



Influence of sports exercises on student flexibility indicators

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PhD, Associate Professor **O.S. Krasnikova**¹

PhD, Associate Professor **A.V. Korichko**¹

Yu.N. Savelyeva¹

¹Nizhnevartovsk State University, Nizhnevartovsk

Corresponding author: oskrasnikova@yandex.ru

Abstract

Objective of the study was to reveal the influence of sports activities on the indicators of flexibility among representatives of student youth on the basis of a comparative analysis.

Methods and structure of the study. During the experiment, students of the 1st and 2nd year, engaged in sports-oriented groups, took part in the following areas: cyclic sport (swimming), mixed (volleyball) and acyclic, power (athletic gymnastics). To study the degree of influence of sportsized areas on flexibility indicators, 102 students were tested at the end of the semester. Flexibility was assessed according to five standards: symmetrical indicators, mobility of the shoulder joint and spinal column were studied.

Results and conclusions. A comparative analysis of the indicators of students attending various sports areas showed that the greatest effect of developing flexibility is achieved in the process of swimming. The impact of the aquatic environment on the body and the cyclical nature of the work have a beneficial effect on flexibility indicators, including leading to harmonious development. As a result of playing volleyball, the flexibility of the left side of the body is actively developing and the mobility of the shoulder joint of the right hand is increasing. There is an asymmetry in the development of the flexibility of the right and left sides, both in boys and girls. Ineffective in the development of flexibility, athletic gymnastics was noted, as indicated by the testing data of representatives of student youth. Excessively developed strength abilities stimulate an increase in the diameter of the muscle fiber, which negatively affects the manifestation of flexibility in those involved. With the help of a comparative analysis in the studied sportsized areas, significant gender differences in the development of flexibility were found. In particular, the indicators of female representatives' flexibility are better developed in comparison with young men who go in for volleyball and athletic gymnastics. The exception is young men involved in volleyball, in which the indicators of mobility of the shoulder joint of the right hand prevail with similar values of girls. There were no gender differences in the results of symmetrical tests among representatives of the sportsized direction of a cyclic nature (swimming).

Keywords: sportization, swimming, volleyball, athletic gymnastics, flexibility, student youth.

Introduction. The promotion of sportization, as a form of mass sports activities for various categories of the population, is seen in the actualization of the process of physical education of student youth. Sports training, which began in school years, should be continued in the classroom in the elective disciplines of physical culture and sports. The choice of a sports-oriented direction offered to students will contribute to the promotion of a sports approach in the physical education of students [5].

Student age is a favorable period for achieving the optimal level of motion control, the formation of

qualitative characteristics of motor actions and the improvement of physical abilities. The conditional choice of a sports-oriented direction will contribute to the formation of the physical culture of the students' personality. The specific features of the sport will have a targeted impact on the improvement of the physical qualities of those involved, which does not always contribute to solving the problem.

Objective of the study was to reveal the influence of sports activities on the indicators of flexibility among representatives of student youth on the basis of a comparative analysis.



Methods and structure of the study. The experiment involved 102 1st and 2nd year students of the Nizhnevartovsk State University, who are engaged in sports-oriented groups. Three areas of sports activities were selected: cyclic sport (swimming), mixed (volleyball) and acyclic, power (athletic gymnastics). The choice of a sports direction was carried out by the students on their own, but it was assumed that they had practical skills to continue practicing a particular sport. Flexibility indicators were determined after a semester period of classes in each sporting direction. Flexibility was assessed according to five standards, among which symmetrical standards were used to analyze the possibilities of the right and left sides of the body, as well as the mobility of the shoulder joint and the flexibility of the spinal column. The choice of tests was determined by the structure of frequently performed motor actions in the process of studying the studied sports areas.

Research results. The data obtained indicate a positive effect of swimming lessons on students' flexibility indicators (Tables 1, 2). In almost all tests conducted, the best results of the study were recorded, in comparison with representatives of other areas. In symmetrical tests, no significant differences were found among students attending swimming, which indicates a uniform development of this quality. Gender

analysis allows us to speak about a significant difference only in the flexibility of the articular-ligamentous apparatus of the shoulder joints, as well as the muscles of the chest and back, which are more developed in girls (moving away from the wall - 58.42 at $p < 0.01$ and arm twist - 66.75 at $p < 0.01$).

In the process of practicing volleyball, there is a significant effect on the mobility of the shoulder joint and the elasticity of the muscles of the upper shoulder girdle on the right side. In particular, a variety of game actions in volleyball, including the abduction of the hand to perform the serve and attacking actions, lead to the formation of asymmetry in the development of flexibility, which is expressed in reliable values. Asymmetry was also established when tilting to the side, which indicates a high tone of the oblique muscles and muscles of the back of the right half of the body, which does not allow the tilt to the left to be performed correctly in representatives of both gender groups. However, the frequently performed swing for attacking actions and serving contributes to an increase in the amplitude of the shoulder joint of the right hand more in boys than in girls (bringing the hands behind the back, right from above, respectively Mb=9.44 and Mg=7.21).

In the process of doing athletic gymnastics, rep-

Table 1. Indicators of flexibility in girls attending sports destinations, M \pm m

Test tasks Volleyball n=19		Sports destinations			Student's t-test		
		Swimming n=18	Athletic gymnastics n=11	Volleyball Swimming	Volleyball Athletic gymnastics	Swimming Athletic gymnastics	
Flexibility of the spinal column to the sides, (cm)	to the right	27,07 $\pm 1,27$	27,83 $\pm 1,02$	22,72 $\pm 1,19$	0,47	2,78**	2,94**
	to the left	24,05 $\pm 1,12$	28,02 $\pm 1,09$	21,43 $\pm 1,38$	2,54**	1,49	3,71**
Reduction of hands behind the back, (cm)	Right top	8,43 $\pm 1,18$	13,92 $\pm 1,05$	4,94 $\pm 1,69$	3,48**	1,75	4,36**
	Left top	7,21* $\pm 0,91$	11,08 $\pm 1,45$	2,49* $\pm 1,84$	2,26*	2,07*	4,18**
Flexibility of the upper shoulder girdle, departure from the wall, (cm)		51,79* $\pm 1,73$	58,42* $\pm 1,18$	47,81** $\pm 1,95$	3,17**	1,75	4,07**
Shoulder mobility, arm twist (cm)		71,07* $\pm 3,53$	66,75** $\pm 2,49$	87,93** $\pm 2,83$	1,00	3,64**	4,68**
Flexibility of the spinal column, forward bend (cm)		7,06 $\pm 1,81$	9,43 $\pm 1,52$	4,50 $\pm 1,58$	1,02	1,17	2,05*

Notes: * - Significance by Student's t-test at $p < 0.05$, ** - Significance by Student's t-test at $p < 0.01$.

**Table 2.** Indicators of flexibility in young men attending sports activities, M±m

Test tasks Volleyball n=18		Sports destinations			Student's t-test		
		Swimming n=21	Athletic gymnastics n=15	Volleyball Swimming	Volleyball Athletic gymnastics	Swimming Athletic gymnastics	
Flexibility of the spinal column to the sides, (cm)	to the right	27,94 ±1,08	28,1 ±1,03	19,42 ±1,43	1,21	3,64**	4,93**
	to the left	23,61 ±1,02	26,02 ±1,14	18,73 ±1,36	1,58	2,87*	4,11**
Reduction of hands behind the back, (cm)	Right top	9,44 ±1,47	10,35 ±2,29	2,75 ±2,39	0,33	2,38*	2,30*
	Left top	5,33* ±1,91	8,31 ±2,08	-3,56* ±1,91	1,06	3,29**	4,20**
Flexibility of the upper shoulder girdle, departure from the wall, (cm)		42,72* ±2,36	44,56* ±1,95	22,31** ±2,28	0,60	4,22**	5,42**
Shoulder mobility, arm twist (cm)		95,58* ±3,25	80,7** ±4,03	101,27** ±4,22	2,87**	1,07	3,53**
Flexibility of the spinal column, forward bend (cm)		7,25 ±2,86	6,83 ±1,03	2,44 ±1,82	0,34	1,42	1,81

Notes: * - Significance by Student's t-test at $p < 0.05$, ** - Significance by Student's t-test at $p < 0.01$.

representatives of student youth have the lowest rates of flexibility development. The reason is seen in the excessive development of strength abilities, an increase in the muscle diameter, the absence of amplitude movements in working with simulators and the insufficiency of means of pedagogical influence that contribute to the development of this quality. By analogy with other sporting areas, there are gender differences, so the representatives of the female half involved in athletic gymnastics have better developed flexibility indicators.

Conclusions. As a result of a comparative analysis of sportsized areas, a specialized impact of the type of sports activity on the development of flexibility among students was revealed. Despite the fact that flexibility is not the dominant physical quality in the sports studied by us, the performance of motor actions stimulates its development.

It has been established that swimming lessons contribute to the effective development of flexibility and create the best conditions for the harmonious development of the flexibility of all muscle groups. Asymmetry is observed in volleyball players, which is due to the biomechanical structure of frequently performed motor actions. Representatives of the power direction deserve special attention, since developed power abilities lead to a deterioration in the demonstration of

flexibility among young people. Low rates were noted among boys in comparison with girls in all sportsized directions.

The data obtained make it possible to correct the process of physical education of students, taking into account the specifics of sportsized areas and to develop pedagogical technologies for a directed impact on the education of flexibility.

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