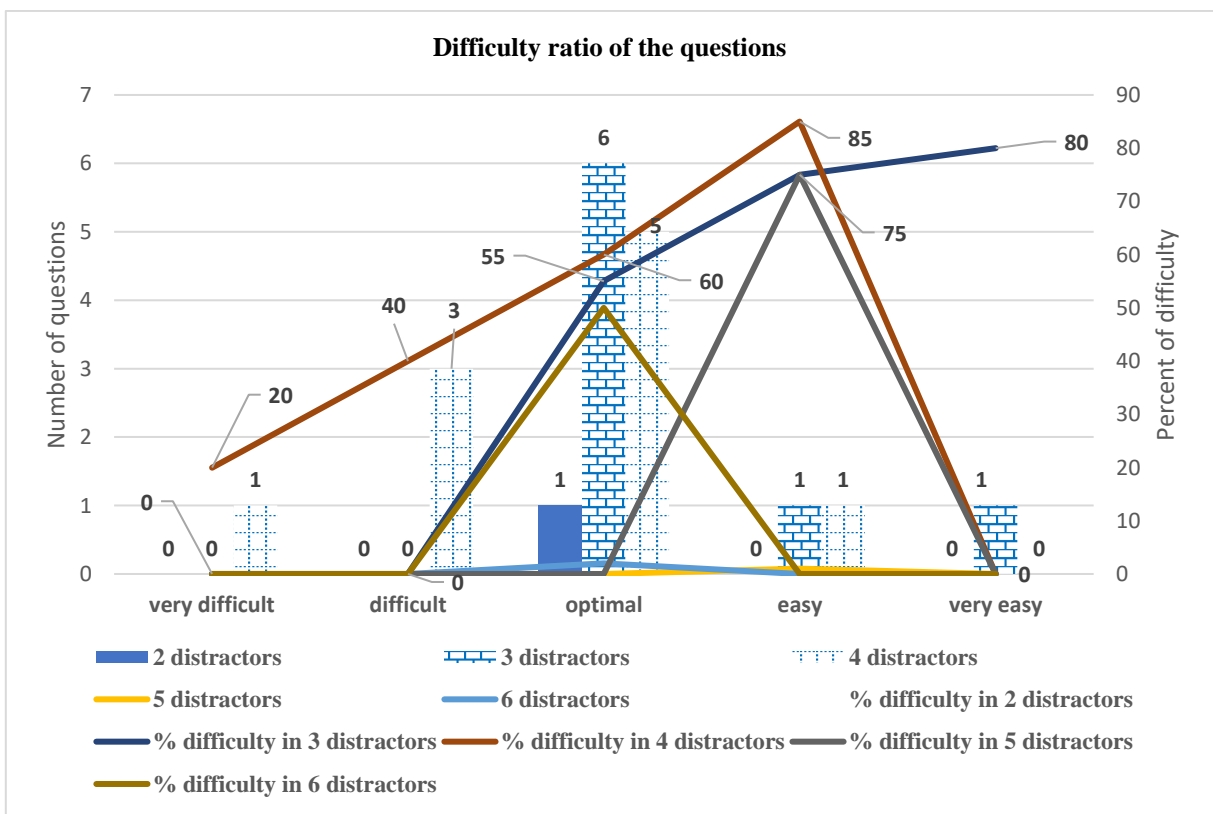


Figure 2. Coefficient of difficulty in sparing

After the analysis, it was found that the questions with three, four, five and six distractors (4 questions in total) were of easy or very easy level of difficulty and should be removed from the test. The two-distractor question used was at an optimal level of difficulty. With an optimal difficulty level, 6 questions (3 distractors), 5 questions (4 distractors), and 2 questions (6 distractors) were also calculated. We find a very high level of difficulty in 1 of the questions with four distractors, and a difficult level in 3 questions. A total of 14 questions with an optimal level of difficulty, 3 with a difficult level and 1 question with a very high level of difficulty were found.

On further analysis, it was found that questions with one correct answer (4 distractors) were most frequently answered incorrectly. The questions were related to "No disqualification awarded for:" (5 correct answers out of 38 answered), "Seven points awarded for:" (11 correct answers out of 38 answered), "Which of the following techniques does not count as two points:" (18 correct answers out of a total of 38 respondents) and 'Safety and protective equipment should be:' (19 correct answers out of a total of 38 respondents).

After calculating the Discriminant Power Index, it was found that 3 of the included questions were not of good quality and should no longer be used. 5 questions need to be revised and improved so that they can continue to be used. Good discriminative power was found for 7 of the questions and they can continue to be used. The remaining 10 questions can be characterized as an "excellent differentiator" and their use continued. Most questions have incredibly good performance ( $0.50 \leq DP \leq 0.90$ ).

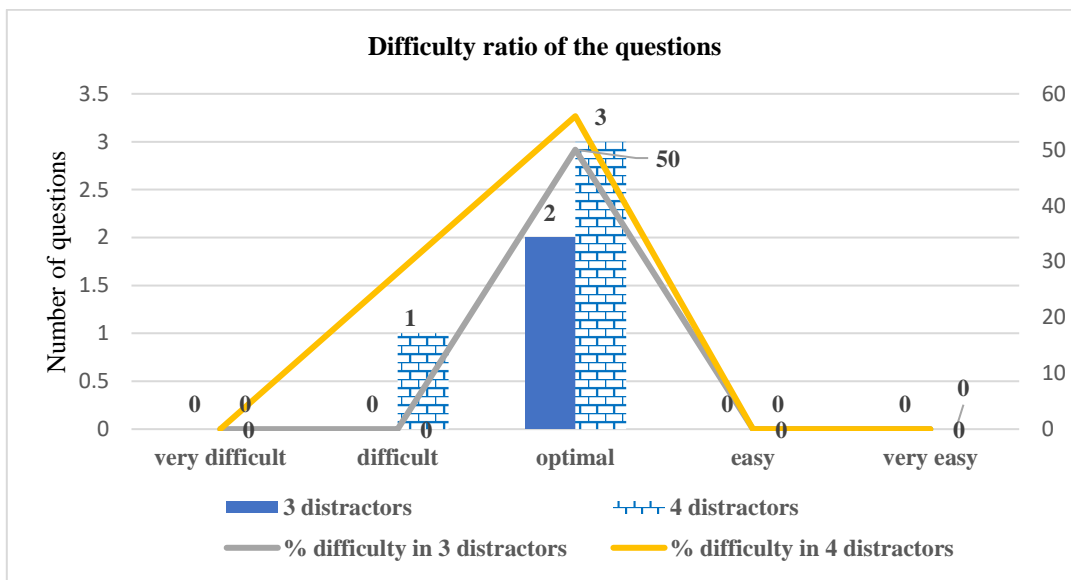


Figure 2. Coefficient of difficulty in self-defense

After the analysis, it was found that the questions with three and four distractors (5 questions in total) were of optimal difficulty level. Difficulty was found in 1 of the four distractor questions. A total of 5 questions with an optimal level of difficulty, 1 with a high level of difficulty were calculated.

The question that gave the examinees the most difficulty was: "What is the correct sequence of the elements of the special technique attempt:" (1 correct answer out of a total of 38 answers) What is interesting in this case is that the question requires the indication of one correct answer. We can conclude that the material is complex and most of the tested did not understand it correctly.

On the other hand, however, we draw attention to the fact that the Google Forms application used is constructed in such a way that it is necessary to indicate all the correct answers to recognize the answer as correct and to give the points for a correct answer. A partially correct answer will not be counted. This fact further complicates the coaches and reduces their overall result. In our opinion, this specificity of the software used increases the difficulty of the questions and allows them to be reused.

After calculating the Discriminant Power Index, it was found that 6 questions can be characterized as "excellent differentiators" and their use continued. Most questions have very good performance ( $0.50 \leq DP \leq 0.85$ ).

A good knowledge of the competition regulations and the specific features of the various disciplines will contribute to additional confidence on the part of the coaches during the meetings and a faster and adequate reaction if a protest is necessary. This is also felt by the competitors, and they feel at ease under the guidance of their coaches. The certainty of an immediate and timely response should a protest be necessary is a very motivating factor for competitors, especially during key meetings. On the other hand, insufficient knowledge of the competition rules will delay the reaction of coaches at critical moments, and this may lead to the loss of prize places or medals. In addition, it will lead to a lack of motivation in the competitors and in some cases even to their abandonment of a racing career.

## **Discussion and Conclusions**

Speaking of Taekwon-do, it has become a popular sport with over 120 million children and adults actively participating worldwide. Along with this increased popularity, coaches and federations need evidence-based and scientific development programs (Babic et al., 2022). Mathematical modeling systems help researchers and coaches understand the behavior of athletes in competition (Ozcinar et al., 2013). Even to describe patterns of play (Barnett et al., 2011, Goldner 2012). Models in the relationships between the actions carried out by competitors have an increasing interest (Menescardi et al., 2015).

At the end of an official sports event, a result is produced. The outcomes of competitions are represented by certain numbers, which may be relative rankings, points, or scores produced by a certain scoring system (Cho et al., 2020).

At present, Taekwon-do teaching in domestic colleges and universities is generally divided into two teaching methods - theory and practice. In terms of theory, teachers choose textbooks as the basis and write on the blackboard to understand, mainly teaching some basic theoretical knowledge about Taekwon-do. In terms of practice, teaching is carried out in relevant venues. The above two methods are the basic teaching methods for colleges and universities. Nowadays, most colleges and universities choose practical teaching for Taekwon-do teaching. This teaching mode ignores the cultural inheritance of Taekwon-do and the importance of theoretical knowledge of Taekwon-do (Chin et al., 2022).

Expanding the knowledge of sports specialists in various fields, including the rules of competition, is of utmost importance for all levels - sports ministry, sports federation, and the coaches themselves. In addition to the regulatory requirements for increasing the qualifications and knowledge of coaches, personal motivation, and awareness of the need for this are of primary importance for achieving high sports results.

To optimize Taekwon-do teaching methods and promote students' active participation and interaction, it is necessary to innovate the traditional Taekwon-do teaching, to improve the teaching quality of colleges and universities and the comprehensive quality of students. The evaluation system should not only assess the basic theoretical knowledge of teaching but also evaluate the comprehensive quality indicators of students in all aspects (Chin et al., 2022).

Empirical data show that the test has good statistical characteristics and can be used to assess the theoretical knowledge of coaches about the sports regulations. The data obtained from the pedagogical experiment give grounds to claim that the level of knowledge of Taekwon-do coaches are at different levels. The regular use of a test to assess knowledge related to the rules of competition will increase the knowledge of coaches and reduce missed matches at critical moments.

After performing the Aposteriori analysis, questions can be refined and those with good characteristics and good discriminative power included for future use.

Making this reduction in questions allows us to create a test with a better quality of included questions that will be much more informative of the theoretical knowledge of Taekwon-do coaches.

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