# Study On The Effectiveness Of Using The Nage-No-Kata Programme To Increase The Technicality Index In Adolescent Judo Athletes

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## Abstract

This study examines the efficacy of a Kata-based technical training programme in improving Judo technique execution. Conducted over eight months (September 27, 2021-April 27, 2022) at the Municipal Sports Club in Bucharest, the experiment involved 16 performance-level judokas with a minimum of five years of experience. A structured Nage-No-Kata programme was implemented three times weekly, with initial and final assessments evaluating Kata performance and competition technique (Ippon scoring). Wilcoxon test results revealed significant improvements ($p < 0.05$) in Kata execution (W = 3.5, Z = -3.20) and Ippon performance (W = 0, Z = -3.51), with effect sizes of 0.80 and 0.87, respectively, indicating a strong positive impact. The findings of this experiment on the use of the Kata tool in Judo sports training for enhancing technical proficiency show that competitive performance can be improved. However, limiting factors place this study in the position of a starting point for future research on this topic

*Keywords*: Judo Kata, Nage-No-Kata, technical training, sport performance

# Introduction

Kata, in a broad sense, means "basic form". In Judo and other martial arts, Kata means the practice of the basics or the practice of what is in its traditional, pure form. While, on the one hand, in Randori (combat training) and Shiai (competition) it is about the realisation and execution of techniques in adverse situations, in Kata it is about their execution in the "ideal" form (Bocioacă, 2000). In Japan, Kata has been an important theme in any martial arts style since ancient times. As far as Judo is concerned, Kata really becomes of interest to other continents when competitions start to be organised. Kata competitions rise up to the level of World Championships, which are non-Olympic events in the sport of Judo. The desire to study Kata becomes stronger and stronger, which is demonstrated by the appearance of specialised works in several countries, even in Romania (Hantău & Bocioacă, 2002).

The supreme governing body of Judo, Kodokan, in the last 7 years, approves and even publishes several theoretical works that discuss this topic or at least have in its composition chapters relevant to this area of interest. The year 2019 represents the "pinnacle" of the literature on Kata as four of the most important specialised works are published: Formal Techniques - a complete guide to Kodokan Randori No Kata by Tadao Otaki and Donn F. Donn. Drageger (Otaki & Drageger, 2019), Nage No Kata by Alessio Oltremari, Formal Techniques - a basic guide to throwing and grappling by Tadao Otaki and Donn F. Drageger (Otaki & Drageger, 2019) and Nage No Kata, Katame No Kata by Edson S. Barbosa. The year 2020 is also a year of discovery as Bruce R. Bethers, President of the United States Jiu Jitsu Federation, publishes a volume entitled The Lost Kata of Kodokan Judodo (Bethers, 2020). This work makes an in-depth and unprecedented study of six ancient, virtually unheard of kata. Some of these were created by Jigoro Kano himself, and others by the first generation of his students or by the Kodokan leadership. Kata has spread in recent years as a necessity to supplement the technical training of athletes taking part in major competitions.

## Methods

The experiment was carried out over a period of eight calendar months, from 27 September 2021 to 27 April 2022. The actual activity took place at Clubul Sportiv Municipal București, Bulevardul Ion Mihalache 162, Sector 1. The participating athletes fall into the category of performance athletes, with at least 5 years of experience in this discipline. They wear coloured belts, at least the green belt. In total, 16 athletes participated, organised in 8 pairs, selected according to height, weight and experience. The proposed training programme ran for 8 months, three times a week on Mondays, Wednesdays and Fridays. The duration of the programme on Mondays and Fridays was 30 minutes and on Wednesdays for 15 minutes. The 30 minutes included drills to perfect attack-defence procedures and situations. On Wednesdays, drills were performed to perfect movements, saluting (Ritsu Rei and Za Rei) and execution distances (Teodorescu, 2009).

Two types of tests were conducted in the experiment. The first test was carried out using a Nage-No-Kata referee sheet and illustrates the score obtained in the execution of the programme with all five groups, both initial and final. The second test was carried out according to the criteria for awarding the maximum score in the execution of a procedure in Judo competition: force and speed of execution, falling backwards, control and smoothness (Bocioacă, 2007). The research was carried out during the athletes' training sessions, with all participants at the same time. The initial/final Kata testing was conducted with a teacher, each pair having approximately 10-15 minutes. The second test was conducted under the same conditions, with approximately 6 minutes per pair. The participants took part in the experiment in a voluntary, respecting ethical principles, and they are informed that they can opt out at any time without repercussions. Data confidentiality was ensured (Predoiu, 2020).

## Results

The results obtained in the experiment are presented in Tables 4.1 and 4.2 of the paper. For Nage-No-Kata, the mean score increased from 71.87 to 90 between the initial and final testing. For the maximum Ippon score, the mean increased from 100.25 to 128.06. Preliminary analysis of the data using an online calculator did not reveal any outliers. In the following, the main descriptive statistical indicators are presented: arithmetic mean, median, standard deviation and coefficient of variability. For the Nage-No-Kata test, the initial test had a mean of 71.87, median of 64.75, standard deviation of 33.93 and coefficient of variability of 0.30, and the final test had a mean of 90, median of 78.5, standard deviation of 33.87 and coefficient of variability of 0.30. For the Ippon test, the initial test had a mean of 100.25, median of 99.5, standard deviation of 28.15 and coefficient of variability of 0.28, and the final test had a mean of 128.06, median of 137, standard deviation of 18.95 and coefficient of variability of 0.18.

**Table 1.**

*Descriptive statistics-participant results initial and final test*

| Indicators | Test 1- initial test | Test 1- final test | Test 2- Initial test | Test 2- final test |
|---|---|---|---|---|
| arithmetic mean | 71,87 | 90 | 100,25 | 128,06 |
| median | 64,75 | 78,5 | 99,5 | 137 |
| standard deviation | 33,93 | 33,87 | 28,15 | 18,95 |
| coefficient of variability | 0,30 | 0,30 | 0,28 | 0,18 |

The Wilcoxon test was applied to test for differences between the baseline and final tests and was chosen due to the small number of participants (16). For Nage-No-Kata, the values obtained were $W = 3.5$, $Z = -3.20$, $p < 0.05$, and for Ippon, $W = 0$, $Z = -3.51$, $p < 0.05$, indicating significant differences in both cases. Effect sizes were calculated to demonstrate the impact of the training plan on technical execution. For Nage-No-Kata, the result obtained was 0.80, and for Ippon, 0.87, both values being greater than 0.25, according to Predoiu (2021), indicating a very strong positive effect.

**Table 2.**

*Wilcoxon Wilcoxon value - Nage-No-Kata*

| Wilcoxon test indices | Values obtained |
|---|---|
| W | 3,5 |
| Z | -3,20 |
| p | <0,05 |

**Table 3.**

*Wilcoxon Wilcoxon maximum Ippon score*

| Wilcoxon test indices | Values obtained |
|---|---|
| W | 0 |
| Z | -3,51 |
| p | <0,05 |

Kata is a set of movements intended to be performed as close as possible to the ideal form, in a predetermined programme illustrating specific combative principles. The primary function of Kata is to train the exact execution of techniques and the exemplary application of principles in a closed situation, in ritual form, over and over again in a repeatable manner. One of the most important elements in Judo is the "Kuzushi", or imbalance, which appears and is emphasised in all Kodokan Kata, including Nage-No-Kata. By utilising this element, techniques performed both in Kata and in competition will enjoy dynamism and efficiency. Nage-No-Kata is made up of 15 techniques, divided into 5 categories of 3 techniques each: Te Waza (arm techniques), Koshi Waza (hip techniques), Ashi Waza (leg techniques), Ma-Sutemi-Waza (backward sacrifice) and Yoko-Sutemi-Waza (side sacrifice). The main characteristics of all these techniques are the principle of attack and defence, the use of the opponent's strength and the principle of correct imbalance.

The results obtained in the experiment confirm that the implemented Kata programme has a major contribution in the development of Judo athletes' technique. According to authors such as Bocioacă, L. and Otaki, T., the non-olympic Judo Kata test is an important means of training for learning and perfecting the techniques used by athletes in competition. Thus, its use in training leads to the improvement of the execution in order to maximise the score (Ippon) and, at the same time, can lead to the maximisation of sports performance in competitions. Following the application of the Wilcoxon test, we find that there are significant differences

between the initial and final results in both Nage-No-Kata execution and in obtaining the maximum Ippon score. The effect sizes (0.80 for Kata and 0.87 for Ippon) indicate a very strong impact of the programme, with a greater effect on technicality in competition, suggesting effective transfer of Kata skills to real combat situations.

Kata competitions have become increasingly recognised in Europe and around the world, the most significant being the World Championships. In Kata the following competitions meet: National Championships, International Tournaments, European/World Cups and European/World Championships. These competitions are made up of several events, each couple may choose a maximum of two Kata. The evaluation is done on the basis of a judging sheet, looking at the component procedures, distance rules, positioning on the tatami and fluency. The types of mistakes encountered in Kata (major, major, medium, medium, minor) influence the scoring, with a major mistake (e.g. forgotten technique) reducing the score to zero for that technique and halving the total score. Romania has a long tradition in Kata competitions, with notable performances such as those of Ciprian Fleisz and Surlă Iulian, 4 times vice world champions and 5 times consecutive European champions in Nage-No-Kata.

However, the research was limited by several factors: the gender of the participants (only 6 males out of 16), age differences (12-30 years), the relatively small number of participants (16) and the training schedule (18:00-21:00), which could have generated unfavourable psychological states. These limitations suggest that the results can be considered as a basis for future studies that rule out such disturbing factors. A future direction could be to apply the programme in larger groups (30-50 participants) and to conduct a test in sports competitions to concretely observe the athletes' possibilities to accumulate the maximum score (Ippon).

**Conclusions**

The results obtained in the experiment confirm that the Kata programme implemented has a major contribution in the development of Judo athletes' technique. The non-olympic event of Judo, Kata, is an important means of training for learning and perfecting the techniques used by athletes in competition. Its use in training leads to improved execution for maximum scoring (Ippon) and can maximise sports performance in competition. The aim of the research was to identify the optimal methods and means of Kata technical training, which would facilitate the elaboration of a technical training plan in order to improve the execution of the procedures and technical elements in Judo, an objective achieved by the programme applied over 8 months.

Due to the fact that Judo is a discipline with a multitude of techniques, over the years specialists have classified and organised the techniques according to several criteria. One of the most widely used classifications is the Go-Kyo, by Jigoro Kano, based on the body segment with which the final thrust of the opponent's throw is made. This includes Tachi-Waza (standing throws) and Sutemi-Waza (sacrificial techniques), along with Ne-Waza (ground techniques). Another classification, Kawaishi, divides the techniques into Nage-Waza and Katame-Waza. The Romanian specialists have made a classification that follows the principle of making the content accessible, starting with the ground techniques (e.g. Kesa Gatame) and then moving on to the standing techniques, divided into six levels of study with 46 techniques. These classifications emphasise the importance of a systematic approach to the learning of techniques, which is also reflected in the Kata method.

The regulations for the DAN grade exam, evaluated by the National Commission of Black Belts of the Romanian Judo Federation, emphasise the role of Kata in the progression of athletes. Candidates must demonstrate mastery of technique, understanding of principles and acquisition of the spirit of Judo, Kata being an essential test (e.g. Nage-No-Kata for DAN 1-4). The implemented programme has captured the most beneficial exercises in Nage-No-Kata, which can be used to improve technical execution, providing a solid basis for future practical applications and extensive research.

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