

Scientific paper

THE QUANTITATIVE CHANGES THAT ORIGINATED FROM THE APPLICATION OF DIFFERENT METHODOLOGICAL PROCEDURES IN THE PROCESS OF ACQUIRING AND IMPROVING COMPLEX MOTORIC MOVEMENTS IN JUDO

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Abstract. *The quantitative effects of the changes, which might appear using different methodological procedures (the classical Japanese methodological training for the leg throwing techniques in judo, the German methodological procedures for the leg throwing techniques) in the controlled groups, and the experimental methodological procedure for training by the throwing techniques in judo, in the experimental group have been analysed firstly as the result of the discriminative analysis of the global quantitative changes in the controlled group and the experimental group.*

Methodological procedures are based to have the best results achieved by using the leg throwing techniques in judo in this experiment.

Analysing the results of the univariate analysis (Table 1) we can see that all the measured variables (the leg throwing judo techniques) are significantly discriminated by the groups. The biggest changes has occurred with the researchees from the first group (the experimental group). The results show the quantitative increase within the group which was twice bigger than in other two groups.

The third group (the classical Japanese methodological procedure) had a smaller quantitative increase within the researched leg throwing techniques that the researchees from the experimental group, and the second group (the German methodological procedure) had similarly the same small quantitative increase of the changes of the researched leg throwing techniques from the both groups.

Key words: *quantitative changes, methodological, leg techniques, judo.*

1. INTRODUCTION

The eternal struggle to reach the top, the need to stay up, falls and rises are the parts of sport, especially of that which has high profile and tendency to develop fast. The very

development can be seen in a faster function, physical, psychological and technical preparedness. As the result, we have conditions, methods and training equipment changing and improving more. New rules have been introduced, equipment, technology has been improved, as well as control of all segments (both athletes and their functioning) has been done in the most modern ways.

The process of achieving the best competition results is more based now on the most recent scientific research methods, having the aim to find and to determine factors which influence success in sport. Among those factors, a significant place is occupied by methodology for improving the technical elements of judo. The drive to reach better results has caused big changes in many sports, as well as in judo.

Judo is the sport that has been developing very fast and intensively. New throwing techniques or the variants of the old ones with the novelties and the methodology ("the workshops" from the ex-USSR, Russia and other institutions) have been dealing with these problems. The new rules have been introduced, the weight categories have been changed and the time of the struggle has been shortened, causing a bigger dynamics, efficiency and attractiveness.

All these changes require a greater research approach to all of the segments of the training process. A special care is given to the early selection of young judo trainees who have the qualities for the biggest results, in order to be directed to a special competition regime and to reach the topmost results.

Judo is the sport with its specific structure of movement, a big range of throwing and ground techniques as well as the competitor characteristics, which demands a unique psychological preparedness, which can significantly compensate the lack of physical, functional and technical abilities.

Judo is the sport from the group of sports which have polystructural acyclic movements, and which unite in their movement structures the highest levels of the psychophysical characteristics.

A successful judo athlete must have the speed of a sprinter, the power of a weight lifter, the endurance of a middle-distance runner, the flexibility and the precision of movement and the feeling for the space that a gymnast has. He also has to be intelligent, decisive, brave and highly motivated in order to achieve more optimal result (4, 7).

Today, there is the insistence on a more rational and optimal training process for achieving high sport results, which was unimaginable without the application of the scientific research methods. The success in sport depends on a range of factors (motoric, morphological, functional, cognitive and connotative characteristics of the athletes).

Knowing all the mentioned dimensions of a personality, a regular and effective selection of the athletes and the application of the most effective programs in training are made possible.

To know well the effectiveness of certain programs applied to the training of the beginners, there has been made possible to have a more rational training process. It would be optimized taking into the account the time and energy investment of an athlete, and thus the final effect of the practice would be improved by having an important effectiveness of acquired technique (8).

The quantitative effects of the changes, which might appear using different methodological procedures (the classical Japanese methodological training for the leg throwing techniques in judo, the German methodological procedures for the leg throwing techniques) in the controlled groups, and the experimental methodological procedure for

training by the throwing techniques in judo, in the experimental group have been analysed firstly as the result of the discriminative analysis of the global quantitative changes in the controlled group and the experimental group.

Methodological procedures are based to have the best results achieved by using the leg throwing techniques in judo in this experiment.

2. THE SUBJECT OF THE RESEARCH

The subject of this research is comparison of different methods (methodological acts) in teaching led techniques in judo. Afterwards, even the limit between forming of habit and improving is not enough defined, this research is limited on problem of fast and efficient forming of motorical stereotype, necessary for performing led techniques, at the same time not interfering in problem of long and complex process of improving.

This research used the classical model with experimental group and two control groups. The model predicts that this three groups have three different methodical acts of teaching led throwing techniques.

3. AIMS

The good knowledge of efficiency of the special programs, applied to the training of the beginners; enables a rational training process. So, it has been optimized from the aspects of the time and energy investment of an athlete in relation to the final effect of the training itself.

The basic aim of this process is to determine the newly appeared changes which spring out from the use of different methodological approaches:

- the classical Japanese methodological procedures,
- the German methodological procedures, and
- the experimental methodological procedures.

4. HYPOTHESIS

H1 – It is expected that the efficiency of learning led techniques in control group, where are used different methodical acts, is not statistically very much different.

H2 – It is expected that quantitative improvement of technique knowledge is the biggest in experimental group which will work according to modified methodical act of teaching.

5. METHODS

The population that has been taken for a sample of the researchees can be defined as the last year students group from the Faculty of Philosophy, Nish, the Physical Education Department.

There were three groups deriving from this big one:

1. group A (30 - 35 researchees)
2. group B (30 - 35 researchees)
3. group C (30 - 35 researchees)

To do the estimation, the research has been done with the sample which was in the stationary phase of the motoric ability development and morphological characteristics.

105 researchees (22 - 25 years old researchees). The sample can be said to have the selection criteria for the enrollment to the Faculty of Philosophy - the Physical Education Department - Nish.

For the estimation of the technical abilities of the researchees, the four representatives of the leg throwing techniques for Ashy - waza have been used:

- a) Deashi-Barai
- b) Okuri-Ashi-Barai
- c) Kosoto-Barai
- d) Ko-Uchi-Barai

The estimation of the effectiveness of the leg throwing judo technique performances has been done by the judges. The judges (being a part of the 5 judge jury) had to fulfill the following conditions:

- to have an ex-competitor's experience.
- to be the owners of a master belt in judo (at least the first day),
- to have the judge licence and to be a trainer as well (1,2).

The data for determining the level of knowing the leg throwing techniques have been collected by:

- VHS video camera (at least three recordings)
- initial recording (before the training process),
- control recording (after 10 hours of the training process),
- final recording (after 20 hours of the training process).

Each of the acquired knowledge of the researchees for each of the leg throwing techniques has been defined by the scale of 10. The evaluation was in full marks. The possible different marks weren't allowed.

6. RESEARCH DISCUSSION RESULTS

Before the analysis of the changes in the results was done, there had been determined, at the initial and final measuring the starting positions of the groups during the researched leg throwing techniques. Actually, using the discriminative analysis we have reached the fact that the results of the leg throwing techniques weren't different. Since our primary task was to find out what the changes were that each group would experience after the completed experimental procedure, the discriminative analysis was done with the results of the real changes between the stages of the initial and final level.

In order to get better results, as far as the marks are concerned, the normalisation was done in order to unburden the marks from the unequal equisity among the marks of different names and a kind of subjectivity of each of the judges individual evaluation. Different distance between the marks of the different names is determined precisely for each

of the judges (what is the distance between 1 and 2, and it is the same between 2 and 3, and so on,...) by the procedure of the variable normalisation (2, 3).

After this all the judges' marks have been fused into one mark and it is evident that the judge who had the most similar marks would influence logically all other marks.

Analysing the results of the univariant analysis (Table 1) we can see that all the measured variables (the leg throwing judo techniques) are significantly discriminated by the groups. Taking into the consideration the results of the F test, we can conclude that what makes the groups differ was more the Okuri-ashai-barai technique and less Deashi-barai technique.

The results of the discriminative analysis shows that the significant discriminative function has been isolated to have 98% of the intra-group variability and canonical correlation of .84.

The discriminative factors were used as the base for the results condensation at the discriminative function leading us to the conclusion that this function is significantly defined by all the measured variables (the leg throwing techniques). However, the leg throwing techniques (Okuri-ashi-barai and Kouchi-barai) are the most influential in defining of the discriminative function, while less influential, but important were the leg throwing techniques Kosoto-barai and Deashi-barai.

Taking into the consideration the position of the group centroids, the correlation and the variable coordinates at the discriminative function (the standardized matrix and the structural matrix), where the variables show the range of the changes, we have the situation where the function is determined by the maximal changes in one of the variables and a bit smaller changes in other variables.

The biggest changes has occurred with the researchees from the first group (the experimental group). Thus, the experimental procedure was the most effective in learning and the improving with the researched leg throwing techniques. The results show the quantitative increase within the group which was twice bigger than in other two groups.

The third group (the classical Japanese methodological procedure) had a smaller quantitative increase within the researched leg throwing techniques than the researchees from the experimental group, and the second group (the German methodological procedure) had similarly the same small quantitative increase of the changes of the researched leg throwing techniques from the both groups.

In our opinion, the cause for this phenomenon, which is expressed within the bigger difference of changes between the experimental and controlled groups, and within the relatively small differences in the quantitative changes between the controlled groups, should be researched within the impact of the experimental factor itself. At the very beginning of the experiment, we found out that there weren't any differences among the groups, but due to the influence of the experimental factor, there appeared bigger increase in the results of the experimental group from those of the controlled groups. That leads us to the conclusion that the experimental group has achieved almost twice better results than the two controlled groups for the same period of time.

The fact is that the motoric base and the initial measuring marks of the leg throwing techniques had the secondary significance to the effectiveness of training with the experimental group. In other words, the level of the motoric base of the researchees and the height of the marks at the initial measuring have a bigger influence on the speed of the training of the leg throwing techniques if the same methodological procedure is applied.

So, this influence is bigger if the German methodological procedure and the classical Japanese methodological procedure are applied.

The discriminative analysis, done with the normalized variables (marks) has shown that there are the significant differences in the quantitative increase of the results among the groups after the end of the experiment. The results have also shown that the biggest increase of the results is within the experimental group, and those of the other two groups (the controlled groups) have the smaller increase of the results

Table 1. Univariant analysis

Variable	Wilks Lambda	F	Q
DEASHI-BARAI	.48	54.73	.00
KOSOTO-BARAI	.49	53.12	.00
KOUCHI-BARAI	.46	59.72	.00
OKURI-ASHI-BARAI	.42	68.91	.00

Table 2. Canonic discriminative function

Function	L	%	R	WL	X2	DF	Q
1	2.56	98%	.84	.27	129.53	8	.00

Table 3.

Variables	The structural matrix	GROUP CENTROIDS	
		group	func
DEASHI-BARAI	.64	1	2.20
KOSOTO-BARAI	.63	2	-1.39
KOUCHI-BARAI	.76	3	-.80
OKURI-ASHI BARI	.72		

7. CONCLUSION

The research is done with the aim to establish, by comparison, the efficiency of different methodical acts for training of leg throwing techniques.

The sample consists of three groups with 101 examinee. For the estimation of leg throwing techniques barai – techniques are used.

The estimation of knowing and efficiency of performing leg techniques in judo are done by judo experts.

The given results, on the initial measurements, are not significantly different among those three groups. After finishing the experimental act, significantly different results appeared, which caused the rejection of hypothesis H1.

The results of discriminative analysis showed that the biggest changes appeared in experimental group. Therefore, during that time experimental acts were the most successful in learning and advancing leg throwing techniques what confirms hypothesis H2.

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KVANTITATIVNE PROMENE NASTALE PRIMENOM RAZLIČITIH METODSKIH POSTUPAKA PRI USVAJANJU I USAVRŠAVANJU SLOŽENIH MOTORIČKIH KRETANJA U DŽUDOU

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Kvantitativni efekti promena koje mogu nastati zbog korišćenja različitih metodskih postupaka (klasični Japanski metodski postupak za nožne tehnike bacanja, Nemački metodski postupak za nožne tehnike bacanja) u kontrolnim grupama i eksperimentalnog postupka, za učenje nožnih tehnika bacanja u džudou, u eksperimentalnoj grupi, su prvo analizirane kao rezultat diskriminativne analize globalnih kvantitativnih promena u kontrolnoj grupi i eksperimentalnoj grupi.

Metodski postupci su tako postavljeni da daju najbolje rezultate u nožnim tehnikama bacanja u džudou, u ovom eksperimentu.

Analizom rezultata univarijantne analize (Tabela 1) može se videti da su sve merene varijable (nožne tehnike bacanja) značajno diskriminativne u grupama. Najveće promene su nastale kod ispitanika u prvoj grupi (eksperimentalna grupa). Rezultati pokazuju kvantitativni porast u grupi koji je bio dva puta veći u odnosu na preostale dve grupe.

Treća grupa (gde je korišćen klasičan japanski metodski postupak) imala je manji kvantitativni porast u ispitivanim nožnim tehnikama bacanja u odnosu na ispitanike iz eksperimentalne grupe, a druga grupa (gde je korišćen nemački metodski postupak) je imala sličan mali kvantitativan porast promena u ispitivanim tehnikama nožnog bacanja u odnosu na obe grupe.

Ključne reči: kvantitativne promene, metodski postupci, nožne tehnike, džudo.