

## ASSESSING THE SANITARY AND HYGIENIC CONDITION AND ORGANIZATION OF TRAINING AT AN ATHLETIC SCHOOL OF OLYMPIC RESERVE

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To achieve high results in sports and preserve health, athletes need favorable conditions for a training process, accommodation and medical supply. The purpose of the study was to assess the sanitary and hygienic condition and organization of a training process at a school of Olympic reserve. Objectives of the study included assessment of architectural and planning concepts for the school-related buildings and premises; examination of sanitary and hygienic condition of training rooms, sports facilities, hall of residence, parameters of air thermal and light regimen; assessment of how the training process is organized and developing the activities to correct the found violations. A hygienic assessment of training and athletic premises, physical factors, medical and pedagogical observation (two types of sports) is done in the trial. It has been established during the examination that no requirements to light furniture labeling, temperature and light regimen, regimen of cleaning and storage of cleaning utensils and sanitary condition of the hall of residence are followed. Training sessions are structured and specific as far as physical activity dynamics goes. By a number of parameters (selection and arrangement of premises, class timetable and equipment), favorable conditions for education and training are created at the school. The established violations of sanitary and hygienic conditions in the school-related premises and buildings can promote fatigue, injuries and infectious diseases. A more proper medical control over the sanitary conditions of education and residence at the school is required.

**Keywords:** sports school, athletes, sanitary and hygienic conditions, training

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## ОЦЕНКА САНИТАРНО-ГИГИЕНИЧЕСКОГО СОСТОЯНИЯ И ОРГАНИЗАЦИИ УЧЕБНО-ТРЕНИРОВОЧНОГО ПРОЦЕССА В УЧИЛИЩЕ ОЛИМПЕЙСКОГО РЕЗЕРВА

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Для достижения высоких спортивных результатов и сохранения здоровья спортсменам необходимо создание благоприятных условий для тренировочного процесса, проживания и медицинского обеспечения. Целью исследования была оценка санитарно-гигиенического состояния и организации учебно-тренировочного процесса в училище олимпийского резерва. Задачами исследования являлись оценка архитектурно-планировочных решений зданий и помещений училища; изучение санитарно-гигиенического состояния учебных помещений, спортивных сооружений, общежития, показателей воздушно-теплого и светового режимов; оценка организации учебно-тренировочного процесса и разработка мероприятий по коррекции выявленных нарушений. В ходе исследования проведена гигиеническая оценка учебных и спортивных помещений, физических факторов, врачебно-педагогического наблюдения (2 вида спорта). При обследовании установлено, что не соблюдаются требования к цветовой маркировке мебели, температурному и световому режиму, режиму уборки и хранению уборочного инвентаря, санитарному состоянию общежития. Тренировочные занятия структурированы, специфичны по динамике физических нагрузок. По ряду показателей (набор и взаиморасположение помещений, расписание занятий, оборудование) в училище созданы благоприятные условия для обучения и тренировок. Установленные нарушения санитарно-гигиенических условий в помещениях и зданиях спортивного училища могут способствовать развитию утомления, травматизма, инфекционных заболеваний. Требуется более тщательный медицинский контроль за санитарными условиями обучения и проживания в училище.

**Ключевые слова:** спортивная школа, спортсмены, санитарно-гигиенические условия, тренировочный процесс

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Formation of sports reserve and selection of gifted young athletes belong to an essential task of the country. Schools of Olympic reserve play a significant role in the preparation of high-class athletes [1, 2]. High sports results can be achieved due to development of physical culture and sports infrastructure and simultaneous creation of educational conditions.

Health of athletes depends on a complex interrelation between numerous factors such as a healthy lifestyle and quality of life, heredity, environmental quality including sports environment, where educational and training sessions along with competitions take place [3].

Improved sports effectiveness of young athletes is accompanied with not yet completed biological maturation

under the effect of significant and intense training and competitive loads [4]. Vigorous exercise, quality and properties of sports equipment, inventory, and microclimate parameters in sports halls and fitness rooms can produce a negative influence on an athlete's health. Under comfort conditions, the educational and training process is done in the most effective and efficient way without additional straining of thermal regulation mechanisms and analyzer functions with complete nervous process concentration [5].

Special requirements are given to round-the-clock sports educational institutions because these are places where the educational and training process, rest and leisure activities take place.

Such unfavorable factors as deficient area of educational, sports, residential premises, sanitary condition, microclimate parameters, and light environment of premises can result in impaired performance, slow rates of restoration, higher emotional load and traumatism of athletes [6, 7]. Optimal microclimate in sports facilities belong to the most important parameters that determine the working capacity of athletes and environmental safety.

The rational formation of a training process, special physical condition of athletes, and training conditions are essential to obtain better sports results and prevent traumatism [8].

The purpose of the study is to assess the sanitary and hygienic condition and organization of an educational and training process at an Olympic reserve school.

## MATERIALS AND METHODS

The study object is a School of Olympic Reserve. Here, basic, general secondary and secondary professional education is provided. There are 12 types of sports for athletes. The sanitary and hygienic assessment was done in October-November 2021.

A method of sanitary and hygienic examination was used during the study to estimate the requirements for the facility accommodation, structure and maintenance and their compliance with Sanitary Rules (SR) 2.1.3678–20 'Sanitary and epidemiological requirements to maintenance of premises, buildings, facilities, equipment and transport, and operational conditions of the economic units that sell goods, execute work or provide services', SR 2.4.3648–20 'Sanitary and epidemiologic requirements to organization of upbringing and education, rest and health improvement of children and young people', Sanitary Rules and Regulations 1.2.3685–21 'Hygienic standards and requirements to safety and (or) harmlessness of environmental factors for people'.

To estimate the air thermal regimen and organize the light regimen, the microclimate and artificial lighting were measured for 13 training premises, 7 living rooms, 11 auxiliary premises, 5 gyms, including workout rooms, and a swimming pool. Microclimate measurements were done using Meteoroscope M (measuring unit of microclimate parameters) in accordance with GOST 30494–2011 'Residential and public buildings. Microclimate parameters for indoor enclosures'. The light environment parameters were measured with a luxometer (TK-ПКМ 08) in accordance with GOST 24940–2016 'Buildings and structures. Methods for measuring the illuminance'.

The educational and training process of two volleyball (men and women) and judo teams was estimated. The medical and pedagogical observation was conducted examining the structure, density of a training process, measurement of heart rate in dynamics. The athletes go through a training process, contest season and 3<sup>rd</sup> year of education.

## STUDY RESULTS

The educational institution is located at a separate site where a training building, hall of residence and universal sports complex are placed. The training and residential buildings are accommodated as per requirements of SR 2.4.3648–20.

The educational process takes place in a three-floor training building. Within the building, the rooms are located in a rational way. Classrooms, separate restrooms for girls and boys, and premises to store cleaning utensils are available on every floor. The training building encompasses two gyms such as a gym hall, heavy athletics hall, a library with a reading hall and an assembly hall. The premises are located in a rational way. There is enough area per one training place. Classrooms have the necessary equipment. Furniture color-coding by height is lacking in one of 13 examined educational premises. Restrooms have enough cleaning appliances and utensils. The sanitary condition is satisfactory. Cabinets are designed to hold cleaning utensils; the inventory is labeled. At the time of the audit, the cleaning utensils were kept in the restroom, clearly contrary to the requirements of SR 2.4.3648–20.

There is natural, organized and forced-air-exhaust ventilation. While examining the microclimate parameters in the educational building it has been established that air temperature was above normal and relative air humidity was decreased (table).

Natural illumination is one-sided and lateral in classrooms, two-sided and lateral in the gym, with the natural illumination decreased coefficient being 23% in classrooms. Blackboards have additional artificial light sources directed right to the working field excluding two rooms. The level of artificial illumination (548.6 Lux in average) and pulsation coefficient (0.7% in average) in the rooms correspond to the hygienic requirements.

The training building is connected with three-storey men and women halls of residence through a heated cross-way passage. Apart from the rooms, every floor has a hall, room for trainers, rooms for self-preparation, toilets with basins, and laundry rooms. A set of premises is incomplete, there are no rooms to dry clothes. 1-, 2-, 3- and 4-person rooms are available in the hall of residence. The sanitary condition of residential premises is unsatisfactory. Some rooms require major and cosmetic repairs (for instance, replacement of windows or their cosmetic repairs, replacement of artificial lighting sources (lamps and illuminators)). The rooms have poor ventilation.

The showers are equipped with enough sanitary utensils, the decoration allows wet cleaning with disinfecting agents. Some showers require installation or replacement of shower heads.

The residential and shower rooms have natural organized ventilation. While estimating the microclimate parameters, a low relative air humidity was found in the rooms of the hall residence (the proportion of discrepancies was 42.8%) with decreased air temperature in the shower rooms (table). The rooms have natural lateral one-sided illumination with the level of artificial illumination (201.6 Lux in average) corresponding to the hygienic standards.

The sports complex building is three-storey and has a wardrobe for outer clothing, medical unit, hall for sports games, 3 gyms such as halls for choreography, strength training and dry land swimming, a 25 m swimming pool with six swim lanes and change rooms.

In the game halls, volleyball and rhythmic gymnastics training sessions are conducted. The floor is even and has

**Table.** Microclimate parameters in the school-based premises

Premises	Value	Standard Норматив	M ± m	Min	Max	Non-significant measurements,% (n)
Training rooms/gym in the training building	Air temperature, °C	18–24/ 18–20	23.9 ± 0.6/ 24.9 ± 0.4	22.7/ 24.1	25.8/ 25.5	61.5 (8 of 13) 100 (1 of 1)
	Relative air humidity, %	40–60	37.4 ± 3.9/ 27.9 ± 0.6	31.7/ 27	46/ 28.9	84.6 (11 of 13) 100 (1 of 1)
	Air velocity, m/s	не более 0.15	0.002 ± 0.004/ 0.015 ± 0.07	0/ 0.01	0.01/ 0.02	0/ 0
Rooms	Air temperature, °C	20–24	22.8 ± 0.8	21.2	23.6	0/ 0
	Relative air humidity, %	40–60	41.1 ± 9.1	25,1	50.7	42.8 (3 of 7)
	Air velocity, m/s	not more than 0,15	0.004 ± 0.005	0	0.01	0/ 0
Dressing rooms/ Shower rooms in the hall of residence	Air temperature, °C	20–24/ 24–26	22.7 ± 0.3/ 23.3 ± 0.1	22.5/ 23.2	23/ 23.4	0/ 100 (2 of 2)
	Relative air humidity, %	60–30/ not a normal value	46 ± 2.4/ 61.5 ± 9.0	44.3/ 55.2	47.7/ 67.9	0/ 0
	Air velocity, m/s	not more than 0,2/ not more than 0,1	0.04 ± 0.03/ 0.005 ± 0.007	0.01/ 0	0.06/ 0.01	0/ 0
Gym halls in a sports center	Air temperature, °C	15–21	23.4 ± 2.4	21.1	25.5	100 (4 of 4)
	Relative air humidity, %	60–30	27.35 ± 2.2	24.5	30	75 (3 of 4)
	Air velocity, m/s	not a normal value	0.02 ± 0.01	0.01	0.04	0/ 0
Dressing rooms/ shower rooms in a sports center	Air temperature, 0C	not below 25	22.75 ± 0.4/ 23.3 ± 0.1	22.5/ 23.2	23/ 23.4	100 (2 of 2)/ 100 (2 of 2)
	Relative air humidity, %	до 60	46 ± 2.4/ 61.6 ± 9.0	44.3/ 55.2	47.7/ 67.9	0/ 50 (1 of 2)
	Air velocity, m/s	not a normal value	0.035 ± 0.03/ 0.005 ± 0.007	0.01/ 0	0.06/ 0.01	0/ 0

no cracks. Floor covering intended for rhythmic gymnastics is available in the game halls. No break for wet cleaning between volleyball and rhythmic gymnastics training sessions is found during the examination. This is of an important hygienic value, as numerous equipment is used in these athletic disciplines. After the carpets are cleaned, dust particles remain on the floor. This can result in an injury of basketball athletes, when acceleration and more dynamic game are involved.

In the choreography hall, the carpet is in a satisfactory sanitary condition. The heating system includes radiators without enclosing structures. The premise lacks natural illumination. The ceiling is defective and equipped with hinged panels.

Various types of training devices are located in the gym. The interior finishing of the floor and walls corresponds to the requirements of SR 2.4.3648–20. The sanitary condition is satisfactory. The natural exhaust ventilation has mechanical draft. Air is properly conditioned with the help of two air conditioning units. Non-operational illuminators are present.

The hall of dry swimming is equipped with different types of training devices, mats, and a wooden wall bar. The sports inventory is stored at the ammunition room next to gyms. The sanitary condition is satisfactory.

When examining the parameters of microclimate in a sports building, an exceeding air temperature in sports halls is recorded; in change rooms and shower rooms it is below the accepted values (table).

The coefficient of natural lighting in sports halls corresponds to the hygienic standards (3.3 ± 3.8%). When artificial lighting is measured, a significantly exceeded pulsation coefficient is found in a game hall (63.0 ± 12.4%); the level of natural lighting corresponded to the hygienic standards.

The swimming pool is equipped with dressing rooms, shower rooms and toilets. Streamlining is properly organized. The dressing rooms are equipped with benches and cabinets. The most of the shower equipment has rusted. The interior is made of materials resistant to moisture, detergent and disinfecting agents (glazed tile), with no defects. The sanitary condition is satisfactory. Forced exhaust ventilation system. The parameters of microclimate and artificial illumination correspond to the hygienic requirements.

The regimen of educational activity corresponds to the hygienic requirements for all rooms, except for insufficient duration of breaks. Taking into account training sessions of sports departments, the sessions have three regimens (A, B, C). Duration of training sessions is as follows: 8 a. m. to 1:40 p. m. for regimen A, 10:30 a. m. to 4:40 p. m. for regimen B, and 8 a. m. to 10:20 a. m. and 1.40 p. m. to 4.40 p. m. for regimen C.

During a medical and pedagogical observation in three teams, the training session duration was 1.5 to 2 hours. The training structure included warming up, basic and final parts. It should be noted that the judo training sessions lacked the final part and had long breaks during the basic part. The motor density of every training session corresponds to hygienic requirements (82.9–96%). During the medical and pedagogical observation over athletes it has been established that every athlete's training session was of different efficiency. Some athletes failed to perform training sessions, i. e., they had low load activity.

## DISCUSSION OF RESULTS

The issue of sanitary and hygienic support of sports objects is widely spread and well represented in the research by Kholser

AN, Popov VI, and Libina II [6, 9]. The most common problems include poor values of microclimate and light environment. Thus, according to Efimova NV and Setko NP, increased air temperature in a premise and violations of the light regimen can result in impaired working capacity and premature fatigue [10, 11]. A violated regimen of wet cleaning promotes an increased level of dust particles in the air an athlete breathes in and can lead to respiratory diseases. Organization of a training process is important for achievement of high sports results. According to Makarova GA and Achkasova EE, systematic control over the level of physical load and exercising technique forms an essential part of sports activity medical support [12].

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## CONCLUSIONS

Sanitary and hygienic conditions of accommodation, selection of premises, equipment, and timetables correspond to the hygienic requirements. The most frequent violations include exceeded temperature values for gyms, violated cleaning regimen both of sports premises, and residential rooms, poor sanitary condition of residential rooms and utility rooms, pulsation factor in a gym. A more proper control over the sanitary condition of residential and sports premises, and systematic medical control over the training process and sanitary condition of the premises are required.

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