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Motor skills reliability of the throws technique of the young SAMBO players

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Key words: reliability of throws technique, modeling characteristics, SAMBO

Summary

Introduction. In the present research some modeling parameters were compared with competitions results.

Material and methods. The indexes of reliability of throws execution and ratio of reliable and unreliable athletes of entire assembly of youth have been defined. More than 60 athletes, 45 members of the Russian senior team and 20 youth athletes 15-16 years old were analyzed.

Results and Conclusions. In modern SAMBO often the result is defined by quantity of attempts of technical actions execution. If athlete tries to make throws more often than his rival, he has more chances to win. In this case it becomes necessary to know athletes' parameters of activity (quantity of attempts during 1 minute), and also reliability of this parameter at competitions. Arrangement of activities' indexes of entire assembly accords to normal arrangement, significant at $p<0,05$. In this case we can suppose that half of all youth athletes potentially will be unreliable at competitions under distracting factors influence (reliability 100% and more [10]). Trainers and athletes should consider parameters of athletes' reliability during preparation to competitions when results are planed and also use these indexes analyzing main rivals.

Introduction

Modern SAMBO promptly develops. A lot of new countries appear in the different international competitions every year. Rivalry rise inside the country, many athletes participate in both kinds of sport, SAMBO and judo, all of these form the structure of modern SAMBO. So, nowadays, standing position fighting predominates ground work, remarks for passive fighting are given in the first minutes of the match, active motions are encouraged. Getting advantage by submission locks becomes harder, as, nowadays, time of ground work is limited, besides there is tendency of its reducing. Modern athletes must possess such technique of throws, which would be functioning under any distracting factors influence.

During a fight before athletes some "sports motor tasks" are raising, which must be resolved by own technical skills. "Functional system" [1,2] forms for getting "useful result" [1,2] from such sports task solution, and this tasks solution is made by "motor programs" and "sensory corrections" which are brought in this program [2,3].

It seems easy; just practice different fights situations during the training, forming "motor programs"; develop physical qualities and in the result the reliable motor skill will be made. But there are some barriers on this pathway.

There are a lot of sports situations in SAMBO which multiply on individuals features and in the result, many sports tasks demanding resolution raise before athletes. To form all "motor programs" previously by practicing during training process very hard. Therefore other way is necessary for resolving this problem.

Another complexity is distracting factors influence appearing during competitions. Some situations are often observed that athlete resolves all "motors tasks" at training process, make throws, but quality and quantity of motors tasks solutions become lower at competitions.

But how to define which athlete will demonstrate all his technical capabilities maximally and which will not be able to realize his potential. How many athletes could be exposed by distracting factors influence, and how many are stimulated by them and could achieve the higher result?

Eventually 3 main tasks have been resolved by this research:

1. To define which of modeling characteristics do stronger influence on athletes results?
2. To define indexes of reliability of throws execution in competitions among youth.
3. To estimate arrangements regularities of reliabilities parameters among youth and to define main characteristics of entire assembly by these parameters.

The purpose of the research

To increase motor skills reliability of throws execution of athletes in scenarios of competitions.

Material and methods

In the present research 2 pedagogical supervisions were spent, the video data with records of training process and competitions were analyzed, indexes of reliability were defined. Correlations between modeling parameters of men and their competitions results were calculated. Graphical analysis of parameters arrangement by block diagrams and cumulative frequency polygon's construction was defined. Test for concordance of small samples was analyzed and characteristic of arrangement of entire assembly was done.

First selection was consisted of 45 athletes, men teams members of 2009.

Second selection was consisted of 20 athletes 15-16 years old students of 2 sports schools of Moscow and Moscow regency. The age was defined by crossing classification of "periods of psychological development" [4] and periods of biological and physiological development of athletes [5].

For describing the indexes of reliability defined in the present research, let's say some words about the term "reliability".

In the field of technology, reliability is an ability of properly and error-free working during some period of time in reference conditions [6,7,8]. It is a characteristic of probability related to performance goals of equipment [7].

In the field of sports activity, reliability is defined as integral characteristic, as probability of error-free execution of motors task. Probability of each of sports motor action (SMA), by which sports motor task (SMT) is resolved, enter as component to probability of SMT resolving, defining it [8].

It shall make differences between absolute and relative reliability. If absolute reliability is estimated as probability of us satisfactory attempts of SMA execution or SMT resolving, defining as quotient of dividing satisfactory attempts by its total number, so relative reliability is estimated as dividing of some 2 absolute reliabilities [8,9,10].

Indexes of reliability were calculated: relative reliability of activity (Pa'), relative reliability of success (Ps'), relative reliability of efficiency (Pe').

Relative reliability of activity (Pa').

Absolute reliability of activity is probability of total number of attempts executing during some period of time (1 min):

$$Pa = N/t,$$

where N – total number of attempts, t – total time of a fight.

This index can be calculated at training and at competitions.

Relative reliability of activity is probability of athlete's error-rate performance of total number of attempts during some period of time under distracting factors influence:

$$P_a' = \frac{Pac}{Pat} * 100\%$$

where Pac – absolute reliability of activity at the competition, Pat – absolute reliability of activity at the training.

This parameter allows to estimate quantitatively the distracting factors' influence on athlete's onrushing potential.

Relative reliability of success (Ps').

Absolute reliability of success is probability of quantity of successful attempts executing during some period of time (1 min):

$$Pa = n/t,$$

where n – quantity of successful attempts,

t – total time of a fight.

This index can be calculated at training and at competitions.

Relative reliability of success is probability of athlete's error-rate performance of successful number of attempts executing during some period of time under distracting factors influence:

$$Ps' = \frac{Psc}{Pst} * 100\%$$

where Psc – absolute reliability of success at the competition, Pst – absolute reliability of success at the training.

Relative reliability of efficiency (Pe')

Absolute reliability of efficiency is a correlation of successful attempts of technique performance to total number of attempts in percentage.

$$Pe = \frac{n}{N} * 100\%$$

where n – quantity of successful attempts, N – total number of attempts.

This index can be calculated at training and at competitions.

Relative reliability of efficiency is probability of successful attempts' quantity of total number of attempts under distracting factors influence:

$$Pe' = \frac{Pec}{Pet} * 100\%$$

where Pec – absolute reliability of efficiency at the competition, Pet – absolute reliability of efficiency at the training.

Results and Discussion

By first pedagogical supervision and analyzing video data, some modeling parameters were calculated for each Russian men teams member: efficiency of an attack (Ea), efficiency of defense (Ed), the factor of activity (Fa) [6].

Spearman's rank correlation coefficient (r_s) for samples with big equal ranks quantity has been defined [13]. Indexes are presented in Tab. 1.

Correlation analysis showed that the factor of activity (Fa) had the strongest relation with athletes competitions results, r_s=-0,6, significant at p<0,01.

In the result of second pedagogical supervision, indexes of reliability have been defined; results are presented in Tab. 2.

Table 1. Correlation between modeling parameters and results of Russia Championship 2009

	Ea	Ed	Fa
Correlation index (r_s)	-0,47	-0,57	-0,6
Level of significance	Significant at p<0,01	Significant at p<0,01	Significant at p<0,01

Table 2. Indexes of reliability

№ of the player	Pa' %	Ps' %	Pe' %
1	79	63	86
2	83	36	44
3	53	0	0
4	81	120	145
5	150	100	58
6	171	100	60
7	165	220	138
8	104	50	53
9	141	400	325
10	117	133	114
11	77	50	68
12	108	188	178
13	107	233	219
14	71	300	650
15	107	200	206
16	75	80	121
17	72	100	125
18	128	100	61
19	79	75	93
20	78	36	44

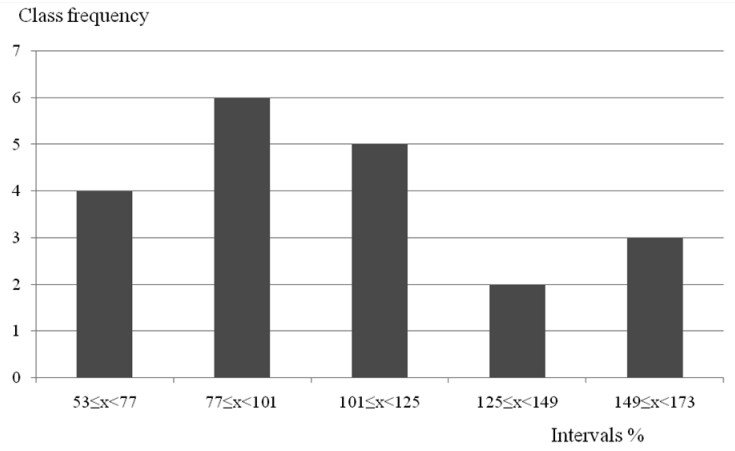

Fig. 1. Block diagram of relative reliability of activities' arrangement

Graphical analysis of empirical evidences Pa' (Fig. 1) allowed us to suppose that sample had tendency to normal arrangement. This hypothesis was confirmed by Shapiro-Wilk's test for concordance (W). It is one of the most powerful and reliable test for concordance for this volume of selection [11].

For Pa' W=0,907, what let us speak about accordance of empirical evidences to normal arrangement, significant at p<0,05.

In addition, mean of sample $\bar{x}$=102% and standard error of the mean r_s=±7,5%.

Mean root square deviation S=33,7.

Confidential interval for average number of entire assembly is: 86,3%≤ M ≤117,7%.

As empirical evidences arrangement accords to normal, we can suppose that Pa' index of 34% of athletes would be in interval $\bar{x}$ - S<Pa≤ $\bar{x}$ ≈ 68,3%<Pa≤ 102%.

Of 13,6% of athletes - 2S<Pa≤ $\bar{x}$ - S ≈ 34,6%<Pa≤ 68,3%.

Of 2% of athletes $\bar{x}$ - 3S<Pa≤ $\bar{x}$ - 2S $\bar{x}$ - 3S ≈ 1%<Pa≤ 34,6%.

Graphical analysis of empirical evidences Ps' (Fig. 2) also allowed us to suppose that sample had tendency to normal arrangement. However, this hypothesis wasn't confirmed by Shapiro-Wilk's test for concordance. For Ps' W=0,889 what is lower than tables index if the level of significance is 95%.

We should mark, that empirical evidences of W criterion is situated near table's index Wtab=0,905 and insignificant difference could be explained by small sample.

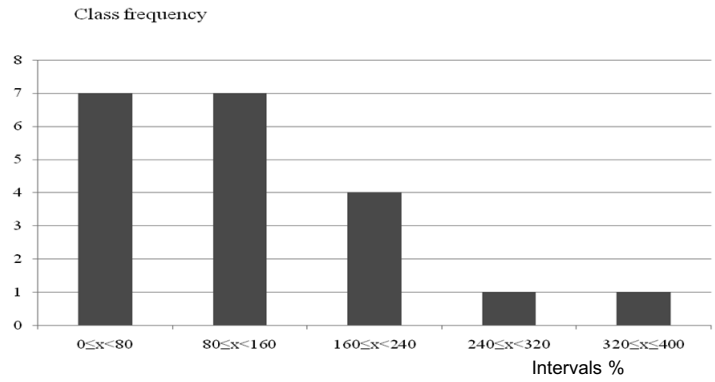

Fig. 2. Block diagram of relative reliability of success's arrangement

Mean of sample $\bar{x}$=129% and standard error of the mean r_s=±22,4%.

Hypothesis about accordance of empirical evidences of relative reliability of efficiency (Pe') to normal arrangement wasn't confirmed by Shapiro-Wilk's test for concordance. W=0,705 what is much lower than table's index at p<0,05.

This parameter always should be observed in combination with other indexes.

Conclusions

1. In modern SAMBO often the result is defined by quantity of attempts of technical actions execution. If athlete tries to make throws more often than his rival, he has more chances to win. In this case it becomes necessary to know athletes parameters of activity (quantity of attempts during 1 minute), and also reliability of this parameter at competitions.
2. Arrangement of activities indexes of entire assembly accords to normal arrangement, significant at p<0,05. In this case we can suppose that half of all youth athletes potentially will be unreliable at competitions under distracting factors influence (reliability 100% and more [10]).
3. Trainers and athletes should consider parameters of athletes' reliability during preparation to competitions when results are planed and also use these indexes analyzing main rivals.

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