

Validity of a Novel Specific Wrestling Fitness Test

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Abstract

Marković, M, Kukić, F, Dopsaj, M, Kasum, G, Toskić, L, and Zarić, I. Validity of a novel specific wrestling fitness test. *J Strength Cond Res* 35(12S): S51–S57, 2021—The specific wrestling fitness test (SWFT) is a novel test aiming to estimate the level of physical preparedness of wrestlers; therefore, it should possess an acceptable level of validity. The aim of this study was to investigate an internal, external, and construct validity of SWFT. The sample consisted of 15 national level male wrestlers (age = 22.6 ± 2.3 years, body mass [BM] = 83.3 ± 6.5 kg, and BM index [BMI] = 25.36 ± 1.2 kg·m⁻²). They performed the SWFT, specific judo fitness test (SJFT), and specific wrestling performance test (SWPT), each test on a separate day. For each test, performance was evaluated in absolute measure as total number of throws at the end of the test (TnThrows) and relative measure as TnThrows/BM and TnThrows/BMI. Heart rate at the end of the test (HR^{0min}) and 1 minute into recovery (HR^{1min}) was used as a measure of cardiovascular functionality, whereas specific judo fitness index (SJF^{index}) was used as an indicator of cardiovascular functionality relative to given performance. A correlation and multiple linear regression analyses were used to investigate the internal, external, and construct validity of SWFT. The SWFT_TnThrows/BM had the highest internal validity relative to SJFT_TnThrows/BM ($R^2 = 0.722$, $p < 0.001$) and the highest external validity relative to SWPT_TnThrows/BM ($r = 0.846$, $p < 0.001$). SWFT_TnThrows/BM predicted SWPT_TnThrows/BM with a large coefficient of determination ($R^2 = 0.818$, $p < 0.001$). SWFT_TnThrows/BM is valid and easily attainable predictor of wrestlers' specific physical preparedness and as such is of high practical value.

Key Words: combat sport, testing, field tests, preparedness, lactates, functional parameters

Introduction

Wrestling is an acyclic multistructural sport in which open and closed motor patterns are intertwined (30). This means that the multijoint complex movements do not consecutively repeat like they do in sports such as running or swimming. Moreover, the level of physical, technical, and tactical preparation of 2 opponents as well as their actions and reactions during the combat reflects in fluctuations in the intensities and durations of the efforts the wrestlers need to overcome (1). Considering that the conditions of situational resistance of the opponent during the combat is unpredictable (3,31), it has been very difficult to test the wrestlers in a specific combat conditions. In general, assessment of specific competitive preparedness is one of the most complex problems in sports, as it needs to estimate the level of sport-specific physical performance, which depends on intertwining of many mutually related specific characteristics and abilities that often cannot be directly measured (7,13). Thus, sport-specific physical performance is often predicted from fitness measures obtained in conditions that are similar to those of competition (i.e., wrestling combat in wrestlers).

All the tests which are used to assess the performance in certain sport are required to have an appropriate level of reliability, sensitivity, validity, and objectivity (13), whereas specificity of the tests reflects in a close representation of the given sport (15,33). These are the controlled and measurable conditions of sport's activity which simulate the time structure of competition, intensity, as well as metabolic and functional demands of the

competition (13,21,26). For example, specificity of wrestling combat reflects in constant and unpredictable exchanges of tempo and rhythm of attacking and defensive actions of maximal and submaximal intensity. Consequently, there is a unique metabolic stress on the body, whereby wrestlers during combat reach the blood lactate level of about 10–20 mmol·L⁻¹ and maximal heart rate (HR) (1,20). Considering this and that combat conditions are less likely to be replicated and may increase the risk of injury, the permanent control of training process of wrestlers would not be followed, evaluated, and controlled accurately and precisely as it could be by utilization of standardized tests.

To be utilized, these tests must be a valid prediction of competitive performance (15). For instance, the most popular specific test in martial arts sports is the specific judo fitness test (SJFT) which has been shown to be valid, sensitive, and reliable (5,8,9,12,14,27). Karimi (18) applied the SJFT with wrestlers, which could be based on similarities between wrestling and judo, such as complex skills and tactical excellence performed during high-intensity intermittent combat (10). Furthermore, Franchini et al. (11) showed that SJFT dominantly evaluate anaerobic alactic system, which was considered to be used for the most of the actions performed in the match. Moreover, a wrestling-specific test has not been developed so far, which could be an additional reason why wrestling coaches used the SJFT to evaluate the anaerobic alactic system of their athletes. However, there are various differences between the judo and wrestling sport such as kimono in judo, the distance between 2 fighters (shorter in wrestling), and the duration of the combat (longer in wrestling). Therefore, the SJFT could be replaced by a fitness test that would be more specific to technical and metabolic demands of wrestling combat. In that regard, 2 specific wrestling tests have been

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