Effectiveness of using representative training methodology for teaching physical education in universities and colleges

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Abstract

Objective of the study was a comparative assessment of the effectiveness of the representative training technique and traditional methods of teaching Taijiquan.

Methods and structure of the study. The scientific work was carried out in the athletics arena of the Sports Faculty of Soochow University. At the beginning of the study, the subjects (n=39, 17-25 years old, qualification – I-II category) were divided into experimental (EG, n=20, 10 girls, 10 boys) and control (CG, n=19, 9 girls, 10 boys) group. The EG included subjects who, in the opinion of the trainer, were less capable of successfully mastering the basic elements of Taijiquan, who showed the lowest activity in training and were in greater need of the help of a psychologist.

Results and conclusions. In the experimental group, the quality of performing three Taijiquan exercises after a training cycle using the representative training technique significantly increased both according to self-assessment and as assessed by the trainer. In the control group, after a cycle of training conducted according to the usual university methodology, the quality of performing two of the three exercises, both according to self-assessment and as assessed by the trainer, on the contrary, significantly decreased; ratings and self-assessments of only the quality of performing the first exercise significantly increased ($p<0.01$), since its development was not so strongly influenced by the psychological fatigue of the subjects. Participants in the CG require volitional efforts to perform exercises, which leads to psychological fatigue. This is accompanied by a deterioration in the functions of some sensory systems, as evidenced by a significant decrease in the speed of switching attention and coordination of movements in the CG.

Keywords: *representative training, image-representation, analyzer, second-signal regulation system, reference image of motor action.*

Introduction. A motor image is a person's idea of the movement that he must make, a movement program (N.A. Bernstein, P.K. Anokhin, D.D. Donskoy, etc.). Representative training is a teaching methodology aimed at identifying and using for training any specific features of single images (for example, muscle-motor sensations) that are important for the effectiveness of the cognitive process, performing a motor task, increasing their share in the emerging image-representations, standards, in accordance with which the action performed will be adjusted.

Objective of the study was a comparative assessment of the effectiveness of the representative training technique and traditional methods of teaching Taijiquan.

Methods and structure of the study. The scientific work was carried out in the athletics arena of the Sports Faculty of Soochow University. Methods: 1) method for determining the speed of switching attention using Schulte tables, modified by Gorbov; 2) Rosenberg self-esteem scale; 3) questionnaire for the Use of Imagery in Sports (SIQ), adapted into Russian by A.N. Veraksy, A.E. Gorovoy, A.I. Grushko, L.F. Bayanova, M.Sh. Galiullina, D.G. Galyavieva, 2014; 4) test to determine the preferred representative system (Tad James, 1990); 5) questionnaire "Degree of chronic fa-

tigue" (A.B. Leonova, 1984); 6) method Relief of mental state (A.O. Prokhorov. 1998); 6) assessment of the success of mastering the elements of taijiquan using specially developed author's tables.

At the beginning of the study, the subjects (n=39, 17-25 years old, qualification – I-II category) were divided into experimental (EG, n=20, 10 girls, 10 boys) and control (CG, n=19, 9 girls, 10 boys) group. The EG included subjects who, in the opinion of the trainer, were less capable of successfully mastering the basic elements of tai chi, who showed the lowest activity in training and were in greater need of the help of a psychologist.

Results of the study and discussion. A comparative analysis showed that the low activity of the subjects from the EG before the experiment could be due to their reluctance to reduce self-esteem (lose self-esteem) due to problems with mastering basic tai chi exercises. The difficulties are due to the lower abilities of the EG subjects to quickly construct and implement complex action programs. This was evidenced by:

1. Significantly lower assessments by the trainer and self-assessments of the correctness of performing the 1st and 2nd taijiquan exercises;

2. Significantly longer time to complete the 2nd and 3rd tasks of the Gorbov-Schulte test (slow search for red numbers in descending order from 24 to 1 and alternate search for numbers);

3. Emotional dullness of visual images (indicator of the "Use of imagination in sports" methodology). Negative emotions that appear during failure can contribute to abstraction from visual images and cause formal, mechanistic repetition of movements. At the same time, the ability to use visual images for activation, to regulate one's state, to change the level of anxiety and emotional arousal decreases. After the experiment, the subjects from the EG coped significantly better with chronic fatigue, including due to significantly higher emotional brightness of images, active and independent use of the influence of images on their emotional state.

In the CG, more significant volitional efforts were required to perform the exercises, which contributed to significantly higher psychological fatigue (indicators of the "Degree of Chronic Fatigue" questionnaire were 2-5 times higher than in the EG). The quality of exercise performance in the EG after the experiment was significantly higher than in the CG, both according to self-assessment and as assessed by the trainer (see table).

Conclusions. In the experimental group, the quality of performing three Tai Chi exercises after a training cycle using the representative training technique significantly increased both according to self-assessment and as assessed by the trainer. In the control group, after a cycle of training conducted according

Significant differences according to the Mann–Whitney U test of indicators obtained after the experiment in the experimental (EG, n=20) and control (CG, n=19) groups

Methods	Indicators	EG		CG		U emp.	p
		$\bar{X}$	σ	$\bar{X}$	σ		
Academic performance (average score for the past semester)		**93,6**	3,9	84,47	5,26	**28,0**	**0,000**
Elements of successful mastery of Taijiquan	Self-assessment 1 exercise	**86,0**	9,1	**60,8**	8,86	**8,5**	**0,000**
	Trainer's assessment of 1 exercise	**76,5**	11,9	**49,7**	6,97	**14,5**	**0,000**
	Self-esteem 2 exercises	**88,5**	7,1	68,68	9,55	**11,0**	**0,000**
	Trainer assessment 2 exercises	**77,5**	9,1	62,63	6,53	**43,0**	**0,000**
	Self-esteem 3 exercises	**85,5**	6,9	56,05	14,87	**9,5**	**0,000**
	Trainer assessment 3 exercises	**73,3**	10,3	43,95	13,50	**17,5**	**0,000**
Using imagination in sports. Emotional brightness of images, use of the influence of images on the emotional state.		**4,8**	1,1	**3,7**	1,58	124,0	***0,064***
Questionnaire "Degree of chronic fatigue"	Symptoms of physiological discomfort	5,8	7,2	25,96	9,27	**16,0**	**0,000**
	Decreased general well-being and cognitive discomfort	18,8	6,5	29,47	11,77	**86,5**	**0,004**
	Disturbances in the emotional-affective sphere	11,3	9,1	25,44	14,29	**80,0**	**0,002**
	Decreased motivation and changes in social communication	29,5	18,8	**46,3**	19,21	**97,0**	**0,009**
	Chronic fatigue index (CFI)	10,3	3,5	21,37	5,09	**10,5**	**0,000**

to the usual university methodology, the quality of performing two of the three exercises, both according to self-assessment and as assessed by the trainer, on the contrary, significantly decreased; ratings and self-assessments only significantly increased the quality of performing the first exercise ($p<0.01$), since its development was not so strongly influenced by the psychological fatigue of the subjects. Participants in the CG require volitional efforts to perform exercises, which leads to psychological fatigue. This is accompanied by a deterioration in the functions of some sensory systems, as evidenced by a significant decrease in the speed of switching attention and coordination of movements in the CG.

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