



Subjective evaluation of the functional well-being of an athlete with a disability: key features, dependability, and external validity

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Abstract

Objective of the study was to creation and validation of a questionnaire-based approach to assess the performance of athletes with disabilities, focusing on the functionality of their body systems in relation to the demands of their sport.

Methods and structure of the study. The framework for the creation of the methodology was based on the theoretical framework of functional comfort. The theoretical framework is a subsystem level of functional comfort, consisting of five subsystems that differ in their functional purpose and unique characteristics: sensory, cognitive, volitional, adaptive, and motor.

The research methods used included testing, expert evaluation by coaches, analysis of training process data, assessment of the progress in developing sports skills, and examination of performance at competitions.

The retest reliability was assessed in two stages, with a six-month interval between them.

Results and conclusions. Based on the majority of scales, the retest reliability is strong and meets the psychometric standards. However, the cognitive subsystem scale stands out with inconsistent results. The internal consistency of the sensory and motor subsystems scale is average, suggesting that subjective functional comfort is influenced by external factors. The correlation analysis results indicate a satisfactory level of empirical validity. This method can be employed for scientific research and as a diagnostic tool for athletes with disabilities.

Keywords: *functional comfort, athlete, disabilities, methodology, reliability, validity.*

Introduction. The category of functional comfort acts as a psychological determinant of the success of the subject, the effectiveness of his activity, implemented in the performance of the task and the achievement of the goal in such a way as to meet the predetermined criteria [3, 5]. Functional comfort is the result of the functioning of the system of mental processes in interaction with environmental factors [7, 8]. When disclosing issues of subjective assessment of functional comfort of athletes with disabilities, it is important to take into account studies that reveal the features of the athlete's condition [2], motivational and volitional characteristics of the athlete's personality [4], and adaptive mechanisms of the body [1]. The relevance of the creation of the technique "Subjective assessment of functional comfort of an athlete

with disabilities" ("SAFC") is due to the objective need caused by the deficit of methods for diagnosing subjective comfort in general and athletes with disabilities (AWD) in particular. The subsystems included in the concept of "SAFC" are traditional and have repeatedly appeared in the studies of domestic and foreign authors. However, an integrated approach involves defining functional comfort as a system [4], which necessarily requires an assessment of the interrelations of all subsystems of the phenomenon under consideration.

Objective of the study was to creation and validation of a questionnaire-based approach to assess the performance of athletes with disabilities, focusing on the functionality of their body systems in relation to the demands of their sport.



Methods and structure of the study. Research methods: testing, expert assessment by trainers, including data on control results of the training process, assessment of the dynamics of development of sports skills of the experiment participant, as well as data on performances in competitions. The “SAFK” technique includes 50 statements that allow an athlete to evaluate the components of five subsystems of the body (sensory, cognitive, volitional, adaptive, motor). The subject evaluates the components of the body’s subsystems using a 5-point system, where 1 is the level of development of the component does not meet the requirements, 2 is extremely rare, 3 is rare, 4 is often 5 is always compliant. The sensory subsystem includes reactions to visual and auditory stimuli, as well as the features of perceiving a large number of signals at the same time, changes occurring in the environment or in activity (with an object, work object, etc.), clarity and awareness of perception when performing exercises. The cognitive subsystem combines the processes involved in the information processing associated with awareness of one’s own states, finding errors, the ability to interpret the causes of defeats, characteristics of attention and memory. The volitional subsystem includes the subject’s assessment of the ability to maintain performance over a long period of training (during training camps), to combat fatigue and exhaustion, readiness to take the initiative, to work in monotonous conditions activity, in conditions of time regulation, volitional qualities in achieving the goal of the activ-

ity. The adaptation subsystem includes a set of resources that allow adaptation to various environmental factors: adaptation to physical, spatial features of the environment, to the requirements of sports activities, to physical activity. The motor subsystem includes the ability to manipulate objects, memorization of large and small motor skills, the presence or absence of muscle tension when performing training exercises, coordination of movements, readiness to perform movements of various natures, tolerance of prolonged motor loads, motor activity.

Mathematical statistics were conducted using the Statistica 20.0 software package using the Pearson linear correlation coefficient and the alpha coefficient. The retest reliability check was conducted in two stages with a 6-month interval between testing. The sample consisted of students – athletes of the Russian State University of Social Technologies with disabilities. A total of 87 people aged 17 to 23 years took part in the study.

Results of the study and discussion. When checking the retest reliability, relationships were established between the results of the first and second measurements (Table 1). The values of the correlation coefficient for all scales have a high level of significance, with the exception of the “cognitive subsystem” scale, which speaks in favor of the reliability of the scales and indicates high retest reliability and compliance of the methodology with psychometric requirements. As for the cognitive subsystem, the fact of the multifaceted nature of the cognitive sphere itself,

Table 1. Results of checking the retest capability of the “SAFK” method

Scales of the «SAFK» methodology	r	p
Sensory subsystem	0,547	0,001
Cognitive subsystem	0,156	0,243
Volitional subsystem	0,647	0,001
Adaptation subsystem	0,874	0,001
Motor subsystem	0,433	0,001

Table 2. Results of testing the “SAFK” methodology for reliability according to internal consistency (at a significance level of $p \leq 0,05$)

Scales of the «SAFK» methodology	Alpha coefficient
Sensory subsystem	0,256
Cognitive subsystem	0,376
Volitional subsystem	0,445
Adaptation subsystem	0,431
Motor subsystem	0,276

Table 3. Correlation links between the indicators of the scales of the “SAFK” methodology and the effectiveness of sports activities

Scales of the «SAFK» methodology	Results of control trainings		Competition results		The presence of dynamics in the development of sports skills	
	r	p	r	p	r	p
Sensory subsystem	0,356	0,004	0,247	0,002	0,258	0,025
Cognitive subsystem	0,272	0,023	0,265	0,000	0,422	0,000
Volitional subsystem	0,347	0,054	0,465	0,031	0,376	0,001
Adaptation subsystem	0,647	0,036	0,574	0,093	0,668	0,003
Motor subsystem	0,543	0,092	0,356	0,065	0,465	0,022

Note: the value of the Pearson correlation coefficient; p is the level of significance of the relationship. Significant relationships are highlighted.

including both general and special cognitive abilities, played a role here. The subject's assessment of cognitive functions can vary depending on external factors (the presence or absence of success in a given period of time) and internal conditions (the dominance of emotional positive or negative experiences regarding one's own success).

The results of the calculation of the reliability check for internal consistency are presented in Table 2.

As can be seen from Table 2, the developed method shows excellent results in terms of reliability of internal consistency. The measure of internal consistency of individual scales is mediocre. This may be a manifestation of the specificity of the phenomenon being studied: the same manifestation of functional comfort may be caused by different reasons.

Table 3 shows the results of testing the empirical validity of the “SAFK” methodology.

It was revealed that the adaptive and motor subsystems have positive relationships with the results of sports activities. The psychological meaning of the revealed correlations is as follows: the more an athlete with disabilities is able to adapt to the physical, hygienic, psychological requirements of sports activities, the more he feels ready for long-term physical exertion during the training process, the more effective his activity. The sensory, volitional and cognitive subsystems also have connections, but only with one of the types of sports performance. With an increase in the ability to perform various movements by nature, to endure long-term motor loads, to accurately perceive and respond to environmental signals, the more successful an athlete is in control training in familiar conditions. However, the success of performances in competitions, as this study showed, requires the inclusion of other subsystems. The volitional subsystem

has close connections with the results of competitions. This confirms the data on the specificity of volitional processes of athletes. An interesting fact is the connection between the cognitive subsystem and the presence of dynamics of sports performance. It is obvious that for the progressive development of sports skills, cognitive activity is necessary, which allows the athlete to conduct self-reflection, memorize information, quickly switch from one object to another, distribute attention or concentrate on objects that are significant for sports activity. The correspondence of the results of the correlation analysis allows us to speak about the satisfactory empirical validity of the methodology.

Conclusions. The structure of subjective functional comfort of an athlete with disabilities, identified on the basis of the systemic and systemic-activity approaches, made it possible to formulate its operational definition as a multi-level system of specific and non-specific cognitive, adaptive, sensory, volitional, motor formations generated by the conditions of activity and assessed by the subject from the point of view of their compliance with the proposed requirements of the activity.

Testing of retest, internal reliability and empirical validity allow us to talk about the possibility of using the “SAFK” method to assess the functional comfort of athletes with disabilities.

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