A special judo fitness test classificatory table

Authors' Contribution:
A Study Design
B Data Collection
C Statistical Analysis
D Manuscript Preparation
E Funds Collection

Emerson Franchini[1ABCDE]**, Fabrício Boscolo Del Vecchio**[1CDE]**,Stanislaw Sterkowicz**[2ACDE]

[1] Martial Arts and Combat Sports Research Group, Sport Department, School of Physical Education and Sport, University of São Paulo, Brasil
[2] Combat Sports Department, Cracow Academy of Physical Education, Cracow, Poland

Abstract

Background and Study Aim: Judo is very physiological demanding sport, but there are no many physical fitness specific tests. One of the most used specific judo tests is the Special Judo Fitness Test (SJFT) proposed by Sterkowicz (1995). Although this test has been used by many coaches in different countries no classificatory table was found to classify the judo athletes according to their results. Thus, the aim of this work was to present a classificatory table for this test.

Material/Methods: For this purpose 141 judo athletes (mean ±standard deviation: 21.3±4.5 years-old; 74.2±15.9 kg of body mass and 176.7±8.2 cm of height; judo ranking between 3rd *kyu* and 3rd *dan*) familiarized with the SJFT performed it once in order to provide data to establish a classificatory table.

Results: After the analysis of data distribution a five scale table (20% for each classificatory category) was developed considering the variables used in the SJFT (number of throws, heart rate after and 1 min after the test and index).

Conclusions: The classificatory table can help coaches using the SJFT to classify their athletes' level and to monitor their physical fitness progress.

Key words: judo • anaerobic test • evaluation • fitness • training control

Author's address: Emerson Franchini, Av. Prof.Mello Moraes, 65 Cidade Universitária, 05508-900 São Paulo (SP) – Brazil, e-mail: emersonfranchini@hotmail.com

BACKGROUND

Judo is a high physiological demanding sport, although technique and tactics seem to play a major influence on competitive performance [1]. However, as physical conditioning is an important aspect of training and competitive processes it is important to have specific tests to evaluate judo players' physical fitness in order to improve their training routine and contribute to a higher level performance in competitions [2].

For this reason some authors tried to develop judo specific tests [3–5] in order to provide the coach a simple tool to access his/her athletes' physical fitness. Nevertheless, among these and other tests proposed the most used both in research [6–10] and in National Team evaluations [10,11] is the Special Judo Fitness Test (SJFT). Although this test has been shown to be reliable [5,12,13], and with a low measurement error [13], sensible to training [12,14] even in high-level athletes [15], able to properly discriminate athletes of different levels [8,16], correlated to performance in well controled laboratorial tests [7,17], and correlated to attacks during a judo match [9] no classificatory table for the SJFT was found. Thus, the aim of this article was to develop such an instrument.

METHODS

Study design

This was a single test descriptive study as subjects were submitted to the SJFT once. Briefly the SJFT is divided in three periods (A=15 s; B and C=30 s) with 10 s
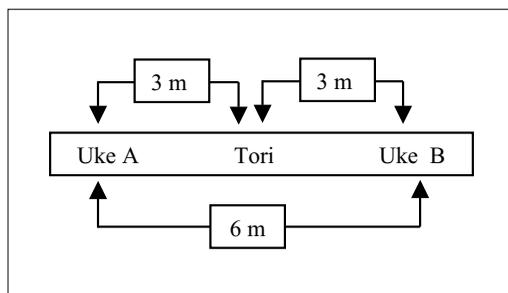
Figure 1. Special Judo Fitness Test representation.

intervals among them. During each period the athlete (*tori*) been evaluated throws two partners (*uke* A and B; far from each by 6 m) as many time as possible using the *ippon-seoi-nage* technique.

Test representation is presented on Figure 1.

Both *uke* A and B should have a similar height and weight from the *tori*. Just after and one minute after the test heart rate is measured. The throws are added and the following index is calculated:

$$\text{Index} = \frac{\text{final HR (bpm)} + \text{HR 1-min after the test (bpm)}}{\text{Number of throws}}$$

Equation 1

Participants

A sample of 141 male judo athletes with the following characteristics (mean ±standard deviation and (range)) took part in the present study: 21.3±4.5 (16–34) years-old 74.2±15.9 (51–151.5) kg of body mass and 176.7±8.2 (159–200) cm of height. Their judo ranking ranged between 3rd *kyu* and 3rd *dan*. All the participants were evaluated during their competitive period and were familiarized with this test. The test was conducted by experienced evaluators (the first author of the study). The subjects signed an informed consent and all the procedures were approved by the institutional ethics committee.

Heart rate measurement

Heart rate was monitored with a heart rate transmitter (Polar Electro Oy, Kempele, Finland).

Statistical analysis

Mean and standard deviation were calculated for each variable (number of throws, heart rate after and 1 min after the test, and index). After the analysis of data distribution a 5-scale table (20% for each classificatory category) was generated.

RESULTS

The main results are presented on Table 1.

DISCUSSION

The results presented on Table 1 can help coaches using the SJFT to classify their athletes and to monitor their physical fitness progress. However, it is important to consider that it is necessary to establish classificatory norms for each weight category for both male and female athletes, given that the present classificatory table was based on male data of all weight categories grouped. Another possible application for this table is the rehabilitation process, i.e., coaches can compare athletes' results on the SJFT before injury and after rehabilitation in order to establish the progress to more complex judo specific exercises according to the athletes' physical condition.

CONCLUSIONS

Based on the classificatory table presented is possible to classify the physical fitness of judo athletes, monitor their training progress and establish goals for judo athletes concerning their special physical fitness. Future research should focus the development of classificatory tables for female judo athletes and for different weight categories.

Table 1. Classificatory norms for total number of throws, heart rate (after and 1-min after) and index in the Special Judo Fitness Test (n=141).

Classification	Variables			
	Total of throws	HR after (bpm)	HR 1min after (bpm)	Index
Excelent	≥29	≤173	≤143	≤11.73
Good	27–28	174–184	144–161	11.74–13.03
Average	26	185–187	162–165	13.04–13.94
Poor	25	188–195	166–174	13.95–14.84
Very Poor	≤24	≥196	≥175	≥14.85

HR – heart rate.

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