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Physiological and hygienic characteristics of relations of biorhythms and tendency to stress among Medical academy students and schoolboys

Резюме В статті представлена фізіолого-гігієнічна характеристика співвідношення біоритмів та стійкості до стресу у 292 студентів медичного вузу та 69 гімназистів випускних класів. Оброблено 722 анкети. Отримані дані дозволили оцінити характер працездатності студентів та випускників з урахуванням їх біоритмів: практично половина обстежених, як студентів (47%), так і гімназистів (45%), відносяться до «голубів» (аритміків), що практично співпадає з даними Р.Хаммпа. Третина студентів (31%) є стресостійкими, а більшість студентів та гімназистів (67 та 72,5% відповідно) мають помірну схильність до стресу. Синдром емоційного вигорання характерний тільки для 2% студентів, але майже для третини (27,5%) випускників шкіл. Симптоми психосоматичних розладів притаманні 67,5% студентів та 63% гімназистів.

Ключові слова: біоритми, стрес, студенти, учні, психосоматичні розлади.

Резюме В статье дана физиолого-гигиеническая характеристика соотношений биоритмов и устойчивости к стрессу у 292 студентов медицинского вуза и 69 гимназистов выпускных классов. Обработано 722 анкеты. Полученные данные позволили оценить характер работоспособности студентов и выпускников по типу их биоритмов: практически половина обследованных, как студентов (47%), так и гимназистов (45%) – «голуби» (аритмики), что практически совпадает с данными Р. Хаммпа. Треть студентов (31%) является стрессоустойчивой, а большинство студентов и гимназистов (67 и 72,5%, соответственно) имеют умеренную склонность к стрессу. Синдром эмоционального выгорания характерен только для 2% студентов, но почти для

трети (27,5%) выпускников. Симптомы психосоматических расстройств присущи 67,5% студентов и 63% гимназистов.

Ключевые слова: биоритмы, стресс, студенты, учащиеся, психосоматические расстройства.

Summary The following review presents the physiological and hygienic characteristics of biorhythms correlations and resistance to stress among 292 medical students and 69 high schoolboys. 722 profiles were processed. The obtained data allowed to evaluate the nature of students' of working capacity and graduates of the schools by type of biorhythms: almost half of the examinees both students (47%), and schoolboys (45%) – «doves» (arrhythmics) that almost coincides with the data R. Hammpa. One-third of students (31%) is stress resistant and the majority of students and high school students (67% and 72.5%, respectively) have a moderate propensity to stress. The emotional burnout syndrome is typical for only 2% of the students, but for almost a third (27.5%) of graduates. The symptoms of psychosomatic disorders are peculiar to 67.5% of students and 63% of high school students.

Key words: biorhythms, stress, students, high school students, psychosomatic disorders.

XX and XXI century - the centuries of scientific and technological progress, which in recent decades is particularly swift and demanding both for the environment and for all the living on the planet. Therefore, man's relation to himself and his health is one of the most important issues not only for personal hygiene, mental health and chronobiology, but in general is the environmental problem [3,4,10,13]. In recent years, the society of our country has changed significantly, which led to changes in the mentality of young people, who much earlier started to take on themselves the responsibilities of an adult. As a result - their responsibility for quality of education in schools and universities increased, which is the basis of the future of young person. Girls and boys are quite easy to sacrifice their health for the sake of high ratings, exhausting yourself with fulfillment of numerous homeworks and other tasks. Observations and research of scientists of the last decades have shown that the use of

chronobiological approach to assess the health status of students in order to maintain it is one of the most urgent problems of the Mental Hygiene of today. [7,9,13].

In this sense the study of features of biorhythms of students and schoolboys will provide the conditions for their harmonious development, maximize the efficiency of learning and teaching process [8,10,14].

At the same time, modern man is growing, studying and working in a «century of stress»: fatigue, overexertion of psychoemotional sphere, as a result of the impact of urbanization, complex school and university programs that have a negative impact on the completely unformed body of schoolchildren and students. All this requires attention to the phenomenon of «burnout syndrome». Author of burnout idea, C.Maslach emphasizes that the burnout - this is not the loss of creativity, but the «emotional exhaustion that occurs on a background of stress ...» [15].

Burnout syndrome (CMEA) - is a reaction of the organism, resulting from exposure to occupational stress of medium intensity. In the WHO European Ministerial Conference (2005) was determined that the stress associated with learning and work, is a major problem for about one-third of people [6,12].

All of the above requires a comprehensive approach to the harmonization of obiorhythms, prevention of stress conditions and anger management as an active method to improve the psychological efficiency of the organism of both students and pupils.

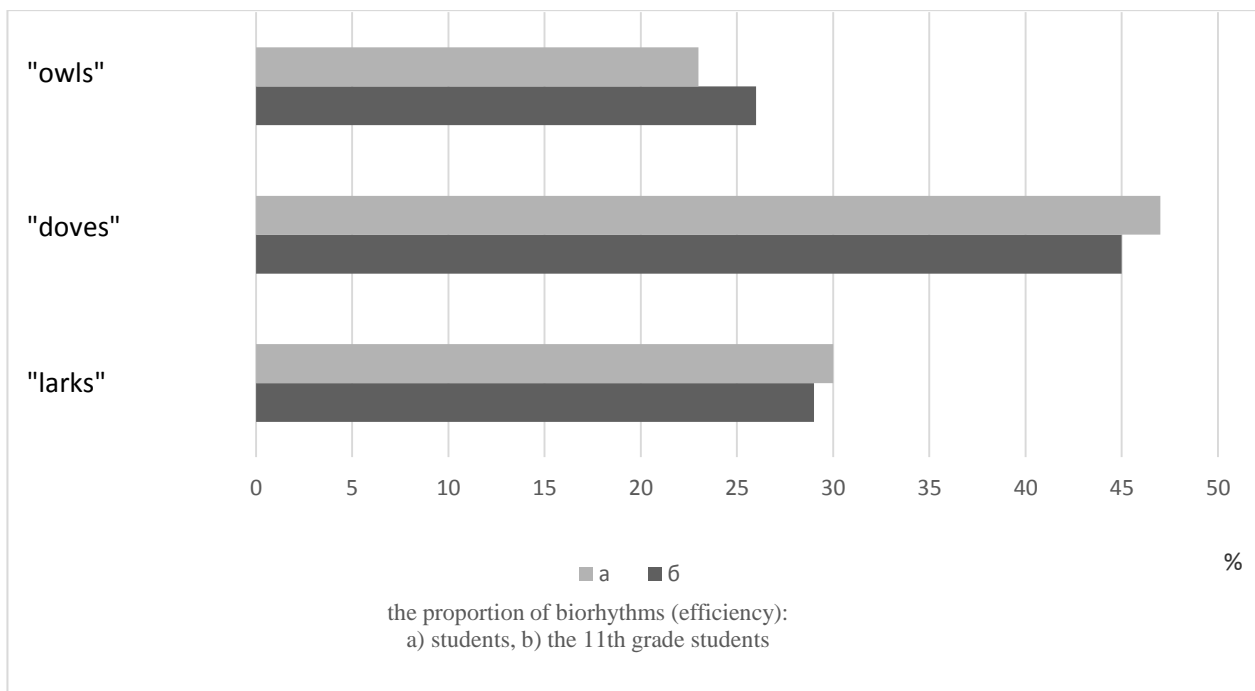
Purpose of the work is to identify and characterize the biological rhythms of students and schoolboys; establish their susceptibility to stress as a basis for developing a set of activities that will help to maintain health both of schoolboys and students, enhance mental and physical performance and antistress capabilities of their body.

Materials and methods of research. The object of the research were 292 students of 3 year of medical faculty (78 boys and 214 girls) and 69 schoolboys (29 boys and 40 girls).

To determine the type of biorhythms of the organism and the degree of inclination to stress we used the methodology of chronobiologists V.A.Doskina and

N.A.Lavrentieva (1986) [2]. The results of the processing of the corresponding test-questionnaire according to this method allowed to determine types of biorhythms – «larks», «pigeons» (aritmikov) and «owls» among the examinees. The degree of susceptibility to stress and CMEA was determined by survey following the procedure of R.V.Kupriyanov [3]. The mathematical processing of the data was performed using Excel and Statistics programs with traditional methods of variational statistics. In total 722 questionnaires were processed (584 - 138 of students and high school students) [1].

Results and its discussion. Analysis of the data presented in the figure shows that the overall distribution of student and schoolboys according to the type of biorhythms (efficiency) is almost the same. Most of them are the «doves» (arrythmics) - 47 and 45%, respectively; in second place are «larks» 30 and 29%; on the third – «owls» 23 and 26%.



This distribution is the most positive, not only from the side of arrythmics' physiological characteristics, who adapt themselves equally well to any daily regime, but also from the social side - the profession of doctor is characterized by unstable operating mode and intensive neuro-emotional stress. For high school graduates this

efficiency regime is the most rational too - taking into account peculiarities of heavy duty of schooling.

As for the inclination to stress (Table. 1), the third of medical students has enough stress-resistance and this is a positive fact. At the same time was not revealed any stress-resistant ones among schoolboys. And if the majority of students (67%) have moderate susceptibility to stress, among the graduates - it is the vast majority (72.5%). Among the surveyed students CMEA was found in only 4 students (2%), while among graduates of the gymnasium - 19 (27.5%). This fact can be explained by quite a lot of stressful situations at graduates, excitement about learning outcomes, emotional stress about the external independent testing and entering higher educational establishment, and the like.

Table 1

The tendency to stress of students and high-school students

Quantity of points	Students		The degree of susceptibility to stress	Schoolboys	
	abs.	%		abs.	%
0-6	93	31	Very low	-	-
7-16	195	67	moderate	50	72,5
17 and more	4	2	Very high (CMEA)	19	27,5
In the whole	292	100	-	69	100

Table 2 shows the symptoms of psychosomatic disorders in students and graduates of the school in accordance with the degree of inclination to stress. The data of table shows that the largest number of students (195 out of 292 surveyed) and schoolboys (50 of 69) have a moderate tendency to stress and in 75-76% of cases complain of

headache, pain in the stomach and back pain, heaviness in the nape (students); 52-72% of cases of the same complaints are registered at graduates. CMEA is peculiar only to 4 students (2%), three of whom complain of psychosomatic disorders, while among the graduates of the school - 19 (27.5%) have the CMEA and 65% of them complain of pain in the stomach and back pain, constant headaches and heaviness in the head.

Table 2

Characteristic of psychosomatic disorders among student and high-school students

Number of examinees	The degree of susceptibility to stress	Students				Number of examinees	Schoolboys			
		headache and pain in the stomach		heaviness in the head and back pain			headache and pain in the stomach		heaviness in the head and back pain	
		abs.	%	abs.	%		abs.	%	abs.	%
93	very low	45	48	50	54	-	-	-	-	
195	moderate	148	76	146	75	50	36	72	26	52
4	CMEA	3	83	3	83	19	12	64	13	66,5
292	-	196	67	199	68	69	48	70	39	56,5

Certain interest is represented by comparative figures of students and graduates of the school in distribution biorhythms types with the most well-known classifications (R. Hampp, 1993; V.A.Doskin, Lavrentieva.N.A, 1991) [2.13], which are presented in Table 3.

As can be seen from Table 3, the distribution of the types biorhythms of students and pupils in our study did not coincide with any classification according to the percentage rank. And, if our results do not coincide with the classification of Russian authors in relation to both the students and to the disciples, in both cases they confirm the conclusion of classification of R. Hampp: most of the people are a "doves" type (arrhythmics).

Table 3

Comparative data on types of biorhythms,%

Biorhythms' types	R.Hampp, 1993	V.A.Doskin, N.A.Lavrentieva, 1991	The results of own researches, 2013	
			students	schoolboys
«lark»	17	41	30	29
«dove»	50	29	47	45
«owl»	33	30	23	26

The practical implementation of the results obtained is the development of a set of measures in the form of guidelines that will help to improve mental and physical performance and anti-stress capabilities of students and pupils. Components of this set are:

- **Methods of harmonizing of rhythms.** This is one of the main directions of modern chronobiology, which is to develop different methods and medications. Among them are five major groups: 1) physical therapy techniques; 2) medication based on melatonin (plays an important role in the regulation of biorhythms); 3) mixture of Pavlov and its analogs; 4) drugs based on chronobiotics (herbal medicines that regulate different phases of biorhythms; 5) preparations based on vitamins, minerals and chronobiotics.

- **Methods of treatment and prevention of burnout syndrome.** Preventive and therapeutic measures at CMEA are similar in many respects: what protects against the development of this syndrome may be used in its treatment. These measures aim to remove the stressor's action: the removal of the operating voltage, increasing professional motivation, alignment of the balance between effort expended and reward received integrated methods of treatment are applied when CMEA attributes: organizational, interpersonal, individual.

- **Recommendations for physical training.** While planning physical activities should be considered two main factors that interact with each other - the load (exposure) and specific functional state of of the organism at the moment.

• **Auto-training method.** Autogenous training - an active method of improving the mental health and anti-stress capacity of the organism, the synthesis of methods of psychic self-regulation. In our studies, we used the most simple and accessible for everyone method of autogenous - verse modification.

Thus, the study of types of biorhythms (efficiency) and tendency to stress of the 3rd year medical students and schoolboys allowed to make the following conclusions:

1. Almost the half of surveyed students (47%) and 45% of the gymnasium graduates are «doves» (arrhythmic), which is positive in terms of the features of their day regime.
2. Stress resistance is inherent for the third of students (31%); the majority of students (67%) and the principal amount of gymnasium students (72.5%) have moderate susceptibility to stress; burnout syndrome is characteristic only for 2% of students and 27.5% of graduates.
3. The 67.5% of students and 63% of gymnasium students have the symptoms of psychosomatic disorders, which are characteristic for the majority of students and schoolboys with a moderate tendency to stress and for those who have the burnout syndrome.
4. Distribution of students and graduates of the school on their biorhythm type does not match the existing classifications (R. Hampp, 1993; V.A.Doskin, Lavrentieva.N.A, 1991), but it confirms the data of R. Hamppa that the vast majority of population belongs to «doves» type.

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