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**MONITORING OF STUDENTS' HEALTH OF FUNCTION GROUP
III IN TECHNICAL INSTITUTIONS**

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Abstract

Key measures to enhance the role of physical culture in designing an educational space based on healthy lifestyle development are application of a system aimed to monitor the level of physical health, physical development and physical fitness of future specialists. Being an assessment tool of productivity of physical education process, monitoring the health state of young people is designed to identify the cause and effect link between physical condition and educational environment having a serious impact on students; to establish factors affecting adversely the life quality of young people; to facilitate adoption of sound managerial decisions to strengthen younger generation health. Monitoring as a diagnostic tool for studying physical development, physical fitness and health status of students of the III function group of Irkutsk National Research Technical University (INRTU) allows teachers of the Department of Physical Education to assess initial parameters of students, monitor their physical development and motor fitness in dynamics, to assess effectiveness of the process of their physical education in HEI and to adjust its content. Using monitoring provision, one can identify priority and long-term comprehensive measures to prevent effects of unfavorable environmental factors and negative impacts of the educational process on students' health; to develop and provide groundings for the differentiated approach to the choice of optimal loads, taking into account their physical development, physical fitness.

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1. Introduction

The analysis of students' health status at technical university indicates a stable tendency to its deterioration. Health is the most vulnerable part of modern youth as students face a number of difficulties connected with the increase of workload, hypodynamia, social problems and poor interpersonal communication (Leyfa, Zheleznyak, & Perelman, 2015; Martynyuk, & Vilyansky, 2015), which negatively affects the process of their adaptation to education in HEI of various levels, as well as it affects the occurrence of their neuropsychiatric breakdowns, leading to deterioration in their health (Koryagin, & Blavt, 2016; Germanov, Stradze, & Sabirova, 2018, p. 48; Koypysheva, 2015). This predetermines the need to monitor physical health of different groups of population and students in particular.

2. Problem Statement

Data based on the results of monitoring research conducted at INRTU over the past decade show a reduction (almost double) in the students' health level in 2013 and some improvements of their health by 2017, as evidenced by the dynamics of changes in the number of students engaged in physical education within "problem" (2 - 4) function groups (Table 1).

Table 01. Distribution of first year students across function groups

Health groups	2007		2009		2011		2013		2015		2017	
	pers.	%	pers.	%	pers.	%	pers.	%	pers.	%	pers.	%
Function group 1	1240	52.5	1060	48.2	1057	51.2	909	50.6	649	40.6	912	60.1
Function group 2	386	16.3	266	12.2	111	5.4	128	7.1	118	7.39	117	7.7
Function group 3	551	23.3	654	29.6	736	35.7	685	38.1	474	29.7	461	30.4
Function group 4	187	7.9	221	10.0	158	7.7	72	4.1	44	2.8	27	1.8

Despite the improvement in the state of students' health (function group I) due to the increase in their number in function group I, 39.9% of the students are divided into "problem" groups (2,3,4), which requires improvement of their physical education system.

3. Research Questions

The analysis of the health status of students defines the need for monitoring studies of the level of their physical development and physical fitness as the main features that determine physical health.

4. Purpose of the Study

One of the research objectives is to provide groundings for the application of monitoring research as a diagnostic tool aimed to determine physical development and physical fitness of students of the function group III, as well as to assess its effectiveness in managing the process of physical education at the university.

5. Research Methods

The level of physical fitness of female students was determined with the help of two groups of methods: anthropometric research (body length, weight, chest circumference) and determination of physiometric characteristics (functional tests of Stange and Genchi). The study of their physical fitness was carried out with the help of control tests reflecting the levels of development: strength abilities (knee push-ups, bent suspension); speed abilities (20-meter run); speed-strength abilities (standing long jump, falling leaf within 30 seconds); endurance (1,000-meter run). Flexibility was determined by the angle body test.

6. Findings

The All-Russian system for monitoring the state of the physical health of young people is a continuation of the state health policy of the nation the main directions of which are denoted in the Decree (No. 916, 2001) of the Government of the Russian Federation “On the All-Russian System for Monitoring the Physical Health of the Population, Physical Development of Children, Adolescents and Youth”. The Research Laboratory Monitoring of Physical Health has been functioning since 2007 at INRTU. The information collected by this Laboratory allows teachers of the Department of Physical Culture to track the dynamics of physical development and physical fitness of students. Besides, it gives an opportunity to assess the harmony of their development, and helps to bring necessary changes to the educational process regarding physical education (Koypysheva, 2015; Perepyolyukova, 2018).

The research had been conducted from September 2007 to September 2017 with the involvement of students who have some permanent or temporary deviations in their health. The results of the physical health of female students in the age group ranging from 17 to 21 years old were compared with the developed regional standards for physical development and physical fitness of students (Lebedinsky et al., 2017). The standards of function group III differ significantly from the parameters set for groups I and II.

The analysis of physical development characteristics of female students of the function group III showed (Table 2) that in the first and the second years of studies the differences in physical development of girls are not observed ($P > 0.05$) except for the weights that by the end of the second and third years of studies are significantly increased ($P < 0.05$). By the end of the third year there is an increase in the length of their body ($P < 0.05$). There is an evident improvement in the results of the tests of Stange and Genchi by the end of the first year ($P < 0.01$). However, during the second year of studies their degradation is noted ($P < 0.05-0.01$) with the subsequent (in the third year) improvement of their performance at a data level for the first year students (Stange ($P < 0.05$), Genchi ($P < 0.01$)).

Table 02. Physical fitness of female students of function group III (1- 4 years of studies)

No	Years of studies	Height (cm)	Weight (kg)	Chest circumference (cm)	Stange's test (c)	Genchi test (c)
1	Beginning of the 1 st year	165.0±0.3	55.8±0.4	85.1±0.4	41.8±0.64	28.9±0.5
2	End of the 1 st year	165.0±0.5	57.3±0.7	85.7±0.7	45.6±1.0	32.3±0.8
	P (1-2)	P>0.05	P<0.05	P>0.05	P<0.01	P<0.01
3	End of the 2 nd year	164.8±0.9	57.2±1.4	86.4±0.8	39.5±2.1	25.6±1.4
	P (2-3)	P>0.05	P>0.05	P>0.05	P<0.05	P<0.01
4	End of the 3 rd year	166.3±0.5	58.8±0.8	86.4±0.6	42.0±1.5	28.0±1.0
	P (3-4)	P<0.05	P<0.05	P>0.05	P>0.05	P>0.05

The analysis of physical fitness of girls (Table 3) showed that the best values of strength ($P < 0.01$) and speed-strength ($P < 0.01$) qualities obtained during push-up test and falling leaf test within 30 seconds (number) are noticed at the end of the first year of study.

Table 03. Physical fitness of girls of function group III (1 – 3 years of studies)

Year of study	20-meter run (sec)	1,000-meter run (min)	Falling Leaf within 30 seconds (number)	Hang (sec)	Straight-leg stretch exercise (cm)	Standing long jump (cm)	Push-ups (number)
Beginning of the 1 st year	4.25±0.1	6:16±0.1	18.8±0.3	9.7±0.6	14.3±0.4	163.0±1.2	21.4±0.4
End of the 1 st year	4.24±0.1	6:05±0.0	21.9±0.7	10.4±0.8	15.4±0.6	163.0±1.6	25.6±0.8
P (1-2)	P>0.05	P>0.05	P<0.01	P>0.05	P>0.05	P>0.05	P<0.01
End of the 2 nd year	4.71±0.1	6:08±0.1	19.0±0.8	15.7±2.1	17.0±1.0	153.2±3.4	22.9±1.6
P (2-3)	P<0.01	P>0.05	P<0.05	P<0.05	P>0.05	P<0.05	P>0.05
End of the 3 rd year	4.94±0.1	6:26±0.1	18.1±0.5	7.7±0.9	15.7±0.6	150.8±2.1	24.2±0.9
P (3-4)	P<0.05	P<0.05	P>0.05	P<0.05	P>0.05	P>0.05	P>0.05

The strength abilities defined through the hang test (c) are best manifested by the end of the first and second ($P (2-3) < 0.05$) years of study at the university. On the contrary, by the end of the second and the third years of studies their significant deterioration is observed: 20-meter run, 1,000-meter run, hang test, jump test ($P (2-3) < 0.05$). Flexibility in the joints does not undergo any significant changes throughout the training period.

7. Conclusion

Thus, considering the physical health of female students, one should speak about positive influence of pedagogical factors on the increase in the characteristics of their physical development and physical fitness especially in the 1 - 2 years of studies at the university. This is determined by the fact that physical education classes at the university are held twice a week. A significant deterioration is observed in the third year of study, which is associated with the decrease in the number of physical education classes in the third year of study (once a week).

The regional standards developed as a result of long-term monitoring studies allow to define five levels of girls' physical development and physical fitness. Moreover, they help design the educational process taking into account typological individual group values of the studied indicators. This makes it possible to determine sustainable ways to correct deviations in their state (Koypysheva, 2015; Lebedinsky et al., 2017), to identify urgent and long-term comprehensive measures, to prevent and eliminate the negative effects of educational process, to develop individual paths for their recovery which significantly improves the process of physical education.

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