Psychoemotional State of the Universities' Teaching Staff in Uzbekistan

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Abstract

The results of assessing the psychophysiological state of modern teachers of Uzbekistan leading universities as the basis for the preventive measures development to maintain their health are presented. It is shown that the teachers' cardiovascular system (CVS) functional state during the working day basically does not go beyond physiological fluctuations, and the functional state of the central nervous system is characterized by a decrease in the quality of the work performed. Revealed a high frequency of emotional burnout (EB) signs in teaching staff in comparison with the administrative and technical employees of universities; the average statistical indicators of the signs of the teaching staff of different universities do not have statistically significant differences. The average level frequency of emotional exhaustion among the teaching staff members is 52-60%, a high level of personal achievement reduction - 44-50%; the average level of depersonalization is 22-40%. For the EB signs frequency, the work experience at the university matters; at the beginning of the academic year, emotional burnout indicators are less pronounced than at the end.

Keywords: *University teachers, psychophysiological state.*

Introduction

In modern conditions of widespread information technology development, a change in the requirements for higher professional education and, consequently, increasing the effectiveness of university teachers as leading subjects of higher education is inevitable[1]. Moreover, the quality of training depends not only on the degree of teacher's professionalism, but also on his internal state - physical and mental health, which, in turn, largely depends on the teacher's working conditions[4].

The main factors of the teacher's work are: a busy schedule with an increased psychoemotional state, significant voice load, prolonged static load with a slight general muscle load, a large amount of visual work[4]. The busy schedule of the teacher, even with favorable hygienic factors of the working environment, can have an adverse effect on the body and, above all, on the central nervous system[1]. It should be borne in mind that a high neuropsychic stress for a teacher is a factor affecting his body every day throughout the entire academic year and throughout his work at a university[3].

The aim of the present research was to assess the psychophysiological state of modern teachers of universities in Uzbekistan as the basis for the development of preventive measures to preserve the health of the universities' teaching staff (faculty).

Research Object and Method

The research object is the teaching staff of three leading universities of the Republic of Uzbekistan: National State University of Uzbekistan (UzNU), Tashkent State Polytechnic University (TSTU), Tashkent Medical Academy (TMA). As comparison groups, we used the results of the psychophysiological state research of the universities' administrative and technical personnel[5].

The research was performed in two stages. At the first stage, the functional state of the cardiovascular (CVS) and central nervous systems (CNS) was studied during the working day[6]. At the second stage, the frequency and nature of the emotional state symptoms of the teachers' body was studied, taking into account gender, age and work experience[7].

We assessed the CVS and central nervous system functional status in the spring (May 2018) in two universities with a significant difference in the areas of study - humanitarian (TMA) and technical (TSTU). In each of these universities from 30 to 60 people of each gender were studied at the beginning and at the end of the academic day. The CVS condition was assessed by the pulse rate and blood pressure, the central nervous system condition - by Anfimov's correction test (Komarova I.A., Melnikov I.Yu., 2014)[8]. In accordance with the recommendations of these authors, in assessing the functional state of the central nervous system, two indicators were considered - the accuracy factor of task performance (A) and the mental productivity coefficient (P).

The emotional burnout (EB) state was revealed by setting up a test for emotional burnout (Boyko V.V., 2002), which contains 22 statements about the feelings and emotions associated with the teaching staff work.

Testing contains the selection of various answers to 22 questions characterizing three indicators of EB: emotional exhaustion, depersonalization and personal achievement reduction.

Emotional exhaustion (EE) is characterized by a decrease in mood and emotional background, fatigue, depression, apathy, a feeling of frustration, and indifference.

Depersonalization is characterized by a violation of relationships with colleagues at work, indifference to team members, and a lack of positive aspects vision in their activities.

The personal achievement reduction implies self-doubt, the possibility of further development and new achievements.

Results and Discussion

Evaluation of some indicators of the functional state of the body of teachers during the working day. Features of the teaching staff of universities are of the greatest importance for the functional state of the cardiovascular and central nervous system, which was taken into account when organizing functional studies.

Functional state assessment of the teaching staff body showed that during the working day in the teacher's body, functional changes are formed, the nature of which depend on specific functions, as well as on gender and work experience.

The functional state of the tested teachers' CVS system is characterized by the data of Table 1. It is revealed that, on average, the indicators studied are within the physiological norm, both before and after work. At the end of the working day, TMA teachers showed a slight increase in systolic and diastolic pressure and heart rate, while TSTU teachers showed only an increase in heart rate. At the same time, a large scatter of individual indicators was noted, as a result of which the average statistical values did not have significant differences either during the working day or when comparing the faculty indicators of two universities.

Table 1. Functional state indicators of the teachers' body at the beginning and at the end of the working day*

University	Time of research	Number of tested	Indicators			
			Arterial pressure		Heart rate	Breathing rate
			Systolic	Diastolic		
Women						
TMA	Before work	30	113 ±5	73± 2	76± 2	20± 1
	After work	30	122± 4	79± 4	79± 3	20± 2
TSTU	Before work	31	116± 8	74± 3	73± 4	23 ± 2
	After work	60	116±7	74± 2	75± 4	23± 2

University	Time of research	Number of tested	Indicators			
			Arterial pressure		Heart rate	Breathing rate
			Systolic	Diastolic		
Men						
TMA	Before work	29	119± 3	74± 2	76± 2	19± 1
	After work	29	124±4	79± 3	80± 4	20 ± 1
TSTU	Before work	61	124±4	82± 4	74 ± 5	22± 2
	After work	60	123±6	81±4	76± 3	22± 2

In all cases, for indicators before and after work, P> 0.05.

At the same time, it was revealed that for such an indicator as systolic pressure, work experience is important (Fig. 1, 2). Moreover, the differences in the indicator before and after work with work experience of 21 years or more were statistically significant in both women and men.

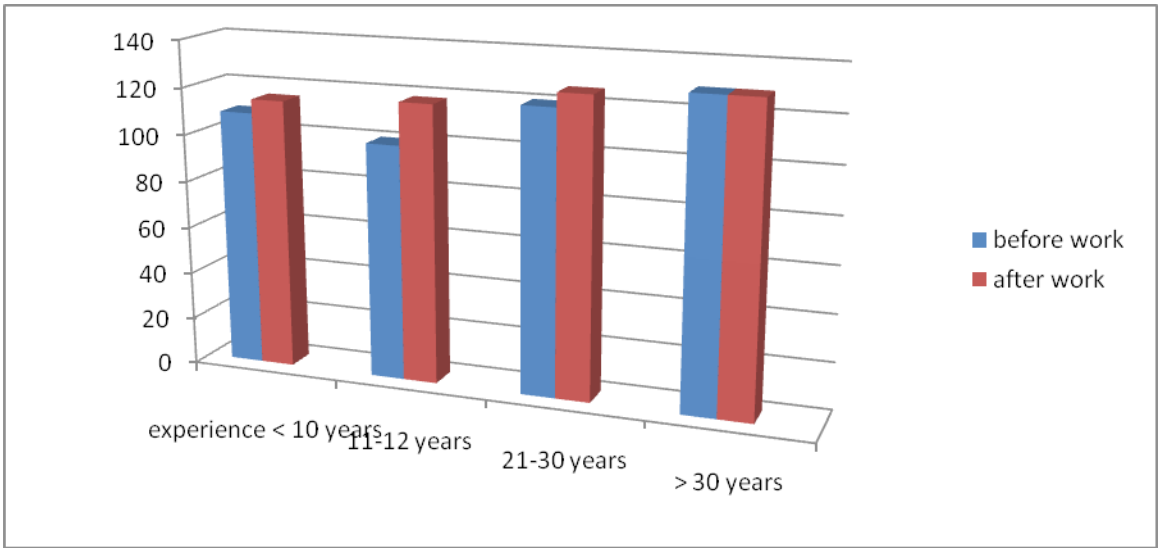


Fig. 1. Change in systolic pressure of TMA female teachers depending on the work experience, mmHg

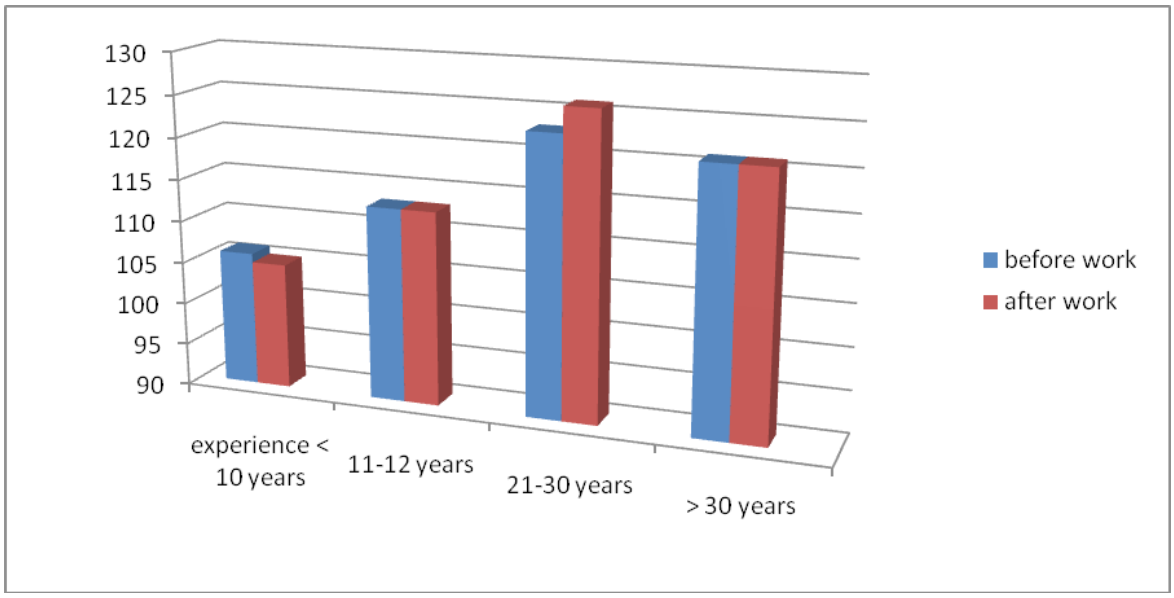


Fig. 2. Change in systolic pressure ofTSTU female teachers depending on the work experience, mmHg

More significant changes were characteristic of the central nervous system's functional state. The amount of work performed by teachers characterizes the mental productivity coefficient, the value of which, for men and women of different universities with rare exceptions, did not have significant differences according to the data of Table 2. At the same time, a number of features are revealed that are characteristic all universities' teaching staff under research. Thus, in all universities the productivity coefficient at the end of work is significantly lower than at the beginning, and the decrease in this indicator in all universities is more noticeable in women: in men, the coefficient decreases by 8.8-12.2%, and in women - by 11.6-24.6%.

Table 2. Comparative characteristics of changes in the productivity coefficient of universities' teaching staff under research at the beginning and end of the day, M±m

University	Men			Women		
	Before work	After work	P	Before work	After work	P
TGTU	659±6	594±4	<0,01	679±8	512±4	<0,01
NUUz	589±8	517±6	<0,01	659±7	558±3	<0,01
TMA	637±5	581±3	<0,01	593±10	524±9	<0,01

The same regularities were revealed with regard to the accuracy of the work performed: the accuracy coefficient of all teachers by the end of the day significantly decreased in all the universities studied (Table 3), and for women this decrease was more pronounced than for men - by 9-17% and 11-19%, respectively.

Table 3. Comparative characteristics of changes in the accuracy coefficient of the task performed by teachers of the studied universities at the beginning and at the end of the day, M±m

University	Men			Women		
	Before work	After work	P	Before work	After work	P
TGTU	0,85±0,04	0,77±0,03	<0,05	0,78±0,04	0,63±0,03	<0,05
NUUz	0,78±0,04	0,67±0,04	=0,05	0,79±0,03	0,67±0,04	<0,05
TMA	0,82±0,05	0,68 ±0,05	=0,05	0,80±0,05	0,71±0,03	<0,05

It was also noted that in all universities the degree of change depends not only on the gender of teachers, but also on their age and work experience. As an example, Table 4 shows the characteristics of TSTU indicators dynamics considering age, gender and work experience.

Table 4. The mental productivity coefficient (P) depending on the age and work experience of TSTU teaching staff

Age or work experience	Men n = 52		Women n = 48	
	Before work	After work	Before work	After work
With regard to age				
Up to 30 years	660±39	611±34 P>0,05	668±38	464±40 P<0,05
31-40 years old	662±28	654±27 P>0,05	840±16	590±95 P<0,05
41-50 years old	752±60	569±41 P<0,05	590±57	464±51 P>0,05
51 years or more	562±40	542±52 P>0,05	619±47 P	533±35 P>0,05

Age or work experience	Men n = 52		Women n = 48	
	Before work	After work	Before work	After work
With regard to work experience				
Up to 10 years	681±31	638±25 P>0,05	680±36	470±38 p<0,05
11-20 years	665±27	616±32 P>0,05	643±57	507±48 P<0,05
21-30 years	655±50	590±53 P>0,05	593±64	515±56 P>0,05
31 years or more	532±50	502±66 P>0,05	633±55	508±50 p>0,05

It was revealed that the central nervous system of men is more resistant to the effects of neuropsychic stress, both considering age and work experience: only for teachers aged 41-50 years, at the end of the working day, a significant decrease in the number of performed mental work. In women, the central nervous system is more labile at a young age - a significant decrease in work productivity was found only in women under the age of 40 years and in people with work experience of up to 20 years (apparently younger than people with more work experience), and the younger women, the changes are all the more pronounced: for people under 30 years of age and with work experience of up to 10 years, productivity by the end of the day decreases by 30.9-38.9%, and at the age of 31-40 years and with work experience of 10-20 years - 21.1-29.8%.

A more accurate indicator turned out to be the accuracy factor of the task, which characterizes the quality of the work performed: a significant deterioration in the indicator was noted in most of the studied age and senior groups of teaching staff in both men and women (table 3); only in the age groups of 31-40 years (for men - and at the age of 51 years or more) the deterioration in the quality of work performed by the end of the day was unreliable. In the experience groups,there was no deterioration in the quality of work only for men with an experience of more than 31 years; in other observations, it was found that the less work experience, the more the quality of its work decreases by the end of the day.

In TMA and NUUz, the dynamics of the functional state indicators of the central nervous system, considering the age and work experience, was similar (Table 5).

Table 5. The accuracy factor of the task, depending on the age and work experience of the TSTU teaching staff

Age or work experience	Men n = 52		Women n = 48	
	Before work	After work	Before work	After work
With regards to age				
Up to 30 years	0,84±0,03	0,80±0,04 P>0,05	0,80±0,03	0,58±0,05 P<0,05
31-40 years old	0,92±0,02	0,88±0,02 P>0,05	0,80±0,07	0,70±0,03 P>0,05
41-50 years old	0,94±0,03	0,70±007 P<0,05	0,76±0,04	0,60±0,04 P<0,05
51 years or more	0,70±0,05	0,70±0,03 P>0,05	0,75 ±0,03	0,66±0,44 P>0,05

Age or work experience	Men n = 52		Women n = 48	
	Before work	After work	Before work	After work
With regards to work experience				
Up to 10 years	0,87±0,02	0,78±0,03 P<0,05	0,80±0,03	0,58±0,04 p<0,01
11-20 years	0,90±0,02	0,76±0,04 P<0,05	0,80±0,04	0,69±0,001 P<0,05
21-30 years	0,88 ±0,02	0,70±0,05 P<0,05	0,80±0,05	0,68±0,04 P=0,05
31 years or more	0,65±0,06	0,70±0,08 P>0,05	0,76±0,04	0,64±0,05 P=0,05

Identified similar shifts in the central nervous system's functional state in all tested individuals, in our opinion, are caused by constant neuro-emotional stress, which is the main harmful factor in the activities of the universities' teaching staff and which, ultimately, lead to the emotional burnout development.

The identification and assessment results of the psychoemotional burnout state in the studied population. Emotional burnout indicators in accordance with the methodology used (emotional exhaustion, depersonalization, personal achievement reduction) can be detected in a variety of people, but their nature and severity depend on many factors, including on the characteristics of work.

It can be assumed that one or another EB level is characteristic of all people, in connection with which we tested a group of university employees (50 persons) not belonging to the teaching staff - laboratory assistants, technical workers, accounting workers; this group of researchers served as a control in relation to the teaching staff of universities. It was revealed that emotional burnout signs do occur in this group of patients, but their level is very variable. Thus, low level emotional exhaustion is typical for most people in this group (64.0 ± 6.8%), while a high level of this indicator is noted only in 2 out of 50 cases (4.0 ± 2.8%). A more characteristic EB sign in this group is depersonalization, the average level of which is observed in 52.0 ± 7.1% of the examined, and the personal achievement reduction is characteristic of most of these individuals - its high level was detected in 84% of cases. It is obvious that the claims of this group of people were quite high, but they were practically not realized, which nevertheless did not oppress them, without causing despondency, without depriving the feeling of joy in life.

The data obtained also allow us to conclude that EB indicators can be detected in any person; therefore, the significance of control in such studies is less than considering the level and nature of changes in emotional burnout indicators recommended by the testing methodology.

The emotional burnout possibility and degree assessment of the universities' teaching staff in Uzbekistan, conducted by us in the three universities under research, allowed us to establish a number of important patterns.

General characteristics of emotional burnout among teachers of the studied universities are presented in Table 6.

Table 6. The level of emotional burnout signs at the studied universities' teaching staff, %, M±m

University	Number of tests	Changes level, M±m					
		Low		Average		High	
		abs	%	abs	%	abs	%
1. Emotional burnout							
Control	50	32	64±6,8	16	32,0±6,6	2	4,0±2,8
TMA	M-30	23	21,9±4,0**	59	56,2±4,8*	23	21,9±4,0*
	W-71						
UzNU	M-50	33	33,0±4,7**	39	39±4,9	28	28,0±4,5**
	W-50						
TSTU	M-50	16	16,0±3,7***	56	56,0±5,0*	28	28,0±4,5**
	W-50						
2. Depersonalization							
Control	50	20	40,0±6,9	26	52,0±7,1	4	8±3,8
TMA	M-30	38	36,2±4,7	45	42,8±4,8	22	20,9±4,0*
	W-71						
UzNU	M-50	42	42,0±4,9	44	44,0±5,0	14	14,0±3,5
	W-50						
TSTU	M-50	38	38,0±4,8	24	24,0±4,3**	38	38,0±4,8**
	W-50						
3. Reduction of personal achievement							
Control	50	3	6±3,3	5	10±4,2	4,2	84,0±5,2
TMA	M-30	20	19,0±3,9*	33	31,4±4,5*	52	49,5±5,1**
	W-71						
UzNU	M-50	26	26,0±4,4*	30	30,0±4,6*	44	44,0±5,0**
	W-50						
TSTU	M-50	20	20,0±4,0*	28	28,0±4,5*	52	52,0±5,0*
	W-50						

Pcomparing to the control: * p<0,05, ** p<0,01, ***p<0,001

It is necessary to note a fairly wide individual scatter of indicators, however, the data presented in the table indicate that we practically did not reveal any reliable differences in the average statistics in different universities, with the exception of 3 of 27 indicators. This suggests that the dynamics and level of emotional burnout indicators in all universities are approximately the same, although the percentage distribution of indicators among universities is slightly different (in 88.9% of cases, p> 0.05).

In all 3 universities, the most typical is the average level of change in the EB indicators (from 28.0% to 56.0% of the tested); less often, a low level of changes (from 16.0% to 42.0%) is noted and even less often, a high level (from 14.0% to 52.0%). Of the 3 EB indicators, the highest indicators of emotional exhaustion are characteristic of the average level (39.0-56.2%), for depersonalization - also the average level (24-44.0%), and for the personal achievement reduction - the high level (44-52.0%).

When comparing the EB indicators of the teaching staff with the control group, it was found that the teaching staff is characterized by significantly higher indicators of high and medium levels of emotional

exhaustion and depersonalization, while the personal achievement reduction of medium and high level is more characteristic of individuals in the control group. This allows to conclude that if dissatisfaction with the achieved is typical for 75-80% of the teaching staff, then in the control group, claims of 94% of the tested people were not implemented, which confirms the relative importance of control in this research.

At the same time, comparison with control shows that the teaching staff is characterized by a significantly higher frequency of unfavorable EBindicators. This makes it necessary to identify factors contributing to the formation of the EB of the faculty. It is completely obvious that typical hygienic working conditions (microclimate, lighting, ventilation, etc.), which are not particularly rigid, cannot be the EB cause, although a prolonged deviation of these conditions from hygiene requirements can play the role of contributing factors in the EB development.

We hypothesized that risk factors for EB can be gender, age, and work experience at the university. To assess the significance of sex for EB, the test results were distributed in each university by the frequency and EB indicators level depending on gender. The data presented indicate that both men and women in all universities have unfavorable EB indicators (medium + high level), amounting to 52-85%.

Despite the fact that the natural values of indicators in men and women have some differences, a statistical analysis of the data showed that in no case have we revealed any significant differences in the indicators in these groups. At the same time, the comparative characteristics of the men and women indicators are almost the same in all universities (Table 6). This is also clearly seen in Fig. 3, where the frequency of various levels of EB indicators in men and women at TSTU is presented.

Of all the EB indicators in both men and women, the highest frequency - at the level of average indicators (52-60%) - is emotional exhaustion characteristic. A high frequency of a high level indicator (44-50%) is characteristic for the personal achievement reduction. Given that in the control this indicator is also the highest, it can be assumed that dissatisfaction with the achieved is characteristic of any person and should be considered as a factor in stimulating human activity in the event that this indicator is not predominant in relation to other EB indicatorsю

EEDPAR

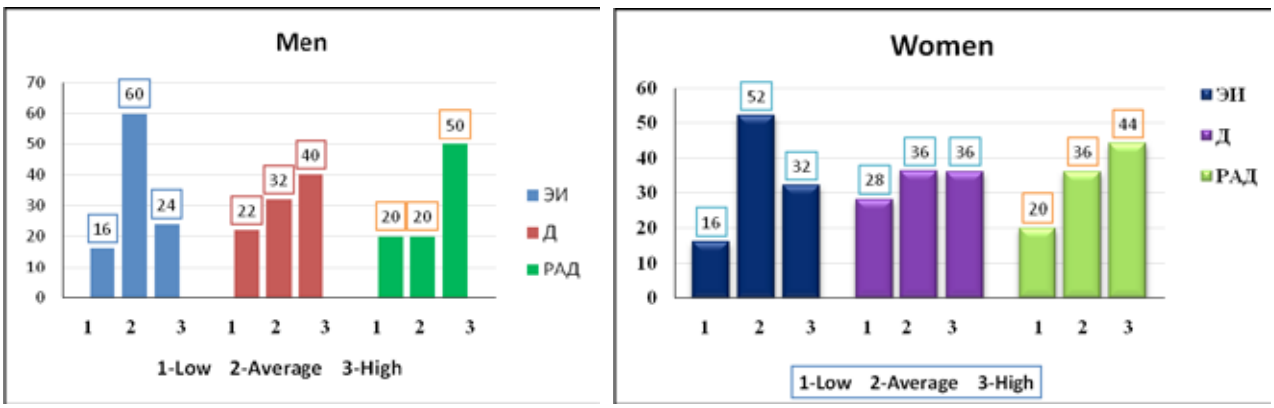


Fig. 3. The frequency of TSTU teaching staff's emotional burnout indicators depending on gender,%

When assessing the significance of the age for EB, we tested all persons under research into age groups: up to 30 years, 31-40 years, 41-50 years and older than 50 years. Given the absence of significant differences between men and women, when assessing the significance of age, the division of subjects in age groups by gender was not carried out.

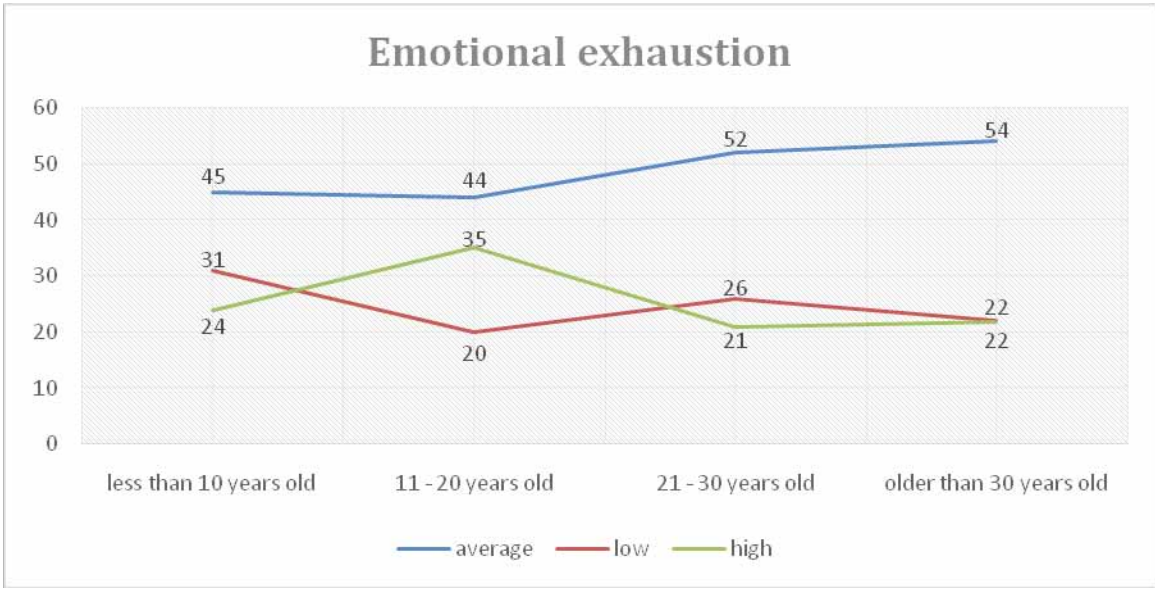
First of all, a comparative analysis of the frequency of the most significant indicator, emotional exhaustion, was carried out in the age-gender groups. The results of this analysis are presented in Tables 7 and 8, from which it can be seen that the distribution of the frequency and level of this indicator in all 3 universities studied is similar, i.e. differences in indicators between universities are not significant.

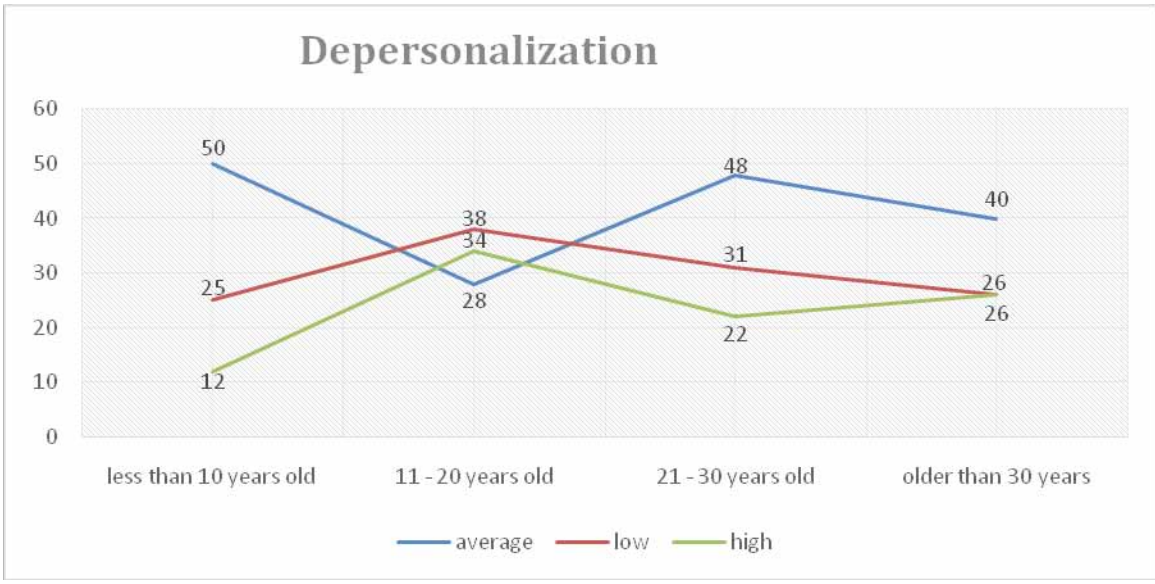
In general, the following patterns can be traced: less often in all age groups there is a low level of emotional exhaustion (3.6-8.1%), somewhat more often (7.8-10.7%) - a high level, most often (7, 2-18.2%) - the average level of EI. At the age of 31-40 years, the frequency of unfavorable types of EE (medium + high) significantly increases (2-3 times in comparison with people under 30), and in 41-50 years - 2.5-7 times compared with the group under the age of 30 years.

After 50 years, the frequency of unfavorable EE levels decreases, but still remains significantly higher in relation to the first age group. Consequently, the most vulnerable group in relation to emotional exhaustion are people aged 41-50 years, i.e. the time of the most active teachers.

The dynamics of depersonalization and personal achievement reduction frequency is similar to the dynamics of emotional exhaustion frequency, but the indicators values are significantly lower than EE; in addition, a significant change in indicators in older age groups compared with the age of up to 30 years was revealed in the group of 41-50 year old teachers and in isolated cases at the age of 31-40 years (high level of "D" and "PAR") and 50 years or more (increase in the number of people with low levels of PAR).

An important factor for the formation of negative trends of emotional burnout turned out to be seniority at the university. Its influence on the level of the studied indicators was mixed. This is evidenced by the data of and graphically shown on Fig. 4.





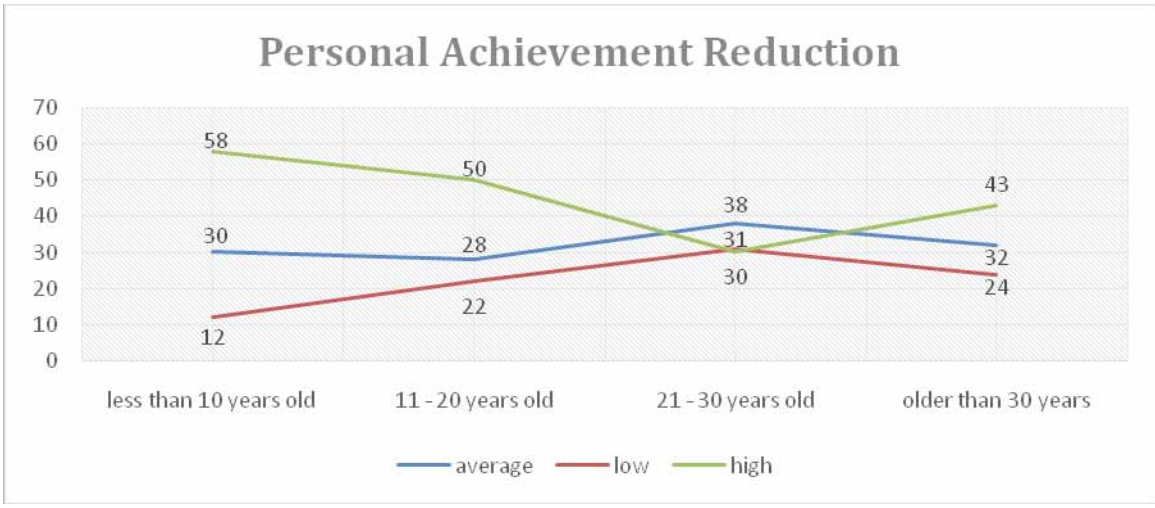


Fig. 4. Dynamics of the emotional burnout indicators level depending on the work experience, %

The indicator of a low EE level changes insignificantly with an increase in the work experience, being detected in 20-30% of the examined persons. Almost at the same level is a high level of changes in EE. The average EE level naturally grows with an increase in the work experience: in individuals with an experience of 21-30 years, the average EE level is recorded 7% more often, and with the experience of more than 30 years - 11% more than with the experience of up to 10 years.

Low and high level of depersonalization occurs in the range of 22-34% and is little dependent on experience. The average level of depersonalization is more characteristic for people with a short work experience (up to 50%), then it decreases almost 2 times (up to 28%), and for people with a work experience of more than 20 years it increases 1.5-1.7 times.

The dynamics of a high PAR level is interesting. Persons with an experience of up to 10 years have a high level of doubt in their own abilities in 58% of cases, then the level of self-esteem increases - with the experience of 21-30 years, only 30% of the tested do not believe in their own strength, but with the experience of more than 30 years, self-confidence is again decreases - 43% of the respondents showed a high level of doubt in their capabilities.

We also studied the psychoemotional state of a TMA teachers group (50 people) at the beginning and at the end of the academic year. The results of these studies showed that by the end of the academic year the number of unfavorable indicators of the psychoemotional state increases significantly. So, by the end of the academic year, the number of teachers with a high level of emotional exhaustion increases 2.5 times, depersonalization - 4 times, with a personal achievement reduction - 2.4 times. This suggests the great importance of a properly organized summer vacation to restore the psychoemotional state of the teacher.

The study of the work content, the functional and psychoemotional state of the universities' teaching staff allows us to draw the following conclusions:

1. Assessment of the functional state of the teachers' CVS throughout the working day indicates that the average statistical indicators of the CVS functional state throughout the working day do not go beyond physiological fluctuations, although the systolic pressure level, especially in people with a long history of work, increases significantly.
2. When assessing the functional state of the central nervous system, a decrease in the quality of the work performed was revealed: a significant deterioration in the indicator was noted in most studied age and senior groups of faculty members in both men and women; it was revealed that the less work experience, the more its quality decreases by the end of the day.
3. Signs of emotional burnout are detected in people who are not involved in pedagogical activities, but the main indicator level of emotional exhaustion in such individuals is low; these individuals are most characterized by a high level of personal

achievement reduction. The revealed facts indicate the relative importance of control in such studies; more informative is the account of the level and nature of the signs of EB.

4. The studied group of teachers is characterized by a wide individual scatter of EB indicators, but the average statistical indicators of EУ, D, and PAR in different universities do not have statistically significant differences:

– The studied group of teachers is not characterized by a low level of changes in the EB indicators, while the prevalence of adverse parameters of changes is noted, i.e. medium and high level changes.

– For EE and D, the most characteristic is the average level of changes, significantly higher than in the control group: for PAR, a high level of changes was detected less often than in the control group, which once again confirms the relative importance of control.

– The average level of emotional depletion of the teaching staff environment is 52-60%, a high level of PAR - 44-50%; average level of D - 22-40%; therefore, the main sign of EB is emotional exhaustion.

5. There were no statistically significant differences in the EB indicators depending on gender - the indicators are almost the same for both men and women in all universities. Adverse parameters of changes in EB (medium + high level) were identified in 52-85% of teachers

6. The most vulnerable age group with a high and medium level of EE are people aged 41-50 years, ie age of the most active teachers.

7. Work experience in a university does not practically change the low and high level of EE and D indicators, while the average level of change in these indicators increases with a work experience growth; a high level of PAR, characterizing the self-assessment of the teaching staff members, was noted among those with the longest work experience, the highest frequency of positive self-esteem was revealed with work experience of 21-30 years, and a sharp decrease in self-esteem of their capabilities was revealed in those with experience of more than 30 years; at the beginning of the academic year, emotional burnout indicators are less pronounced than at the end; this indicates the great importance of rational relaxation for the teachers' psychoemotional state.

Ethical Clearance: No ethical approval is needed.

Source of Funding: Self

Conflict of Interest: Nil

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