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PSYCHOLOGICAL AND PEDAGOGICAL MEASURES TO DEVELOP RESISTANCE TO POST-STRESS DISORDERS IN EMPLOYEES OF THE FIRE SERVICE

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Abstract

This paper reviews the features of the development of post-stress disorders in employees of the State Fire Service under the influence of occupational stress effects. The paper describes a general characteristic of personality traits that contribute to the development of post-stress disorders among employees of the State Fire Service. The novelty of this paper is associated with the study of the influence of character accentuations among employees of the State Fire Service on the development of post-stress disorders under the influence of occupational stress effects.

Keywords

Occupational stress effects – Personality traits – State fire service – Post-stress disorders

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Introduction

The life of a modern individual is increasingly exposed to traumatic factors. This is due to both an increase in the number of technological disasters and natural disasters (earthquakes, fires, tsunamis, etc.) and the unwillingness of the individual to confront these factors. The modern society does not foster personality traits that can withstand the traumatic factors of the external environment in a growing individual. The organization of preschools, ordinary and vocational schools is focused on the average individual and tries to minimize the external impact of stressful and especially traumatic factors. Therefore, when a critical incident occurs, one is not ready to face the psycho-traumatic factors associated with it, which leads to the development of acute stress reactions and the inability of one's body to transition to a normal working state¹.

Touching upon the history of the study of acute stress reactions and post-traumatic disorders in psychology, we see that J.M. da Costa called the condition of soldiers who returned from the war "soldier's heart". This condition is characterized by disturbances in the organic functioning of psychogenic etiology, such as pain in the heart, accompanied by a painful fear of death, psychogenic cough and shortness of breath, various manifestations of neurosis². Subsequently, this condition received other notations, such as anxiety neurosis, war neurosis, anxious heart, da Costa syndrome, where anxiety is indicated as a key personality characteristic in one way or another. Consequently, psychologists name a certain ratio of levels of anxiety and stress tolerance that does not allow the development of post-traumatic stress disorder (PTSD).

Anxiety as a personal characteristic affects the features of the processes of the whole system of an individual's relationship to what is happening in different areas of their activities. A weak (or strong) nervous system, imbalance (or balance) of nervous processes, emotional excitability (or resistance to changes in emotions and mood) are associated with the neurodynamic and temperamental properties of an individual³.

¹ L. I. Antsiferova, "Personality in difficult life conditions: rethinking, transformation of situations and psychological protection", *Psychological Journal* Vol: 15 num 1 (1994): 3-18; P. A. Korchemny y A. P. Eliseev, *Psychological stability in emergency situations: a course of lectures. Unit I, II, III* (Novogorsk: 2000); V. I. Evdokimov y A. I. Gubin, *Assessment of forming of professional burnout syndrome among traumatologists. Psychotherapy Bulletin* Vol: 30 num 35 (2009): 106-119; V. S. Koshkarov y N. V. Shnaider, *The impact of extreme situations on the individual and personality traits of fire service officer. Vestnik Universiteta* num 7 (2011): 106-119; V. S. Koshkarov, *The phenomenon of "burnout" in the activities of employees of structural units. Socio - political aspects of reforming the economic system of modern society: Proceeding of international scientific and practical conference* (Saratov: 2009); I. G. Malkikn-Pykh, *Psychological aid in crisis situations* (Moscow: Eksmo, 2009); M. I. Marin y E. S. Sobolev, *Studying of the impact of working conditions on the functional state of firefighters. Psychological Journal* Vol: 11 num 1 (1990): 102-108; M. I. Marin, *Criteria for assessing the severity of the work of firefighters. Fire case* num 3 (1990) y M. I. Marin; S. I. Lovchan; I. N. Efanova; A. L. Gegel y L. O. Apostolova. *Extreme physiology, hygiene and personal protective equipment* (Moscow: 1990).

² E. Foa; T. M. Kin y M. Fridman, *Effective therapy for post-traumatic stress disorder* (Moscow: Kogito-Center, 2005).

³ A. V. Pischelko, *Psychology of post-traumatic stress. textbook* (Domodedovo: Republican Institute of professional development of MIA of Russia, 1998); M. I. Marin, *Psychological support of the activities of the internal affairs agency in extreme conditions. Guidelines* (Moscow: 2000) y M. M. Reshetnikov; Y. L. Baranov; A. P. Mukhin y S. V. Chernyatt, "Ufa disaster: features of the state, behavior and activities of people", *Psychological Journal* Vol: 11 num 1 (1990): 95-101.

I. Feingerberg draws attention to the fact that in conditions of emotional stress, in a situation of frustration, people with high anxiety level commit more erroneous actions under increased neuropsychic stress than people with medium and low anxiety levels. They consider almost every mistake as a defeat, leading them to become uncertain in their abilities, realize the significance of unfortunate events and their failure. The neuropsychic stress that accompanies one's work under stress exposure increases the "activity price" in the form of energy expenditures for the body as a whole and the psyche in particular. It strains its resources to the limit, destroying the protective mechanisms of the psyche⁴, which ultimately leads to the development of PTSD.

In Russian psychology, PTSD research has been going on for several decades. Thus, the laboratory of post-traumatic stress and psychotherapy under N. Tarabrina opened at the Institute of Psychology of the Russian Academy of Sciences in the 1990s and the Psychological Society of Traumatic Stress was created as early as in May 1991. At the same time, numerous scientific publications appeared on the description and discussion of the pathogenesis of stress disorders among specialists of an extreme profile of professional activity and inhabitants of combat zones or victims of man-made and natural disasters. In particular, it was found that such factors as emotional stability, general state of body systems, switching and focus (concentration) of attention, endurance of the body in relation to specific stressful effects, adaptive mechanisms developed by the individual and positive experience in experiencing similar situations contributed to a successful resolution of the traumatic situation and leveling the development of PTSD⁵.

Methods

To identify the personality traits that determine the development of PTSD in firefighters, we conducted an empirical study, which was organized based on the principles of the comparative method.

The study involved employees of the State Fire Service of the Ministry of Emergency Situations (EMERCOM) of Russia involved in extinguishing fires, rescue operations burdened by human casualties and significant material damage, i.e. people who participated in situations directly related to a threat to life and health while performing their professional duties. The first group of participants included employees without PTSD symptoms; with the average age of 32 years. Employees diagnosed with PTSD formed the second group, with their average age also equaling 32 years.

⁴ I. M. Feingerberg, *Brain. Psyche. Health* (Moscow: Science, 1972).

⁵ L. I. Antsiferova, "Personality in difficult life conditions: rethinking, transformation of situations and psychological protection", *Psychological Journal* Vol: 15 num 1 (1994): 3-18; M. M. Skugarevskaya, "The burnout syndrome. Medical news num 7 (2002): 3-18; E. S. Starchenkova, "Psychological factors of the burnout syndrome (in example of a sales agent) (St.- Petersburg: St.- Petersburg State University, 2002); A. M. Stolyarenko, *Extreme psycho-pedagogy* (Moscow: 2002); V. V. Terbenev y V. A. Grachev, *Organization of the service of the chief guard of the fire department* (Moscow: 2001); A. V. Shlenkov, *Psychological support for the professional training of employees of State Fire Service of EMERCOM of Russia: concept, principles, technologies* (St.-Petersburg: St.-Petersburg University of State Fire Service of EMERCOM of Russia, 2010); A. V. Shlenkov; E. A. Malygina y G. V. Moskalenko, "Influence of negative occupational factors on individual personality traits of fire and rescuers", *Fire and Explosion Safety* Vol: 26 num 10 (2017): 61-68 y V. V. Nechiporenko; S. V. Litvinets; E. V. Snedkov; Y. K. Malikov y V. E. Salamatov, *Psychological and psychiatric aspects of rehabilitation of war veterans. Medical rehabilitation of wounded and sick* (St.-Petersburg: 1997).

The hypothesis of the study

Compared to employees without PTSD symptoms, employees of the State Fire Service at the EMERCOM of Russia with PTSD are less hyperthymic and flexible in thinking but show higher levels of personal anxiety, pessimism and demonstrative behavior.

To achieve the goal of the study, we used the following empirical methods of psychological research: the Traumatic Stress Questionnaire (TSQ) (by I.O. Kotenev) and the Methodology for the Study of Character Accentuations test questionnaire by Leonhard-Schmishek. This technique was also used for preliminary diagnostic differentiation of groups of employees with and without PTSD symptoms.

We applied Student's t-test for independent samples as a method of mathematical and statistical processing of research data. Statistical effects were determined at significance levels of $\alpha \leq 0.05$; $\square \square \leq 0.01$; $\square \square \square \leq 0.001$. Mathematical and statistical data processing was carried out using the STATISTICA program (ver. 7.0).

Results

The results of the intergroup comparison of signs of post-stress disorders measured using the TSQ methodology (by I.O. Kotenev) are presented in Table 1.

Post-stress disorder symptoms	Employee group	Arithmetic mean value	Standard deviation	Empirical value of Student's t-test
Presence of a traumatic event (A1)	1	4.30	2.655	-3.888***
	2	6.64	2.343	
Invasion symptoms (B)	1	14.16	4.450	-6.640***
	2	22.73	6.276	
Evasion symptoms (C)	1	19.62	4.431	-8.371***
	2	30.18	6.075	
Hyperactivity symptoms (D)	1	20.08	5.775	-16.196***
	2	39.18	3.745	
Distress (F)	1	7.62	2.126	-6.440***
	2	11.82	3.264	
Dissociative symptoms (b)	1	15.05	2.972	-8.860***
	2	22.82	4.304	
Invasion symptoms (c)	1	13.03	4.343	-7.074***
	2	21.91	6.100	
Evasion symptoms (d)	1	3.78	1.734	-4.351***
	2	5.55	1.641	
Hyperactivity symptoms (e)	1	31.22	5.618	-16.854***
	2	51.00	3.945	
Maladjustment (f)	1	7.73	2.281	-4.902***
	2	11.18	3.540	
PTSD	1	65.78	13.181	-12.381***
	2	110.55	17.000	
Acute stress disorder	1	75.11	12.249	-11.979***
	2	118.18	17.620	

Depression	1	20.51	4.987	-7.215***
	2	34.36	10.422	

Table 1

Empirical values of Student's t-test, arithmetic mean values, standard deviations for signs of post-stress disorders of the compared groups ($n_1 = 48$, $n_2 = 45$)

Group 1– without PTSD, group 2 – with PTSD

We discovered statistically significant differences in the mean values of the characteristics between the compared groups using Student's t-test for independent samples:

* v at a significance level of $0.01 < \alpha \leq 0.05$;

** –at a significance level of $0.001 < \alpha \leq 0.01$;

*** –at a significance level of $\alpha \leq 0.001$.

The analysis revealed statistically significant differences in arithmetic mean values for all signs of post-stress disorders between the compared groups of employees (Table 1).

The most pronounced changes were observed in the values of Hyperactivity symptoms (e) and Hyperactivitysymptoms (D). Moreover, an increase was detected in the Invasion symptoms (B), Evasion symptoms (C) and Dissociative symptoms (b).

The presence of these changes is due to the influence of traumatic factors on the psyche of the employee in the process of performing their professional activities. Employees with signs of post-stress disorders can demonstrate increased irritability, difficulty falling asleep, outbursts of anger and unmotivated vigilance in all areas of activity. A frequent manifestation of the “anger reaction” can be observed both in professional and official activities. This category of employees has a constant recollection of a traumatic event, a repeated experience when they fall into a similar situation or in the process of dreams. The manifestation of these signs entails attempts to exclude memories or activities reminiscent of a traumatic situation, people, places of stay and thoughts about what happened or the future.

PTSD is a generalized scale that indicates the presence and degree of symptoms of chronic or delayed manifestations of PTSD.

The results of the intergroup comparison of characters measured using the methodology for studying character accentuations (K. Leonhard, G. Schmishek) are presented in Table 2.

Character accentuation symptom	Employee group	Arithmetic mean value	Standard deviation	Empiricalvalueof Student's t-test
Excitability	1	4.95	4.428	-4.061***
	2	9.59	5.231	
Dysthymic character	1	4.78	1.931	-3.499***
	2	6.95	2.273	
Meticulousness	1	8.97	3.700	-3.435***
	2	12.27	4.259	

Cyclothymic character	1	9.89	3.665	-2.801**
	2	12.31	3.810	
Demonstrative character	1	14.00	3.590	2.653**
	2	11.58	4.055	
Hyperthymic character	1	16.86	4.762	2.528**
	2	12.34	5.311	
Fixedness	1	12.32	2.688	-2.076*
	2	14.01	3.341	
Anxiety	1	3.49	3.841	-2.181*
	2	6.61	6.643	
Exaltation	1	10.54	4.776	-1.646
	2	11.34	4.662	
Affectability	1	11.27	8.787	-1.123
	2	11.61	5.011	

Table 2

Empirical values of Student's t-test, arithmetic mean values, standard deviations for signs of accentuation of the character of the compared groups ($n_1 = 48$, $n_2 = 45$)

Group 1— without PTSD, group 2 – with PTSD

We discovered statistically significant differences in the mean values of the characteristics between the compared groups using Student's t-test for independent samples:

* –at a significance level of $0.01 < \alpha \leq 0.05$;

** –at a significance level of $0.001 < \alpha \leq 0.01$;

*** –at a significance level of $\alpha \leq 0.001$.

Discussion

Statistically significant differences were found in the arithmetic mean values of the following signs of character accentuations: Excitability, Meticulousness, Hyperthymic character, Cyclothymic character (Table 2).

The excitable type: the significant differences obtained for this indicator ($p \leq 0.01$) show that the employees of the State Fire Service at the EMERCOM of Russia demonstrated the most pronounced lack of emotional restraint and lack of self-control in behavior in the group with PTSD symptoms compared to the group without them. The participants demonstrated impulsiveness in making decisions, rashness in behavior, irritability, bad temper for any kind of reason, even not very significant. Moreover, this type of accentuation is characterized by low contact in communication, as well as a slowdown in verbal and non-verbal reactions. It is worth noting that the values of this indicator do not give reason to believe in the presence of the high level of the excitable type of accentuation in either of the groups. The meticulous type: the expressed indicators on this scale at $p \leq 0.01$ show the predisposition of employees with PTSD to the inertia of mental processes associated with a long experience of traumatic events. This type of accentuation is also characterized by punctuality, accuracy, tendency to frequent self-tests, doubt about the correctness of the work performed and formalism in it.

The hyperthymic type: unlike the employees of the State Fire Service at the EMERCOM of the Russian Federation with PTSD symptoms ($p \leq 0.05$), the group of employees without PTSD symptoms was prone to greater mobility, sociability, expressiveness of gestures and facial expressions. This type of accentuation is characterized by an improved mood and high vitality. The values of the indicator for the group without PTSD symptoms show an average degree of this type of accentuation among employees.

The cyclothymic type: the obtained significant differences in this indicator ($p \leq 0.05$) may show that employees of the State Fire Service at the EMERCOM of the Russian Federation with PTSD symptoms are more prone to mood changes without significant reasons, are less active in overcoming difficulties and manifesting volitional efforts difficult. With the occurrence of joyful events, they show vigorous activity, but not for long; interpersonal contacts become more active, while with negative events, the emotional background changes, their thinking becomes slow and rigid. The style of communication in the family and at work may change.

The values of the indicator for employees of the group with PTSD symptoms show an average degree of this type of accentuation among employees.

The dysthymic type: the obtained significant differences in this indicator ($p \leq 0.01$) may show that employees of the State Fire Service at the EMERCOM of the Russian Federation in the group with PTSD symptoms are more likely to demonstrate depression and weakness of volitional efforts. This type is characterized by low activity in interpersonal contacts, pessimism regarding upcoming affairs, prospects for the development of the situation, low self-esteem.

The demonstrative type: this type is characterized by the ease of establishing contacts, desire for leadership, need for recognition and desire for constant attention to oneself. Employees belonging to this type are characterized by high adaptability to people; they have good emotional lability and are often predisposed to demonstrate their behavior. The values of the indicators for the group without PTSD symptoms indicate an average degree of this type of accentuation.

Concerning the fixed type, we have revealed certain differences between groups at a significance level of $p \leq 0.05$. Employees of the State Fire Service at the EMERCOM of the Russian Federation with PTSD symptoms are more prone to resentment and vindictiveness. This type of accentuation is also characterized by emotional rigidity, tendency to manifest affective reactions. The values of the indicator for the employees of the group with PTSD symptoms and the group without PTSD symptoms indicate a slight degree of this type of accentuation.

The anxious type is characterized by low contact ability and self-doubt. This type of accentuation can be expressed in underestimation or understatement of one's abilities. It is worth noting that the expressiveness of this indicator does not give reason to believe in its pronounced accentuation, which is a consequence of the professional activities at the State Fire Service at the EMERCOM of Russia, where one needs to keep oneself prepared to solve professional problems. Note that in the group of employees without PTSD symptoms of the State Fire Service at the EMERCOM of the Russian Federation, we mostly observed character accentuations of hyperthymic and demonstrative types while the employees with PTSD symptoms demonstrated the prevalence of fixedness.

Conclusion

1. A theoretical analysis of scientific approaches to the study of PTSD suggests that with the termination of the exposure of an individual to stressful factors acute stress reactions disappear and conditions are created for normalizing the external manifestations of the emotional state. At the same time, the experienced traumatic situation does not stop exerting its influence on the individual. The overwhelming majority of symptoms from experienced stress are transformed into PTSD. Experiencing a traumatic situation affects the life of an individual in all possible spheres, primarily damaging their emotional background and, ultimately, negatively affecting their mental health.

2. A comparative analysis of character accentuation revealed the personality traits of the employees of the State Fire Service at the EMERCOM of Russia, which contribute to the development of PTSD. This includes, first of all, low communication potential, i.e. lack of ability to successfully understand and predict the behavior of people and use different communication styles, low level of the formation of skills of interaction with people of different social backgrounds. These characteristics also include pessimism, inflexibility of thinking, insecurity in one's capabilities and correctness of one's actions, as well as exposure to the influence of the opinion of the majority. Differences were determined at the following levels of statistical significance: $0.01 < \alpha \leq 0.05$; $0.001 < \alpha \leq 0.01$; $\alpha \leq 0.001$.

3. Employees of the State Fire Service at the EMERCOM of Russia with a diagnosis of PTSD compared with employees without PTSD symptoms are characterized by lower socialization, as well as adaptive and communication potential. They typically experience difficulties in establishing contact and interacting with others. These features lead to insufficient behavioral regulation and, as a result, emotional breakdowns (differences are statistically significant at a significance level of $0.001 < \alpha \leq 0.01$).

Among the distinctive features of employees with a diagnosis of PTSD, one can name the depersonalization in professional activities and presence of occupational destruction on the background of developing emotional burnout (differences are statistically significant at a significance level of $0.01 < \alpha \leq 0.05$).

4. Such personal qualities of employees diagnosed with PTSD as resentment, suspiciousness, bad temper and harshness are most pronounced in professional activities, which often leads to affective reactions in the process of conflict resolution and oppositional moods in resolving disputes (differences are statistically significant at the significance level $0.001 < \alpha \leq 0.01$).

Moreover, employees diagnosed with PTSD are prone to aggressive behavior. They demonstrate a high level of physical and indirect aggression (differences are statistically significant at a significance level of $0.01 < \alpha \leq 0.05$).

The further research on the subject that we have raised may be aimed at the development of a methodological apparatus for identifying facts of the development of post-stress disorders in employees of the State Fire Service under the influence of occupational stress effects. Based on the obtained results, one might develop psychological and pedagogical measures in the implementation of psychological support for the professional activities of employees aimed at developing their resistance to post-stress disorders.

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