



METHODOLOGY FOR ASSESSING PHYSICAL FITNESS  
PERFORMANCE IN STUDENT JUDO ATHLETES

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**Abstract:** *Physical fitness is a fundamental component of judo performance because athletes must combine strength, explosive power, speed, agility, muscular endurance, and the ability to recover between high-intensity efforts. However, assessing student judo athletes requires a systematic methodology that integrates general physical fitness tests with sport-specific performance indicators.*

**Keywords:** *judo; student athletes; physical fitness; performance assessment; Special Judo Fitness Test; Uchi-komi Fitness Test; strength; endurance; evaluation methodology.*

## 1. Introduction

Judo is an intermittent combat sport characterized by repeated high-intensity actions, including gripping, pulling, pushing, throwing, defending, and transitions between standing and ground techniques. Successful performance depends on the interaction of technical proficiency, tactical decision-making, psychological readiness, and physical fitness. During training and competition, judoka must produce force rapidly, maintain effective gripping actions, change direction, stabilize the body, and recover sufficiently to perform subsequent efforts.



Physical fitness assessment is therefore an important component of evidence-informed training. Systematic testing can help coaches identify individual strengths and limitations, establish baseline performance, monitor adaptation to training, and adjust exercise prescription. Nevertheless, the usefulness of assessment depends on selecting tests that reflect the physical demands of judo and implementing them under standardized conditions.

General physical fitness tests, such as sprinting, jumping, grip-strength testing, and flexibility assessment, provide useful information about specific physical capacities. However, these tests do not fully reproduce the intermittent and technically demanding nature of judo. Sport-specific assessments can complement general testing by incorporating movements and work patterns associated with judo performance. Kons et al. [1] reviewed judo-specific tests and discussed their use in assessing aerobic and anaerobic capacities, strength endurance, and other performance-related characteristics. Research examining the relationship between the Special Judo Fitness Test and other performance measures has also demonstrated the importance of interpreting test results in relation to the physical quality being assessed [2].

The Uchi-komi Fitness Test provides another relevant assessment option. Its performance characteristics and measurement properties have been investigated in judoka of different competitive levels, supporting its potential use in monitoring repeated technical efforts [3]. Nevertheless, the selection of tests must reflect the athletes' age, sex, training experience, competitive level, available equipment, and purpose of assessment.

University student athletes represent a population with potentially diverse training backgrounds and physical development. Some may have substantial competitive experience, whereas others may be developing their foundational physical and technical abilities. Applying identical interpretation standards to all students may therefore produce misleading conclusions.



Assessment should account for individual characteristics and should distinguish general physical development from judo-specific performance.

Although a wide range of fitness tests is available, a practical challenge remains: how can the results of different tests be combined into a coherent assessment system that supports training decisions without overemphasizing a single performance indicator?

This article addresses that question by proposing a multidimensional methodology for assessing physical fitness performance in student judo athletes. The framework combines general fitness tests, judo-specific assessments, standardized testing procedures, and an individual performance profile.

## **2. Aim and Objectives**

### **2.1. Aim**

The aim of this article is to develop a scientifically grounded, practical methodology for assessing physical fitness performance in student judo athletes.

### **2.2. Objectives**

The objectives are:

1. To identify the principal physical fitness components relevant to judo performance.
2. To select appropriate general and judo-specific assessment methods.
3. To establish a standardized protocol for test administration and data recording.
4. To propose a multidimensional framework for interpreting individual test results.
5. To formulate recommendations for using assessment findings in training planning and longitudinal monitoring.

## **3. Materials and Methods**





## 3.1. Research design

This article uses a narrative literature-analysis approach and methodological synthesis. Relevant scientific literature on physical fitness assessment in judo, sport-specific testing, and measurement reliability was considered in developing the proposed framework.

The methodology is a proposed assessment model rather than a report of a completed intervention or experimental study. No new participant data were collected for this article. Consequently, the results presented below describe the structure and intended application of the proposed methodology, not experimentally demonstrated improvements or validated norms for university students.

## 3.2. Conceptual framework for physical fitness assessment

The assessment framework includes five domains:

1. Anthropometric and contextual characteristics.
2. General physical fitness.
3. Strength, power, and movement performance.
4. Judo-specific fitness.
5. Recovery and training-response indicators.

These domains are complementary. Anthropometric characteristics provide context for interpreting performance, whereas general and sport-specific tests assess different aspects of physical capacity. Recovery-related indicators help determine whether changes in performance may be associated with fatigue, insufficient recovery, or adaptation to training.

**Table 1.**

**Main domains of physical fitness assessment in student judo athletes**

| Assessment domain | Indicators | Recommended methods | Main purpose |
|-------------------|------------|---------------------|--------------|
|-------------------|------------|---------------------|--------------|

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|                                |                                                                      |                                                     |                                                   |
|--------------------------------|----------------------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------|
| Anthropometric characteristics | Body mass, height, body mass index where appropriate                 | Standardized height and body-mass measurements      | Describe the athlete's physical characteristics   |
| Maximal or isometric strength  | Handgrip strength; other strength indicators when appropriate        | Hand dynamometer; standardized strength tests       | Assess force-producing capacity                   |
| Explosive power                | Lower-limb power and upper-body power where relevant                 | Countermovement jump; medicine-ball throw           | Assess rapid force production                     |
| Speed and agility              | Short-distance sprint; change-of-direction performance               | Timed sprint; standardized agility test             | Assess acceleration and movement control          |
| Flexibility and mobility       | Relevant joint range of motion                                       | Standardized range-of-motion assessment             | Identify mobility limitations                     |
| Judo-specific fitness          | Repeated throwing performance, technical repetition, test heart rate | SJFT; Uchi-komi Fitness Test                        | Assess performance in judo-related movement tasks |
| Recovery and training response | Heart-rate recovery, perceived exertion, session response            | Heart-rate monitoring; rating of perceived exertion | Support interpretation of workload and recovery   |

*Source: Compiled by the author from the reviewed literature and the proposed methodological framework.*

### **3.3. Selection of general physical fitness tests**

Test selection should be guided by the purpose of the assessment, measurement quality, feasibility, and safety. A small, carefully selected battery is generally more practical than a large collection of tests that creates excessive fatigue or reduces measurement consistency.

#### **3.3.1. Handgrip strength**

Handgrip strength is relevant to judo because gripping and controlling the judogi are integral components of technical and tactical performance. It can be assessed using a calibrated hand dynamometer.

The participant should use a standardized body position and grip protocol. Handle setting, hand tested, number of attempts, rest interval, and the rule for recording the result must remain consistent across testing sessions. Results may be recorded for both hands, with the best valid trial or the mean of valid trials selected according to the protocol established before data collection.

Grip strength should not be treated as a complete measure of judo-specific gripping ability. Technical grip control, endurance, tactical timing, and the ability to maintain grip under dynamic conditions are not fully represented by a single maximal-strength test.

#### **3.3.2. Explosive lower-limb power**

The countermovement jump may be used to assess lower-limb explosive performance. The athlete begins from an upright position, performs a controlled downward movement, and jumps vertically with maximal effort.

Jump height may be measured using a validated jump mat, force platform, or suitable validated measurement system. The equipment, arm-swing conditions, warm-up, number of trials, and rest intervals should be standardized.

Explosive power is relevant to rapid movement and force production, but vertical-jump performance should be interpreted as a general physical indicator rather than a direct measure of throwing effectiveness.

### **3.3.3. Sprint performance**

A short-distance sprint test, such as a 10-m or 20-m sprint, can be used to assess acceleration and linear speed. The selected distance should reflect the testing purpose and the practical constraints of the facility.

Timing gates are preferable where available because manual timing may introduce additional measurement error. The surface, footwear, starting position, warm-up, and recovery period between trials should remain consistent.

Sprint results may help identify differences in acceleration capacity, although judo movements frequently involve multidirectional displacement, resistance from an opponent, and changes in body position.

### **3.3.4. Change-of-direction performance**

A standardized change-of-direction test can provide information about the athlete's ability to accelerate, decelerate, and redirect movement. The test should be selected according to available space and equipment, and its protocol should be documented in sufficient detail to allow replication.

Agility and change-of-direction speed should not be considered identical. A preplanned test primarily evaluates change-of-direction performance, whereas reactive agility also requires responding to an external stimulus or opponent. The latter is particularly relevant to combat-sport decision-making but requires a more specialized protocol.

### **3.3.5. Flexibility and mobility**

Flexibility testing should focus on joint movements relevant to the athlete's training demands and injury-prevention needs. Appropriate measures may include standardized hip, shoulder, or ankle range-of-motion assessments.

The same positioning, equipment, assessor instructions, and measurement technique should be used at each assessment. Excessive flexibility should not automatically be interpreted as superior performance; the



relevant objective is sufficient, controlled mobility for the athlete's technical and physical requirements.

### **3.4. Judo-specific assessment methods**

#### **3.4.1. Special Judo Fitness Test**

The Special Judo Fitness Test (SJFT) is a commonly discussed judo-specific assessment designed to evaluate performance during repeated throwing actions under a standardized protocol. It provides a sport-specific complement to general fitness testing.

The test typically involves a central athlete performing repeated throwing techniques on two partners positioned at specified distances. The test includes work intervals separated by short recovery periods. The precise protocol, throwing technique, partner positioning, and scoring procedure must follow the selected published version of the test.

When this conventional index is used, a lower value generally indicates a more favorable combination of throwing output and the two heart-rate measurements. However, the index should be interpreted alongside the number of throws, heart-rate response, athlete characteristics, and test conditions. It should not be used as the sole criterion for ranking athletes.

Researchers have examined relationships between SJFT classifications and other physical performance variables, including anaerobic power and sprint and jump performance [2]. These relationships do not imply that the SJFT measures every relevant physical quality or that a particular index guarantees competitive success.

#### **3.4.2. Uchi-komi Fitness Test**

The Uchi-komi Fitness Test evaluates repeated performance of a specified judo entry or technique in a structured testing format. The test can provide information about the ability to repeat technically relevant actions during sustained or intermittent effort.

The selected protocol should specify:



- The technique or techniques to be performed.
- The duration and structure of work intervals.
- The permitted movement pattern and technical criteria.
- The method used to count valid repetitions.
- Rest intervals and any physiological measurements.
- The criteria for terminating an invalid or unsafe trial.

The number of technically valid repetitions should be recorded separately from total attempted repetitions whenever the protocol permits. This distinction is important because a high repetition count does not necessarily indicate high-quality technical execution.

Research published in 2024 examined the reliability and responsiveness of the Uchi-komi Fitness Test in judoka with different performance levels and reported evidence supporting its potential use for monitoring judo-specific fitness [3]. The applicability of these findings to student populations should nevertheless be evaluated with consideration of training level and protocol differences.

### **3.5. Proposed standardized testing protocol**

To improve comparability, the assessment should be conducted under consistent conditions. Testing should preferably take place at a similar time of day, using the same equipment, testing surface, instructions, and scoring procedures.

Athletes should avoid unusually strenuous exercise immediately before testing and should report relevant symptoms, illness, injury, or unusual fatigue. The assessor should document any deviation from the planned protocol.

### **Conclusion**

The assessment of physical fitness performance in student judo athletes requires a multidimensional methodology that integrates general physical fitness indicators with judo-specific tests. Handgrip strength, jumping



performance, sprint speed, change-of-direction performance, and flexibility can provide information about selected physical capacities, while the Special Judo Fitness Test and Uchi-komi Fitness Test add sport-specific perspectives.

The proposed methodology emphasizes standardized testing procedures, careful interpretation of raw and derived indicators, and longitudinal monitoring. It also recognizes that technical proficiency, training experience, body mass, fatigue, and testing conditions may influence performance. Consequently, no single test or composite score should be treated as a complete representation of an athlete's physical fitness.

The framework offers a practical basis for developing individual assessment profiles and informing training decisions in university judo programs. However, it should not be considered a validated normative system. Future empirical research should test its reliability, measurement error, responsiveness to training, and applicability to student judoka across different levels of experience and competitive categories.

## REFERENCES

1. Kons, R. L., Orssatto, L. B. R., Athayde, M. S. S., & Detanico, D. (2023). Judo-Specific Tests: A Narrative Review With Recommendations for Physical Assessment. *Strength & Conditioning Journal*, 45(3), 294–308. <https://doi.org/10.1519/SSC.0000000000000749>
2. Which Performance Tests Best Define the Special Judo Fitness Test Classification in Elite Judo Athletes? (2022). *Journal of Functional Morphology and Kinesiology*, 7(4), Article 101. <https://doi.org/10.3390/jfmk7040101>
3. Reliability and Responsiveness of the Uchi-Komi Fitness Test among Judo Athletes. (2024). *South African Journal for Research in Sport, Physical Education and Recreation*, 46(1). [https://hdl.handle.net/10520/ejc-sport\\_v46\\_n1\\_a2](https://hdl.handle.net/10520/ejc-sport_v46_n1_a2)



4. World Medical Association. (2013). World Medical Association Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects. *JAMA*, 310(20), 2191–2194.  
<https://doi.org/10.1001/jama.2013.281053>
5. COPE, DOAJ, OASPA, & WAME. (2022). *Principles of Transparency and Best Practice in Scholarly Publishing* (Version 4).  
<https://doi.org/10.24318/cope.2019.1.12>