Estimation of stress resistance of medical students in Lviv, Ukraine

Keywords:
health status, health-saving technologies, stress resistance

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ABSTRACT

High demands for speed and amount of students' trainings in health care education are among the stress causes. Presence of stress can negatively affect the state of progress and level of physical health of medical students. We have tested 275 students of II-IV years of the medical faculty (145 women, 130 men) using methods of Friedman and Rosenman modifications «tendency to stress» and «self-rating of stress resistance». Test results revealed: 34% of women and 29% of men showed below average level self-rating of stress resistance, including the group tendency to stressful situations. Average level was characterized for 39% of women and 27% of men. This indicates the sufficient resistance to stress and rejection as failure stress. Higher average level of stress resistance was observed for 15% of women and 26% of men. These students, despite the negative influence of different factors, fight stress and try to prevent it. High aptitude was recorded for 11% of women and 7% of men. Relatively high frequency of getting into stress was inherent for 25% of women and 21% of men. Presence of stress and attempts to avoid it were found for 29% of women and 40% of men. For 22% of women and 26% of men was found the ability to resist stress due to communicability and harmonic lifestyles. High level of self-regulation, the ability to achieve goals as the result of low aptitude to stress was inherent for 10% of women and 7% of men. Reducing adaptation to stress among medical students was registered. Formation of skills for stress resistance by implementation of health-saving technologies in student lifestyle is necessary.

IINTRODUCTION

The current period of social development raises the problem of human health as the global problem. According to numerous scientific data recently there has been a steady decrease of general health status, including students, while the society needs active, healthy, creative young people, who are ready to realize themselves in all spheres of life - first of all in the professional activity.

Students' health care is one of the major social problems in the society. University students are the future social-economic, intellectual and creative potential. However, students can be referred to the increased risk group, as the difficult age problems of modern students are named negative impact of the crisis almost in all major sectors of society and the state.

Nowadays significantly increased the interest of scientists and specialists to questions, related to professional stress – especially to the mechanisms of formation of human resistance to stress in different occupations. Such professional stress is often a reason, for what a significant number of highly educated employees leave their jobs, change professional areas, turn to consultants, psychologists and doctors.

METHODOLOGY

Materials and Methods

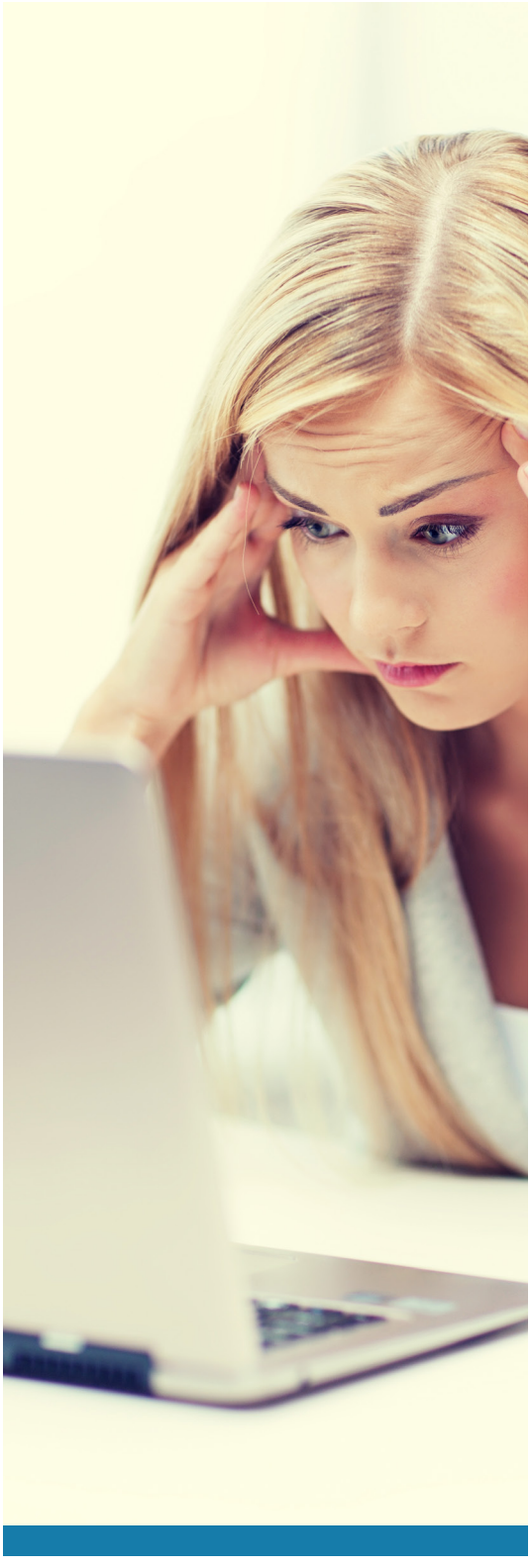
This study is a part of our scientific research "formation of healthy lifestyle of medical students". Sociological research was carried out among students at Lviv National Medical University by questionnaire "Self appraisals of mental states" (Eysenck) and our specifically elaborated sociological questionnaire "Self appraisals of medical students study", based on a random statistical population (n=275) where the error probability survey results did not exceed 5% ($p<0.05$). The mental status was assessed using the Eysenck Personality Questionnaire (EPQ) [*].

Study design

The aim of this work was to study introspection health status of medical students. The results, in our opinion, can be used for choosing the right tactics and methodology to preserve and strengthen the mental health of students.

Data collection

Both male and female students willing to participate were included in the study after explanation was given. We have tested 275 students from years II-IV of the medical faculty (145 women and 130 men) using methods of Friedman [*] and Rosenman [*] modifications «tendency to stress» and «self-rating of stress resistance». As well as



our self-administered structured questionnaire was used for data collection. The forty item questionnaire comprised items pertaining to preference, awareness and consumption pattern.

Statistical analysis

All statistical analyses were carried out using SPSS version 11 and SPSS Statistics version 22. P-values < 0.05 were considered as significant.

The level of personal anxiety in the tested population was 41.4 ± 0.8 points [*]. Among the tested students there were some with both high and low personal anxieties, which determine their different reactions to examination stress. Based on the currently accepted interpretation of dividing people on levels of anxiety [*] 5.8% of the tested people have reduced personal anxiety (less than 35 points), about 5% have higher anxiety – above 55 points. About 90% of students have average personal anxiety from 35 to 55 points.

Intermediate reactive (situational) anxiety specified by Spielberger questionnaire, in a quiet position equal to 39.8 ± 0.7 points. Before the test, the figure increased significantly, reaching an average of 56.5 ± 0.8 points, indicating a rather high level of reactive anxiety in students before the exam ($p<0.001$).

RESULTS

According to recent studies, there are several factors that may affect stress situations during obtaining medical profession: the nature of medical work (constant involvement in human suffering), desire for independence in acquiring knowledge and rather rigid forms and methods of training specialists particular profile, acquisition and development of skills facing student in learning and development professional role socialization, personality problems and gender questions (Table 1).

Students also face social, emotional, physical, family problems, which may affect their ability to learn and progress. As stress factors act: student achievement, which has competitive influence at the ranking, lack of interaction teacher-student and absence of extracurricular activities (Table 2).

Table 1. Factors leading to stress for medical students

Stress factors	men (%)	women (%)
Individual adaptation to the curriculum	93.8	82.1
Economic problems	31.3	32.5
Work with patients	13.1	9.8
Collaboration with hospital staff	13.1	9.8
Lecturers	3.1	14.6
Test/examination fear	37.5	42.3
Family problems	25.0	6.5
Future work and employment	12.5	23.6

Table 2. The nature of stress among medical students during learning process

Stress levels	men (%)	women (%)
Do not feel stress	12.5	5.7
Minimum stress	25.0	26.0
Partial stress	12.5	25.2
Severe stress	21.9	13.8
Very strong stress	6.3	7.3

We conducted an investigation among medical students of the second study year to determine the level and nature of stress in students. For this purpose 275 students were tested. Analysis of the levels of stress among student contingent is presented in Table 2.

Test results revealed: 34% of women and 29% of men showed below average level of self-rating of stress resistance, including group tendency to stressful situations. Aveage level was characterized for 39% of women and 27% of men. This indicates the sufficient resistance to stress and rejection as failure stress. Higher average level of stress resistance was observed for 15% of women and 26% of men. These students, despite the negative influence of different factors fight stress and try to prevent it. High level of stress resistance was exposed only by 12% of women and 18% of men.

We have analyzed the impact on the success of medical students of stress and self-assessment of their health (Figure 1). The data show that the best success rates are observed in students who are more resistant to stress and lead a healthy lifestyle.

Gender differences in the aptitude to stress of medical students were i dentified. High aptitude was recorded for 11% of women and 7% of men. Relatively high frequency of getting into stress was inherent for 25% of women and 21% of men. Presence of stress and attempts to avoid it were found for 29% of women and 40% of men. For 22% of women and 26% of men it was found the ability to resist stress by communicative and harmony lifestyles. High level of self-regulation, the ability to achieve goals as the result of low aptitude to stress was inherent for 10% of women and 7% of men.

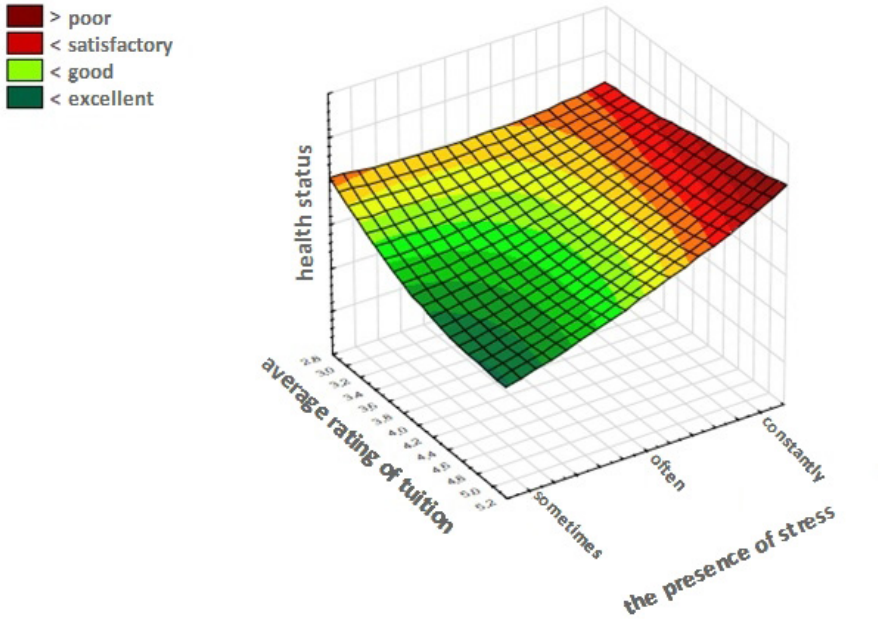


Figure 1. The relationship between presence of stress, average rating of tuition and self-assessment health score of the students

The presence of significant ($p<0.05$) relationship between material conditions of medical students and self-stress state ($r=+0.34$). That means, with the deterioration of the financial position there is an increase in stress level, which greatly affects the self-assessment of health of medical students (Figure 2).

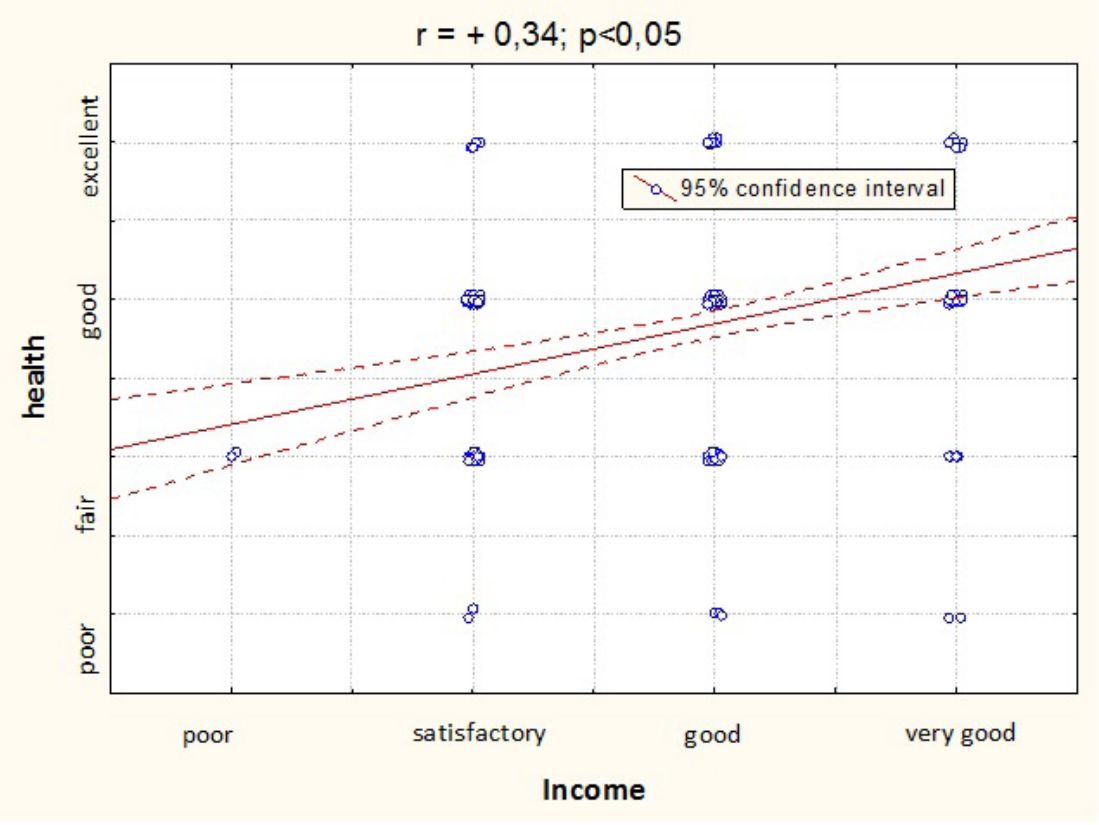


Figure 2. The relationship between material conditions and self-assessed health score of students

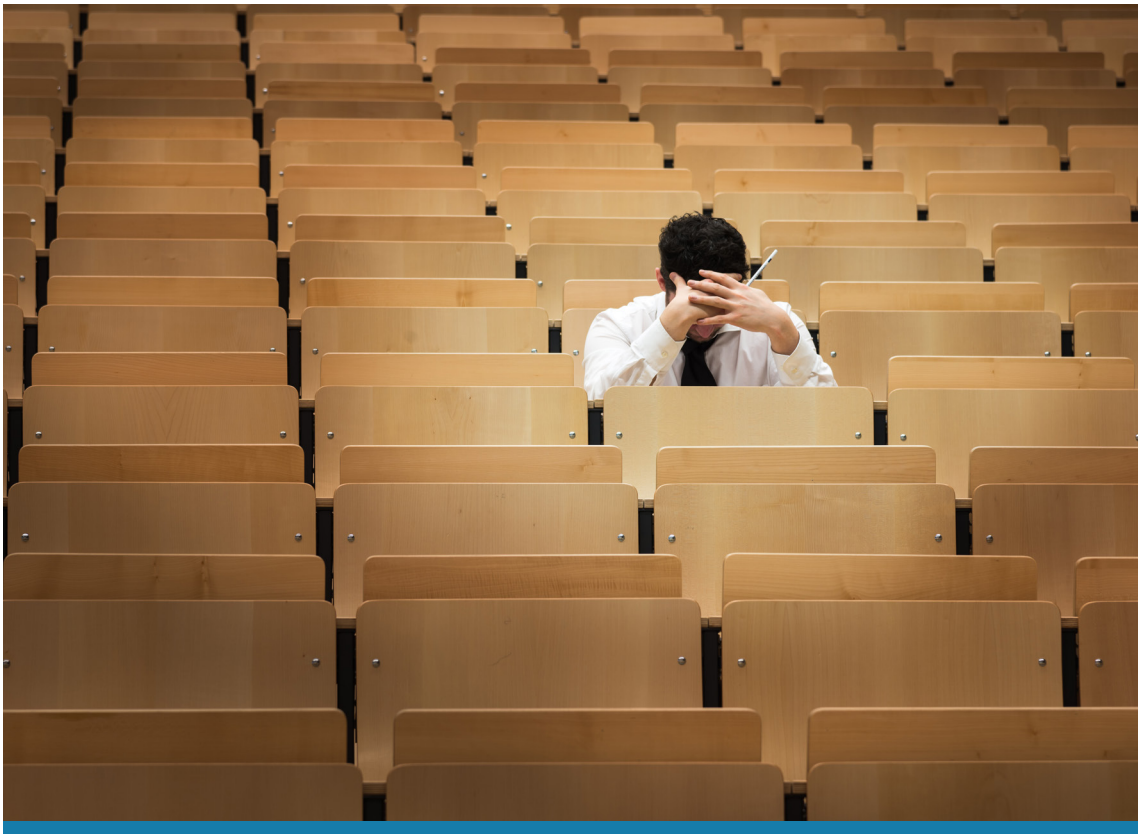
As the table 2 shows, the vast majority of students have minimal or partial stress, while a minimum and a very strong stress does not depend on gender identity. In conducting the correlation between gender and anxiety, frustration, aggressiveness and rigidity there is a weak correlation (Spearman correlation coefficient is 0.176, 0.103, 0.001 and 0.091 respectively). Female students often assess their mental state more negative than their male counterparts, or most likely during the test they tend to lower their assessment of mental state.

DISCUSSION

Determining the level of adaptation was made taking into account such factors as: the duration of professional activities, acquiring professional knowledge and skills to apply them in practice, the degree of autonomy in the profession, professional communication skills, etc. However, the formation of stress-resistance is laid by student at a medical university level.

Healthy students develop the ability to learn through self-examination, self-observation and practical judgment. At the same time, they also develop the ability to form interpersonal relationships and work in team and society. Medical students and practitioners, compared with workers in other professions and the population in general, are prone to academic and professional stress, and therefore are susceptible to psychosocial health problems and some specific dysfunctions that may endanger their physical, mental and social health.

There are a lot of research studies about the relationship between education and lifestyle of medical students [*]. Implementation in the profession includes the image of the profession, especially at the stage of selecting professional field. The image of



the future profession combines emotional and evaluative and cognitive components. Compliance with these components makes reasonable choice of profession, especially taking into account the professional requirements of human potential. The level of student perceptions of the profession is directly related to the level of attitude to learning: the more students know about their future profession, the better is their attitude to learning. However, expanding the range of interests related to the chosen specialty increased their intellectual, aesthetic, moral and material needs.

Otherwise, in the consciousness of the future specialist negative experience is accumulated, some kind of solutions for tasks is formed, including ignoring of criticisms, evasion of solving problems, etc. [*].

Examination stress is one of the greatest among causes of mental stress among students. Very often exam is a factor, which may cause psychical injury or shock and may become a trigger to activate depression [*]. Recently strong evidence was obtained, indicating that examination stress has a negative effect on the students nervous, cardiovascular and immune systems [*]. According to many researchers during the examination sessions students marked disturbances of the autonomic regulation of the cardiovascular system, manifested the increase in heart rate and blood pressure, the growth of muscle and emotional stress [*]. Emotional stress can lead to activation of the sympathetic and parasympathetic divisions of the vegetative nervous system and to the development of transient processes involving violation of homeostasis and increased vegetative ability for reactions of cardiovascular system on emotional stress. After the exam physiological parameters do not immediately return to normal – usually it takes a few days for parameters of blood pressure to return to base quantities [*]. Recently it was proved, that examination stress, especially when combined with caffeine, may lead to further sustained

increase in blood pressure among students [*]. It should also be noted that the problem of exam stress affects every year hundreds of thousands of students all over the world, and to solve this problem the joint efforts of scientists from different disciplines – physiology, psychology, psychiatry, cardiology and health care- are necessary.

Investigation of the mechanisms of examination stress development and establishing the relationship of individual reactions to specific personal characteristics is a tool, with which may be disclosed linkages physiological and psychological aspects of human. Understanding of these mechanisms will develop more effective methods for correcting adverse functional states of human.

When stress is perceived negatively or becomes excessive, the students have physical and psychological deviation [*].

In order to understand the relationship between stress and medical training for future professional activities of physician the educational process should be considered more deeply. Studies show that the mental health of medical students compared to other students from other universities before admission to the university is about the same [*], but worse during the learning process. Each year the student is accompanied by new shocks with stressful career choices. For many significant amount of educational material during the first year is associated with the knowledge that the material cannot fully be digested [*]. That significantly affects the previous self-assessment of many students.

Although some degree of stress is a normal part of medical training and can be an incentive for some students, not all students consider stress to be constructive. For many of them stress causes fear, incompetence, guilt, anger and may be associated with both psychological and physical morbidity. Elevated levels of stress can adversely affect the learning of the curriculum, prevent concentration, decision making and mastering other skills necessary for studying.

Studies, which have focused on identifying the sources of stress among medical students, in general, indicate 3 areas: academic pressure, social and financial problems, which range from 25% to 75%.

According to Bragina K.R. [*] during university studies one can identify medical students in three main critical periods - the first, fourth and sixth (last) years of study (existing till now system of training specialists). At the first year a change in the social role of student needs an adjustment of values, there is a need for more flexibility to adjust their behavior to adapt to the more stringent requirements of higher education, to establish relationships in the new team; for non-resident – to build up everyday life. Students often lack clinical medical experience and any possibility of self-realization as a future doctor, complaining of professional isolation [*].

For the undergraduates during their clinical training, where students are expected to experience stress associated with the beginning of their direct contact with patients, their intrusion into previously restricted areas, that are not common in social interaction, for example, examination of the patient, the study of his medical history, soul-searching, rethinking choice of specialty [*]. Medical students, with the advent of the program of clinical disciplines are beginning to feel a load of medical liability. The crisis of fifth (sixth) year is related to the future employment prospects and professional development within their chosen specialty. The lack of reserves of mental and physical health at each of these stages can lead to neurotic and adjustment disorders.

Gradually, students try to take more responsibility for the patients care. They need to be more competent, but still feel insecure. Students learning to overcome these feelings are sometimes arrogant and try to learn "all at once", challenge everything. Therefore, it may happen that a student cannot cope with the task, or cannot make the right decision at a given pace with high responsibility for the consequences of this decision, that there is an information overload - load that exceeds the capacity of the human subject to maintain high motivation and do the work.

CONCLUSIONS

1. Reducing adaptation to stress among medical students was registered.
2. Formation of skills for stress resistance by implementation of health-saving technologies in student lifestyle is necessary.
3. In order to accelerate and improve the adaptation of freshmen to university studies it's necessary:

- to create conditions for cognitive-information students adapt to a new environment, the structure of university, content and training requirements, duties;
- to get acquainted with the peculiarities of university training for creating a positive attitude towards their chosen specialty;
- to prepare students for new forms and methods of educational work in higher education.

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REFERENCES

1. Borozdina LV. Theoretical and experimental study of self-assessment. Borozdina LV., Abstract Thesis. Doctor Psychology Science, MSU 2001; 120-121
2. Bragina KR. Anxiety and depressive symptoms within the neurotic and adaptation disorders in medical students at various grade levels. Bragina KR., Announcer of Vinnitsa State Medical University 2003; Vol. 7 (2/2): 849 - 851
3. Eysenck H., S. Eysenck. The Manual for Eysenck Personality Questionnaire. Hodder and Stoughton; London 1975; 737-744
4. Friedman HS., Hall JA., Harris MJ. Type A behavior nonverbal expressive style and health // J. Personal Social Psychology 1985; Vol.48: 1299-1315
5. Lawrence R. Stress Management in Work Settings: A Critical Review of the Health Effects. Lawrence R., Murphy A., American Journal of Health Promotion 1996; 112–135
6. Maes M., Van der Planken M., Van Gastel A., Bruyland K. et al., Influence of academic examination stress on hematological measurements in subjectively healthy volunteers; Psychiatry Res, 1998; Vol.21 (6): 581-599
7. Marishchuk VL. Psychodiagnostics in sports: studies manual for schools. Marishchuk VL., Fornications YM., Serov LK., Education 2005: 349 p
8. Nozdrachev A. Translated from Fiziologiya Cheloveka. Nozdrachev A., Shcherbatykh S., Human Physiology 2001: 732–737
9. Pylypenko NM. Motivational mechanisms of adaptation of the individual student to modern educational changes. Pylypenko NM., Practical Psychology and Social Work, 2008; 8 (113): 46-54
10. Rosenman RH., Checney MA. The Relationship of Type A behavior pattern to coronary heart disease; Activitas Nervos Superior, 1980; 22: 11-45
11. Saipanish R. Stress among medical students in a Thai medical school. Med Teach, 2003; Vol. 25(5): 502-506
12. Shcherbatykh N. Translated from Fiziologiya Cheloveka; Human Physiology, 2000; Vol. 26 (5): 641-642
13. Shepard J. Additive pressor effects of caffeine and stress in male medical students at risk for hypertension. Shepard J., Al'Absi M., Whitsett T. Am J Hypertens, 2000; 475–480
14. Sherina MS, Rampal L, Kaneson N. Psychological stress among undergraduate medical students; Med J Malaysia, 2004; Vol.59: 207-211
15. Skrypnyk V. Peculiarities of self-acceptance and social and psychological adaptation of first-year students; Skrypnyk V., Psychology and Society, 2005; 2: 87-93
16. Spielberger ChD. The treatment of test anxiety: A transactional model. In Schwarzer R., Van der Ploeg. H., Spielberger ChD. (Eds). Spielberger ChD., Vagg PR., Advances in WPI anxiety research, 1987; 179–186
17. Tyssen R., Hem E., Gude T., Gronvold NT., Ekeberg O., Vaglum P. Lower life satisfaction in physicians compared with a general population sample: a 10-year longitudinal, nationwide study of course and predictors; Soc Psychiatry Epidemiol, 2009; Vol. 44: 47-54
18. Strelets VB., Samko NN., Golikova JV. Physiological parameters of pre-examination stress; JHNA, 1998; Vol. 48 (3): 458-463

*FOOTNOTES

1. Eysenck, H., S. Eysenck. The Manual for Eysenck Personality Questionnaire. Hodder and Stoughton; London 1975; 737-744
2. Friedman HS., Hall JA., Harris MJ. Type A behavior nonverbal expressive style and health // J. Personal Social Psychology 1985; Vol.48: 1299-1315
3. Rosenman RH., Checney MA. The Relationship of Type A behavior pattern to coronary heart disease; Activitas Nervos Superior, 1980; 22: 11-45
4. Marishchuk VL. Psychodiagnostics in sports: studies manual for schools. Marishchuk VL., Fornications YM., Serov LK., Education 2005: 349 p
5. Spielberger ChD. The treatment of test anxiety: A transactional model. In Schwarzer R., Van der Ploeg. H., Spielberger ChD. (Eds). Spielberger ChD., Vagg PR., Advances in WPI anxiety research, 1987; 179–186
6. Pylypenko NM. Motivational mechanisms of adaptation of the individual student to modern educational changes. Pylypenko NM., Practical Psychology and Social Work, 2008; 8 (113): 46-54
7. Borozdina LV. Theoretical and experimental study of self-assessment. Borozdina LV., Abstract Thesis. Doctor Psychology Science, MSU 2001; 120-121
8. Tyssen R., Hem E., Gude T., Gronvold NT., Ekeberg O., Vaglum P. Lower life satisfaction in physicians compared with a general population sample: a 10-year longitudinal, nationwide study of course and predictors; Soc Psychiatry Epidemiol, 2009; Vol. 44: 47-54
9. Maes M., Van der Planken M., Van Gastel A., Bruyland K. et al., Influence of academic examination stress on hematological measurements in subjectively healthy volunteers; Psychiatry Res, 1998; Vol.21 (6): 581-599
10. Nozdrachev A. Translated from Fiziologiya Cheloveka. Nozdrachev A., Shcherbatykh S., Human Physiology 2001: 732–737
11. Shcherbatykh N. Translated from Fiziologiya Cheloveka; Human Physiology, 2000; Vol. 26 (5): 641-642
12. Shepard J. Additive pressor effects of caffeine and stress in male medical students at risk for hypertension. Shepard J., AlAbsi M., Whitsett T. Am J Hypertens, 2000; 475–480
13. Lawrence R. Stress Management in Work Settings: A Critical Review of the Health Effects. Lawrence R., Murphy A., American Journal of Health Promotion 1996; 112–135
14. Bragina KR. Anxiety and depressive symptoms within the neurotic and adaptation disorders in medical students at various grade levels. Bragina KR., Announcer of Vinnitsa State Medical University 2003; Vol. 7 (2/2): 849 - 851
15. Strelets VB., Samko NN., Golikova JV. Physiological parameters of pre-examination stress; JHNA, 1998; Vol. 48 (3): 458-463
16. Skrypnyk V. Peculiarities of self-acceptance and social and psychological adaptation of first-year students; Skrypnyk V., Psychology and Society, 2005; 2: 87-93
17. Sherina MS, Rampal L, Kaneson N. Psychological stress among undergraduate medical students; Med J Malaysia, 2004; Vol.59: 207-211
18. Saipanish R. Stress among medical students in a Thai medical school. Med Teach, 2003; Vol. 25(5): 502-506