Anne Talvio, Mats Engström & Mare Rantaniemi (eds.)

”Physical Culture and Sport as a Factor of Health and Well-Being”

Papers presented at scientific-practical
Conference in Murmansk,
28th -29th of November 2006

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Physical Culture and Sport as a Factor of Health and Well-Being

Preface

Health among people in the Barents region its one of the most important issues that concerns both children, adolescents, adults and the elderly. Physical activity as an important factor for health is well known. Every country in the Barents region is well aware of this factor and has developed different ways of keeping people healthy or at least attempting to do so.

Sport is a key part of physical activity, but there are many other important parts associated with it. Sport is culture, social education, as well as being related to tourism. In fact health and sport tourism is a growing field within developing tourism today.

The Barents Specialists Network and Murmansk State Pedagogical University arranged the international scientific conference "Physical Culture and Sport as a Factor of Health and Well-Being" at Murmansk State Pedagogical University, November 28th -29th. The conference was financed by The European Regional Development Fund (Interreg III A / Kolarctic and by The County Administrative Board of Norrbotten, Sweden and State Provincial Office of Lapland).

This publication is a collection of the papers presented at the conference. The conference was arranged in order to connect researchers, specialists and teachers in the Barents Area. Regional level authorities were also invited and actively took part during the conference, clearly showing the subject's importance and its future questions for the Barents Area.

The presented papers are categorized into three subgroups within this publication:

1. Health and Conditions in the North
2. Sport and Training

3. Students and Physical Education

The organizing committee for the conference consisted of the Chief Executive Officer for WINTERNET (research centre in Sweden for health and sports) Mats Engström, Associate Professor Olga Kievskaya, Murmansk State Pedagocical University, Director of International Relations Inna Ryzhkova, Murmansk State Pedagocical University, Vice Dean Elena Golishnikova, Murmansk State Pedagocical University. I also wish to mention Mare Rantaniemi, Project Leader for the Barents Specialist´s who coordinates all activities in the project. Thanks go out to all of these and also special thanks to the contributors to this publication and of course The rector of Murmansk State Pedagocical University, Professor Roman Tripolsky, who kindly allowed us have the conference at his University.

Mats Engström

HEALTH AND CONDITIONS IN THE NORTH

Fitness as a Factor in the Health and Physical Well-Being of Students

Olga Kievskaya
Murmansk State Pedagogical University

Climatic conditions of the Far North place more specific demands on the human organism than in other regions of our country. This is precisely why the mortality rate in the Murmansk region is the highest in Russia at 33 percent. According to many reports, a great drop in physical ability in the subarctic environment is happening during the academic year and is especially influenced by polar night. A High incidence of acute and chronic diseases in students in the Murmansk region determine the main goal of this study – the integration of measures which are carried out in the health and educational systems for the prevention of disease and recruitment of youth in the Kola Peninsula.

It's well-known that physical exercise improves physical ability, increases functional resources of the body and improves physical abilities, as well as improving the resistance plus immunity of the body to various diseases.

A person's physical growth and development is completed while they are still students. This period is a "peak" in the development of physiological potentials (maximum reactivity, optimal blood pressure levels etc.). The process of developing motor function and the formation of various muscle groups' structure are completed by the age of 17-18. Thus students are in the final stage of progressive advancement and development of psychological and motor abilities. This is why physical exercise and sport become the main means of the improving health of young people.

Fitness is the means of opposition to factors which promote the development of diseases. Regular fitness activity causes the adaptation of a

body to the physical and mental loads of the conditions of the Far North. In the course of intense cerebral activity, tight time and limitation of physical activity, fitness has a great preventative importance in being the means of rehabilitation and development of the optimal (especially for young person) psychophysiological state in negative climatic conditions. Increasing movements can provide an opportunity of realization of motor potential, remove static tension and help solve the majority of problems connected with the development of exhaustion, the presence of deformations of limbs and vision disorders among the students of the Kola polar region.

The popularity of fitness is due to its availability, emotive nature and its effectiveness. The choice of movements in fitness is not limited since the main part of programs are composed of general exercises, which help to influence all parts of the body and develop all physical abilities.

The word “fitness” comes from the English “to be fit”, which is to be healthy and lead a healthy life. As a whole it’s possible to characterize fitness as an active life style, physical activity of an integral plan, combined both athletics and nutrition, its goal is to improve the body’s ability to cope with physical loads, improve body functional systems and correct the posture. Fitness activity is based on the following principles:

-The principle of harmony is one of the founding principles of fitness.

-Individual fitness-programs must be well thought out and balanced, otherwise there will not be any visible effect of the fitness.

In relation to harmony, another principle of fitness exists, a principle of rational interchange. As part of daily fitness-programs different types of loads take turns with each other and put together the harmoniously, which will allow the achievement of good health, beauty and harmony. Exercise machines can be used in strength training as a way of activating all body muscles and add tone. Rhythmic gymnastics’ demanding activity

of movements can be combined with easier loads, i.e. the run. A combination of different methods of figure correction harmonically will be rather effective.

The success and popularity of fitness is due to it's not necessary to engage in fitness to exhaust oneself with training and diets. Most fitness activity is carried out in special clubs, led by expert instructors at a pace that suits the individual.

Fitness activity is a combination of many elements: sensible nutrition, reduction of and individual programs of physical loads. Nowadays in many European countries fitness has a national program, directed at promoting the health of the population. Fitness activity includes not only a great number of directives which help to lead a healthy life, but also a special focus of fitness, i.e. sports. Fitness-aerobics competitions attract more and more attention.

It should be noted that fitness-aerobics is very popular among students. The range and number of the various fitness-aerobics sport events, championships and competitions for students are huge. Since 2000 10.000 people have taken part in the championships, Russia Cups run by the Aerobics Federation. The Murmansk State Pedagogical University team "Aerodance" is a frequent winner and medallist of the championships in Russia, Europe and the World. Performance at competitions, contests and festivals are one of the strongest motivational factors for young people to do regular physical exercises, thus have vigorous stimulus for leading a healthy life.

Regular fitness activity causes the adaptation of a body to cope with physical loads in conditions of the Far North. Physical activity removes the stress characteristic of students, for training revives the students' emotions

and spirits, phasing out the negative influence of stresses and educational work loads.

In this way a well planned and optimal fitness training program will promote the maintenance of a high functional level of all physiological systems, provide total and specialized ability, make the activity of the young more economical and finally prevent the development of many pathological processes in the body. It's very important in conditions of the Kola Peninsula, where fitness is a life style, that allow become healthy and fit, to balance on emotional state and improve physical shape.

Carrying out the survey has allowed us to discover the influence of fitness activity on the formation of a healthy life style, academic progress and the total health of learners aged between 16–18. The controlled measurement of movement skills (flexibility, speed, strength endurance and perception reaction time) and physical ability of the Harvard step-test has conducted in five stages, divided in accordance with the seasonal changes of the Kola North:

-The first stage "Autumn" – the beginning of the research (the beginning of September);

-The second stage "Autumn-Winter" – the end of October;

-The third stage "Winter" – the period of the polar night, peak of the polar night (January);

-The fourth stage "Winter-Spring" – the end of the polar nights (March);

-The fifth stage "Spring" – the beginning the polar day, end of the research (May).

The pedagogical experiment was carried out at the Murmansk State Pedagogical University and the fitness-club "Sport Plaza" from September until May 2005. Students aged between 16–18 training 2 times a week, of

90 minutes each. Training was carried out in accordance with special programs. The programs consisted of the following elements: the development of coordination and flexibility were offered to learners in a gym (on the principle of circuit training), as well as programs for muscle tone, classic aerobics, yoga and stretching.

The sport-programs were compiled in consideration to the anatomical and physiological peculiarities and the regular influence of physical loads. The quantity of exercises provided increased as did their various uses, which in turn increased the number of learners and reduced the monotony of the tasks.

Physical education is an important factor in a person's physical development within the conditions of any education establishment. The laying down of foundations for physical education are the basis for the further formation of the functioning level of different organs and systems, mental and physical abilities improve and finally health increases. It is particularly important for those living in regions with negative climatic conditions.

The successful acquirement of fitness exercise techniques depends not only on the level of physical abilities, but on the many individual peculiarities of the learners. These include: functioning ability of respiratory and cardio-vascular systems, coordination of movements and spatial awareness. During any exertion of these aspects a correlation is seen, which has a great importance in order the choice of fitness means. To gain healthy and effective training from fitness it's necessary to carry out exercises at a prescribed pace, with an appropriate intensity of movements, controlled by pulse.

A decline in the functioning state of all physiological systems and a reduction in physical ability take place during the start and end of the polar night. The activity load should first be made for the purpose of improving health, and then in view of other aspects. It is also necessary to consider the existing health of the learners, defining it through survey and attendance of learners during training which help to estimate the level of their fatigue by observation of their symptoms.

The result is that fitness activity successfully influences the improvement of the health of learners aged 16-18, living in the conditions of the Far North. During the entire experiment a gradual improvement of the functioning state of the cardio- vascular system has been seen. At the end of the research the growth rate of the half value of this indicator, expressed in the form of the Harvard step-test index, was 14.7%±2.2%.

It has been claimed that fitness activity influences the development and exertion of basic physical qualities: flexibility, perception reaction time and speed endurance of the learners. However it’s not identical in the different seasonal periods in conditions of the Kola Peninsula. The higher indicators of physical ability on the Harvard step-test index, development and exertion the basis physical qualities are fixed in the “Autumn-Winter” and “Spring” periods. The total rate of flexibility was 58.4%±3.6%, the total rate of perception reaction time was 24.9%±1.9%, the total rate of speed and strength endurance was 22.7%±1.4%, the total rate of the speed endurance was 24 %±2.3%.

Based on the results from questioning, we can conclude that fitness activity positively influences health, increases ability, the formation of a health life style, including helping to make effective use of free time, increases activity and promotes academic progress.

In order to increase motivation, positive attitude and establish contacts with a group we can use the following practical methods:

- The inclusion of new movements in trainings;
- The use of different music;
- The variation of load and styles of trainings;
- The inclusion of partner exercises;
- The use of competitive moments.

During the planning of fitness activity it is necessary to consider how the indicators of physical qualities change. Thus, during the Polar Night it is more preferable to do yoga and stretching, in spring and autumn it is good to introduce dance forms of aerobics as indicators of endurance and coordination increased.

Protecting the Health of Children in the Institutions of Extra-Curricular Education in the Kola North

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The Problem of health protection for the population is especially important in the High North regions, the conditions of which are extremely adverse for the people. Morbidity in the High Northern regions is on average 7% higher than in the rest of the Russian Federation territories. The Murmansk region was recognized a High North region in 1967 according to the decision of the Council of Ministers of the USSR. At the end of 2003 those in the health care system numbered about 270.000 in the Murmansk region.

Regional authorities undertake relevant measures to protect and strengthen the health of people and the most vulnerable age group, children. On average only 10% of school graduates are completely healthy, 45-50% of school children have various chronic diseases, and 15% pupils have neuropsychic disorders due to too much school work and unfavourable socio-hygienic factors. Health problems also result from the sanitary and hygienic conditions in school, i.e. poor illumination, air and warmth conditions, noise, overwork, overstrain and stress at school, insufficient physical activity, nutrition, health-compromising behaviour, low level of pupils' culture of health, lack of knowledge of health-improving technologies among teachers.

Due to these factors the regional government pays close attention to the health protection and disease prevention among the younger generation. Health protection of school children in the Murmansk region is developed according to the following principles: the principle of non-infliction of

harm, the principle of active health protection and the principle of the triune health idea (physical, psychological and spiritual).

Along with schools the problem of health protection is solved by the institutions of extra-curricular education. In the system of education in the Murmansk region there are eighty eight institutions of extra-curricular education with 78.765 children – 72.3% of all pupils of the region. The number of rural pupils who attend supplementary education institutions is constantly growing and increased 2.3 times during the last year.

Physical, health-improving and sport activities in the institutions of extra-curricular education are aimed at the physical development of a child, introducing them to a healthy life and healthy life-style habits. In the Kola Peninsula there are more than 33.000 pupils who attend 2.300 sports schools and youth sports clubs, which offer physical education and provide the opportunity to go in for various sports. Youth and children's sport develops not only due to the growth of the number of sports schools, but also due to the development of different forms of out-of-class and out-of-school work with children, opening recreational, health-improving and sports units and clubs in schools and training colleges.

Children and youth clubs of physical education, sports schools, sports arenas and various sport clubs widely use disease preventive measures, organize health-strengthening and health-improving, physical activities in out of school time, promote physical culture and sports, a healthy life style, provide valeological education, i.e. teaching techniques of self-diagnostics, self-assessment, self-control, ways of improving health, developing a stable emotional state, as well as new modes of life.

Three years ago the committee for children and youth sport development decided to increase the number of associations working in this field. The

implementation of this decision had positive effects. In institutions of extra-curricular physical and sport education of Severomorsk, Monchegorsk and the Pechenga district new health-improving units started to operation. Opportunities to use sport establishments for school children on preferential terms were offered to the sport institutions and schemes for efficient use of sport gyms were developed.

The organization of physical activity plays an important role in children's health protection, therefore sports activities are organized in this region on a regular basis so that children and teenagers can participate in the city and regional competitions. The Murmansk region took the fifth place in the third stage of the Federal Competition, 88 sportsmen and women became prize and medal winners in 13 different sports. In the final of the competition our sportsmen and women became prize winners in boxing, track and field athletics and chess.

Conditions are created that are necessary for building the network of the so called "schools of health". These schools organize various extra-curricular activities during the academic year: monthly days of health, spring and autumn track and field events, ski relay races, sport performances of amateur theatricals, biathlon competitions, races for runners, skiers, various contests and mini Olympic Games.

These schools introduce new forms of work, e.g. sport-dramatic festivals, for instance, "Mother, father and myself is a sport family", "Olympionika" etc. School children have taken prizes for many years at the regional sport and athletics meetings among region schools, as well as the regional ski and basketball competitions.

The contest "School is a Territory of Health" was organized in the region and 15 educational institutions from Monchegorsk, Kovdor, Apatity,

Polarnie Zori and the Kola district took part in it in working in various directions in teaching positive habits of healthy life style and reducing negative ecological factors. Educational institutions from Monchegorsk, Kovdor, Polarny managed to maintain the positive attitudes in the pupils' state of health.

In spite of difficulties the system of health-improving camps is preserved and developed. For the last three years the number of children and teenagers involved in summer health-improving camps increased by 25% and by 70% in autumn and winter. To protect pupils' health a complex measures are implemented within the programme "Healthy Child", including a summer camp for children and teenagers. In 2003 one third of all children and teenagers involved in health-improving camps were taken within this programme to the summer camp outside the region.

Teenagers are occupied within camps focusing on socially useful work, which are organized in Murmansk, Apatity, Monchegorsk, Severomorsk, Polarny, the Lovozero district, and in day time camps covering 40% of all those involved in health-improving camps. Summer camps are primarily organized for orphans and children without custody, for boarding school children of whom 90% are taken outside the region. In January 2003 regional a health-improving year round camp was opened for orphans and children from poor families.

The teenagers public association organize prevention of psychoactive substances abuse, support and promote the anti-drug movement, contribute to volunteer movement among senior school children against drug-abuse, alcohol consumption and smoking. They hold seminars and training for leaders of children and teenagers organizations. To support and coordinate the work of individual associations a regional council of chief leaders and heads of children and teenagers associations was created in 2002.

Psychological medical pedagogical services in this region continue to develop. There have appeared services of psychological pedagogical and medical social help for children in many municipal educational institutions and about a thousand children received help from the regional center of psychological medical social assistance. All the municipal institutions within educational administrative offices, except the Tersky and Lovozero districts, have psychological medical pedagogical commissions.

During the last decade the number of children in different spheres of work within the institutions of extra-curricular education decreased, except the sphere of sport education in which the number of children increased almost three times. This can be explained by the peculiar features of this region, i.e. severe natural and climatic conditions of the Kola North, constant changes of the ecological situation for the worse and the increased morbidity of the population, especially in children. Negative tendencies in the sphere of health resulted in focused attention to the sport extra-curricular education.

Murmansk region authorities plan to further improve the conditions for disease prevention and strengthening the health of children and teenagers in educational institutions, including improving the system of health protection, nutrition, organized holidays in extra-curricular education institutions. Disease prevention and health protection remains a sphere of priority.

The Influence of Different Modes of Movement Activity of Primary School Children on the Heart Rate Indices

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In a wide sense studying is nothing more than the constant adaptation to the permanently changing physical and mental tasks. It becomes especially important in the Kola North because natural and climatic conditions of the Barents region, distortion of the ecological balance make higher demands on the regulatory systems of children and teenagers[1].

It is known that the time between 7-10 years is a sensitive period for significant changes in the motor activity of a child.

One of the most available methods for reducing the negative influence of environmental factors is to optimize daily physical activity and to prevent hypodynamia among primary school children. The analysis of locomotor activity of primary school children (natural and organized) shows that it meets the age requirements for only 35-40% and classes of physical activity of 2 hours per week cover only 11% of necessary activity. It is inefficient to increase motor activity by introducing extra classes of physical activity.

In connection with the aforementioned, one very important issue is the choice of means of physical education for the maximum improvement of health and for the best development of adaptive reactions. To verify the efficiency of the different modes of locomotor activity of primary school children an experimental study of children's adaptive abilities was carried

[1] Kaznacheev & Kulik 1980, 74–82.

out during the academic year, with the use of statistical indicators of heart rate, according to the R. M. Baevsky technique.

According to R. M. Baevsky's concept heart rate variability is an integral index which shows the interaction of three factors that regulate heart rate: reflex sympathetic, reflex parasympathetic and humoral-metabolic. Thus, it is possible to speak about the body's reaction on the whole to different factors of the external and internal environment judging by the changes of heart rate[2].

School children in the second grade were chosen as the focus of the research; one of the classes was the control and another one was pilot, pupils of which had not only standard physical education, but also two hour swimming classes twice a week. In total 20 school children of the control and pilot groups took part in the research.

The control of changes in tension during the rest state of the body's of heart rate was held 4 times during the academic year: in September, December, March and May. The following statistical indices of heart rate were used for the analysis: the average heart frequency (HF), the average RR interval (M), mode (Mo), amplitude of mode (AMo), variation range (Δx), standard deviation. R. M. Baevsky's index of tension (IT) was used to define the level of centralization of mechanisms of the heart rate's rest state. The index is calculated by the formula:

$$IT=AMO/2(\Delta x)\ Mo$$

The analysis allowed us find out that by the end of the year there was a statistical decrease in the number of children (from 36% to 10%) with a satisfactory adaptation of the cardio-vascular system and almost double the

[2] Baevsky 1979, 280.

increase in the number of pupils with satisfactory adaptation in the control group.

There were positive changes in functional state in the pilot group, i.e. increase in number of children with satisfactory adaptation (from 45% to 65%) and almost double decrease in number of children with dissatisfactory adaptation.

According to the data in table 1, by the end of the year there was a decrease in the heart frequency of children in the control group, and an increase in RR interval and mode, which shows the growth of parasympathetic influence, which in turn reflects the tiredness development by the end of the academic year, with a high level of activity of the central mechanisms of regulation at the same time.

Table 1

Changes in heart rate indices in the control group (n=20)

indices	Stages of research			
	September	December	March	May
IT (c.u.)	181.05±44.81	120.05±19.32	155.40±28.21	110.18±13.73***
HF	93.22±2.23	98.64±2.20	88.32±2.34	85.34±1.15*
M	0.64±0.02	0.68±0.01	0.66±0.02	0.73±0.01*
Mo	0.64±0.02	0.63±0.01	0.66±0.01	0.70±0.01**

Note:

* - reliability when $p<0.05$ in comparison with the research in September;

** - reliability when $p<0.05$ in comparison with the research in December;

*** - reliability when $p<0.05$ in comparison with the research in March.

There was a positive tendency in the functional state in the pilot group, i.e. increase in the number of children with satisfactory adaptation (from 44 to 64%) and a double decrease in the number of school children with the dissatisfactory adaptation. The large decrease in the index of tension (IT) during the academic year shows that the level of centralization of heart rate regulation at rest lowers (table 2). Increase in heart rate variations (Δx) and decrease in amplitude of mode (AMo) also reveal the prevailing role of autonomous mechanisms in heart rate regulation at rest.

Table 2

Changes of the indices to regulation of the heart rate at rest in the pilot group (n=20)

indices	Stages of the experiment			
	September	December	March	May
IT (c.u.)	176.64±34.55	135.64±22.43	80.10±15.37*	86.60±20.44*
AMo	38.40±2.52	36.00±2.74	31.26±2.30	29.80±2.55*
Δx	0.25±0.01	0.31±0.04	0.35±0.03	0.34±0.04*

When studying the reliable difference in indices for regulation of heart rate at rest, in the control and pilot groups at the end of the academic year (table 2) it becomes possible to point out that pupils who had traditional physical education are characterized by the lower centralization of control and higher role of autonomous mechanisms of heart rate regulation; it is proved by the higher variation range (Δx) and lower indices of amplitude of mode (AMo) and tension (IT).

In conclusion, depending on the suggested physical activity, two types of adaptive reactions were formed by the end of the year, which were revealed through the analysis of dynamics of heart rate variability:

1. school children with standard physical activity had a more important role in the central mechanisms of heart rate control;
2. school children from the pilot group had adaptive reaction by the end of the year, which is moderate activation of sympathetic parasympathetic influences on the heart rate.

Thus, different modes of physical action cause different methods of forming adaptive reactions of the cardio vascular system in the process of adaptation to studies and ecological and social conditions of the circumpolar regions.

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The Influence of Fitness-Aerobic Activities on the Possibility of Primary School Children's Bodies to Adapt

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A modern person knows quite a lot about health, as well as about those things which one must do to maintain and support it. However, it's necessary to bear in mind and to avoid a number of negative circumstances so that this knowledge starts giving results.

There is no step-by-step and continuous system in teaching health. Bearing in mind the fact that the level of people's health, mostly of children and teenagers, is drastically decreasing and health care organizations are not able to cope, not only with prevention system, but even with pathologies. The elaboration of a continuous system of valeological education is very important.

Developing of people's knowledge about health does not automatically mean that he or she will lead a healthy way of life. It's necessary to create a strong motivation for health.

The modern system of education in itself is a factor in the risk to students' health. It concerns both the organization of the learning process and the methods of teaching. The latter does not always take into account the individual needs of children and is not oriented to the prevention of problems in their health.

The importance of researching this problem is explained by the critical situation of health which takes place in the whole country, especially in the Far North.

Health care technologies mean the system of measures in maintaining students' health, which takes into account the most important characteristics of the educational environment and the living conditions of a child. We refer to such conditions as:

- environmental factors;
- school environmental factors;
- organization of the learning process and the timetable of the learning load;
- organization and forms of the physical rearing and work of physical health care system;
- the dynamics of the current and chronicle illnesses.

Scientists discovered long ago that a person's body living in the conditions of the territory beyond the Polar Circle is able to adapt to them up to a certain limit. Above this limit comes the formation of a regional 'Nordic' type of physiology of a person. All in all, the price for living in the Far North becomes inevitable, and this price is paid in equally by both children and adults.

The easiest targets of the extreme northern climate are children. One may only mention the following fact: the level of sickness of children in the Murmansk region has taken the data of the entire country for the last five years. So, in comparison with young people of the same age, children of the Kola region fall ill with infectious diseases 1.5 times more often, 2 times as often with diseases of the endocrine system and 3 times as often with digestive system. The level of general sickness of children in the Murmansk region has increased by 30% over the last 10 years.

These figures made the staff of the gymnasium consider the ways in which we can try to change the present situation.

In 1999 a control group of students from a primary school were allocated fitness aerobics 3 times a week. This meant that this group influenced their physical and psychological health through exercise. Moreover, at the lessons of valeology this group received theoretical knowledge about their health and about the methods of helping their body fight the negative influence of the environment, to train it and to support the immune system. They were forming their attitude towards health as the main value of a person's life. The group was supervised for three years and the results of the sickness during this period gave us a lot to consider:

Table 1

The table of registering the accounts of sickness of the control group of primary school students (1999-2002)

№	Name/surname	The year of birth	1999-2002 days	2000-2001 days	2001-2002 days	The year they started aerobics
1	Shkurko Daria	1992	17	0	5	1995
2	Seidof Arif	1989	56	14	9	1999
3	Sergaeva Daria	1989	40	17	17	1999
4	Yurkovskaya Z	1991	32	22	14	1999
5	Yurkovsky Ivan	1992	34	31	20	1999
6	Maksimovich Ek.	1989	38	18	6	1999
7	Drozd Andrei	1990	45	18	7	1999
8	Poluektova Tat.	1989	68	25	20	1999
9	Kashirtseva Ksenia	1991	27	21	4	1999
10	Bochko Alesya	1988	52	19	24	1999

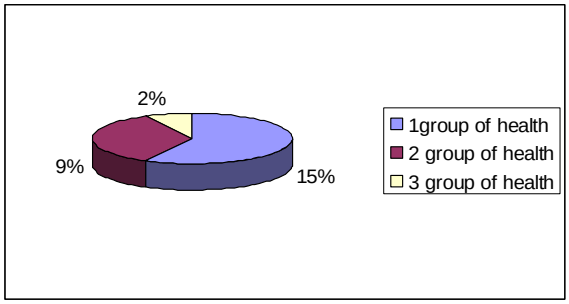
The following work showed that the frequency of getting ill for this group of children, in comparison with other children of the same age, is lower by 70%; this fact convinced us that we were moving in the right direction.

The next stage of activity was the formation of a group with a valeological major in gymnasium in the academic year 2003-2004. In this group the following health care technologies were included:

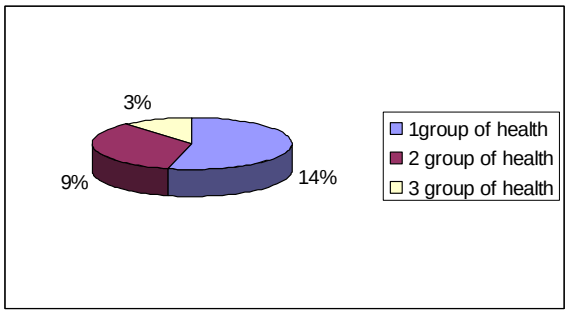
1. During academic year 2003-2004 (1 grade) classes of fitness aerobics took place three times a week; in 2004-2005 a third lesson of physical training – class of fitness aerobics.
2. During the time an extra class “Valeology” takes place, where motivation towards health is formed through different forms of work, including out of class activity and work with parents.
3. Every day there are valeological breaks during the lessons. The children are taught the right methods for fortifying the health and body. They keep special diaries which are called “Carrying out the conditions of long living in my family”, that means that they try to influence the other members of their family and insert a healthy way of life into the family.

At this stage of the activity we started our work with getting acquainted with the reference group, having a talk with the parents, conducting a questionnaire. There was an additional special questionnaire held to find out how the first grade pupils feel in the gymnasium, about their mood, willingness to attend. The results of the answers were shown in specific tables.

According to medical documents there were almost equal quantities of students, both in the reference group and in the control group, according to groups of health.



Pic. 1 Groups of health from 1 C



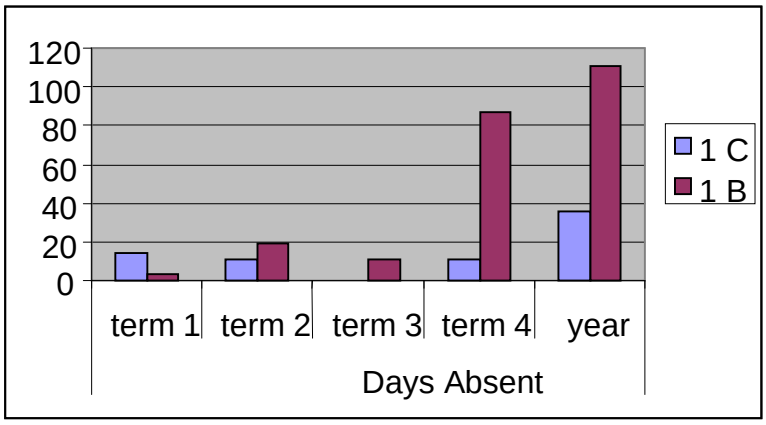
Pic. 2 Groups of health from 1 B

During the first year of the study there was systematic and oriented work in the group of valeological direction. Everyday breaks for the prevention of illnesses of eyesight, incorrect balance, flu, as well as lessons of fitness aerobics 3 times a week led, to our point of view, to some definite results. The comparative analysis of illnesses in the reference and control classes shows that.

Table 2

The comparative analysis of illnesses of forms 1C and 1B for 2003-2004 academic year

Form	Number of people	Days Absent				
		term 1	term 2	term 3	term 4	year
1 C	26	14	11	-	11	36
1 B	26	3	19	11	87	111



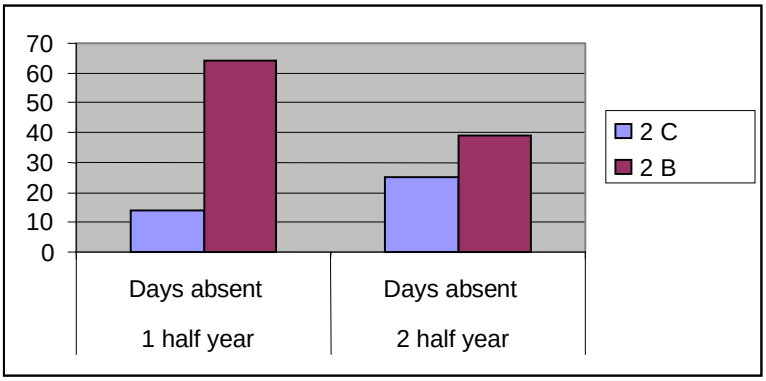
Pic. 3 The comparative analysis of illnesses of forms 1C and 1B for academic year 2003-2004

At the same time a test was conducted and a comparison of data about the frequency of heart beats before and after physical activity. The results of the testing also showed a meaningful positive tendency in the valeological group.

Table 3

The comparative table of attendance for lessons the 1st and 2nd half of years 2004-2005

Form	Number of people	1st half year Days Absent	2nd half year Days Absent
2 C	27	14	25
2 B	26	64	39



Pic. 4 The comparative table of attendance for the 1st and 2nd half of years of 2004-2005

The formation in the reference group of a strong motivation towards health, via optional lessons of valeology, played a very important role. During these lessons the children made a valeological analysis, filled in diaries concerning the conditions of long living in the families, took part in different out of class activities: a lesson in the form of a competition “To know your own body”, lessons about the digestive system, etc.

The comparative analyses of attendance of the groups showed the effectiveness of the activities which we conducted.

This research work is planned for 4 years. During this period the children of the reference and control groups study in the primary school. The dynamics of developing the physical abilities of the students, analysis of the data of the frequency of heart beats before and after physical activity in the reference and control groups, the comparative analysis of the accounts of sickness in 2003-2004 and in the 1st and 2nd terms of academic year 2004-2005 already show the vital importance of continuing this work and using it in all the forms of the primary school.

The Department of Education in the district of Severomorsk, under Sharova Nina Sergeevna, worked out the project “Education and Health” for 2005-

2008, where it proposes "…to find financial opportunities to include in the staff of educational institutions the posts for specialists, who provide work oriented towards maintaining and strengthening the health of the students".

Thus, during this pedagogical research I collected all the results of the work of the preliminary and first stage, which showed that we are going the right direction. The second and the third stages are about to start. They are to include the above mentioned activities in all forms of the primary school and to take into the staff of the gymnasium a specialist who is going to work on the development of the health, not only of children, but of the teachers too.

Features of Training Senior Swimmers under the Conditions of the Far North during Polar Nights

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Living conditions in the Far North imposes many aspects in the vital activity of the person including the training process. Kola Peninsula being in extreme northwest territory of the Russian Federation is located between latitude of 66' and 70' N and beyond the Polar Circle. The Kola North has its own climatic features which have no analogue in the world.

The extreme factors of the environment peculiar to the climate of Kola Peninsula are: low mid-annual temperatures combined with strong winds and high humidity, constant changes of atmospheric pressure that cause frequent and absolute weather changing during the day. "Light Deprivation" during polar nights and the comparison of this phenomenon to the period of the polar day, has collateral influences, as well as the period of biological darkness. In addition to this there is influence from the high geo-magnetic field, peculiar to all subpolar latitudes and an influence of adverse ecological factors. But labour and sport activity of humans continues even in the Far North and is possible owing to the adaptable abilities of the human body. Under the conditions of the Kola North a special kind of adaptation is formed. It is shown in the change of the basic energy source for the body - it starts to produce energy not of carbohydrates but of fats. It is one of the most general features of change in the metabolism of northerners and that transition differs by the raised maintenance of fats and nonsaturated fatly acids in blood and tissues. On the whole it is possible to speak here about a polar metabolic type.[1]

[1] Kulicov 1987, 10.

Another important factor is the process of adaptation of the respiratory system. The influence of the factor of coldness leads to the increasing consumption of oxygen. In response to this the body increases the volume of breath and exhalation using reserve abilities of the pulmonary system, resulting in the evaporation of moisture from the respiratory path decreases and heat is lost.[2]

Adaptive changes in the functional systems are directed to the preservation of a thermal homeostasis reached, due to increase of thermal production and decrease in thermal output. Thus thermal production increases by 40% - 55% due to thermotaxis and is 2-3 times due to shiver.[3]

It should not be forgotten that the period of polar night and polar day leads to the disruption of all internal biological rhythms: the general depression, decrease in muscular and intellectual tone, presence of feeling of unreasonable alarm aggravated by depression and drowsiness. The period of polar day begins in the spring but scientists established that that time is characterized by the essential change of the mental status of the person, shown in excessive irritability, irascibility and unreasonable physical activity.[4]

These changes cannot pass imperceptibly for inhabitants of the north, but the human body adapts to a certain limit and then a regional type of vital activity of the body is formed. The condition of body caused by the influence of the climate of the Kola North is named “the syndrome of polar pressure” or “the Polar syndrome”. This concept was developed in 1974 by the academic Kaznacheev V.P. who understood it as a complicated complex of physiological, metabolic, psychophysical and other changes

[2] Kulicov 1987, 13.

[3] Kulicov 1987, 17.

[4] Arsenev 1993, 17.

arising due to residing under the conditions of the Kola North. But one should not consider "the Polar syndrome" as illness; it is the increased vulnerability of the body, the "pathway" to illness.

Northerners continue to live, work, train and achieve sports successes even under these conditions. The aim of teachers who are engaged with children is to minimize all climatic influences on the body, to maintain its health, to consider all factors preventing normal abilities to live and train and to compose the pedagogical plan of achievement of sports results according the aforementioned particulars.

For the purpose of this study I would like to focus on the features of sports training of senior swimmers during the polar nights under the conditions of the Far North. It is now necessary to define who is a "senior swimmer" and to define the features and differences of their training under the conditions of the Kola North.

The training of swimmers to a high level of proficiency is a long process. The first stage is preliminary training, for boys of 8-10 years and girls of 7-9 years. The second stage initial training, for boys of 10-12 years and girls of 9-11 years. The third stage is the specialization in their specific sport, for boys of 13-17 years and girls of 12-17 years. Under "the senior age group" we refer to those aged 18-21 years (young men) and 17-19 years (young women) – this is the stage for sports perfection and achievement of skill. The final stage is the period of maximum achievement; it begins approximately at the age of 20 year and continues until 30.[5] The object of this study is the senior age group, for I work with them in high school. It is a rather complicated stage in the life of the sportsmen and women. During this period of enormous physical activity they feel a great responsibility for the future. It refers to: education, self-determination, allocation of

[5] Timakova 1985, 82.

priorities of their future life and career. It imposes pressure on training process of the future champion and the trainer is obliged to recognise all the changes occurring, not only in physical condition of the sportsmen and women, but also in psychological sphere.

At this stage the highest teaching load is imposed. Training tasks increase several times and the rate of training is constantly kept on the verge of anaerobic exchange 90% - 100% of the potentialities. At this stage of the preparation a specialization of the sportsmen and women is expressed; the trainer and the sportsmen and women should determine what distance and in what kind of sports they will achieve as much as possible high results. What way is the training of swimming organized at Murmansk State Pedagogical University?

The training process begins in September from the initial meeting with sportsmen and women, having joined the high school. This meeting covers the initial purposes and problems of the training process.

The following stage is the general physical training, including the work on increasing of force and endurance that is organized in the street in fresh air, and the specific training in an exercise room on the development of force and flexibility. Unfortunately this stage is very short-term, the reason being is that the general education system in the Russian Federation does not consider features of essential activity under the conditions of the Far North. The works of Mazurevich V.I., Arsenev E.N. and Riabchenko G.S. proved that August is an ideal month for a life and training activity in the Kola North. The study-training process should begin a month earlier as it is the most favourable time for the health of northerners. During the polar nights an extra vacation should be given and the academic year should be finished

before the beginning of polar day, for example, at the beginning of May.[6] All these would give an enormous total health-promoting effect. Unfortunately the education system is not going to be changed around in the country and therefore teachers have to work under conditions they have.

Coming to the next training stage it is necessary to prepare the precise study-training plan with a gradual, but constant and fast enough, increase of the training load by the beginning of November, with daily work by the swimmer from about 4-5 km up to 10 km. At the beginning of the month it is necessary to pay attention to such elements as endurance, but by the end of this short-term training stage it is necessary to pay attention to the power work of the ratio 50\50, including exercises with training tools (work with swimming shovels, swimming in T-shirts, with a bucket). We should pay special attention to the pulse modes of training; try to lead them to 80%-90% of their training-limit (170-190 strokes per minute). This stage is very important. October is not a month of the polar night but winter is drawing nearer and this month is the last opportunity to raise the aerobic abilities of the body without special adaptable efforts. Our aim is to use this month effectively as much as possible. In the middle of November winter and polar night have arrived. All the climatic phenomena mentioned earlier start to act upon the body of the swimmers. At this stage of study-training process the following changes are necessary:

1. First of all, low daily volume of work up to 4-5 km but not to refuse aerobic work.

2. Start the morning training at 10-11 o'clock to give the swimmer the opportunity to sleep well.

3. Pay special attention to technical and tactical training of the swimmer (perfection of techniques of start and turn).

[6] Mazurevich 1987, 81.

4. Increase the share of power exercises in pulse modes with a reduction of length of swum pieces to make the training process more "explosive" and short-term.

5. Include additional training exercises of “dry swimming” and increase their share up to 30%-40% instead of the recommended 20%-25%. Add a lot of anaerobic exercises promoting the development of force. The work should be done of a high rate but for no more than 45-60 minutes.

6. Give additional exercises with a change of activity. For this aspect the following games help the trainer: basketball, bandy, football, volleyball and also skiing. This allows escape from monotonous training in the water.

7. Organize an increased warm-up including respiratory exercises before the beginning of training in water. It gives higher muscular tone allowing them to keep training at a higher level.

8. Give recommendations about the swimmer’s food and pay attention to whether they consume enough vitamins and minerals. Add stimulating tinktura Araliae, Rhodiolae extractum fluidium, Schizandrae fructum tincture, extractum eleutherococci fluidium to a sports diet.

9. Pay special attention to the psychological atmosphere in the group and organize your training promoting the unity of the collective.

10. Watch progress during the period of polar night at the beginning of sessions in the majority of high schools in Russia.

All these recommendations will minimize the negative influence of nature on the sportsmen and women living under the conditions of the Kola North, to maintain high muscular and intellectual activity during “the biological darkness” and to use the peculiarities of the special polar metabolic type. Certainly, it is impossible to completely exclude the influence of a polar climate, but the aim of teachers is to minimize its negative influence on a body and psyche of our students. Work on the features training of sportsmen and women after the period of polar night and in spring training for the start of the year are still in the process.

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Peculiarities of a Weekly Psychological Rhythm of Students during Different Seasons of the Year

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At present there is a great deal of scientific studies which are devoted to the question of young people's health. In most researches these questions are considered according to physical-adaptive processes. At the same time, the fact that a human being as an open non-linear system, who has a temporal function organization and who is subjected to a huge amount of exogenous effects, is not taken into account. The aim of this research was to find out the students' psychological state over a week's duration during different seasons of the year.

Fifty students aged 19.45±0.13, weight 71.94±1.24 k, height 177.11±1.04 cm were included in the research, they were considered healthy at that time. Every day during a five day period each person gave a subjective grade to their state of health over 10 indices: sleep duration, sleep quality, speed of switching on to work, tone in the morning, mood in the morning, tone during day time, capacity for work during day time, tone in the evening, need for sleep in the evening, general state of health at the present time (from -3 to +3 points). The research was carried out in October (autumn), in December (winter), in March (spring), in June (summer).

The analyzed temporal pattern of psychological indices shows its wavy character. The autumn season (Fig.1) diagram, with single peak represents the typical fall of practically every index on Tuesday and its smooth rise from Wednesday until the weekend. It is interesting to note that this change has a synchronous character. There is an insignificant isochronous between the sleep duration (that becomes smaller by the end of the week) and the

need for sleep (that grows by the middle of the week). The variation of the marked data was from 0.67 to 2.00 points (satisfactory-good).

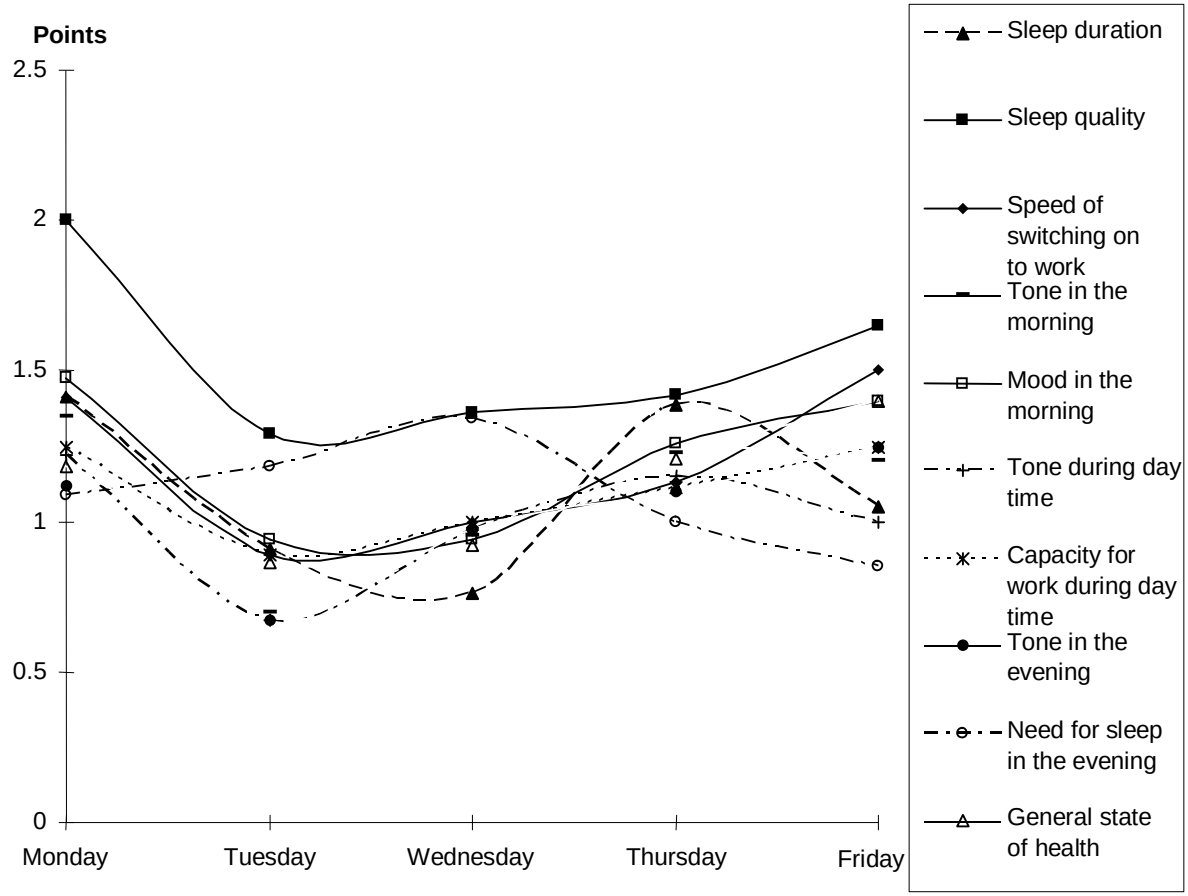

Fig.1 Weekly dynamics of psychological indices in autumn

In winter time we received a quite different response (Fig.2). It is typical for a weekly wave to have 3 high (Monday, Wednesday, Friday) and 2 low (Tuesday, Thursday) peaks. At the same time, the almost perfect synchronization of every wave is apparent. This season notes a greater need for sleep, a lack of energy in the morning and evening. The marked data dynamics only range from 0.5 to 1.68 points (satisfactory).

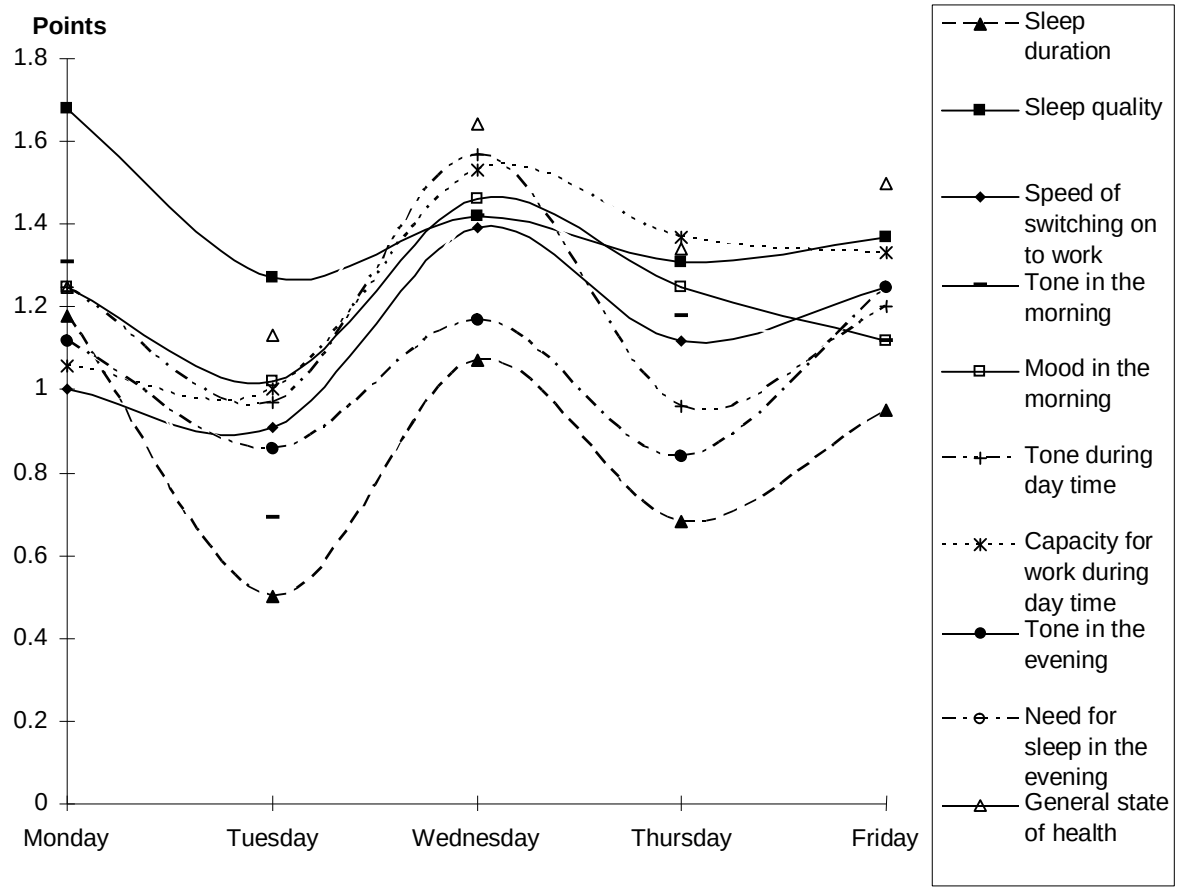

Fig.2 Weekly dynamics of psychological indices in winter

The spring results (Fig.3) show that a return to a single peak again, but it differs from those of autumn. At the beginning of the week (Monday) there is a rise in the indices and it is its peak by the middle of the week (Wednesday–Thursday). On Thursday in the indices for “capacity to work”, “tone during day time” and “tone in the evening” show a negative shift; often indicating tiredness. An insignificant isochronous character in the main wave is typical for “mood in the morning” and “tone in the morning” (by the middle of the week).

We can assume that the fall in “capacity to work” in spring is caused by psychological functioning weariness after a difficult winter season and it is not possible to recover over a weekend period; indicated by the low marks on Monday (0.51 to 1.76 points).

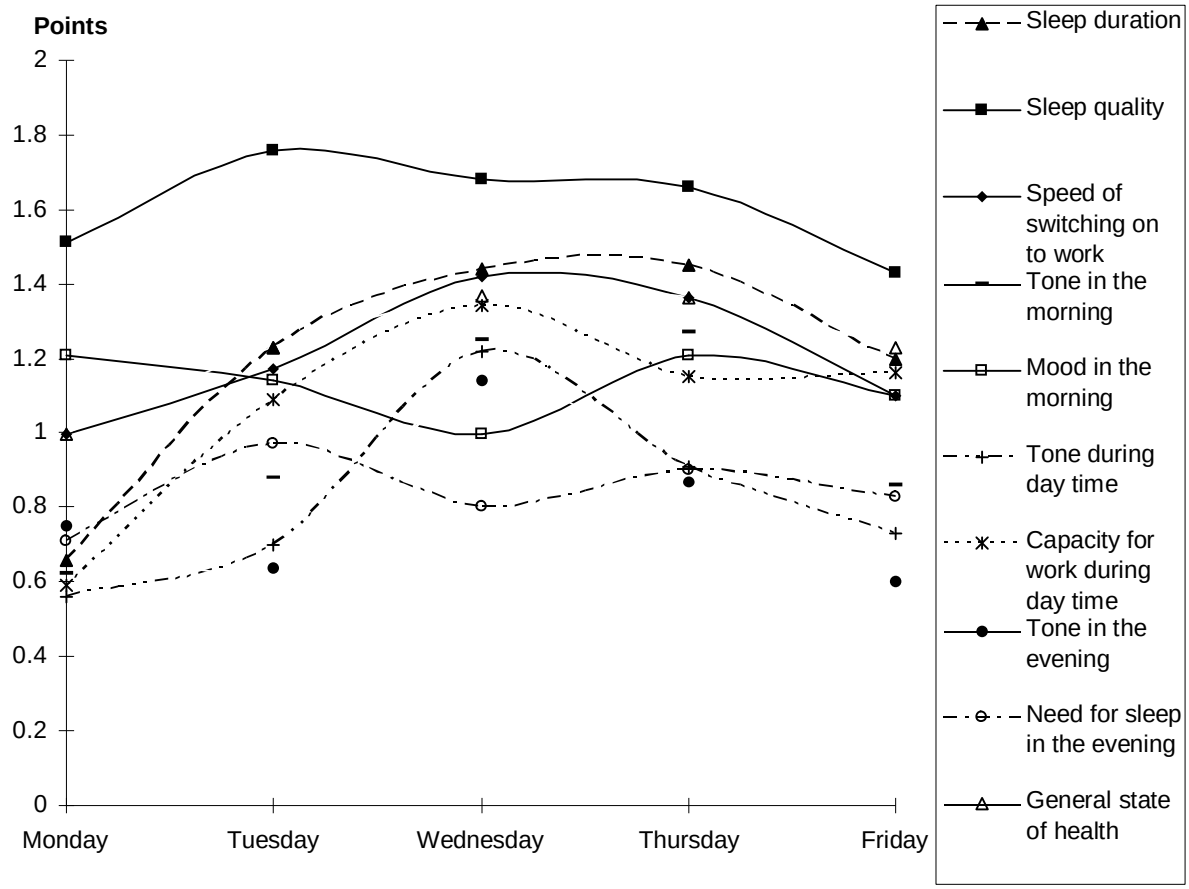

Fig.3 Weekly dynamics of psychological indices in spring

The summer series (Fig.4) signify several isochronous features. This can be seen in the number of indices that rise by the weekend, it has two low peaks and that some indices do not change. The indices of “sleep quality”, “general state of health” are at the top of the diagram and “sleep duration” and “need for sleep in the evening” are at the bottom. Subjective marks of all characteristics range from 0.6 to 1.3 points (satisfactory).

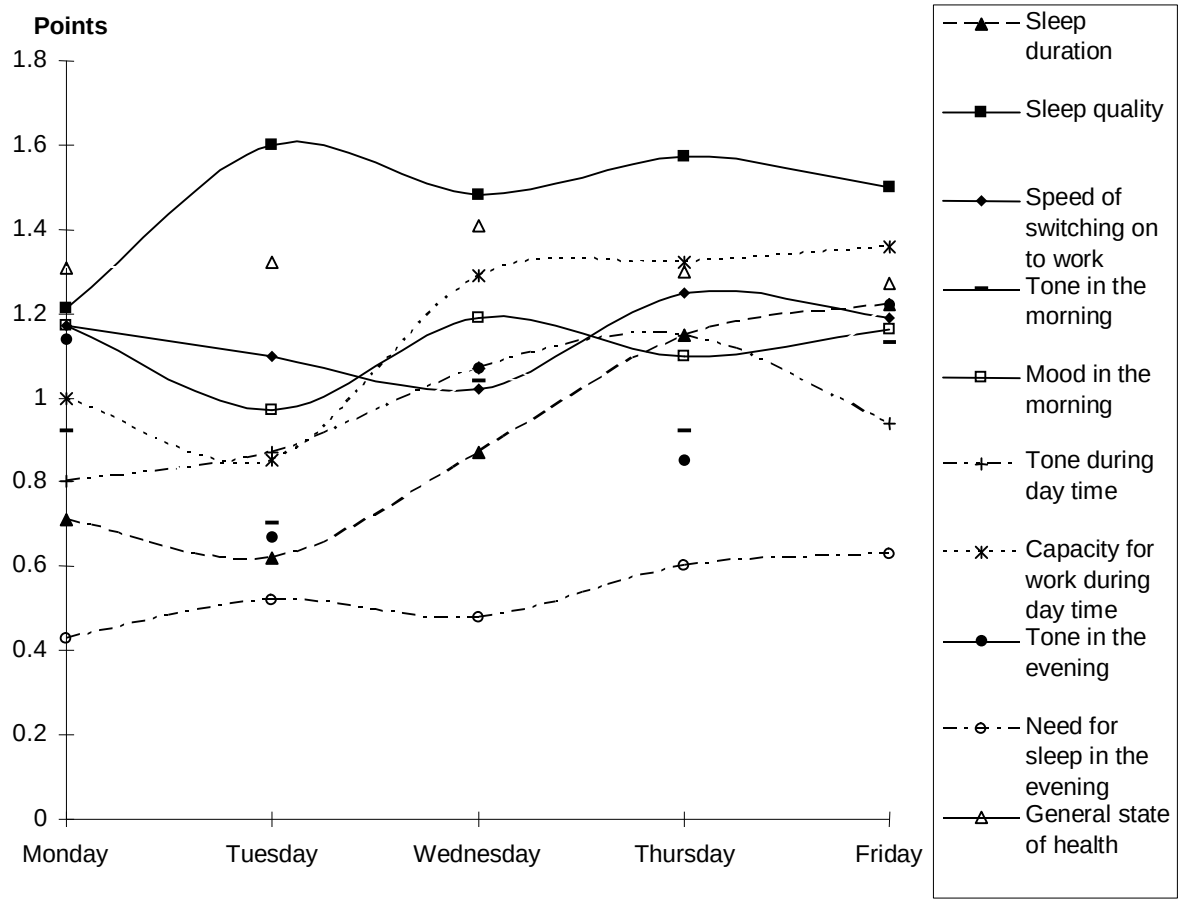

Fig.4 Weekly dynamics of psychological indices in summer

In conclusion,

1. Studies and training should be planned taking into consideration the bio-rhythmical dynamics of students' psychological state during different seasons.

2. Studies and training should be distributed taking into consideration the rise and falls of their psychological state.

3. Studies and training should be reduced in summer time as there are indices of disharmony during that period. Students are advised to take rejuvenation measures, such as baths, sauna, massage, emotional release activities, vitamins and hydro-therapeutic activities.

The State of the Immune Systems of Those who Live Permanently in Kola Zapolyarje's Conditions

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There are ecological troubles in the Murmansk region, the most polluted cities of Kola North being Monchegorsk, Olenigorsk, Kandalaksha, Kovdor and Pechenga, which are sitiuated near the mining and smelting industry factories. This is very dangerous for those who live nearby because the air is greatly polluted. In Kirovsk and Apatiti the apatite ore that is used can cause pnevmokoniozapatioz. The air pollution reduces and sometimes destroys the body's protective forces, such as the immune system, resulting in the body's inability to adapt and cope in harsh conditions. That is why the exacerbation of chronic diseases increases.

The basic negative climate factors of the North are peculiarities of solar radiation, which is 44% less than in central regions of Russia. Due to the cold air flow from the ocean and Polar basin there is a huge difference between the maximum and minimum temperatures. In autumn the daily temperature variation can be 10 degrees or more. There is a variation of temperature between 0 till + 10 degrees combined with winds and storms. The number of days with + 10 degrees in the Kola Peninsula during the year varies from 231 to 324. Such unusually low temperatures can affect climate and can be the reason for the continual cooling of the body, especially in winter period, where storms can make the weather very severe. The air humidity can be 80%, especially in summer[1]. The atmospheric electricity of the aurora borealis and magnetic storms greatly influences the systems of a body. It can be manifest itself in different

[1] Aleynikov 1982, 168; Arnoldi 1962, 72; Danishevsky 1968, 412.

reactions, for example, high level of fatigue, headache, irritability and exacerbation of chronic diseases. Active migration is also another reason. According to many researchers, the last adaptation of those who move north is a long process and with different changes to the body's systems, in particular the immune system. During the 7 years the body needs to adapt, emaciation can appear[2]. That is why the climate of the polar areas can be deemed uncomfortable, even extreme.

The condition of the environment greatly influences people's health, especially those who live near industrial factories. Many researches show the connection between air pollution and health. The analysis of human health state is very interesting in practice. The complex influence of many dangerous substances and transformation in environment and body are only researched. The dangerous measures of environmental pollution on human health is likely to cause negative effects[3].

One of the ecological troubles are chronic diseases of the lungs[4], allergies and growths[5], the pathology of blood diseases[6], cardio-vascular system diseases and thyroid glands[7]. There is research into the influence of ecological factors on the change in the state of the immune system[8], the peripheral blood, the state of the alular and other metabolisms and the organ structures.

In many medical researches have found correlating connections between high atmospheric air pollution and lungs diseases. This is because of the

[2] Arnoldi 1962, 72.

[3] Bertollini, Dora et al., 1996.

[4] Steerenberg, Fischer, Gmelig-Meyling et al., 1996.

[5] Schlumberger, 1995.

[6] Kodama, Fujiwara, Yamada, et al., 1996.

[7] Weigel, 1996.

[8] Van-Loveren, Steerenberg, Garssen & Van-Bree, 1996.

absence of a protective covering when xenobiotics passing through when breathing. This then makes the body weaker when toxic substances come through the lungs than through the stomach. During the last few years people's sensitivity and chronic bronchitis has increased. With the dramatic ecological situation the number of people with asthma increases yearly, which is the worst form of allergy.

The changes in the immune system can be an indicator of ecological troubles. The decrease in the immune systems functions can cause an increase in diseases among those who live in ecologically polluted areas. The main purpose of this research is to find out the state of the immune system among people who have lived in the North for no less than 3 years and are considered healthy. The research was carried out within the city hospital for children, polyclinic 5 in Murmansk. A blood test was taken from healthy donors with an empty stomach in the morning, following correct procedures.

20 healthy donors were selected aged 18 to 41, who constantly live in Murmansk and don't have chronic diseases (group A). The comparative group consisted of those who live in Moscow of the same age (group B). 42 teenagers were chosen 14 of them were girls aged 13.6+0.48. Group D (Kirovsk) was made up of two smaller groups, D1 – boys aged 13.8+0.57 and D2 – girls aged 13.4+0.48. The control group results were taken from a group of children of the same age from Minsk (the researches of Titov and Kirilchik). Results showed leucocytes, lymphocytes, T-lymphocytes and B-lymphocytes, serum immunoglobulins A,M,G in the blood. The definition of T-lymphocytes (CD3) and B-lymphocytes (CD22) was made using immunocitochemical method, with the help of reactors from "DAKO". The concentration within the immunoglobulins serum was discovered using the Manchini reaction using the antiserum from the Vitebsk Medical Academy.

The results of the immuno-analysis are presented by statistic with the base average measures and the figure of reliability according to the Student.

As we see from table 1, the donors from Murmansk, compared with those from Moscow, have the decrease in the allular immunity, such as the total amount of T- lymphocytes 48.8 + 3.21% (Murmansk) and 63.8 + 4.42% (Moscow), and also T-supressors 18.2+2.35% (Murmansk) and 25.2 +1.83 (Moscow).

Table 1

The figures of allular immunity of citizens in Murmansk and Moscow

Figures (%)	Healthy donors Moscow (n=12)	Healthy donors Murmansk (n=20)
CD 3	63.8+4.42	48.8+3.21*
CD 4	40.3+2.58	37.5+4.94
CD 8	25.2+1.83	18.2+2.35*
CD4 /CD8 (IRI)	1.59+0.08	2.0+0.89

* true according to the donors from Moscow ($p<0.05$)

According to the results of groups C, D1, D2, there is a decrease in B-lymphocytes in group C control group (table 2). From the gumoral immunity: an increase in concentration of immunoglobulin A in groups C, with more shown in group D1, an increase in concentration of immunoglobulin M, with the lowest concentration in group C. The consistence of IgG truly increased in the control group of teenage girls in Murmansk (table 3).

Table 2

T-lymphocytes (CD3) and B-lymphocytes (CD22) in peripheral blood among teenagers in the Murmansk region (%)

Marker	group-C (n=14)	group – D 1 (n=13)	group- D 2 (n=15)	group-E (n=108)
leucocytes	7.05+0.64	5.00+0.64	5.67+0.81	-
lymphocytes	36.6+5.76	39.0+6.56	42.41+4.60	-
CD3 %	58.0+8.88	n/d	n/d	59.3+1.7
CD22 %	27.4+4.32*	n/d	n/d	15.5+1.1

*true according to the control group ($p<0.05$).

Table 3

Concentration in peripheral blood among teenagers in Murmansk region (g/l)

Isotype	group-C (n=14)	group – D 1 (n=13)	group- D 2 (n=15)	group-E (n=108)
IgA	1.20+0.34	0.80+0.24*	1.30+0.26	1.36+0.11
IgM	0.27+0.03	1.01+ 0.32	1.8+0.33*	0.83+0.08
IgG	7.38+1.18*	6.72+1.07*	8.40+1.21	9.95+0.4

* true according to the control group ($p<0.05$).

In comparison it was discovered that the first step for disease is higher in Murmansk 5.4% and Kirovsk 30.6%, according to the figures from central regions. As the result of the immune research the main reasons for these differences can be climate and ecological factors, which first start a complex series of reactions, which are needed for adaptation. Long exposure causes increased strain on central organs of the immune system and bone marrow and causes emaciation of functioning abilities and development of adaptation and causes problems with the regulation of immune responses.

Research into the immune systems among teenagers shows that the figures of allular immune zones among girls in Murmansk are normal, but humoral immunity is higher, which causes the process of progressive imbalance of the immune system. The lower figure accorded to the teenage boys from Kirovsk. As we can see from table 3, an increased concentration in immunoglobulin A in group D 1, immunoglobulin G in group C and D1.

This research shows that people under 40 and teenagers show significant changes in their immune systems when influenced by climate, ecology and social factors. These changes may be the reason for the appearance and chronic problems of the inner organs among people of Kola Zapolyrje (Kola Peninsula).

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SPORT AND TRAINING

The Role of Adaptive Physical Training for Those with Children's Cerebral Palsy

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Children's Cerebral Palsy falls within the wider category of infringement of development, which includes problems in the motor functions. Children with such problems are characterized by the presence of a lack of strong muscular and skeletal systems and the specific condition of the central nervous system.

The term Children's Cerebral Palsy – originates from the breakdown of the central nervous system arising during intra-uterine development, or during the neonatal and encompasses movement, speech and cerebral problems. There are classifications of the given disease all over the world.

In our country K.A. Semenovoj's classification (1978) is widely used. According to the given classification five clinical forms of children's cerebral palsy are allocated: double hemiplegia, spastic diplegia, hemiparetic form, hyperkinetic, atonic and astonic form. In all forms motor function problems of the reflex system are characteristic. Movements are possible, but they do not aid the child: such as compensatory movements, negative movement stereotype, coordination of movements is erratic, muscle tone is raised. Children's Cerebral Palsy does not progress. As a child grows and develops one may see a marked reduction in the clinical symptoms of the disease. The treatment of children with Children's Cerebral Palsy requires a complex program, which includes physio-therapeutic, orthopedic, logopedic treatment, etc. Physical activity is the most important part of the general educational system, training and treatment of children with Children's Cerebral Palsy. Muscular activity

during the performance of physical exercises stimulates physical process, forms a new functional condition, which is characterized by the adaptation to deflect, reduction of the damaged functions, adaptation of vegetative systems to physical activity. Originally the process of physical exercise consisted in engaging corresponding eisodic and motor centers, mobilization of skeletal muscles, blood circulation and breath, which in total form the uniform functional system responsible for the realization of any given motor reaction.

With the purpose of restoring motor problems, various forms of medical physical training, massage, physiotherapy, electrostimulation and other various simulators are applied. The programme of physiotherapy exercises is carried out the basis of ontogenetic sequences of movements of the child (exercises for increased training movements of the head, extending the top part of the trunk, support on forearms and hands, crawling on stomach, turning of the trunk, ability to sit, independently sit down, kneel, on legs, etc.).

The primary method of developing the movements of children with cerebral paralysis is carried out using medical gymnastics. Children with Children's Cerebral Palsy can not develop static or locomotor functions spontaneously or correctly. Thus, the influence of medical gymnastics on the muscles, sinews, joints are the nervous impulses going through the central nervous system, stimulating development of the motor function zones of the brain. During medical gymnastics poses and positions the muscular tone decreases, violent movements decrease or are overcome. The child starts to feel various parts of their body move into a correct position and improve motor functions and skills. Special attention to the employment of medical gymnastics is given to those motor skills which are more necessary in life, such as walking, in practical activities, looking after

one’s self etc. Thus, correct performance of movements of the child should be strictly fixed; only then can the child develop a correct motor type.

Music is recommended for the physical training sessions as it influences the development of movements. Musical rhythm promotes the reduction of violent movements, trains the function of active attention, raises the emotional level and creates a good mood during each session.

In Murmansk there are many specialized establishments working with children with problems with motor functions. So, for example, in the children's rehabilitation center, depending on aim of the doctor, the child can take part in following procedures:

- Various kinds of baths ("Cascade", a vortical bath "Coral", " the Pearl bath");
- A cabinet of electrostimulation;
- A cabinet of medical physical gymnastics which is equipped with the following simulators:
- Simulators for the top body section;
- Simulators for the bottom body section;
- Simulators for training crawling; Trampoline and balls of different forms and diameters.

Children may work on their own or in groups during games. This raises interest, motivation and improves the mood of the child.

Ball-pools are another excellent training resource as the body of the child in the pool is constantly supported. At the same time it is possible to move, feel constant contact of the balls, thus, there is a constant massage all over the body and sensitivity is stimulated. The child in a ball-pool can move independently and freely, changing directions of movements, poses, alternating motor activity with rest. The ball-pool promotes development of

mobility, coordination of movements, balance, a sensitivity of all touch systems, activates cardiovascular and respiratory systems, promotes the development of physical qualities, promotes an increase in mobility of backbone and joints of the top and bottom sections and creates a positive emotional spirit.

It is important to consider that the volume of daily motor activity of children during the process of growth and development should gradually increase. A two year old child should use various forms of motor activity for 4 times 30 minutes a day (2 hrs total), and 3-7 year olds 6 hours per day. It is natural that all motor activity cannot be achieved through special activity, for the greater role in the education and treatment of children with a Children's Cerebral Palsy lies with the parents. In order to develop the movements of the child at home, it is necessary to allocate the child a special corner, which has the following: a specially equipped table and chair, hand rail, a rocking chair, wall bars, sports equipment, sets of didactic material of different forms, sizes and volume.

Thus, the rational use of all means and methods of adaptive physical training will help a child with Children's Cerebral Palsy be prepared for school life, find independence, to adapt to the world around them, to develop skills of social, domestic and mental activity.

Developing New Methods of Rehabilitation and Treatment for Children and Teenagers with Locomotor System Disorders in the Rehabilitation Center "Children hospital No2" Murmansk

Sergey Ageev & Tatiana Maksimenko

During the last decade in Russia there has been a considerable growth in the number of diseases with locomotor system disorders. These are paresis of different localization, ataxia, muscular and articular contracture, neuromuscular dystrophy, arcuation of upper and lower limbs, diseases of the spine and feet. According to data from the Bureau of Medico-Social Expertise the number of invalid children in Murmansk increased by 13.3% from 2000 to 2005 in a similar disease group.

In attempting to understand this problem led researchers to seek solutions in high lighting these negative tendencies. In spring 2003 a trilateral agreement on creating a Rehabilitation Center for Children and Teenagers with locomotor system disorders was signed by the authorities of Murmansk, the Murmansk branch of the International Rotary Club and the Council of Public Initiatives Fund.

The main goals of the Center were to improve medical help for children on an outpatient basis, improve economic effectiveness of medical prophylactic institutions by introducing and widely using modern resource saving medical technologies of remedial treatment, thus preventing children invalidity.

These goals are achieved through complex remedial treatment using modern medical techniques: continual, successive and consistent treatment, individual approach in organization and the realization of a treatment programme.

Five groups of diseases, which require recovery of the locomotor functions system in children between 6 months to 18 years, will be treated in the Rehabilitation Center: diseases of the nervous system, after-effects of perinatal affects of the central nervous system, musculo-skeletal system and conjunctive tissue diseases, after-effects of injuries, congenital malformations. The Center was open for the first patients on October 15th, 2005.

The Center has several therapy rooms. There is a weight room for individual lessons of 40m^2 with mechanical therapeutic machines, training machines, platform “Delta”, machines for inactive working out of limb joints, biological feedback device, and various other apparatus. A hydropathic establishment of 52m^2, which has four types of hydro massage baths: a bath for subsurface massage shower-bath, a gas-bubble bath, and a whirlpool bath “Coral” for children who are still weaning. There is also the hypoxia-therapy zone “Mountain Air”, room for “Lymphatic therapy”, a room for healing massage, for electro phototherapy with machines for electrical and magnet stimulation of muscles, low-frequency magnet therapy, microwave resonant therapy, laser therapy and chromo phototherapy.

A staying at the Center begins with defining rehabilitation potential and the development of an individual treatment programme. Dynamic control of the condition of the patients and assessment of the initial treatment results is conducted during the stay. A physician and an exercise therapist take part in elaborating the individual treatment scheme.

A daily programme of rehabilitation activities includes: remedial gymnastics, apparatus physiotherapy, healing massage and hydrotherapy.

380 children were accepted from October 15th, 2005 until September 1st, 2006, among them 104 with locomotor system disorders. The total number of visits is 6265. Tables 1, 2, 3 show age and disease types of those under treatment.

Table 1

Age of those under treatment

Children age	Abs.	%
under 1 year	47	12.4
1 – 3 years	80	21
3 – 7 years	89	23.4
7 – 14 years	128	33.7
teenagers	36	9.5

Table 2

Disease types of those under treatment, which lead to locomotor system disorders

Disease types	Abs.	%
Nervous system diseases	160	42
Musculoskeletal system and conjunctive tissue diseases	125	33
Congenital malformations	46	12
After effects of perinatal affects of central nervous system	38	10
After effects of injuries	11	3

Table 3

Types of diseases of invalid children under treatment, which lead to locomotor system disorders

Disease types	Abs.	%
Nervous system diseases	307	81
Musculoskeletal system and conjunctive tissue diseases	8	2
Congenital malformations	53	14
After effects of perinatal affects of central nervous system	4	1
After effects of injuries	8	2

The data shows that the older the children are, including invalids, the more they need rehabilitation. The most common ailment among children are nervous system diseases – 42%, musculo-skeletal system and conjunctive tissue diseases – 33%. The most widespread among invalid children are nervous system diseases – 81%.

Assessment of locomotor system functions was made after rehabilitation using T.A. Maximenko's techniques, a physiotherapist of the highest qualification.

Assessment of locomotor system functions using T.A. Maximenko's techniques follows the criteria:

1. Improvement of quantitative characteristics of movements:
    - growth of strength (tolerance) of hyposthenic muscles;
    - growth of capacity for active movements in joints;
    - reduction of stiffness or contracture;
2. Improvement of qualitative characteristics of movements:
    - improvement of coordination;
    - reduction of intensity of hyperkinetic disorders;

- reduction of intensity of synkinesis.

3. Reduction of deflection intensity of locomotor system:
    - reduction of intensity of defective postures;
    - forming habit of correct posture, correct staying and walking.
4. Improving muscle tone.
5. Reduction (removal) of pains and functional disorders.
6. Improvement of quality of life:
    - forming habits of self-service and transportation;
    - developing new and improving quality of existing levels of motor development.

Analysis of the Center activities in 2005-2006 lets us make the following conclusions:

1. Locomotor system functions improved among 89.7% of children.
2. 25% of children under rehabilitation for central nervous system diseases had improvement of mental and speech functions.
3. The best rehabilitation outcome (in maximum number of criteria) was in groups of children under 3 years old, i.e. those still weaning.
4. The first reliable results were achieved, which prove that the Rehabilitation Center was opened timely, treatment programmes are efficient and further development of quality and number of services is necessary.
5. Goals:

5.1 Improving organization and quality of medical help for children on an outpatient basis.

5.2 Improving economic effectiveness of medico-prophylactic institutions by introducing and widely using modern resource-saving medical technologies for remedial treatment.

5.3 Prevention of children invalidity.

5.4 Medical help for invalids in improving quality of life.

6. Objectives:

6.1 Complex remedial treatment with modern medical techniques for sick children including invalids.

6.2 Continuity, successiveness and consistency in treatment.

6.3 Individual approach in organizing and realization of treatment programme.

Psychological and Pedagogical Aspects of Training Cheerleaders for Competitions

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Cheerleading as a form of sport was invented by the Americans. In translation to the Russian language it is “a leader of those who cheer at a stadium”. In the beginning cheerleaders were men who actively supported their favourite sports team, later the teams became combined. According to statistics, nowadays women’s teams prevail. In spite of the fact that the ancestors of this sport were Americans, such countries as Finland and Japan have very strong teams. In Japan cheerleading is so popular that it is studied within school programmes. There are World and European Cheerleading Championships.

Cheerleading is a combination various techniques, with two main directions in it – “Cheer” and “Dance”. In the first case cheers, pyramids and jumps prevail, while in the second one there is more choreography, dance elements, pirouettes. Team, pair and individual cheerleading are distinguished, as well as no age limitations. There are children’s teams (9-11 years old), junior (11-15 years old), and adult teams (16 and older).

The more varied and multifaceted the training of participants is, the more interesting the team looks as a whole group. It becomes real thanks to more specific, than in other kinds of sports, opportunities to satisfy personal interests and consideration of individual psychophysical peculiarities and body reserves. Of course, successful team training is impossible without a due level of value and motivation sphere, without good knowledge and skills of trainings’ arrangement, without scientifically-based approach to choosing the members of a cheerleading team.

In spectator sports, to which cheerleading belongs, first of all it is necessary to study personal peculiarities of an athlete, which determine the subjective reflection of the phenomenon “publicity of competitions” in order to teach them methods of psychological protection against unfavourable influences. In modern sports in order to achieve good results it becomes more and more important to take into consideration the peculiarities of the nervous system and temperament of each athlete – the steadiest individual peculiarities of a person, which cannot be significantly changed during the trainings and which should be taken into account.

This article gives the research findings of expression of the typical features of a nervous system, temperament among the women – gymnasts and their interrelations with the effectiveness of teaching, training and performance. All members of the target group, age 11-12, have been engaged in rhythmic sportive gymnastics for no less than three years and are candidates for a cheerleading team. Their sports qualification is the I-II category. Individual testing took place in September and May 2006.

The article gives a view over the nervous system features and temperament of 15 athletes of 11-12 years old and their interrelations with the effectiveness of teaching, training and performances. The following methods were used: research methodology of extraversion – introversion and neuritis (Isenc’s inquiry); tapping- test methodology, simple visual - motor reaction method; “mini-mult” methodology. In order to carry out methods 3.4 the apparatus – programme complex “Psycho physiologist” was used. Having analyzed the simple visual – motor reaction, we distinguished 2 groups of people. The first group – average capacities of the central nervous system (60% of the total number) – (3^{rd} class); the second group – low capacities (40%) (1^{st} class). Those who belonged to the first or second group had both strong and weak type of nervous system.

In order to measure the degree of manifestation of personal traits the methodology of express-test ("mini-mult") was used. This test deduced persistence and aggressiveness among 20% of the women gymnasts and activeness, buoyancy, vigor and insufficient self-restrain among 13%. The analysis of the tapping-test let us divide the group under investigation (n=15) into 3 types: with weak (n=10), strong (n=3) and average (n=2) nervous system. The high percentage (66.6%) of people with a weak type of nervous system confirm the data of many researchers. Most people with a weak type of nervous system represent those sports which need coordination and precision in movement, a high level of intellectual development, perception-reaction time (synchronised swimming, artistic gymnastics, cheerleading). Perception-reaction time, spatial awareness are qualities which depend on the nervous system strength, within the theory about a greater level of sensitivity of the weak type, give certain advantages to the athlete of this type. The analysis of the athlete's performances and their dependence on the nervous system type let us come to the conclusion that athlete with a weak nervous system lower the training results during performances. These changes are not regular among athletes with a strong nervous system (Table 1).

Table 1

Performances' influence on the gymnasts' results depending on the nervous system type (n=15)

People under test	Results in training, %	Results in competitions, %	Reliability of differences, (p)
With a weak nervous system	100	80.7	$p<0.05$
With a strong nervous system	100	90.5	$p>0.05$
With an average nervous system	100	91.5	$p>0.05$

Having analysed the data, using Izenc's test, the average extraversion was deduced, constituting (X=14±0.8) (Table 2), which corresponds to the moderate extraversion. The representatives of this group, according to our observations, produce conditioned reflexes harder in comparison with introverts, endure sensory deprivation badly, and as a result they cannot stand monotony and are often distracted during trainings. Self-control is not well-expressed, they are communicative and strive for leadership. These results coincide with the data found in the literature.

Table 2

Average indicators of extraversion and neurotics (=15) (X±m)

Extraversion	Neurotics (emotional stability)
Moderate (12-18)	Average (11-14)
14±0.8	11±0.6

Average indicators of the neurotics scale constituted 11 points (X=11±0.6), which corresponds with the average level of emotional stability. The analysis of individual data in the neurotics scale let us deduce that those with a higher level of emotional stability – 6 persons (40%) and 3 athletes (20%). 6 turned out to have average emotional instability (Table 3).

Table 3

Indicators of individual level according to the neurotics scale (n =15)

Emotional stability		Emotional instability
high	average	high
9 points	12 points	16 points
6 persons (40%)	3 persons (20%)	6 persons (40%)

With the help of "Izenc's circle" and based on the collected indicators of extraversion and neurotics, the sanguine temperament type was defined among 9, and choleric among 6 persons.

In our research the prevailing temperament features were emotional excitement, extroversion, impulsiveness. A high level of emotional instability, anxiety was found among 40 persons during the test – 16 and 15 points according to the scale. In spite of the difference in the prevalence of these or the features of temperament, all the members of the experiment group showed good results during competitions. This can be explained by the fact that under the same conditions (in training or a competition) different temperament features can have a similar, for example positive, impact on the performance. Thus, anxiety during the training process testifies to a conscientious attitude to trainings, especial thoroughness, emotional excitement – an athlete's activeness while mastering elements of an exercise; impulsiveness – determination during important moments of a competition. At the same time one and the same feature of temperament can influence sports activity in the opposite way. Anxiety is a positive feature during training, testifying to diligence in doing exercises. At a competition this highly positive attitude promotes too much anxiety, excessive nervousness and can have a negative impact on the results. Under the same conditions the polar manifestations of this feature can influence sports activity in a different way, for example, too much anxiety testifying to an athlete's self-analysis of one's performance, has a positive impact. A low level of anxiety has the same influence, testifying to a high level of emotional stability during important competitions. These statements confirm certain researcher's data about the ability to compensate certain typical features and adapt to reality.

As is seen in Table 4, improvement or lowering of training results is determined by the differences in temperament. Emotionally excited and nervous athletes have poorer results in a competition than during the training process, while those with opposite features do not have these results. As far sampling of the experiment is not big, we may assume that during a competition these features of temperament determine the optimum

and minimum of psychological stress, caused by participation in a sports competition. It is such conditions that display distinct negative features of a temperament which determines excessive nervousness, anxiety, responsibility, activeness, hesitation, movement un-coordination, musical and rhythmic feeling problems and so on. All this leads to a decreasing sports result.

Table 4

Influence of competitions on the level of achievements depending on the peculiarities of temperament (n=15)

People under test	Results in points		Reliability of differences (P)
	trainings	competitions	
Emotionally unexcited	7.82	7.75	$p>0.05$
Emotionally excited	8.45	8.1	$p<0.05$
Anxious	8.44	8.11	$p<0.05$
Not anxious	8.60	8.52	$p>0.05$

We can assume that the higher the level of stress is, the worse the results of a competition are for athletes with a weak nervous system, because a high level of stress will have a greater influence on those with a strong nervous system and will have a negative impact on those with a weak nervous system. As is seen in the Table 4, athletes with a strong and average nervous system show results close to the training ones. Observations of the nervous system features during the training process, competitions and so on, as well as research results and comparison with performance style, lead us to the conclusion that gymnasts with a weak nervous system have an artistic style, which is connected with the expression of the image evoked by the music. Technical style is characteristic of gymnasts with a strong or average nervous system, balance of nervous processes and it determines technically correct and brilliant fulfilment of movements and a harmonious programme of performance.

Practical development of an individual style has the following elements: determination of typological features of the nervous system and temperament; individual peculiarities, promoting or preventing success; choosing and realizing corresponding pedagogical methods of work with athletes. Using “another” style will be “more expensive”, slows down mastering technical and tactical methods and the development of sports achievements slows down. Thus, the problem of style becomes the problem of compatibility of a teacher and a pupil, a trainer and an athlete.

In conclusion:

1. Features of temperament are ability, because it is the necessary condition of success.
2. The higher the level of stress is, the poorer the results of a competition are for athletes with a weak nervous.
3. If the level of stress is not high, athletes with a strong or weak nervous system show results closer to those in training.
4. Gymnasts with a weak nervous system have an artistic style of performance.
5. Technical style is characteristic of gymnasts with a strong or average nervous system.

Consideration of typological features of the nervous system and temperament is a condition of success during performance in a sports specialization, such as cheerleading.

Integrated Function of Discipline "Physical Training" in Sea High School

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The primary activity of experts in fishery consists of conditions of uncertainty of situations that in itself is already the stress factor that causes tension regulating the body's systems. The stress upon both manual operators and those in command of machinery are considered to be equally heavy. A number of researches confirm the validity of similar statements. Measurements of the pulse rate of log commanders on the training ship "Professor Baranov" have shown an increase while passing through La – Manche of 2-2.5 times. According to L. Matsevich in complicated navigating conditions a captain's pulse rate may rise up to 120-180 and static tremor to 1.5-1.7 times. This condition is similar to that which arises in complex conditions of sportsmen and women and is characterized as "prestarting" with 3 forms identified: "physical fitness" – we see moderate and emotional engagement promoting an increase in sports result; The condition entitled "starting fever" – strongly expressed excitement and agitation under its influence where both an increase and decrease in performance capacity is possible; Too long and strong prestarting phase in some cases is replaced by strain and depression – by starting apathy leading to decrease in sports performance. In this context the problems at work and in sports are similar: the achievement of physical fitness and the prevention of negative displays of unduly vigorous activity, which are the characteristics of unexperienced sportsmen and women and operators. The similarities between sports and the professional work of operators do not end there, for the high speed of processing information, decision-making and implementation of them are typical for the practice of sports and navigation. In certain types of activity, ability plays an important role in

predicting the development of different situations and increased anticipation, which is characteristic of sports competitions.

Increased tolerance against sea sickness, improved balance, development of special qualities and psychophysiological functions which are important for sea profession, are formed during the activity, but due to the direct use of physical exercise it occurs more quickly and qualitatively. System-forming factor of security of the navigation which includes personal and collective security is inconceivable without qualitative mastering by applied motor skills: by applied navigations, jump off boards into water, moving in complicated conditions, moving weights, climbing, etc.

Skills are also formed by means of physical training. It is considered that the basic physical quality for the sea trade is static endurance development, which includes a long and intense process of exercises such as – weight sports, power lifting, heavy athletics, bodybuilding and also cyclic kinds of sports – running, skiing, swimming. It is established that preliminary game preparation (sports with ball) positively influences the mobility function of the reflex systems which are the basis for effective camera activity, particularly in developing efficient professional skills for work on navigating training devices – radar stations, electronic cartography, etc.

Considering the aforementioned it is possible to assume that there are concealed cross-curricular connections between physical training and disciplines of navigating direction. Similar connections between physical training and work safety and security precautions, called to teach future seafarers the principles of health and safety of sea, which are no less significant.

Practical realization regarding the acquisition of important applicational skills is achievable due to special physical preparation, the basic of which

were stated above. A decrease in the level of physical readiness of students and a simultaneous increase in requirements on the state of health of navigating operators within the international community, forms a contradiction between the needs of security of navigation and the opportunities of the so-called human factor, is the reason for failures in moving objects in 70-85% of cases. Similar theoretical lessons on special training preparation, even training swimming practice, due to the short duration cannot provide a high quality of education for the sea engineer. The preparation of an expert for successful activity of sea, without costs for to their own health, of the log commander to endure a four hour watch requires the development of the specific qualities, often affected by bad habits formed by the profession over a long period of time (frequently due to poor rehabilitation from the previous loading or after physiologically inefficient rest). However duly adequate, specific influences can allow for the formulation a psychological and physiological base for the profession during education.

The realization of a functional model of the future expert of a fleet, including the structure of preparations of physical, psychological, physiological, motor (applied skills) components, is not the unique purpose of professional physical training. The main aspect of the preparation of modern engineers is the formation of physical training of the person as a component of their general culture, including physical education and physical training. The first is understood as the process and result of mastering skills, the knowledge connected with the use of special means and methods in the directed physical development of a person and also the development of the ability to transfer these acquired skills to the appropriate surroundings.

Within physical training is understood the need to form lessons with physical exercises concerned with the all-round development of a person,

the formation of a positive attitude towards physical training, the development of valuable orientations, beliefs, tastes and habits. One common purpose of these processes is the formation and development of physical training of a person. In the context of our research, in revealing the interrelations of physical training with other disciplines, we found, in this case, a direct connection between cultural sciences in which physical training is also found.

Ecology is a science which considers the problems of the mutual relations of a person and their environment is also one of the educational and scientific disciplines; studying behaviour of the person and the interference of nature and society. One of the problems of professional physical training is the adaptation of the subject of work to external conditions, similar problems are also solved together with ecology.

Having considered the subject and domain of "physical culture" we came to the conclusion that diverse communications of only a small range of disciplines can mutually enrich adjacent subjects, deepen interpretations of students about unity of the world, and expand interpretations about the place of the person in nature and in modern society. The subject of physical culture reached by numerous communications, in our opinion, is a unique means for the integration of many areas.

Athletes' Capacity for Work during the Pre-Competitive Stage under the Use of a Stimulating Recuperative Complex

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One of the factors of an optimal training process is a reasonable combination of physical exercise, rest and stimulating recuperative measures, taking into consideration each training lesson and effects of the previous one(s), which are part of the micro and macro cycles of the whole training process.

The system of stimulating recuperative measures should be simple and should not take much time and effort, but be highly efficient. It provides a high level of effectiveness to the training process in the end. It is particularly important in the polar latitudes to have a quick recovery process and increase in physical and mental activity of athletes, because living in the Kola North activates peroxide oxidation of lipids, which in turn limits adaptive capacity of the body under conditions cold, hypoxia, physical exercise. Sports pharmacology uses medications of different functions which meet the anti doping requirements (safety, absence of side effects and approval of the Medical Committee of the International Olympic Committee)[1].

Over recent years the use of complex biological active supplements has increased. "Stimulor" is one of them; it is a protein vitamin mineral product with a natural formula. "Stimulor" is an efficient adaptogene, biostimulant, biocorrector and immunomodulator, which lets us use it widely for medical and preventive purposes. The high content of arginine and methionine in

[1] Kudrjashova, 1995.

"Stimulor" results in the formation of creatine phosphoric acid, which makes the exercise peak longer due to the growth of phosphagen reserves by 10-20%, it increases highest possible work and speed of response. The product contains free amino acids, important for quick utilization of 30-50% of the lactic acid. In addition, free amino acids facilitate transformation of the lactic acid into energetic reserves (glyconeogenesis). "Stimulor" restores basic mineral elements spent during physical exercise and rapid rehydration. Prolonged use of this product can increase the capacity for work by 30%, increase the peak level of oxygen consumption and improve the work of cardio-vascular system, which is important when doing cyclic, speed and strength training under sub-extreme conditions of the Far North. The goal is to experimentally prove the efficiency of a stimulating recuperative complex with the usage of the biocorrector "Stimulor" during the pre-competitive stage of the training process of long-distance 15-17 year old runners. The pulse rate was used to define the physiological effect of the specialized tasks on the body, because cardiac frequency (CF) is considered a highly informative index of the body state and its reaction to the completed task. The pulse rate was taken 4 times: first – before exercise; second – at the peak of exercise; third – 15 minutes before the end of exercise; forth – right after the exercise was over. It was taken into consideration that a body's reactions to permissible exercise are mainly seen through increased cardiac frequency[2]. When assessing the level of tiredness after sport exercise, external indicators of tiredness of N.N. Alfimov's scale were taken into account. Control exercises to assess the preparation level of the athletes consisted of the following: standing broad jumps (3 attempts, the best was recorded) and push-ups in a plank position far 1 minute.

The research was conducted within the sport school for children and youth №4 in April, 2006. During 2 weeks both groups of 15 students (a control

[2] Platonov 1988, 140.

one and pilot one) did the same number of training exercises with the same strength. The pilot group consisted of athletes who took the product according to a specific programme. The control group included athletes who took a placebo. Their pulse rate was taken in order to study the reactions of the cardio-vascular system. The results are given in table 1.

Table 1

15-17 year old runners' cardiac frequency during the experiment (n=30)

Group of persons under test	Stages of experiment	
	Before the experiment	The end of experiment
Pilot group		
Before the exercises	80±3.89	70.6±4.32
50th minute of the exercises	116.3±3.89	138.6±7.57
15 minutes before the end	96.6±5.6	90±5.62
After the exercises	85±5.46	80.2±6.98
Control group		
Before the exercises	71±1.92	68±0.96
50th minute of the exercises	118.6±2.40	142±1.92
15 minutes before the end	100.6±4.69	94.6±1.92
After the exercises	82.2±4.25	85.7±6.98

The table shows that during the experiment the average pulse rates changed in a similar way. A slightly higher pulse among the pilot group at the beginning of the experiment is explained by the unsteady emotional state. At the beginning and the end of the experiment the pulse rate increased at the 50th minute of the exercise in both groups with ($P<0.05$) in the pilot group and ($P<0.01$) in the control group. In both groups their pulse slowed notably 15 minutes before the end of the exercises; these shifts were considerable in the control group with ($P<0.01$). At the end of the

experiment the slowing of the pulse rate in both groups was steadier and reached 80.2 beats per minute in the pilot and 85.7 beats per minute in the control group. During the exercises the average pulse rate was 94.8 beats per minute in the pilot group and 97.5 beats per minute in the control one, with a big difference between them ($P<0.05$). Thus, during the exercises the pulse rate of the pilot group was lower than that of the control one; it can be explained by the effect of the stimulating recuperative complex.

Results of the questionnaire on external indicators of tiredness also show the importance for runners' training of the suggested system of recuperative measures, which includes a complex of simple physical recuperative means and use of "Stimulor" of the yeast origin (table 2).

Table 2

Results of the questionnaire - 15-17 year old athletes on external indicators of tiredness (n=30)

Groups of persons under test	pilot	control
1. complexion	1.42±0.30	1.71±0.15
2.sweatiness	1.85±0.30	1.57±0.15
3.breathing	1.28±0.15	1.85±0.15
4.movements	1.14±0.15	1.28±0.15
5.attention	1±0	1.42±0.15
6.well-being	1±0	1.28±0.15

Indicators of standing broad jumps included 3 attempts, of which the best result was recorded; after that the average group result was counted (table 3).

Table 3

Indicators of standing broad jumps during the pedagogical experiment among 15-17 year old athletes (n=30)

Groups of persons under test	Stages of experiment	
	Before the experiment	After the experiment
Pilot	2.22±0.09	2.38±0.07
Control	2.35±0.12	2.31±0.11

Table 3 shows the changes in the indicators of both groups: by the end of the experiment the indicator in the pilot group grew by 0.16м, while in the control group it decreased by 0.04м. Taking into consideration that during the experiment the pilot group had exercises which increased in number and strength by 23% and that the final result turned out higher than in the control group; it proves the positive effect of the stimulating recuperative complex on the pilot group.

Table 4

Push-ups from plank position in 1 minute of 15-17 year old runners during pedagogical experiment (n=30)

Groups of persons under test	Stages of experiment	
	Before the experiment	After the experiment
Pilot	43±3.23	49.6±4.01
Control	37.2±3.01	39.0±4.40

Table 4 shows the increase in general number of completed push-ups per minute in both groups. The general increase in the pilot group reached 6.6 times, in the control one – 1.8. Although in both cases the shifts were unreliable ($P<0.05$), it is possible to conclude that this data also shows some positive effects of the recuperative complex.

Thus, the use of the biocorrector “Stimulor” before and after exercise together with the traditional recuperative means, undoubtedly has, not only recuperative, but also a stimulating effect on the body’s physiological systems of athletes under intensive training at the pre-competitive stage. The suggested and used recuperative complex can be considered efficient, which is proved by the results of this research.

If to accept the integrity of the training and recuperative complex in the athletes training system, the suggested components combined into the integral system can promote an increase in sport achievements and a positive effect on the sport activities in track and field athletics.

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Physical Activity and Sport as an Important Factor in the Prevention of Drug-Abuse

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The spread of drug-abuse in the Russian Federation has an increasingly negative influence on the social psychological atmosphere of society, economy, politics, law and order, health of the nation and touches upon all spheres of life of the state, individual and society. Over the past few years in practically all regions of the Russian Federation the situation, connected with drug-abuse and illegal trafficking, has worsened. The speed of the Russian society and criminality is dependence on narcotics, is considered one of the real threats to the national security of the country. Having an available physical culture and sport, to our mind, will help solve the problem of drug-abuse among the youth in the Murmansk region and in Russia in general.

At present the most important course of activity is the search for effective technologies to oppose drug-abuse among children, adolescents and the youth, who are able to form such behavioural examples that could exclude a hankering for drugs. Unfortunately, at present in the majority of Russian regions too much attention is paid, not to prevention of use of psycho-active substances, but to the treatment and rehabilitation of drug-users. The most available, effective and underestimated spheres of activity, which can develop reliable and sustainable values to oppose drug-abuse, are physical culture and sport.

The world and national experience shows that tools of physical culture and sport have a universal ability to improve the health of the population solve problems of education and raising children, adolescents and the youth and

form a healthy psychological climate in society. One interesting fact is that in some regions, where preventive work is done with an emphasis on mass physical activities, the number of drug addicts has not increased.

The data from a sociological survey conducted by the administration of Faculty of Physical Culture and Life Security at Murmansk State Pedagogical University (2006), shows that among students (the age of respondents: 16-17 years – 31%, 18-19 years – 44%, 20-22 years – 24%, 23 years and older – 1%; the gender of the respondents: male – 57%, female – 43%), who prefer physical culture and sport, the majority (71%) consider that physical culture and sport keep young people from drug-addiction, 19% deny such ability, 10% doubt and do not know which point of view to choose.

The strategy of physical and sports preventive activities must presuppose a complex of activities, directed at:

- Development of personal orientations, providing prevalence of healthy way of life values;
- Achievement of sports results, struggle for both personal and team indices;
- Integration of innovational sports technologies, promoting values of physical culture and sport in the pedagogical sphere and mass sports work;
- Development of effective forms and ways of organizing physical and activities.

The main factors which hamper the use of physical culture and sport in preventing drug-abuse, addictive behaviour among adolescents are:

- Lack of funding;
- Lack of sports bases;
- Lack of information and promotion of a healthy way of life;

- Underestimation of opportunities of sports activities by the administration and state structures, which are outside the sphere of physical culture and sport;
- Absence of work on physical education and development of a healthy way of life, especially in pre-school educational institutions, general educational institutions and institutions of special education;
- Lack of qualified staff and low level of materials for specialists.

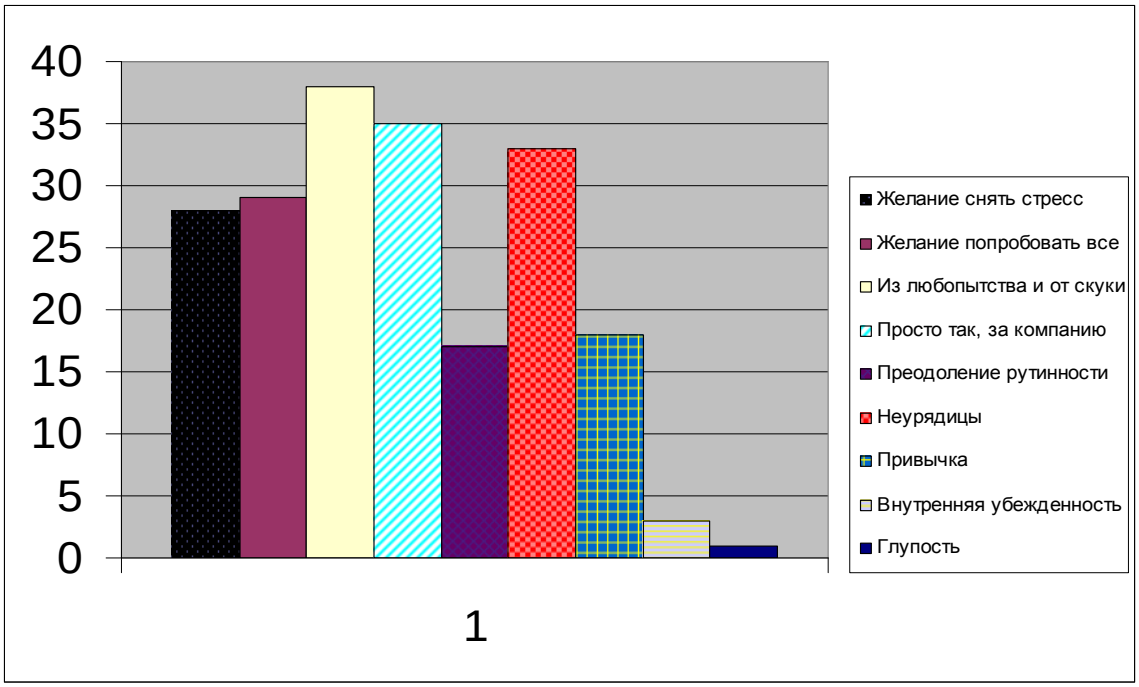
It is necessary to seriously and competently create conditions for personal and professional self-determination among the youth, conscious understanding of the importance of a healthy way of life, development of health culture, development of communicative skills and positive emotional experience among the pupils and students, adolescents and youth in each educational institution and in society in general. It is necessary to direct the main efforts not only to the dissolution of drug-abuse consequences, but also to the primary prevention of drug dependence. Prevention includes measures and activities oriented at the exclusion of external and internal reasons for drug use.

Initial prevention should be aimed not at drug-addicts, but those schoolchildren and students who form the risk group. It is also important to take into consideration teenagers and adolescents who are in the immediate environment of the risk group as well as those who have become regular drug-users and drug-addicts. The level of freedom in self-expression, in choosing an adequate and sufficient programme for each person's, character and form of behaviour, determine perceptions and adaptation, motivation and consciousness.

According to sociological research results, students explained the usage of drugs, regardless of financial position, education and status as follows, they could choose several answers:

1. Desire to release stress, tension, to relax (28%);
2. Desire to try everything in life (29%);
3. Out of curiosity and boredom (38%);
4. Just for a company (35%);
5. To overcome conventionalism and routine (17%);
6. Problems in life, studies, relations (33%);
7. Habit (18%);
8. Inner beliefs (3%);
9. One of the respondents said “foolishness” (1%).

Thus, the motives that scored more are connected to pleasure and gaining tranquillity, emotional calmness, releasing tension, i.e. indices of heavy psychological state of students. It should also be noted that the questionnaire was held in the Far North during the Polar Nights, which influence the psycho-emotional state of people.



Histogram 1 Motives for drug-use[1]

[1] 1. Stress relief 2. To get new experience 3. Because of curiosity or boredom 4. Without any purpose or following friend’s example 5. To get out everyday routine 6. Problems 7. Habits 8. Inner conviction 9. Stupidity

The social environment, together with the prevailing culture of behaviour, the educational system had an unconscious influence on physical and psychological development of a person. This influence can be seen in the responses. To compare opinions of the youth depending on their life situation and time we present students' answers to the same questions with two-year difference (see Table 1).

Table 1

Comparative characteristic of students' responses to the questionnaire questions

Answers / Questions	2004/2005 academic year			2006/2007 academic year		
	Yes	No	I don't know	Yes	No	I don't know
1. Can one enjoy life without stimulators (alcohol, drugs)?	71 %	21 %	8 %	83 %	15 %	2 %
2. If you learn that your friend is a drug-user will you try to help him/her?	80%	12 %	8 %	79 %	5 %	16 %

As can be seen in Table 1, the attitude towards drugs as a source of pleasure has become more alert (2004 – 71%, 2006 – 83%); the readiness to help a friend in need remained the same; though there's been an increase in those who doubt they can help drug-addicts.

The basis of creative acquirement of professional skills is optimal physical development and being prepared. Research shows though, that most students do not have the desire for physical perfection, they are not aware of the importance of physical culture classes. It is pleasing to see that

students of Faculty of Physical Culture and Life Security have a different attitude towards sports (see Table 2).

Table 2

Characteristics of students' answers to questions about sports

№	Answers to questions	Numerical data	
		Number	Abs.
1.	Take part in sport regularly, sport club member	55	55 %
2.	Take part in sport regularly	8	8 %
3.	Try to take part in sport	18	18 %
4.	Take part in sport seldom	13	13 %
5.	Do not take part in sport while I do not have money	3	3 %
6.	I do not like taking part in sport	1	1 %
7.	I used to, but now my purposes have changed	2	2 %

Thus, 63% respondents take part in sport regularly and 18% try to take part in sport quite regularly. In total 81% of all respondents make a positive index.

At MSPU a lot of sport opportunities are offered by the student sport club "Olympia", including; fitness-aerobics, swimming, basketball, volleyball, football, badminton and others. A number of students attend various sport clubs where they have a good time, improve the level of physical ability and health and release emotional tension after a working day. Students who take part in sports do not fall into to the risk group, which is the initial prevention of drug-addiction. Physical culture and sports provide positive mental activity, teach how to release muscle and emotional tension, instil a healthy way of life, promote help and solidarity in a team and provide an alternative to drugs.

STUDENTS AND PHYSICAL EDUCATION

Modern School Children's Attitude towards Physical Training and Sports

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The article presents the results of the research carried out by specialists of the Department of Social Pedagogy and Social Work, Murmansk State Pedagogical University in 2005, in order to find out a school child's attitude towards physical training and sports. The questionnaire, based on the survey of the World Health Organization, was used as the basic methodology for the research; the notion 'health' is understood as a state of medical, psychological and social well-being, which emphasizes the necessity to consider the problem in complex, not only within medical, but also within a social and psychological approach. Altogether 369 school children from the 5th - 10th form from Murmansk and Lovozero. The survey was anonymous.

The state of health was estimated by the school children by choosing the following variants of response: "excellent", "good", "satisfactory", "bad". 61.5% of 5th form pupils consider their health "good", 23.1% - "excellent". Among senior pupils the percentage of such replies is lower: only 9.3% of 10th form pupils consider their health "excellent", 55.6% - "good". The answers from 9th form pupils are closer to the results of the 10th form. The majority of satisfactory replies came from the senior pupils: slightly more than 30% of 9th and 10th form pupils consider their health "satisfactory". There was no reply "bad" among 5th form pupils and, in general, the percentage of such replies in all the questionnaires constituted about 2%. Thus, we can come to the conclusion that the level of health decreases from the 5th to the 10th form. At the same time it is necessary to take into account

the factor of subjectiveness and that the children do not base their answers on any medical parameters.

Table 1

The state of health

Health				
	excellent	good	satisfactory	bad
5 form	23.1%	61.5%	15.4%	-
6 form	15.9%	55.6%	23.8%	4.8%
7 form	20.0%	56.0%	22.7%	1.3%
8 form	15.6%	58.4%	23.4%	2.6%
9 form	20.3%	41.9%	33.8%	1.4%
10 form	9.3%	55.6%	33.3%	1.9%
11 form	17.1%	53.9%	26.3%	2.2%

In the light of this data it is important to analyze school children's attitude towards physical training as a phenomenon and a school subject, as well as their involvement in clubs and sports activities. According to the results of the survey, only a few school children are members of a sports club. The answer "I am a member of a school sports club" was given by 23.1% of 5th form pupils, 9.5% 6th form pupils and 16.7% 10th form pupils. 41.3% of 6th form pupils go to a sports school, but at the same time only 16.2 of 9th form pupils and 24% of 10th form pupils attend sports schools. The level of involvement in sports clubs decreases from the 5th to the 10th form, which can be explained by the difference in motivation. The preparation for higher education institutions focuses senior pupils' attention on other school subjects than physical training. At the same time it is necessary to take into consideration leisure activities in general. One of the 'competitors' against sports can be television, which often occupies the majority of free time of children and adolescents, for example, nearly 29% of 6th form pupils and 27% of 9th form pupils noted that they watched TV for "7 hours / a week or more".

Table 2

Member of a sports club

Member of a sports club					
	no answer	no	not now, only earlier	sports club at school	sports school
5 form	–	57.7%	15.4%	23.1%	–
6 form	–	34.9%	14.3%	9.5%	41.3%
7 form	–	44.0%	16.0%	13.3%	26.7%
8 form	–	37.7%	15.6%	9.1%	37.7%
9 form	1.4%	41.9%	27.0%	13.5%	16.2%
10 form	–	33.3%	25.9%	16.7%	24.1%
11 form	0.3%	40.1%	19.2%	13.0%	27.1%

It is interesting to compare the attitude towards physical training as a school subject with the attitude towards other school subjects. One of the questions in the survey was devoted to this aspect, with the children ranking the school subjects with the following rating: “very important”, “important”, “both important and unimportant”, “unimportant”, “not important at all”. The following subjects turned out to be the most important ones: Russian, Literature, Foreign Languages, Algebra, Geometry, i.e. the main subjects of the school curriculum. Traditionally, these subjects are considered the core of the school curriculum, especially from the point of view of enrolling in higher education institutions after school. Motivation is also increased by the views of parents’ and teachers’, for example, prestige, which may determine the attitude towards such subjects, as, for example, Foreign Languages.

Table 3

Attitude towards Physical Training as a school subject

Physical Training					
	very important	important	both important and unimportant	unimportant	not important at all
5 form	57.7%	19.2%	7.7%	15.4%	–
6 form	47.6%	25.4%	11.1%	4.8%	11.1%
7 form	41.3%	28.0%	18.7%	9.3%	1.3%
8 form	33.8%	27.3%	22.1%	10.4%	6.5%
9 form	33.8%	24.3%	20.3%	10.8%	10.8%
10 form	35.2%	18.5%	31.5%	7.4%	7.4%
11 form	39.6%	24.7%	19.5%	9.2%	6.8%

At the same time, physical training as a school subject is highly assessed, too. This subject was not important at all only for 11% of 6th form pupils, 1.3% of 7th form pupils and 7.4% of 10th form pupils. The answer "unimportant" was given by 15.4% of 5th form pupils, 4.8% of 6th form pupils, 9.3% of 7th form pupils and 7.4% of 10th form pupils; Thus the majority of respondents consider this subject important (the replies "very important" and "important" prevail in all forms).

Knowledge in physical training is assessed positively by the children and adolescents. The answer "I know enough" was chosen by 76.9% of 5th form pupils, 60.3% of 6th form pupils, 61.3% of 7th form pupils and 72.2% of 10th form pupils. The replies "I know much" are mentioned in few of the questionnaires: 15.4% in the 5th form, 26.7% in the 7th form and 11.1% in the 10th form. The answer "I don't know and do not consider it necessary" was given by very few respondents: 1.6% of 6th form pupils, 1.3% of 7th form pupils and 4.1% of 9th form pupils.

Table 4

Knowledge in Physical Training

Knowledge in Physical Training				
	I know much	I know enough	I know little	I know nothing and consider it not necessary
5 form	15.4%	76.9%	7.7%	–
6 form	22.2%	60.3%	15.9%	1.6%
7 form	26.7%	61.3%	10.7%	1.3%
8 form	23.4%	57.1%	13.0%	6.5%
9 form	17.6%	50.0%	28.4%	4.1%
10 form	11.1%	72.2%	14.8%	–
11 form	20.3%	60.7%	16.0%	2.7%

As the survey has shown, the attitude towards physical training lessons is, in general, positive. The majority of the respondents have a positive opinion (the answers “I like very much”, “I like”). 46.2% of 5th form pupils, 52.4% of 6th form pupils, 48% of 7th form pupils, 32.5% of 8th form pupils, 33.8% of 9th form pupils and 29.6% of 10th form pupils. It is apparent that the attitude changes from the 5th to the 10th form. 10th form pupils choose a neutral assessment: 51.9% of them answered that, in general, they like PT lessons. The answer “I don’t like much” was in few questionnaires: not more than 8% in each form.

The questionnaire included a question, oriented at the general motivation of physical training and sports. “To train for entertainment” is important for half 10th form pupils (51.9%), 31.1% of 9th form pupils, 32% of 6th form pupils and 27% of 5th form pupils. Entertainment is not an important motive for only 15.4% of 5th form pupils, 1.6% of 6th form pupils and 3.7% of 10th form pupils. More than half of all respondents mention the importance “to win”: “very important” was answered by 46.2 of 5th form

pupils, 33.3% of 6th form pupils, 48% of 7th form pupils, 49.4% of 8th form pupils, 35.1% of 9th form pupils and 29.6% of 10th form pupils. Thus, the significance of the motive "to win" decreases from junior to senior forms.

The importance of communication with friends was emphasized in the majority of questionnaires (the answers "very important" and "important"). To meet friends during physical training lessons is "important" for 34.6% of 5th form pupils, 42.7% of 7th form pupils and 44.4% of 10th form pupils; "very important" – for 38.5% of 5th form pupils, 33.3% of 7th form pupils and 35.2% of 9th form pupils. This fact is "not important at all" only for 1.9% of 10th form pupils, 4% of 7th form pupils and 7.7% of 5th form pupils.

Practically, the same concerns the other motives: "To be able to manage one's body" and "to improve one's health". The majority of the respondents acknowledge the importance of these motives in respect physical training and sports. Thus, it is important to go in for sports in order "to improve one's health" for 65.4% of 5th form pupils, 65.1% of 6th form pupils, 62.7% of 7th form pupils, 63.6% of 8th form pupils. The percentage of choosing this reply is a bit lower in senior forms: 51.4% of 9th form pupils and 46.3% of 10th form pupils. "To be able to manage one's body" is important for more than a half of the respondents from the 6th, 7th and 8th forms. Pupils of the 5th, 9th and 10th forms also underline the importance of this factor, but the percentage is lower: 38.5%, 43.2% and 48.1% respectively.

Table 5

To improve one's health

To improve one's health					
	very important	important	both important and unimportant	unimportant	not important at all
5 form	65.4%	23.1%	11.5%	–	–
6 form	65.1%	23.8%	3.2%	1.6%	6.3%
7 form	62.7%	28.0%	6.7%	–	2.7%
8 form	63.6%	23.4%	6.5%	–	6.5%
9 form	51.4%	27.0%	12.2%	4.1%	5.4%
10 form	46.3%	46.3%	5.6%	0.8%	1.9%
11 form	58.8%	28.5%	7.3%	1.1%	4.3%

Significant differences have been revealed in respect to the following motives: "to be like a sports star", "to win parents' favour" and "for the future work". If it is very important for 5th form pupils "to be like a sports star" (42.3%), by the 10th form the attractiveness of this motive goes down (20.4%). The factor, connected with romanticism, naturally decreases from junior to senior classes. It is natural that adolescents turn out to be independent of their parent's opinion; thus, "to win parents' favour" is very important for 34.6% of 5th form pupils, 25.3% of 7th form pupils only 13% of 10th form pupils.

Forecasting the future in respect to physical training and sports is interesting ("Sports at the age of 20"). Taking part in sports is admitted by the majority of the respondents (the replies: "of course, yes", "probable, yes"). The percentage of answers "probably, yes" falls from the 5th to the 10th forms: from 50% to 40.7%, respectively. The negative answer "of

course, not" is found only in very few questionnaires – not more than 7%. 10th form pupils did not choose this answer at all.

Table 6

Sports at the age of 20

Sports at the age of 20				
	of course, yes	probably, yes	probably, not	of course, not
5 form	23.1%	50.0%	19.2%	3.8%
6 form	36.5%	49.2%	7.9%	4.8%
7 form	32.0%	42.7%	18.7%	6.7%
8 form	27.3%	49.4%	16.9%	6.5%
9 form	29.7%	47.3%	18.9%	4.1%
10 form	35.2%	40.7%	24.1%	–
11 form	31.2%	46.3%	17.3%	4.6%

Thus, the research demonstrates a positive attitude of a modern pupil towards physical training and sports as a form of activity. The significance of this phenomenon is admitted both from the point of view of the present and future perspectives.

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Student Sports at Federal and Regional Levels

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The number of students is known to have increased twice in the country. The state makes efforts to justify the name of the third millennium as “the education millennium”. Student sports are an important instrument of social and psychological adaptation, meaning the integration of a person within the student environment, adopting its values, behaviour norms and standards, as well as professional adaptation. Student sports are characterized by the intensive work on forming the personality and developing a way of behaviour.

The provision of student sports in developed countries is better than in the countries which are considered to be backward, concerning their socio-economic development. A sportsman or woman studying at university has a more advantageous position in comparison with those not studying of the same age. It should be mentioned that in many developed countries student sports is the basis of national sport policy, where about 60% of members of Olympic teams are students of higher educational institutions. Student sports in such countries as the USA is considered to be an independent sport branch having law, financial and organisational basis.

Physical education of the student youth in Russia is an integral part of the population’s healthy life-style. It is built upon the broad interaction of educational and non-educational forms of work, related to physical culture, health improving and sport. In connection with the changes occurring in the field of physical culture and sport student sports must become a foundation of the national sport policy, the basis and the main source of replenishing the national teams.

According to certain data about 30% of students in Russian higher educational establishments don't achieve the necessary level of motion activity, which is equal to minimal physiologic norm.[1] At the same time it is known that students having a high level of motion activity study better, they are rarely ill and more hard working. Maintaining motion activity improvement is from their participation in different forms of activity connected with physical culture and sport. At present the integral system of legal regulation of physical culture and sport has been formed in Russia. Before it was held in the framework of the Fundamentals of Physical Culture and Sport Legislation of the Russian Federation of April 27, 1993, and now it is under Federal Law "Physical Culture and Sport in the Russian Federation" of January 13, 1999. However some regulations of this law are declarative in essence, for example, according to clause 14, securing the peculiarities of development of physical culture and sport in educational institutions, the latter must create such conditions under which every student can learn to swim. The mechanism of realizing this task is not provided and it is extremely difficult to perform this task under modern economical conditions.

The bill on student sport needs to be completed; it must determine the principles and measures of state support and create the necessary prerequisites for solving the problems of social, financial, material and technical provision for student sports and carrying out the state policy in the field of physical culture and sport.

In Russia there is a public physical culture and sports movement, realizing its programs through the Russian Student Sports Union (RSSU). As for its financing, part of the funds is allocated by the Agency of Physical Culture and Sport and the Education Agency, as well as by membership fees.

[1] Рапопорт 2002, 22-36.

Recently considerable budgets were appropriated for providing for participation in international competitions, subsequently teams perform successfully in them. Unfortunately programs for the development of student sports are not widely adopted for putting into practice. Nowadays the normative requirements with regard to financing student sports, say, are not developed as a whole at the state level, though this problem was raised repeatedly at the portback election conferences of the RSSU.

It should be noted that recently the number of supported sports among students has increased from 102 to 121, and Olympic sports from 44 to 48.

In federal subjects student sports are developed chaotically, regions conduct competitions in a different ways, for example, the Rostov region conducts competitions in 32 sports and Murmansk region in 7 sports. The regional branches of RSSU are established in large regions such as the Urals, Bashkiria, Saint Petersburg, the Rostov region etc. These branches conduct the sport events in their regions. Financing student sports in regions is carried out through two sources: at the expense of Physical Culture and Sport Committees and by own means of the educational institution. State educational institutions also receive budget funds under the clause 111040 “Other current expenses”.

Generally, certain traditions of supporting student sports exist in every higher educational institution, the more powerful the university the more recourses it allocates to arranging events connected with conducting periodical training or sportsmen and women’s participation in competitions, technically equipping the physical culture and sport movement. It is clear that central higher educational institutions differ greatly from peripheral ones in the scope of financing. According to experts’ opinion, student sports today is not only the image of the higher

educational institution, but also a support of higher sport, and in regions it is the prevention the sportsmen and women from migration to other cities.

In accordance with the data from the questionnaire on sport preferences conducted at the Murmansk State Technical University among first year students, 46% of students would like to go in for event sports: football, basketball, volleyball, table tennis; after those sports the young men choose exercises in the training hall. Girls, on the other hand, prefer to go in for aerobics and fitness. It appears that these sports must be the basis of student sports. 16% of the respondents don't want to take part in any sport, this is more likely to be a specific group of young people or people with low value attitude towards sport.

Complex student competitions must include contests in much more sports; they must be more popular and attract students of private higher educational institutions. The issuing of order № 1025 and the model program on the subject "Physical Culture" became a powerful means for further development of physical culture and sport in higher and secondary educational establishments and strengthened leading position and responsibility of Physical Education Departments. Nevertheless, the positive effects of the direction from The Ministry of Education of the Russian Federation did not solve all the problems which physical education departments face, especially in their work on raising the level of sportsmanship. Besides which we need such legislative acts which will contribute to the development of commercial, investment policy of student sports. It would allow them to obtain additional funds from non-budget sources.

No matter how trivial it may sound, one of the main problems is attracting experienced coaches for work with highly skilled sportsmen and women, for today the unified tariff scale limits their salary. It turns out that a

schoolteacher’s salary is higher than the salary of a university senior lecturer. Hence neither young nor experienced coaches go to higher educational establishments. As a result the middle age instructors at physical education departments are approaching retirement age.

Further development of physical culture and sport in educational institutions requires coordinating the legislative regulations and their realization. As a result it will help solve the problem of joining young people to a healthy life-style and improving the physical health of the Russian population.

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The Innovative Processes in Students' Physical Education in Higher Education Establishments

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Changes occurring in society have greatly influenced the structure and content of education in higher pedagogical education. Differentiation of preschool education has increased, with new types and models of education institutions have appearing, the spectrum of problem solving technologies used by teachers have broadened and experimental work has become a wide spread occurrence in infant schools.

Nowadays a new field of scientific study is developing, it's a pedagogical innovation. The changes in the contents and organization of work in preschool education establishments, their innovation polarity are closely connected with changes in methodological and technological preparation of the future teacher. The democratic changes in the educational system legislative right to the freedom of pedagogical creative work, promotes the appearance of an innovative curriculum to the masses and the introduction of new technology in pedagogical process. At the same time only 32% of teachers and 12% of students in pedagogical universities represent the essence of pedagogical innovations, including innovative pedagogical technologies in the field of physical culture.

It's becoming familiar trend to see alarming data about the decreasing state of people's health, in particular, the lowering level of children's fitness. For some researchers, the main reasons for this is the lowering of living standards and protection of population of the Russia, bad ecology of the environment, an imperfect medical service etc.

Nowadays the majority of preschool education establishments work more or less, an innovative regime. However the insufficient readiness of teachers to accept and implement these innovations lowers their productiveness. Pedagogical innovations covering both organizational (creation of new types of preschool education establishments) and didactic (innovative pedagogical processes) aspects are becoming the subject for study for philosophers, sociologists, psychologists and teachers. General and specific peculiarities of creative (innovative) pedagogical activity were researched between 1960-1980 in the works of A.N. Gonobolin, V.A. Kan-Kalic, N.V. Kuzmina, V.A. Slastenin and others. There are several PhD theses devoted to this pedagogical innovative.

This innovation has become an inter-disciplinary field of research combining philosophy, psychology, sociology, theory of management, economics and others. The pedagogical innovative process has been the subject of special study since 1950 in the West and in recent times in Russia. The interest in pedagogical innovative processes is revealed in the creation of special innovative services, editions and journals.

The separate theoretical and practical aspects of innovative processes and changes in the educational system, on the basis of different pedagogical ideas, are considered in international work. The questions of innovative process control, organization of changes in education, planning and methods of advertising innovations are analysed in Ch. Barnet, G. Basset, D. Hamelton, N. Gross, A. Haberman's researches. The social-psychological aspect of the dissemination of innovations is considerably developed in the American innovative (A. Rogers, V. Braun, W. Wolker and others). The methodological problem of the work on innovation is the examination of the parameters of creative work and innovations. Thus, the phenomenon of teachers as innovators and teachers as creators of alternative and researchers school has been of great interest.

The development of a pedagogical innovation in Russia is connected with the mass social-pedagogical impulse, the emergence of a contradiction between the demand of a rapid development of educational establishments and the incapability of teachers to organize it. There has developed a mass adaptation to the new, therefore there has intensified a requirement for new knowledge, a comprehension of new conceptions such as “innovation”, “the new”, “innovative process” and others.

The concept “innovation” first appeared in the researches of culture and referred to the introduction of certain elements from one culture to another. The theory and practise of physical culture are also connected with innovative work. These from the foundation of the new conception of physical education, the start of refreshing the system of methods of the educational process, a transition from monologue to dialogue forms of carrying out studies, the humanization of professional work and the necessity of forming creative and critical thought among students in conditions of contemporary competition.

Physical educators have to work in an environment of constant innovations for it concerns not only sport activity but also fundamental changes in the students’ philosophy of life in pedagogical universities. Teachers have to prepare students for their future competitive work therefore teachers have to be able to innovate. The professionalism of modern teachers is defined by their aptitude for innovative work. The French academic A. Bransuic distinguishes 3 possible pedagogical innovations:

- Innovations can be educational thoughts and actions, fully new and unknown before, though there are only a few such fully new and original ideas;
- the largest quantity of innovations are adapted, expanded and refreshed ideas and actions, which require a special topic in a definite medium and at a definite period of time;

- pedagogical innovations arise in such situations where certain actions, existing before, come to life, due to repeated organization of aims, as new conditions guarantee their success and the success of definite positive ideas.[1]

The innovations are connected with creative work in the field of physical culture, but what are the criteria of creative work? The concept "creative work" is defined by several researchers as creating new and original treasured social importance (S.L. Rubinshtein[2]). Other researchers define it as the creation of something new, including the inner world of the person (L.S. Vygotskii[3]), while some define it as a source and mechanism for development.

The creative work of a teacher is regarded as activity in line with the solution of problems arising in the pedagogical process during physical culture studies. Such approach highlights the necessary activity of each teacher, which presents itself in different volumes in each study, in each moment of interaction between the teacher and children during the preparation of studies etc. Actually, without any decision, all the problems surrounding the different difficulties which constantly arise, it's difficult to image the teacher's work. The creative process of a teacher in preschool is examined as their activity is linked to constant decision making of numerous educational and physical problems in the changeable conditions, during which individual original and optimal decisions are produced and realized in communication with children.

After making the creative pedagogical work concrete V.A. Kan-Kalic and N.D. Nikandrov have defined the following sequence of stages in its

[1] Angelovski, 1991.

[2] Rubinshtein, 2001.

[3] Vygotskii, 1956.

realization: 1) the emergence of a teacher's scheme linked to the decision to a pedagogical problem; 2) the foundation of the teacher's scheme; 3) the embodiment of the teacher's scheme of work and communication; 4) analysis and assessment of results of the creative work.[4]

The distinguishing trait of pedagogical creative work in the field of physical culture, from other forms of productive activity of a person, is that the teacher always creates using living "human material". They put to the foreground the ethical aspect of creative work.

The analysis of theoretical work, which generalizes from innovative work of teachers/experts, allows us to assign the leading tendencies and promising directions, which are essential for determining and perfecting teacher's innovative work in the field of physical culture:

- the approval of humane attitudes between the teacher and the child;
- the development of preschool children's creative and intellectual opportunities;
- individual and creative development of the teacher in the process of innovative work;
- the study of research work of creators of alternative and author's schools, preschool education establishments.

Nowadays, in M.V. Klarin's opinion, we have crashed under "the avalanche of innovative work" in education. The developing international contacts stimulate the supply of international innovations, which are included in the educational process without required scientific analysis. Therefore Klarin recommends the search for a process oriented approach, which is realized in the foundation of such models as systematic organization of research work; communicative activity, active exchange of opinions and creative discussion. Within these models the students are set

[4] Kan-Kalic & Nikandrov, 1991.

in action along the course of an educational process, the teacher is in the position of the partner-helper in mastering the experience of a health-improving activity.[5]

The importance in understanding methods and conditions of students' preparation for innovation work has forms of organization of research activity as systematic research, communicative and dialogue activity etc. Thus V.A. Slastenin recommends new approaches for the organization of higher education and teachers' preparation: 1) culturological approach to contents of education through the main development of "knowledge about person"; 2) individual approach, which is connected with new technologies of educational process; 3) dialogue approach, which promotes individual teacher's position, attitudes towards them in the higher education establishment, personalization of professional preparation; 4) individual and creative approach, which determines the structure of interaction between teacher and student.[6]

The priorities of pedagogical education in the field of physical culture, academics have suggested are: the teacher's individual potential and their ability fir initial innovation work. Physical education is examined not only as production and assumption of new knowledge, physical skills, treasures, but as discovering psychophysical abilities of a person, their opportunities for competent accomplishment of professional role, creation of the teacher's own real backgrounds for the psychophysical self-development and physical perfection. A teacher trained in the innovative educational processes must master both individual culture of information processing (including help from modern computer technology), can adapt it according to the children's needs and master didactic abilities.

[5] Klarin, 1997.

[6] Slastein &Podymova, 1997.

The formation of a teacher's readiness for innovation work encompasses the following:

- the conscious analysis of professional activity on the grounds of motives;
- the critical attitude towards pedagogical standards;
- the openness to medium and professional innovations;
- the creative and modifying attitude toward the world;
- the aspiration for self-actualization and embodiment of own intentions and lifestyle in their professional activity.[7]

As a rule, innovative work is connected with the negotiation of certain psychological barriers. Barriers of creative work are recognized and tend to be found among those who have worked in preschool education establishments for 11-20 years. During this period the high process and resultative indicators of the teacher's work are being achieved and the requirement to alter something in the educational process appears. There is also dissatisfaction in oneself and a desire to change one's professional behaviour. On the one hand, the teacher has to adjust to the creative work, on the other hand the different barriers don't provide opportunities for self-actualization. Hence the high indicators of lack of self-trust and effectiveness of innovations (64%), fear and intimidation of making mistakes (52%), care in the fate of innovation (40%), fear of constant control on the part of administration (31%). 65% of teachers have difficulties with the perception of innovation and their reserve is often apparent.

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The Peculiarities of the Organization of Informal Learning and Sport and Ski Events with Students in Higher Education

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In the majority of the regions in Russia, where winter brings snow and prolonged classes of skiing, is one of the most accessible and mass forms of physical activity. Skiing training is compulsory in physical education classes in comprehensive schools, technical colleges, higher education establishments of different types and the armed forces of our country. Skiing training promotes the education of correct skiing techniques and the formation of skills of independent study.[1] Formal learning and informal learning methods of ski training can be used. The basis comes from formal form of learning, which is held according to the curriculum of physical education department. Informal learning occurs in various ways from different health-improving measures to different sporting events and competitions. The problems in the further development of physical qualities, the perfection of movement techniques in skiing and the improvement of ability levels are decided in the course of informal studies.

During the course of the skiing studies one can come into contact with such problems as the different fitness levels of students interested in skiing; this definitely causes difficulty in organization. Therefore, it is necessary for physical educators to maintain the differential approach, bearing in mind the students' level of fitness. It makes sense to conduct tests to define the level of fitness and speed abilities of the students of the first study, for example, skiing 20 metres at maximum speed (starting stride – 20-30 metres) and of 30 metres at maximum intensity, noting the number of strides. The results of this test allow us access the take-off force (indirectly

[1] Butin, 2000.

– the length of slide), speed (the tempo of movements) and the correlation of these indicators.[2]

It's necessary to divide the students' results into 3 ranges: high range, middle one and low range. The composition of the group must be mobile, which means that students are moved from one group to another as their fitness increases. It is necessary to consider that the speed individual rise up is not similar: some students obtain results quickly, but others may stay at the same level for a long time. Physical educators have to make the methods concrete and the level of workload before each session. It's desirable to have an educational plan for each group and, if necessary, for individual students as well, both for the more advanced and for those falling behind.

Informal learning situations such as sports events and competitions have a great importance in improving health problems. Informal skiing sessions are organized in various ways depending on the students' fitness, which also motivates the students. The majority of these are sports celebrations, since they don't demand special preparation and attract a great number of students. Programmes often included skiing games, skiing entertainment, skiing excursion and ski walks. Sports celebrations are a good way to popularize skiing owing to the fact that they are accessible and very motivating. Both advanced skiers and beginners can take part in these events.

Winter plays an important role in the improvement student's health and endurance. The attraction of ski walks not only brings students, but also lecturers closer together. Ski walks in the beautiful nature over varied terrain give students and lecturers great aesthetic pleasure and have a

[2] Bogdanov 1999, 32.

positive influence on the nervous system, improve systemic and aesthetic conditions, raise mental and physical working capacity.[3]

Skiing competitions have a great and multifaceted importance in the physical education of students. They promote a broadening of the sport at the university, as well as attracting students to systematic studies of physical culture which are connected to the educational process. They are also a continuation of the educational process, for educators and lecturers sum up the work, discover its positive and negative sides and determine the best groups, departments and courses.

Careful preliminary work precedes the organization of skiing competitions. Complications arise due to the weather conditions and the lay of the land. The main goal of university competitions is to attract as many students as possible in order to popularize skiing. The schedule for the ski competitions is drawn up in accordance with the schedule of the regional and city sports committee. It is important to organize the university competitions regularly during the season (competitions among courses, groups, departments) as it will allow us to identify the most capable skiers from students. University competitions among departments focus not on results but on the number of students who take part in the competition. It promotes the development of community spirit in skiing. It is important to advertise such competitions in order to attract the most spectators and to popularize this sport.

It is possible to divide the participants into three groups depending on the students' fitness, for it will attract a great number wishing to compete. It's possible to set different goals for each group, for example, length and difficulty of the course. The course for the first group consisting of students, who don't take part in sports, is: men – 1 km, women – 500 m.

[3] Lukoyanov, 1995.

The second group, which consists of students having junior degrees the ski-course is: men – 3 km, women – 1 km. The third group consists of the best skiers: men – 5 km, women – 3 km. Each department or course (depending on purpose of competition) can contain any number of students in any group, but points per team are given according to the best three results.

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The Peculiarities of Working with Students with Health Problems

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Physical exercise for the treatment and prevention of health problems date back two thousand years to first century China and India. Physical exercise consisting of natural and specific movements is used in therapeutic exercise. Unlike standard movement they have a special focus and they are specially designed for improving the health and restoration of the damaged functions.

A disease makes different structural and functional changes in a person's body. The forced long hypodynamia can increase the spread of illness and cause a number of complications. Therapeutic exercise provides a direct medical effect (stimulating protective mechanisms, accelerating and improving the development of compensations, changing metabolism, restoring the damaged functions), it also reduces the adverse effects of lowered motor activity.

A healthy body has a greater ability to adapt to changeable conditions of the environment, with the suppression and weakening of adaptive reactions to diseases. Intelligent physical training, stimulating physiological processes increases the opportunity for a sick body to development adaptive processes. The completeness of adaptation is the completeness of health.[1]

Physical exercise is carried out with the simultaneous participation of both mental and physical sphere of the person. Under the influence of physical exercise the state of basic nerve processes is changed – excitability

[1] Moshkov, 1982.

increases, inhibitory reactions develop from the pathologically expressed heightened excitement. Physical exercise forms a new dynamic stereotype that promotes the reduction or disappearance pathological displays.[2] Any exercise to the muscles is accompanied by changes in the condition of interior organs. Therefore it is important to involve students, with a poor state of health, in lessons of physical activity. It goes without saying that there are no medical contradictions to it.

When giving lessons a teacher must consider the following peculiarities that affect a body's function; these are insufficient fitness, a low level of functional abilities and slight adaptation to physical strain. Students, who fall into the special medical group, demand an individual approach depending on their ability to differentiate the load. In the case of students with vision impairments, one may excuse them from the performance of jump exercises, resistance exercises, leans and twisting actions.

Physical education in the university foresees not only improving health, improving physical coordination and increasing the level of physical attributes, but also the mastering of technique of many kinds of physical exercises included in the curriculum. Working with students with special medical needs it is necessary to remember that the intensity and volume of the workload changes during the whole study cycle. For the first term it is characteristic to have a very low density of studies (55%). It is characteristic for the second term as well. Firstly it's connected with the fact that the load must be minimal during the initial period of studies and then to increase; secondly, in the first and second terms the mastering of new educational material takes time.

Carrying out sports and agility games demands close attention to be paid by the physical educator in terms of their emotional intension and constant

[2] Belaya, 2004.

contact with students. It is necessary to keep a sharp lookout during the game at the student's actions, to see any display of symptoms of the onset of fatigue (colour of face, sweating, shortness of breath, dystaxia). The influence of therapeutic exercise on the ill depends on the strength and feedback of a body during exercise.[3]

The basis of therapeutic exercise is the process of dose training, which develops adaptation opportunities of a body. It's necessary to control and regulate physical training, watching for the feedback signs of the body. The simple and accessible way for regulation of the load is the control of pulse. A graphic presentation of the change in pulse rate is called a curve of physiological load. The highest pulse rate and maximum workload is usually attained during the middle of the class; it is a single humped curve. In some diseases it is necessary to lower the load after it starts rising and then to raise it again. In these cases a curve can have a many peaks. It is also important to measure the pulse rate 3-5 minutes after the class.

The feedback depends on the severity of the illness, age, individual reaction peculiarities, fitness and psychological structure. Therefore the dose of physical exercise must be selected according to these factors. Thus, for lower back pain it's necessary to reduce muscle tone on the side of damaged muscles, which control the movements of the head, spinal column.[4] A poor posture, on the other hand, requires exercises which strengthen muscle groups and improve their tone. The preventation poor posture is a long term process, which demands an appropriate attitude and active participation. For students this is carried out by controlling and maintaining the correct posture in everyday life, during different kinds of activity and at rest. The basis of the treatment of the poor posture (particularly in the young) is the general training of trunk muscles, which

[3] Popov , 2004.

[4] Epifanova & Apanasenko, 1990.

must be carried out against a background of organized medical and kinetic support, taking into account the type of fault in posture. The elimination of the fault in posture is an important condition for the primary and the secondary preventation of orthopedic diseases and splanchnopathy. It is also the only one way to effectively plane the myotonia of the anterior surface of trunk and huckles.[5] It is necessary to include exercises for the formation of a correct posture as a means of prevention and treatment of the fault in posture in each area of physical study.

For back muscles:

Lie prone on your front, chin on the opisthenar.

1. Raise the head and shoulders, put hands on hips and connect the shoulder blades. Hold this position.
2. The same exercise, but wrists put on the shoulders or behind the head.
3. Lifting head and shoulders to put hands up slowly, arms held out sideways and to shoulders.
4. Arms held sideways, backwards, upwards.
5. To raise the head and shoulders, arms held sideways. To bend and flex wrists.
6. The same exercise, but wing movements with straight arms.

Perform exercises № 1-6 and hold each movement for 3-4 counts. In the following it's possible to use weights and resistance training.

7. Alternate straight legs raises. Slow tempo.
8. Raise straight legs and hold for 3-5 counts.

[5] Epifanova & Rolik, 1997.

9. Count one – to raise the right leg, count two – to raise the left one to the right leg, counts three – six: hold, count seven to lower the right leg, count eight - to lower the left one.

10. Count one - to raise both straight legs, count two - to separate them, count three - to attach them, count four – to lower them to original position.

Lie prone on your front on a bench.

11. Raise the head, chest and straight legs. Hold this position for 3-5 counts.

12. Perform the arm and leg movements of breast stroke.

13. Rolling the medicine ball to a partner.

For abdominal muscles:

Lie on your back, press lower back to the floor.

1. Bend and unbend legs at knees and hip alternatively.

2. Bend and unbend legs alternatively, then to lower them slowly.

3. Suspend legs and to bend and unbend them alternatively.

4. Lock arms behind neck and to raise straight legs upwards.

5. Put hands up, to raise legs slowly to 90 degrees and then to lower them slowly.

6. Bend and unbend legs at 45 degrees, to separate them, to lower them slowly.

7. Hold a ball between the knees, bend legs, then unbend them at 90 degrees, lower them slowly.

8. The same exercise, but holding the ball between the ankles.

9. Straight leg circling at 45 degrees.

10. Raise and cross straight legs.

11. Move to a sitting position holding down the correct position of head and back.

12. Hold arms to the side, raise straight legs slowly, start swinging the arms, put hands on hips, hold the correct posture and return to original position.

13. Put hands up, raise straight legs, swing the arms, put hands on hips, hold the correct posture and return in original position.

14. Fix legs to the bottom bar of a bench or a partner, move to a sitting position slowly and back.

15. Lie on your back on a bench, hold straight legs, sit up slowly and then return to original position.

16. The same exercise, but with different arm movements or exercises with equipment, i.e. weights.

For lateral body surface:

1. Original position: lie on right side, put the right arm up, the left one along the body. Hold the body in this position, raise and lower the left leg.

2. The same exercise, but on left side, raise and lower the right leg.

3. Lie on your right side, put the right arm up, the left one is bent, lay palms flat on the floor. Raise straight legs and suspend them for 3-5 counts and then lower them slowly.

4. The same exercise, but on left side.

5. Raise one leg and then the another to it lower legs.

6. The same exercise, but on the other side.

Therapeutic exercise is medically required in almost all diseases. The development of methods of curing increases the opportunities of using therapeutic exercise and allows us to use it for such problems in which it has not been used before.

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The Role of Physical Training as a Factor in the Health and Well-being of Students and Faculty of the Murmansk State Pedagogical University

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The high intellectual and psychophysical load placed upon northern students during training, substantially influences the formation of knowledge, skills, the capacity for work and on their health. Therefore the main issue the whole complex range of problems connected with education and health of students and teachers living in northern regions is to working out basic health promoting physical training.

When organizing physical training in the North, the particular attention is given to scientific substantiation of techniques, in training and education for physical training lessons. The reason being, that the extreme climate and geographical features of high latitudes have an effect, on not only on living conditions, but also on the nature of adaptation of the young students and faculty staff when at work and rest.

Numerous researches into the physical development and functional condition of the human body carried out in the Far North, show an essential increase in the basic functions of northern students in comparison with their contemporaries from centrals part of Russia. The influence of ecological factors also affect the potential of the energy supply system of northerners, which frequently do not correspond with the high requirements demanded by the environmental conditions on a person's body. Therefore all activity, both cerebral and motor, is carried out under a high degree of exertion on the adaptive mechanisms and surpasses the "physiological cost" of similar activity in other regions of the country. Researches into physical fitness of the young students living in various climatic zones of our country, testify

that today only 65% of the general number of students can produce the same results their counterparts showed twenty years ago. In Zapolarie these changes are even more significant.

The general strain experienced by students and teachers during annual seasonal periods of Zapolaria, is reflected in the increased reactivity of a body during the beginning and ending of the polar night and the fast transition to the polar day. It is important to note another important circumstance connected with the nature of northerners' lives - mass departures during the summer holiday period to central areas and the south of the country, returning at the beginning of the new academic year to the usual conditions which are accompanied by the processes of adaptation and re-acclimatization. The process of reorganization of the physiological systems of both teachers and students at the beginning of the academic year coincides with the formation of adaptive reactions to an academic workload (a phenomenon of "cross adaptation") that make increased demands on the body. Therefore studying the questions of the correlation between the volume and intensity of pressure and the organization and technique of carrying out studies in physical training during the various seasonal periods deserve special attention.

The reduced tolerance to physical strain, seasonal instability of motor and cerebral activity, physical fitness and efficiency observed throughout the academic year, are accompanied by the adequate reorganization of physiological functions and metabolism that is particularly expressed during the winter period. The results of observations and researches carried out with students of History and Philology Faculty of the Murmansk State Pedagogical University, show that the process of rejuvenation of a body after winter examinations (in January) are not fully completed even by April. Evidently inadequate mastering of program material in physical training during the second term (from March to April) is an explanation for

this. It takes for granted the seasonal rhythms of change of physiological functions of the body and, consequently, the rational distribution of academic loads in every term.

The specific natural climate conditions of the Kola North and the living conditions of the students and teachers living there, substantiate “the physiological norm”, displaying motor activity as one of the important means of increasing the reserve capabilities for adaptation of the body. At the same time, the conditions of Zapolarie during the different periods of the polar day, the conditions and opportunities for demonstrating the motor activity of students and teachers are different.

The Polar academic year can be divided into four periods: The first, and most favourable (September to October), is characterized by the opportunity for carrying out physical training in the open air. Here the motor activity is demonstrated according to the physiological norms. In the second period (November to February) a sudden reduction in basic motor function is observed, amounting to only 16-20% of the total ability. Students spend about 80% of their waking time indoors. During the Polar nights during winter holidays they have sleep longer. During the third period (March to May) an increase in motor activity occurs. That puts stress and strain on 50% of students with cases of a traumatism being observed. The fourth period is characterized by the end of training and leaving for practice and vacation by a significant part of the students. They usually go to central areas of the country, to the south or abroad. The process of acclimatization, substantial increase of strain on the musculo-skeletal system connected with the quick change in the lifestyle of student's and teachers during their stay in other regions, form the new physiologically created level of motor activity.

In analysing the data received through the research work over the last few years, it is possible to ascertain that in spite of certain transformations taking place in high schools, many questions, which concern the quality of education, have not been answered yet. Another important problem is caused by the fact that the existing program of physical training for students does not take into account all the variables of climate, geography, social and economic, ethnic and professional aspects upon the vital functions of a person living in conditions of high latitudes.

The work on creating the complex target program “Health of students, teachers and employees of the Murmansk State Pedagogical University” is devoted to the problem of improving the quality of training, preservation and strengthening the health of students and teachers. The programs objectives, problems, directions for the specific activity of forming a healthy way of life for teachers and students of the Murmansk Pedagogical University are determined. Social and pedagogical conditions, means and methods for maintaining health, ways of increasing efficiency during various seasonal periods of Kola Zapolaria are also raised.

The program offered is based upon the concept of forming positive values and attitudes towards a healthy way of life, which is considered to be a purposeful psychological and pedagogical process of specially organized creative activity in gaining and perfecting physical, mental and spiritual health.

The methodology and theoretical basis for the concept stem from the system and comprehensive approaches to formation of physical training and a healthy way of life for a person.

The purpose of the program is to preserve and strengthen the professional health of teachers and students at the Murmansk State Pedagogical

University. The problems of the program are:

- Scientific and methodological maintenance of the program in preserving and strengthening the health of teachers and students at the Murmansk State Pedagogical University (approval of modern means and methods, as well as perfection and introduction of innovative health preserving technologies);
- Assistance for the all round physical development of an individual, to increase the level of efficiency, the perfection of professionally significant psycho-physical qualities of students and teachers in high schools;
- Formation of a valuable attitude towards a healthy way of life of the teacher and student's of the University;
- Creation of a system of health education for teachers and students, directed at mastering the basics of a healthy way of life, improving physical training and family physical training;
- Realization of medical, psychological and pedagogical control over the state of health, physical development and physical fitness of the teachers and students at the university;
- Strengthening the material base of the University with a view to the formation and maintaining of the health of the students and teachers.

The project highlights from the program “Health of students, teachers and employees of the Murmansk State Pedagogical University” two basic ways forward:

1. Maintenance of objective conditions for physical and mental well-being of students and teachers - search for potential reserves and opportunities in high school for the improvement in living conditions, the studies and work of a teacher and student and for preserving and strengthening their health;
2. Psychological and pedagogical influences on the teacher and student, namely, the formation of a positive attitude towards a

healthy way of life, as subjective motivation and behavioural factor in strengthening health.

The continuing of this work by physiologists, psychologists, physicians and teachers with the purpose of studying all aspects of the life, study and work, both students and teachers, will allow for the development of a regional model of the vital functions of a person living in the Kola North further.