

## Physical education and sports achievement ratings as a significant factor to increase the level of physical activity of students and staff in high school.

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### Abstract:

The article is devoted to the analysis of the activity of the teachers of the department of physical education and administration of the Krasnoyarsk state medical university named after professor V.F. Voyno-Yasenetsky devoted to increasing the level of physical activity of the students and staff of the higher school. To increase the level of physical activity and sports achievements of the students and staff of the higher school it was decided to use the rating system for assessing the athletic and athletic achievements of all students and staff. Moreover, the rating system was a scale of assessments for the participation in sports and sports events. At the end of each year the points were summed up and monetary rewards were paid for each collected score to the students and staff. Besides, the use of this rating system allowed to increase the total number of the students and staff significantly ( $P < 0,01$ ) who regularly receive points for physical exercises and various sports for a short period less than for 2 years. However, the results of the medical examination showed a significant decrease ( $P < 0,05$ ) in the number of higher school staff with excessive body weight. The body weight of the Krasnoyarsk state medical university staff has decreased on average from  $81 \pm 1,4$  kg to  $78 \pm 1,2$  kg. The body mass index of the students of the Krasnoyarsk state medical university did not undergo significant changes (central tendency -  $76 \pm 1,8$  kg) for 3 years of operation of the rating system.

**Key words:** higher schools; students; staff; health; physical activity; rating; criteria for evaluation; athletic achievements; a health-saving environment.

### Introduction

According to the experts opinion the latest scientific data on the analysis of the physical development and health of young people up to the age of 30 shows a negative dynamics of the decline in the basic indicators of physical development and functional readiness of those who are under study. Today, the specialists note a significant increase in the number of young people who are overweight or obese (Gaetano, 2016). Moreover, a significant concern of doctors and scientists is the fact that similar dynamics have been detected in young people practically in all countries of the world (Radziimińska, Weber-Rajek, Lulińska-Kuklik, et al., 2016). The rapid growth in the number of obese people can be a serious problem for the most developed countries (Fagaras, Radu, & Vanvu, 2015). For its successful solution, it is necessary to create conditions for modern young people to spend the most of their leisure time in sports halls rather than in front of computer screens (Kudryavtsev, Kramida, & Osipov, 2016). The modern healthcare around the world has two equivalent goals: increasing the level of motor activity of the world's population and limiting the time significantly spent by people in front of the computers and tablets (D'Abundo, M., Sidman, C., Fiala, K., et al., 2015 ). Unfortunately, the studies show that although regular physical activity provides numerous physiological and psychological benefits the modern young people do not receive the level of daily physical activity recommended by physicians for this population category (Troiano, et al., 2008). According to the experts' opinions, this circumstance is facilitated by the existing structure of modern society and the anthropogenic environment surrounding young people with an abundance of factors impeding the maintenance of a healthy lifestyle (Bocarro, et al., 2012).

The analysis of scientific research of the problems of the physical education of the student youth showed that the main problems according to the experts and scientists are today: the lack of motor activity and lack of motivation to exercise and do sports for the most students (Osipov, Vonog, Prokhorova, et al., 2016). A

significant deterioration in the indicators of the physical development of young people during their studies at universities was revealed (Osipov, Kudryavtsev, Iermakov, et al., 2017). At the same time, there was a significant increase in the number of students who are overweight or obese (Osipov, Kudryavtsev, Gruzinky, et al., 2017; Peshkov, & Sharaykina, 2014). Consequently, to solve this problem, the scientists suggest using additional sports programs in the educational process of higher education institutions. Sports education will help to increase positive effects such as the growth of students' achievement directly in training activities and their commitment to a high level of physical activity (Trudeau, & Shephard, 2008). Moreover, the scientists emphasize the need for speedy introduction of changes in the current educational programs related to the increase in the overall level of the culture of health both for the students and university professors and for the formation of persistent beliefs about the need for a healthy lifestyle and maintaining a high level of motor activity (Iermakov, Cieślicka, & Muszkieta, 2015; Bolotin, & Bakayev, 2015). There are many experts who recommend to increase the amount of physical activity of the modern students. You can do this through additional physical education or sports activities in your spare time (Fotynyuk, 2017). The students who are regular participants in various sporting events have higher rates of physical development, they are physically attractive and have a lower fat content in the total body weight than students who do not engage in active sports activities (Campos, Marques, Silva, et al., 2017). Unfortunately, the experts note that the proportion of students regularly participating in various sporting events has significantly decreased since the beginning of the Bologna reform of education and the abolition of compulsory physical education in a number of universities (Cerar, Kondric, & Sindik, 2017). For example, in the colleges and universities in England and Wales, despite significant measures to support the physical activity of the students, the participation rates of young people in various sports and sports activities are not acceptable (Boccaro, Kanters, Cerin, et al., 2012). Indeed, many experts say that there is a clear negative trend of lack of attention to physical exercises among the modern students (Osipov, Kudryavtsev, Fedorova, et al., 2017; Fotynyuk, 2017). Thus, the administration of educational institutions faces the difficult task of significantly increasing the level of motor activity of students in the context of a decrease in the interest of young people in sports and sports activities.

Thus, a significant increase in the motor activity of students can be achieved when the administration of the higher educational institutions uses various methods of encouragement and sports competition among young people (Osipov, Kudryavtsev, Fedorova, et al., 2017). It should be also considered the possibility of free admission of the students to the physical education classes without strict adherence to the training schedule. The studies show that there are many students who combine work and study and they cannot always attend classes at the prescribed time. The choice of a convenient time for classes will allow young people to maintain the weekly volume of physical activity necessary for their health, (Osipov, Starova, Malakhova, et al., 2016). This step can contribute to increasing the interest to the physical education and sports activities. The authors of the article consider the importance of the social and educational orientation of the educational process for preserving the health of students, regardless of their social status and medical conditions, is emphasized by modern researchers (Zavydivska, et al., 2017; D'Isanto, & Di Tore, 2016). It is known that the students are a dynamic age group that is in the process of social, biological and psychological development. This age group is exposed to unfavorable factors and needs a well-designed and qualitatively built system of measures to protect their mental and physical health (Artyukhov, Petrova, Kaskaeva et al., 2016). The experts agree that a significant increase in the level of their daily physical activity will help to improve the physical health of young people (Clemente, Nikolaidis, Martins, et al., 2016). We must admit that the authors of the article say that this purpose is a system of rating of the physical culture and sports achievements both students and employees of the university developed and operating in the Krasnoyarsk state medical university after Professor V.F. Voyno-Yasenetsky.

## Material & methods

The studies were conducted in one of the largest universities in the Krasnoyarsk state medical university named after Professor V.F. Voyno-Yasenetsky of the Krasnoyarsk Territory. The study period was about 4 years (2014-2017). In the first year, the normative documents were developed and clear criteria for assessing the indicators of the athletic and athletic achievements of the students and staff of the university (Osipov, Dvorkina, & Shubin, 2014). Moreover, the technical support service has developed an automatic scoring system for physical culture and sports activities and has opened a special page for input of results on the university's official website. The administration of the university determined the mechanisms for the encouragement of the students and staff of the university expressed in the translation of the points they scored into financial incentives. In the second year, the rating system was launched in a test mode to encourage university students who are in favor of the sports teams of the university and showed high sports results. Over the next two years, the opportunity to obtain rating points for achievements in sports and sports activities was provided to all students and staff of the university. The points for the achievements in various aspects of the physical fitness and sports activities are presented in Table 1.

Table 1. The number of points awarded to the staff and students of the Krasnoyarsk state medical university for the achievements in physical culture and sports activities.

№	Categories	Students of the Krasnoyarsk state medical university	Staff of the Krasnoyarsk state medical university
1	Participation in sports and sporting events of the university	5	10
2	Award for sporting achievements in the university competitions	10	15
3	Participation in the physical culture and sports events in the city and region	10	20
4	Award for the sporting achievements in the city and region	20	25
5	Participation in the sports and athletic events at the federal level	15	20
6	Award for the sporting achievements of the federal level	30	35
7	Members of the national teams of the University in sports	10	10
8	Captains of the national teams of the University by sport	15	15
9	Volunteering at the physical culture and sports events	10	10
10	Organization of the sports and sporting events at the university level	5	10
11	The organization of the physical culture and sports events at the level of the city and region	10	15
12	Organization of the sports and fitness events at the federal level	20	30

In our studies, to apply for rating points the applicants had to fill out a special form on their personal page of the university's official website followed by a verification of the accuracy of the information submitted by the special commission which included faculty members of the physical culture department, representatives of the sports club and the administration of the university. The accrual of points for achievements in physical culture and sports activities occurred throughout the calendar year. The total number of points was calculated in December by summing up the points received by the applicants for all the above mentioned achievements in the health and fitness and sport activities. Thus, the rating system raised the level of motivation of the students and university staff to recruit the highest possible number of rating points.

It should be noted that particular attention should be paid to the statistical analysis of the results of the rating system was carried out using automated software to determine the reliability and statistical significance of research results. In our case, the SPSS20 program was used. The reliability and significance of the results was determined using Student's t-test as the most appropriate tool for determining the differences in mean values in the interrelated samples in the opinion of the authors.

## Results

In 2014, the Krasnoyarsk state medical university named after Professor V.F. Voyno-Yasenetsky was launched a rating system for athletic and sports achievements of the students and staff of the university. Initially, the system was operated in a test mode and, only the achievements of students-members of national teams of the university were judged by the kinds of sports that took prizes at competitions of various levels. The scores for sports activities were awarded to 267 students. The total number of points is 12585. On average, each student had  $47 \pm 3,1$  points. For participation in sports and sports events of the University students received 5645 points (on average for one student -  $21 \pm 1,8$  points). For participation and prizes at competitions of the city and regional level young people received 4270 points (on the average for the student -  $16 \pm 1,7$  points). For participation and achievements at competitions at the level of the Russian Federation the students received 2670 points (on average,  $10 \pm 1$  point per student). In the test mode, the scores for volunteer activities and organization of sports and sports events were not assessed.

It turned out that the analysis of the number of points scored for achievements in sports and sports activities among students of the Krasnoyarsk state medical university named after Professor V.F. Voyno-Yasenetsky in the third year of the rating system (2015) showed that only a little more than a thousand people received points for this activity ( $n = 1005$ ). With the total number of students at the university in 5,046 people, it

turns out that every fifth student of a medical university received points for physical culture and sports activities. This is significantly higher than the figures that were present at the beginning of the rating system when there were only 267 students (every eighteenth student of the university) received scores for athletics and sports achievements. The total amount of scored points by young people for 2015 was 94475 points. The average score of each student was  $94 \pm 3$  points. The analysis of the points by categories showed that in the main the young people gained a rating due to the participation in sports and sports events at the university level (the total score was 45165, an average of  $45 \pm 2,2$  points per student), cities and regions - 34865 points, on average for each student -  $35 \pm 3,2$  points). For the organization of physical culture and sports and sports events, young people received 8045 points (on average, one student -  $8 \pm 2,1$  points of the rating). For volunteer activities, 2345 points were accrued ( $2,3 \pm 1,4$  rating points per student). For membership in the national teams of the university by sports and winning prizes at competitions at the federal level the students were credited with 4,055 points (on average, for one student -  $4 \pm 2,1$  points).

Moreover, the analysis of the scoring during the fourth year of the rating system (2016) showed that the number of students applying for points on various categories of sports and sports rankings and received them significantly ( $P < 0.01$ ) increased. Points for achievements in physical culture and sports were 1,438 people. The total score for achievements was 209740 points. On average, the score of each student was  $146 \pm 5$  points. There was a significant ( $P < 0.01$ ) increase in the number of points recruited by students in the categories: winning prizes at competitions at the federal level (the total number of points is 45785, on average for one student -  $32 \pm 4,4$  points). It should be noted that particular attention should be paid for volunteer activities where the students were credited with 24,540 points (on average, the student -  $17 \pm 2,5$  points). Significant ( $P < 0,01$ ) increase occurred in the category - the organization of recreational and physical culture and sports events. The total score was 19145. On average, each student had  $13,3 \pm 1,6$  points. For participation and prizes at competitions held in the university the students received 68,915 points (on average, one student had  $48 \pm 4.5$  points). For participation and winning prizes at competitions of the city and regional level the students received 51355 points (on the average for one participant -  $36 \pm 3,4$  points).

However, it should be noted that the statistical indicators of the body weight of the students who applied for the accrual of rating points for the achievements in physical culture and sports activities. At the medical university, all students and staff of the university undergo an annual mandatory medical examination which includes the weighing procedure. The authors compared the data on the body weight of students participating in the rating in 2014-2016 and found that the average body weight of young people did not undergo significant changes. An important point is that the main statistical results of the rating system for the period of research are presented in Table 2.

Table 2. Dynamics of the growth of points of a rating for the achievements in sports and sports activity of the students of Krasnoyarsk state medical university named after Professor V.F. Voyno-Yasenetsky in 2014-2016.

№	Rating Categories	The number of rating points (on average for one student)		
		2014 г. (n=267)	2015 г. (n=1005)	2016 г. (n=1438)
1	Participation in sports and sporting events of the higher school	21±1,8	45±2,2	48±4,5*
2	Volunteer Activity	-	2,3±1,4	17±2,5**
3	Participation in physical culture and sports events in the city and the region	16±1,7	35±3,2	36±3,4
4	Organization of sports and sports events	-	8±2,1	13,3±1,6**
5	Participation in sports and athletic events at the federal level	10±1	4±2,1	32±4,4**
6	Body weight (kg)	77±1,6	76±1,2	76±1,6

Note. – authenticity \* -  $P < 0,05$ ; \*\* -  $P < 0,01$ .

According to the results of the rating system of athletic and athletic achievements of the University staffs in 2015 indicate that 436 teachers and university staff received scores for physical culture and sport activities. The total number of awarded points was 22365 points (on average  $51 \pm 1,2$  points per staff). For participation in sports and sports events of the university there were accrued 8455 points (on average  $19 \pm 2,3$  points per staff). Actually, for the participation in sports events of the city and regional level the university staff received 6870 points (on average the staff  $16 \pm 4,2$  points). For participation in competitions of the federal level the university staff was credited with 2015 points (on average  $5 \pm 1,5$  points for each staff). In our studies, for the organization of sports and sports competitions the teachers and staff were credited with 5,025 points (on average,  $11 \pm 2,1$  points for one staff).

In 2016 in fact it is recognized that the number of points awarded to the teachers and employees of the Krasnoyarsk state medical university named after Professor V.F. Voyno-Yasenetsky for the achievements in sports and sports activities was significantly ( $P < 0,01$ ) increased. Accordingly, the total number of points was

64525; the number of employees who received points was 863. On average,  $75 \pm 4,2$  points fell on one employee. For the participation in sporting events of university scale, the staff received 24,750 points (on average  $29 \pm 2,6$  points for each staff). At the same time, for the competitions of the city and regional level employees received 27845 points. On average, one staff had  $32 \pm 3,2$  points. For the competitions of the federal level, the university staff received 3680 points (on average for each employee -  $4 \pm 1,6$  points). For the organization of physical culture and sports events, the teachers and staff of the university received 8250 points (on average for each employee -  $10 \pm 1,4$  points).

By the way, an analysis of changes in the body weight of university staff who participated in the rating of physical culture and sports achievements showed that during the validity of the rating system, a significant ( $P < 0,05$ ) decrease in the body weight of teachers and university staff was revealed. The average body weight of employees fell from  $81 \pm 1,4$  kg to  $78 \pm 1,2$  kg. The statistical results of the achievements of the employees of the State Educational Establishment for the years of operation of the rating system are presented in Table 3.

Table 3. Dynamics of growth of points of a rating for achievements in sports and sports the students of the Krasnoyarsk state medical university named after Professor V.F. Voyno-Yasenetsky in 2015-2016.

№	Rating Categories	The number of rating points (on average for one staff)	
		2015 г. (n=436)	2016 г. (n=863)
1	Participation in sports and sporting events of the higher school	19±2,3	29±2,6**
2	Participation in physical culture and sports events in the city and the region	16±4,2	32±3,2**
3	Participation in physical culture and sports events of the federal level	5±1,5	4±1,6
4	Organization of sports and sports events	11±2,1	10±1,4
5	Body weight (kg)	81±1,4	78±1,2*

Note. – authenticity \* -  $P < 0,05$ ; \*\* -  $P < 0,01$ .

### Discussion

On the basis of the obtained data, it can be concluded that a significant ( $P < 0,01$ ) increase in the total number of the students and staff of the Krasnoyarsk state medical university named after Professor V.F. Voyno-Yasenetsky regularly engaged in physical culture and health and sports activities. At the same time, the authors believe that the introduction of the rating system of physical culture and sports achievements into the teaching and upbringing process of the university greatly contributes to the formation of a social sports and sports environment within the educational institution. The fact that the creation of a sporting environment adapted to the wishes and needs of the modern youth will contribute to the prevention of diseases associated with the overweight and the development of the obesity and the latest scientific studies confirm it (Fenton, Duda, Appleton, et al., 2016). It was also found out that extra-curricular independent physical exercises and sports have a positive impact on the health, educational achievement and behavioral patterns of the young people (Petrova, Pronina, Baron, et al., 2016; Keating, Castelli, & Ayers, 2013). The serious encouragement of modern young people for sports and providing them with the necessary sports infrastructure is an important political task which is already in many countries of the world (Felfe, Lechner, & Steinmayr, 2016). It should be noted that the formation of a health-forming environment in the educational institution that contributes to the preservation and strengthening of the level of health of all participants in the educational process is today one of the main tasks of the administration of schools, universities and colleges. The creation of a special environment conducive to the successful adaptation of the individual in the educational space of the university and the creation of a pedagogical health-protective space are among the main psychological and pedagogical conditions for effectively promoting the health of students (Levanova, Kokorina, Nikitin, et al., 2016). The successful fulfillment of these conditions corresponds to the physical culture and sports environment of the university which is a combination of certain conditions and opportunities for the physical formation and development of the personality contained both in the spatial-objective and social environment (Patrikeev, & Durkin, 2012).

In the opinion of the authors of the article, the creation and effective functioning of such environment will be effective only in the event of the effective use of qualitative rating systems for recording and assessing the level of athletic and athletic achievements of the students and staff of the educational institutions. The introduction of a system of rating points charged for participation in sports and sports events and the publication of data on the rating of staff and students on the official website of the university allows young people to emphasize their physical superiority over their peers and employees of the university to improve their social status. At the same time, the wide availability of information on athletic and sports achievements allows both publicizing their successes and attracting the attention of peers and others. In this case, an element of competitive competition will be involved. Both students and employees can compete in the set of as many rating points as

possible. To achieve this goal, the young people will start attending additional classes in sports clubs and sections, conduct training on individual programs. This will ensure a rapid growth in the level of development of the basic physical qualities and motor abilities of the students. The scientists have found that there is a significant increase in the level of development of the leading physical qualities and physical health of the students engaged in physical exercises according to the individual programs taking into account the differences in the physical training of young people and their personal responses to various physical activities (Andres, 2017).

Besides, the similar statements of the authors agree with the latest scientific research. It was revealed that active sports help to satisfy the basic motives of the behavioral activity of the modern students: acquiring popularity among peers, increasing social status, strengthening physical health (Kondric, Sindik, Furjan-Mandic, et al., 2013). To increase the level of motivation for active participation in sports and health and sporting events, the financial encouragement paid by the university administration to all students and staff of the university which scored at least 5 points in the rating of the evaluation of athletic and sporting achievements should also contribute. According to the experts, the mechanisms of material incentive will contribute to a significant increase in the level of physical activity of all participants in the educational process through the desire to recruit the largest number of points (Osipov, A., Kadomtseva, E., Lepilina, T., et al, 2015). However, the experts point out that without significant mechanisms for encouraging students it will be possible to successfully solve the problem of deterioration in the level of physical development and health of the modern young people (Osipov, Kudryavtsev, Fedorova, et al., 2017).

It should be noted that the operation of the rating system of accounting and evaluation of physical culture and sports achievements of the students and higher school staff will allow the administration of the university to receive the objective information about the physical abilities of the students and the level of their motor activity throughout the year. The experts argue that it is necessary to have objective data about the environment of motor activity existing in higher educational institutions and the physical capabilities of the students. This will determine the adequacy and success of their interaction (Druz, Iermakov, & Muszkieta, 2017).

Thus, separately it is worth mentioning the favorable effect of the rating system of sports and athletic achievements on the dynamics of changes in the body weight of the students and staff of the higher school. At present, the administrations of the higher educational institutions should pay significant attention to the prevention of the diseases associated with the overweight and obesity. As you know, the best preventive measure will be an increase in the level of everyday motor activity of the students and staff of the university. The desire for a set of rating points will lead the teachers and students to regular exercise and sports activities as a result of which the level of their daily motor activity will significantly increase.

## Conclusions

The introduction of a rating system for assessing the athletic and athletic achievements of employees and students in the structure of the activity of higher educational institutions can significantly increase both the total number of people who are regularly engaged in physical exercises and the level of sports achievements of the young people in a relatively short (2-3 years) time. However, the positive influence of this rating system on the body weight of the students and higher school staff has been revealed which contributes to solving one of the main problems of our time - the development of the obesity among young people. Moreover, the mechanisms of encouragement including financial incentives encourage rating participants to the maximum possible number of points, therefore, contribute to a significant increase in the level of daily mobility of the students and higher school staff.

It should be noted that particular attention should be paid to the use of a system for calculating the sports and sports rating of all participants in the educational process which will contribute to the formation of a social sports and sporting environment within the higher educational institution that contributes to a significant strengthening of the level of physical health of students and staff of the university in the future.

**Conflicts of interest** - If the authors have any conflicts of interest to declare.

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