

Interactive Methods for Students Life Quality Formation

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Abstract: The modern concept of education of the higher school of Russia is based on a set of valeological principles aimed at preserving the health of students, which is one of the priority tasks facing universities. The aim of the study is to test interactive pedagogical health-saving technologies to improve the quality of students' life at the Technical University of Irkutsk (Russia). The basis of the pedagogical experiment was the didactic reconstruction of the theoretical educational material in the discipline "Physical Culture": reading multimedia lectures on Valeology and discussing story slides on health saving. For conducting further independent work, it was proposed to carry out final research design projects by students on the topic "Physical Culture and Health of Students," which formed the general cultural and professional competences of students. During the school year, 258 senior students (boys and girls) were supervised. A written questionnaire using the Short Form Health Survey was conducted during the experiment (2 times). The use of pedagogical technologies offered by us in the educational process has led to an improvement in the quality of life (QOL) of INRTU students. At the end of the experiment, there was an increase in the indicators on the scales of the physical and psychological components, with the exception of the indicator of the scale "viability." The proposed method of valeological education showed the positive dynamics for QOL and the prevalence of students' positive attitudes towards their health and motor activity.

1. Introduction

Student youth occupies a significant share in the population structure of various countries of the world. According to UNESCO, the number of students in the world exceeded 207 million people in 2014.

The results of studies by several authors indicate a decrease in the level of physical, somatic, and mental health of students [1; 2]. Therefore, the problem of studying the health of students has a multifaceted nature and is relevant.

Over the past two decades, serious socio-economic, political, and spiritual-moral changes have occurred in Russia, which could not but affect the state of health of the population, including students.

In 2018, in the Russian Federation, the number of students studying under the programs of bachelor's degree, master's degree, and specialization was 4161.7 thousand people [3]. Analysis of the state of physical and psychological components of health allows us to assess the potential of motor activity of students, their resistance to environmental factors and difficulties of adaptation to learning conditions in the new educational environment.

In recent decades, the study of the health of populations from the standpoint of characterizing the level of quality of life (QOL) has become widely used in world practice, which subjectively evaluates the results of public activities of people, personal satisfaction with various aspects of their life. In different countries [4; 5], the most popular questionnaire for research is SF-36 (Short Form Health Survey) [6], which allows one to determine the quantitative assessment of the physical and psychological components of human health. Such work was carried out in several regions of Russia. Our studies of QOL student's in Irkutsk allow us to identify the vector of change in their physical, mental health, and social functioning. This is important for the choice of pedagogical technologies of physical and valeological education in the organization of physical education classes in the university.

The purpose of the study is to test interactive pedagogical health-saving technologies to improve the student's quality of life studying at a technical university in Irkutsk (Russia).

2. Materials and Methods

The pedagogical experiment was attended by 258 students (116 girls and 142 boys) of the Irkutsk national research technical University (INRTU), born and permanently residing in Irkutsk. The first survey on the status of QOL was conducted at the beginning of the study of the theoretical course of the discipline "physical education" (February 2018, 3rd course, 6th semester), the second survey – at the end of the study of the course (December 2018, 4th course, 7th semester).

The pedagogical experiment aimed at increasing the QOL of students is based on the didactic reconstruction of educational material of multimedia lectures in the discipline "physical culture," with emphasis on valeological education, demonstration, and discussion of story slides on health saving. For independent work, it was proposed to carry out final research design projects on the topic "physical culture and health of students," forming the general cultural and general professional competencies of students.

The questionnaire for quality of life SF-36 (Short Form Health Survey) [6] was used in the Russian language, where 36 items are grouped into 8 scales of characteristics of the physical (Physical health – PH) and psychological (Mental Health – MH) health components. The responses provide a quantitative assessment of the person's ability to perform his professional activities, the subjective characteristics of mood and general health, the emotional ability to communicate with other people, the degree of daily physical activity. Answers are scored from 0 to 100.

Statistical analysis. The obtained digital data were processed on a personal computer using the Microsoft Excel and Statistica 6.0 applications by the standard methods of variation statistics with the following calculation: the sample size (n), the average value (M), the standard deviation (σ), and standard errors. The significance of differences was determined by Student's test. Differences were considered significant at a significance level of $p < 0.05$.

3. Results

Table 1 shows data on the physical component of the quality of life of INRTU students using the SF-36 questionnaire before and after the pedagogical experiment.

As can be seen from Table 1, it is established that, compared with the beginning of the experiment, at its end:

1. The scale level "physical functioning," i.e., the range of feasible physical activity of students increased among girls by 13.5% (84.2 ± 1.4 and 95.60 ± 0.5 points, respectively), among boys by 10.8%, (86.2 ± 1.6 and 95.5 ± 0.7 points, respectively), $p < 0.05$.
2. The scale level "role functioning," which characterizes the degree of influence of physical condition on daily role activity, increased in girls by 25.5% (66.7 ± 1.9 and 83.70 ± 2.7 points, respectively), in boys by 23,8% (67.4 ± 1.8 and 83.50 ± 2.6 points, respectively), $p < 0.05$.

TABLE 1. PHYSICAL COMPONENT OF QUALITY OF LIFE OF INRTU STUDENTS BEFORE AND AFTER A PEDAGOGICAL EXPERIMENT (M \pm M)

Stages of a Pedagogical Experiment	Sex	Physical Functioning (PF)	Role-Physical (RP)	Body Pain (BP)	General Health (GH)
Start Of Experiment	Girls	84,2 \pm 1,4	66,7 \pm 1,9	82,4 \pm 1,8	61,2 \pm 1,7
	Boys	86,2 \pm 1,6	67,4 \pm 1,8	78,6 \pm 1,8	62,4 \pm 1,8
End Of Experiment	Girls	95,6 \pm 0,5	83,7 \pm 2,7	72,4 \pm 0,9	72,1 \pm 1,7
	Boys	95,5 \pm 0,7	83,5 \pm 2,6	73,6 \pm 1,1	71,4 \pm 1,6

3. The "pain intensity/body pain" scale, when the presence of pain significantly limits the physical activity of students, decreased by 13.8% in girls (82.40 ± 1.8 and 72.4 ± 0.9 points, respectively), in boys by 4.3 % (78.6 ± 1.8 and 73.6 ± 1.1 points, respectively), $p < 0.05$. It is generally accepted that the higher the indicator, the stronger the pain experienced by the respondent. Thus, a decrease in

the indicator value on this scale indicates that pain has become less restrictive of student's physical activity.

- The level of the "general health" scale for girls increased by 17.8% (61.2 ± 1.7 and 72.1 ± 1.7 points, respectively.), for boys by 14.4% ($62.4 \pm 1, 8$ and 71.4 ± 1.6 points, respectively), $p < 0.05$. The lower the score, the worse the state of health.

Thus, after the experiment, both boys and girls, QOL on the scales of the physical component improved.

The characteristics of the psychological component of the health of INRTU students, according to the SF-36 questionnaire, are presented in Table. 2.

TABLE 2. THE PSYCHOLOGICAL COMPONENT OF STUDENTS' LIFE QUALITY BEFORE AND AFTER A PEDAGOGICAL EXPERIMENT (M±M)

Stages of a pedagogical experiment	Sex	Mental Health (MH)	Role-Emotional (RE)	Social Functioning (SF)	Vitality (VT)
Start of experiment	Girls	38,5±0,5	54,2±0,6	63,4±0,9	64,4±1,9
	Boys	41,4±0,5	60,1±0,7	71,7±1,0	74,8±1,1
End of experiment	Girls	44,6±0,9	65,9±3,8	81,4±1,9	62,4±1,5
	Boys	49,7±0,9	75,8±3,1	86,9±1,8	70,6±1,4

As can be seen from Table 2, it is established that compared with the beginning of the experiment, at its end:

- The level of the scale "mental health," which assesses the degree of anxiety in a person, the reduction of emotional and behavioral control, the ability to cope with life stresses and work productively, increased in girls by 15.8% (38.5 ± 0.5 and 44.6 ± 0.9 points, respectively), in boys by 20.0% (41.4 ± 0.5 and 49.7 ± 0.9 points, respectively), $p < 0.05$. Relatively low values of indicators (less than 50 points) on the "mental health" scale indicate a continuing high level of student anxiety, depression, and a decrease in emotional control, which is explained by high pre-diploma psycho-emotional stress.
- The level of the "role-emotional functioning" scale, characterizing the influence of a person's emotional state on daily activities, increased in girls by 21.6% (54.2 ± 0.6 and 65.9 ± 3.8 points, respectively), in boys by 26.1% (60.1 ± 0.7 and 75.8 ± 3.1 points, respectively), $p < 0.05$.
- The level of the "social activity/social functioning" scale, which reflects the degree of possible limitations in a person's social life, increased in girls by 28.4% (63.4 ± 0.9 and 81.4 ± 1.9 points, respectively), in boys by 21.2% (71.7 ± 1.0 and 86.9 ± 1.8 points, respectively), $p < 0.05$. This indicates an increase in social activity and the ability to communicate and dialogue of students with other people.
- The level of the "vital activity/vitality" scale decreased in girls by 3.1% (64.4 ± 1.9 and 62.4 ± 1.5 points, respectively, $p > 0.05$), in boys by 5.9% ($74, 8 \pm 1.1$ and 70.6 ± 1.4 points, respectively), $p < 0.05$. This may indicate an increase in fatigue among students associated with the intensification of education at the university and preparation for the defense of the diploma.

Thus, after conducting an experiment in both boys and girls, the quality of life on the scales of the psychological component improved, with the exception of the indicator on the scale of "vital activity."

4. Discussion

The reconstruction of pedagogical technologies of teaching the theoretical course of the discipline "physical culture" with a focus on valeological education of students at the Department of Physical Culture by the end of the experiment resulted in positive dynamics of the majority of indicators of scales of physical and psychological components of quality of life of senior university students, which ensured an increase in their level of general and mental health (Fig. 1).

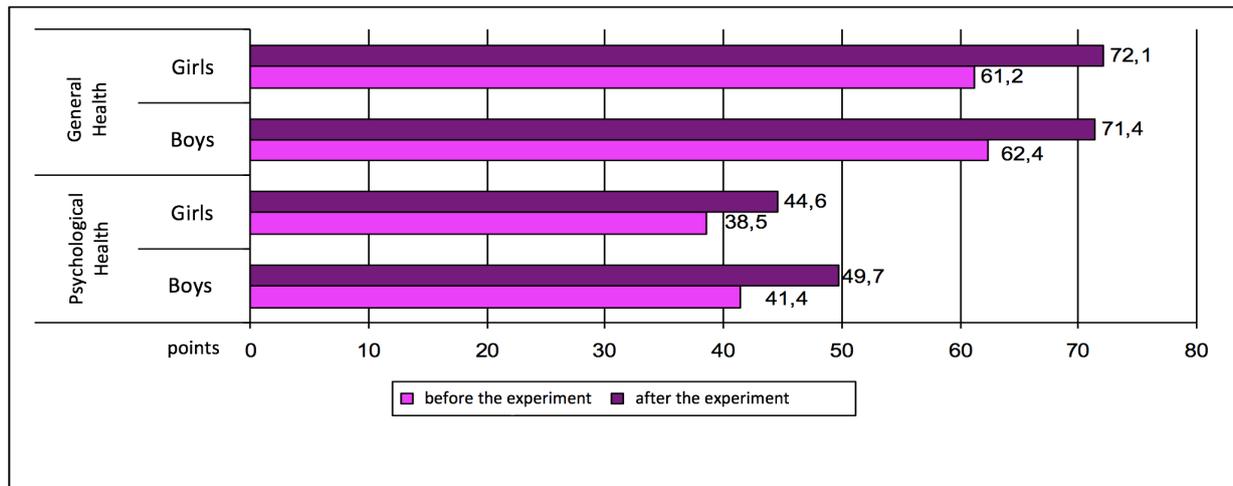


Fig. 1. The state of general and mental health of INRTU students, according to the questionnaire, is SF-36 at the beginning and at the end of the pedagogical experiment (in points).

It is established that at the end of the pedagogical experiment, the INRTU students have a value of the indicator of the scale “physical activity/physical functioning” of more than 95 points. Approximately the same results were recorded among students of the Nizhny Novgorod University of Architecture and Civil Engineering [7]. The increase in the value of the indicator of scales “physical activity/physical functioning” and “role functioning” recorded by us is also confirmed by the results of previous studies of the motor activity of INRTU students [8].

By the end of the experiment, the value of the “general health” scale indicator increased in both boys and girls. We believe this is due to an increase in the number of students motivated to observe the basics of a healthy lifestyle and independently engage in physical exercises outside the university. Approximately the same values of the indicator on the QOL questionnaire of the student’s health scale were obtained by researchers at the Medical University of Minsk (Belarus) [9].

According to the results of the student survey, the level of the psychological component of the boys’ quality of life is higher than that of girls ($p < 0.05$) both at the beginning and at the end of the experiment, which is consistent with the results of a study of the quality of life of schoolchildren and students in Omsk [4], as well as different population groups in five regions of Russia [10]. Some foreign researchers note higher values of QOL in the male population compared to the female [5; 11].

5. Conclusion

At the end of the pedagogical experiment, senior students of a technical university in Irkutsk established high values of the “physical activity/physical functioning” scale indicator in excess of 95 points. The latest student survey showed that more than 50% of students attend sports clubs, fitness clubs, go skiing and cycling, go in for jogging or walking. Despite the fact that senior students have completed the development of the “elective course in physical education and sports” at the department of physical education at the university, they continue to perform motor loads independently, i.e., they have increased motivation to lead a healthy lifestyle.

Compared with the results of the respondents’ answers at the beginning of the experiment, at the end of the observation, the indicators of pain syndrome in students decreased, i.e., the pain began to have less impact on the quality of life.

By the end of the experiment, students had an increase in the “role-emotional functioning” and “general health” scales. This may indicate that students are beginning to value their health more.

After the experiment, in both boys and girls, the quality of life on the scales of the psychological component improved, with the exception of the indicator “vital activity,” which indicates a slight decrease in emotional control, the level of anxiety and depression did not change. Such a reaction on the part of the body

is explained by the intensification of the educational process at the university, a decrease in time for rest, and an increase in psycho-emotional stress before exams.

In the educational process, as part of the theoretical course of the discipline “physical culture,” the use of multimedia lectures with an emphasis on valueology had led to an increase in the quality of life of INRTU students.

Thus, the implementation of the tasks of training specialists for production is inextricably linked with the state of student’s physical, mental, and moral health.

References

- [1] Tolgfors, B., & Ohman, M. (2016). The implications of assessment for learning in physical education and health. *European Physical Education Review*, 22(2), 150-166.
- [2] Yang, C. B., & Dong, M. K. (2017). A study of the correlation between teachers’ teaching styles and students’ participation motivation in the physical education. *Journal of Baltic Science Education*, 16(2), 199-206.
- [3] Federal State Statistics Service. (2019). *Official Statistics*. Moscow, Russia: Rosstat.
- [4] Yunatskaya, T. A., Turchaninova, M. S., Kozubenko, O. V., & Turchaninov, D. V. (2014). Psychological component of quality of life related to health, teenagers and students of Omsk region. *Basic Research*, 7, 170-173.
- [5] Jamali, A., Tofangchiha, S., Jamali, R., Nedjat, S., Jan D., Narimani, A., & Montazeri, A. (2013). Medical students’ health-related quality of life: roles of social and behavioural factors. *Med Educ.*, 47(10), 1001-1012.
- [6] Ware, J. E., Snow, K. K., Kosinski, M., & Gandek, B. (1993). *SF-36 Health survey: Manual and interpretation guide*. Boston, MA: The Health institute, New England Medical Center.
- [7] Sidorov, D. G., Krainik, V. L., & Vorontsov, P. G. (Eds.). (2010). *Problems of formation of healthy-oriented process of education in the university*. Barnaul, Russia: AltGPA.
- [8] Mandrykin, P. G., & Kolokoltsev, M. M. (2019). *Lifestyle of students at a technical university of different generations*. Retrieved from <http://mvestnik.istu.irk.ru>.
- [9] Zelezinsky, G. A., Korenko, P. N., Kravchenok, M. A., & Sallum, A. I. (2005). Quality of life for medical students and clinical residents. *Clinical Medicine*, 8, 29-31.
- [10] Amirjanova, V. N., Gorichev, D. V. Korshunov, N. I., Rebrov, A. P., & Sorotskaya, V. N. (2008). Population indicators of quality of life according to the SF-36 questionnaire (results of a multi-center study of quality of life MIRAGE). *Scientific and Practical Rheumatology*, 1, 36-48.
- [11] Voltmer, E., Rosta, J., Aasland, O. G., & Spahn, C. (2010). Study-related health and behavior patterns of medical students: a longitudinal study. *Med Teach*, 32(10), 422-428.