

## The Dependence of the Performance of High School Teachers from Professional Stress

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**Abstract:** The aim of this study is to examine the dependence of the states on the performance from the professional stress. Psycho-physiological methods and correlation analysis. In the theoretical departments of teachers were identified pronounced degrees of fatigue index (FI) -10.3% satiety index (SI) - 17.1%, the index of stress (SI) - 16.6%. In the clinical departments of teachers were found high degrees of fatigue index (FI) -1.34%, satiety index (SI) - 1.3%, and severe degree of stress - 16%. Qualitative and quantitative performance of indicators were higher in clinical departments of teachers on all counts. Between indicators of mental performance and stress were identified 8 strong correlations. With increasing of the performance of stress the indicators are declining, but the accuracy of the attention is weakly correlated with increasing of the coefficient of stress and significant differences between the theoretical and clinical departments were found.

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### 1. Introduction

Recent years the interest grows for the matters of professional stress and the mechanisms of stress tolerance in human activities. [1, 2, 3, 4, 5]. Investigation of the mechanisms of stress and coping strategies is the foundation for the development of psychological techniques of prevention, correction and ways to overcome the adverse effects of stress and the improvement of the stress tolerance of a person in the workplace [1, 6, 7, 8, 9].

In modern stress investigation the main is the complexity in explaining features of the interaction between the individual worker and his entourage at work. It is believed that it is necessary to consider the factors of environmental production and updated internal human resources in the aggregate, as the discrepancy between them leads to the formation of various kinds of negative effects of \_ [10]. The presence of an imbalance in the cycle of "personality - professional environment" describes a wide range of adverse \_\_, which include a variety of features to reduce labor efficiency (reduced productivity, defects of the "human factor" in the behavior of inadequacy, fatigue), impaired physical and mental health (psychosomatic illnesses, professional deformation and neurotic disorder) [11, 12, 13, 14, 15]. The aim of this investigation is to examine the dependence of the states on the professional stress.

**2. Methods.** The investigation was conducted for the period from 2011 to 2013. Study sample were teachers of JSC "Astana Medical University" (Astana). In

general, 250 teachers took part in the investigation: 76 men and 174 women, aged 24 to 73 years. The average age of the surveyed is 38.5 years of professional experience on average 13 years (from 1 to 48 years).

Description of examined groups is shown in Table 1.

**Table 1. The surveyed groups**

The contingent of the surveyed		Number
Theoretical departments	Men	32
	Women	143
Clinical departments	Men	44
	Women	31
The total number of the surveyed		250

This scientific investigation includes the following methods:

1. Psycho-physiological: a differentiated assessment of the conditions reduced by working capacity (DACRP), allowing to determine the stress index (SI), monotony index (MI), fatigue index (FI), an index of mental satiation (SI), and assessment of mental capacity with correction test Bourdon-Anfimova. To build the profile of attention at work educators were defined key performance indicators: Number of characters (N), the number of correctly crossed-out symbols (M), the coefficient of performance (speed) of attention (A), the accuracy rate of (T) and the ratio of intellectual efficiency (E).

2. Statistics: software package (SPSS21) used for correlation analysis of indicators in the investigation

of mental performance depending on professional stress.

**3. The main part.** With the aim of detection and differentiation of health states using the technique DORS 250 teachers of theoretical and clinical departments have been studied.

The difference in the intensity of labor, psycho-physiological states of the teachers allowed to separate into 2 groups: the theoretical (175) and clinical (75 people).

In the theoretical departments of teachers following results were obtained (Table).

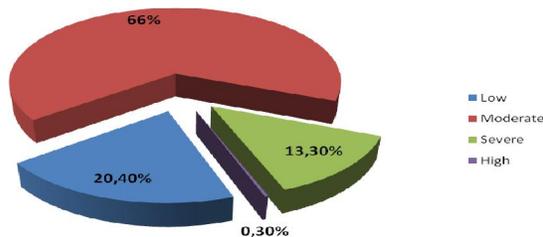
**Table 2. Indicators of health states in the theoretical departments of teachers degree of severity.**

The degree of severity condition	FI		MI		SI		SI	
	abs.	comp.	abs.	comp.	abs.	comp.	abs.	comp.
Low	22	12,6	32	18,3	63	36	26	14,9
Medium	155	77,1	127	72,6	82	46,9	118	67,4
Severe	18	10,3	16	9,1	30	17,1	29	16,6
High	-	-	-	-	-	-	2	1,1

Above mentioned 4 parameters in the theoretical departments of teachers were identified pronounced degree of fatigue index (IS) -10.3% satiety index (PI) - 17.1%, the index of stress (IS) - 16.6%.

The least severe is the index of monotony (MI) - 9.1%, characterized as a state of reduced conscious control over the execution of activities, accompanied by the repetition of stereotyped actions and depleted the environment, feelings of boredom and / or sleepiness, and motivation to change the dominant activity.

The calculation of average values for all four indicators were as follows (Figure 1):



**Figure 1. Percentage of all degrees of severity of health status indicators.**

As can be seen from Picture 1, the relative magnitude of all four indicators the health state at low severity was - 20.4%, moderate - 66%, severe - 13.3% higher - 0.3%.

The calculation of average values for each index matched moderate severity by factors of fatigue, monotony, mental satiation and stress (Table 3).

**Table 3. Average values for indicators of performance.**

Index	Average values	Degree of severity
Fatigue index	20,3±0,3	medium
Monitone index	19,4±0,3	medium
Satiety index	19,1±0,4	medium
Stress index	20,6±0,3	medium

Analysis of the results by the method of DORS among teachers of clinical departments have been showed the following results, which are in Table 4.

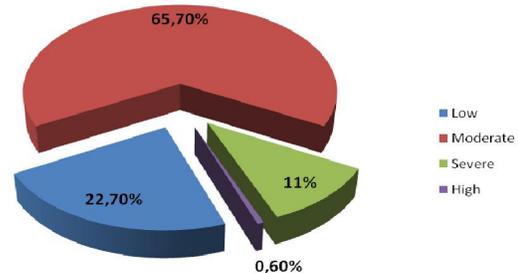
From 4-indices in clinical departments of teachers have been identified high degree of fatigue index (IS) -1.34%, satiety index (PI) - 1.3%, and severe degree of stress - 16%.

The least severe is the index of monotony (MI) - 5.3%.

**Table 4. Indicators of the performance of clinical departments of teachers on degree of severity.**

The degree of severity condition	FI		MI		SI		SI	
	abs.	comp.	abs.	comp.	abs.	comp.	abs.	comp.
Low	19	25,33	18	24	23	30,7	8	10,7
Medium	46	61,3	53	70,7	43	57,3	55	73,3
Severe	9	12	4	5,3	8	10,7	12	16
High	1	1,34	-	-	1	1,3	-	-

The calculation of average values for all four indicators were as follows (Figure 2):



**Figure 2. Percentage of degrees of severity in all states of health indicators for the teachers of clinical departments of teachers on.**

As can be seen from Picture 2 the relative value for all four indicators SSR with low severity was - 22.7%, moderate - 65.7%, severe - 11.0% higher - 0.60%.

The calculation of average values for each index matched moderate severity by factors of fatigue, monotony, mental stress and satiety.

**Table 5. Average values for indicators of performance of clinical departments of teachers.**

Index	Average values	Degree of severity
Fatigue index	19,6±0,5	medium
Monotone index	18,3±0,4	medium
Satiety index	18,2±0,6	medium
Stress index	20,4±0,4	medium

Results of the study of attention from teachers were as follows: qualitative and quantitative indicators of performance were higher in the faculty of clinical departments on all measures except the accuracy factor of attention. Characteristics of performance specified in the table 6. In the clinical departments of teachers the number of characters has been viewed significantly higher at  $1774,2 \pm 47,2$  ( $p < 0,05$ ), than the theoretical faculty chairs  $1637,8 \pm 39$ .

The number of correctly crossed out characters ( $188,8 \pm 3,9$ ), the level of productivity of attention ( $29,9 \pm 0,8$ ) were also significantly higher in ( $p < 0,05$ ), but the level of accuracy of the tasks was lower than that of teachers the theoretical departments, which leads to the conclusion of a significant stress and fatigue in their activities.

**Table 6. Qualitative and quantitative performance of teachers**

Investigated	N	M	T	A	E
theorists	1637,8±39	176,8±3,6	0,95±0,08	27,3±0,7	1550,9±36,3
clinician	1774,2±47,2	188,8±3,9	0,94±0,1	29,9±0,8	1640,6±35,5

According to the men and women in the clinical departments of teachers, all five indicators were presented above, including the quality indicator (the number of correctly crossed-out symbols) was significantly higher ( $p < 0,05$ ), but the accuracy of the attention has been lower than the theoretical departments.

Correlation analysis of indicators of stress and mental performance on five indicators in each group (theoretical, clinical) revealed 10 correlations, of which 8 were negative and two positive.

Analysis of the relationship of mental health from the stress of the teachers the theoretical departments were as follows:

1) the dependence of the number of scanned characters and stress had a strong negative correlation ( $r = -0,924$ ,  $p < 0,001$ );

2) the dependence of quality indicator (correctly erased symbols) and stress had a strong negative correlation ( $r = -0,726$ ,  $p < 0,001$ );

3) the dependence of the accuracy of the job and the stress had a weak positive correlation ( $r = 0,217$ ,  $p < 0,001$ );

4) the dependence of the coefficient of performance and stress had a strong negative correlation ( $r = -0,924$ ,  $p < 0,001$ );

5) the dependence of productivity and mental stress had a strong negative correlation ( $r = 0,842$ ,  $p < 0,001$ ).

Analysis of the relationship of mental health from the stress of the teachers of the clinical departments showed the following:

1) the dependence of the number of scanned characters and stress had a strong negative correlation ( $r = -0,909$ ,  $p < 0,001$ );

2) the dependence of quality indicator (correctly erased symbols) and stress had a strong negative correlation ( $r = -0,909$ ,  $p < 0,001$ );

3) the dependence of the accuracy of the job and the stress had a weak positive correlation ( $r = 0,2$ ,  $p < 0,001$ );

4) the dependence of the coefficient of performance and stress had a strong negative correlation ( $r = -0,909$ ,  $p < 0,001$ );

5) the dependence of productivity and mental stress had a strong negative correlation ( $r = 0,807$ ,  $p < 0,001$ ).

The presence of severe negative relationships between indicators of mental health shows that with increasing values of stress performance indicators are falling, but the accuracy of the attention is weakly correlated with an increase in the coefficient of stress and significant differences between the theoretical and clinical departments were found.

**4. Conclusions.** The investigation of reduced states efficiency, characterized by factors of fatigue, monotony, and mental satiety level of occupational stress has revealed that about half of the teachers have a moderate degree of severity of these indicators, however, it should be noted that teachers in the theoretical departments were identified pronounced degree of fatigue - 10.3% satiety - 17.1%, and stress - 16.6%, and the teachers of the clinical departments expressed the state of stress - 16%, fatigue - 12%, and higher states of fatigue - 1.3% and mental satiety - 1.3%.

The analysis of occupational stress according to the Department of Facilities (theoretical, clinical) revealed that in terms of monotony averages were significantly higher ( $p < 0,05$ ) teachers have the theoretical departments, all other indices of the reduced working capacity of no significant differences were found.

Assessment of mental capacity for correction test Bourdon-Anfimova showed that the number of teachers of the clinical departments visited Marks was significantly higher at  $1774,2 \pm 47,2$  ( $p < 0,05$ ), than the theoretical faculty chairs  $1637,8 \pm 39$ . The number of correctly crossed out characters ( $188,8 \pm 3,9$ ), the

level of productivity of attention ( $29,9 \pm 0,8$ ) were also significantly higher in ( $p < 0,05$ ), but the level of accuracy of the tasks was lower than that of teachers the theoretical departments, which leads to the conclusion of a significant stress and fatigue in their activities that affect the quality of the work itself and is expressed as an error occurs because of the low accuracy of attention.

The dependence of the mental capacity of stress had a strong inverse correlation between qualitative and quantitative indicators in 8 cases, and a weak positive in 2 cases.

The strong negative correlation between the indicators of mental health shows that with increasing values of stress performance indicators are falling, but the accuracy of the attention is weakly correlated with an increase in the coefficient of stress.

In the analysis of stress and mental health of significant differences in the effect of occupational stress on mental performance between the theoretical and clinical departments didn't find, as the correlation coefficients in the groups did not differ.

**5. Findings.** Reduced health status of teachers of the theoretical departments were characterized by expression of the degree of fatigue, stress and satiety, and the teachers of the clinical departments severe degrees of stress, fatigue, and high degrees of fatigue and mental satiation.

Monotony in the labor force was significantly higher ( $p < 0,05$ ) in the teachers of the theoretical departments than clinical, and there is no significant differences on all other indicators of states reduced performance.

Mental performance of teachers of the clinical departments were significantly higher than the theoretical faculty departments, but the level of accuracy of attention that allows us to conclude that a significant stress and fatigue. The dependence of the mental capacity of the stress has a strong inverse correlation in both groups, with no significant differences.

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