

СОЦІАЛЬНІ АСПЕКТИ

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GENDER AND SOCIAL FACTORS AS PREDICTORS FOR THE DEVELOPMENT OF DISORDERS OF THE AUTONOMIC NERVOUS SYSTEM IN VETERANS OF THE ANTI-TERRORIST OPERATION*

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Протягом останніх семи років на східній частині України протікає збройний конфлікт, який веде до значних людських втрат з одного боку, а з іншого супроводжується для учасників (як військовослужбовців, так і цивільного населення) підвищеним рівнем емоційного та фізичного навантаження, що часто переходить у стан посттравматичного стресу, чинить руйнівний вплив на психічну та соматичну сферу особистості, змінює її духовні цінності. Вимірювання показників роботи вегетативної нервової системи (збудливість, дратівливість, апатія, млявість; зменшення працездатності; безсоння; гіперстезія, відчуття «грудки в горлі») проводилось у військовослужбовців, які знаходилися на лікуванні в Полтавському обласному клінічному госпіталі для ветеранів війни протягом 2019-2020 років. Предикторами виступали соціальні чинники (наявність працевлаштування та сімейний стан) та стать пацієнтів. Шляхом методу відношення шансів визначали вплив предикторів на розвиток розладів вегетативної нервової системи. В результаті статистичних розрахунків були виявлені фактори ризику клінічних проявів розладів вегетативної нервової системи, що безробіття, з одного боку, підвищує ризик апатії та знижує працездатність, але з іншого - безробітні мають кращий сон; у сімейних людей частіше спостерігається такий прояв, як відчуття "кома в горлі". Аналізуючи вплив статі, було встановлено, що чоловіки частіше почувуються збудженими, а жінки рідше відчують "ком у горлі".

Ключові слова: розлади вегетативної нервової системи, фактори ризику, учасники анти-терористичної операції.

Over the past seven years, an armed conflict has taken place in the eastern part of Ukraine, leading to significant human losses and involving an increased emotional and physical strain on participants (both military and civilian), post-traumatic stress, which has a devastating effect on the mental and somatic sphere of the individual, changes its spiritual values. Measurement of the autonomic nervous system (excitability, irritability, apathy, lethargy; reduced efficiency; insomnia; hyperesthesia, a feeling of "a lump in the throat") was performed in servicemen who were treated at the Poltava Regional Clinical Hospital for War Veterans during 2019-2020. Predictors were social factors (employment and marital status) and the gender of patients. The influence of predictors on the development of disorders of the autonomic nervous system was determined by the method of the odds ratio. As a result of statistical calculations, risk factors for clinical manifestations of disorders of the autonomic nervous system were identified, that unemployment, on the one hand, increases the risk of apathy and reduces efficiency, but on the other - the unemployed have better sleep; in married people, such manifestation as a feeling of "a lump in a throat" is more often observed. Analyzing the influence of sex, it was found that men are more likely to feel aroused, and women are less likely to feel "a lump in the throat".

Key words: disorders of the autonomic nervous system, risk factors, participants in the anti-terrorist operation.

During the last seven years, an armed conflict has been taking place in the eastern part of Ukraine, leading to significant human losses and accompanied by an increased level of emotional and physical strain for its participants (both servicemen and civilians). Soldiers serving in the area of Operation Allied Forces / Anti-Terrorist Operation, in addition to gaining combat experience, are exposed to a variety of traumatic factors, including psychological (threat to life and well-being, constant incredible

physical and psychological stress, experiences with deaths), which leads to a number of psycho-physiological disorders. The experienced stress continues to put pressure on the psychosomatic sphere of people, turns into a state of post-traumatic syndrome and has a devastating effect on the mental and somatic sphere of the individual, changes its spiritual values [6].

Nowadays, the problem of restoring of the normal psychological state of persons who have been subjected

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to psycho-traumatic factors in the zone of military conflict is one of the priorities in the medical practice of our country. Along with the issues of treatment and rehabilitation of such persons, the issue of timely and accurate diagnosis of psycho-physiological disorders in persons returning from the zone of armed conflict is extremely important. [13].

A number of scientific research have been devoted to the study of the physiology of emotions and methods for assessing their changes. Such studies aim to create new objective tools for assessing the affective state of the patient, because it is known that the emergence of emotions is associated with changes in the physiological parameters of the human body [4]. Therefore, it is quite natural for researchers to determine the presence of a particular emotional state, based on these objective physiological indicators.

Among physiological indicators (indicators of the autonomic nervous system) most often use heart rate, arterial pressure and skin galvanic reaction, less often - indicators of gas exchange and level of energy consumption of the person [1, 5, 7, 11].

Materials and methods

Measurements of the autonomic nervous system were performed in 202 servicemen who were treated at the Poltava Regional Clinical Hospital for War Veterans during 2018-2020. The mean age of patients who participated in the study was 41.8±13.229 (95% CI 36.80 – 46.86).

The monitoring was based on the indicators proposed by physical rehabilitation specialists: excitability, irritability; apathy, lethargy; reduction of working capacity; insomnia; hyperesthesia, feeling of "a lump in the throat" [14]. Using the odds ratio method, we determined the relationship between melon symptoms and social factors - marital status, employment and gender of the patient.

Results and discussion

First of all, all patients underwent a general examination of the state of the body's functional capabilities. In all patients who participated in the study, we measured the parameters of central hemodynamics: heart rate, blood pressure and determination of systolic blood volume. The average values of the indicators are shown in table 1.

Table 1
Generalized parameters of central hemodynamics in patients who participated in the study of disorders of the autonomic nervous system

| Indicator | Average value (M+m) |
|--------------------------|---------------------|
| Heart rate | 86.6 ± 1.05 |
| Systolic blood pressure | 137.4± 1.59 |
| Diastolic blood pressure | 90.1 ± 1.05 |
| Systolic blood volume | 3801.3 ± 75.1 |

As can be seen from the above data, in the group of studied patients there are high heart rates and elevated levels of systolic blood pressure. Such changes in indicators confirm the presence of psycho-emotional disorders, emotional lability, and so on.

Since the psychosomatic sphere of a person suffers from stress-related disorders, the rehabilitation of such patients should realize not only through psychological assistance, but also through the normalization of the physical condition. Therefore, the next step of the study was devoted to the evaluation of the performance of the autonomic nervous system in patients treated at the Poltava Regional Clinical Hospital for War Veterans. When assessing the condition in patients identified the following manifestations of dysfunction of the autonomic nervous system: excitability, irritability; apathy, lethargy; reduction of working capacity; insomnia; hyperesthesia, a feeling of "a lump in the throat". As a result of the analysis of the collected data of patients, it was found that the highest frequency among the clinical manifestations of astheno-neurotic syndrome is excitability and sleep disorders, which is 41.6% (84 patients), and the lowest - apathy – 10.4% (21 patients) (Table 2, Fig. 1).

Table 2
Frequency of clinical manifestations of astheno-neurotic syndrome among patients - participants in armed hostilities

| Autonomic disorder | Frequency of clinical manifestations (positive answer) |
|-----------------------------------|--|
| Excitability, irritability | 84 (41,6%) |
| Apathy, lethargy | 21 (10,4%) |
| Reduction of working capacity | 49 (24,3%) |
| Insomnia | 84 (41,6%) |
| Hyperesthesia | 28 (13,9%) |
| Feeling of "a lump in the throat" | 34 (16,8%) |

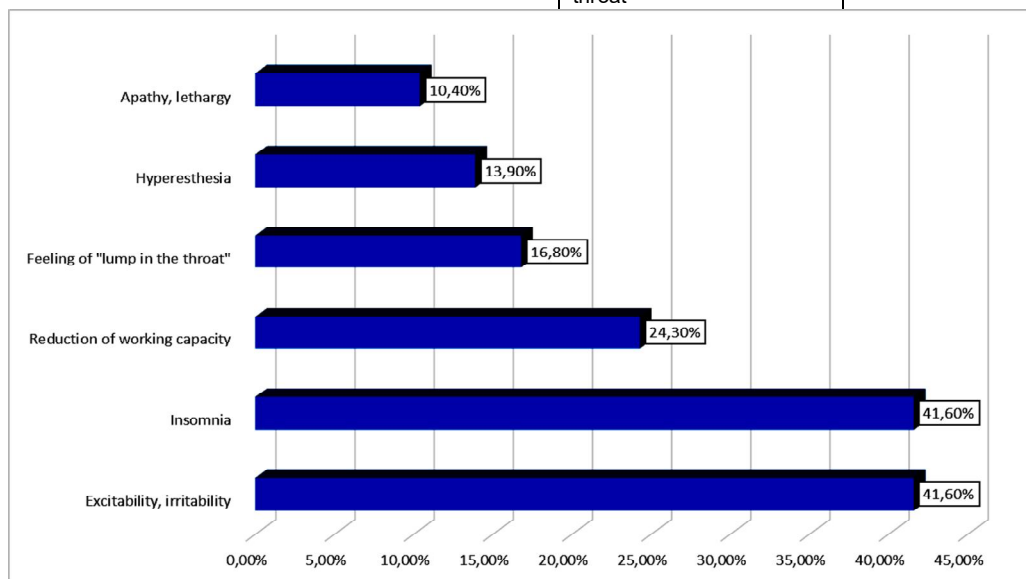


Figure 1. Frequency of clinical manifestations of astheno-neurotic syndrome among patients

An analysis of scientific sources on the rehabilitation of servicemen after returning from the war zone it was found that, according to the research by American scientists, most of the soldiers who returned from Vietnam could not find their place in life. The reasons for this situation were mainly not material, but rather socio-psychological in nature [8, 12]. Therefore, in order to improve the understanding of the organization of work of psychologists and psychotherapists with soldiers during rehabilitation, we correlated autonomic responses to such social components as marital status and job availability, and with the gender characteristics of patients - male or female. Somatic manifestations of disorders of the autonomic nervous system were divided according

to the characteristics identified by the dependent variables.

Comparing the presence of excitability and irritability in the patient with the studied social factors, it was found that these symptoms are by 1.8 times more common in men, OR = 1.8 (95% CI 2.226 – 13.098), p = 0.001 (Table 3). It should be noted that the feeling of excitability in addition to astheno-neurotic syndrome is also a sign of post-traumatic stress disorder. In addition, this feature is extremely important, because due to emotional instability, anti-terrorist operation participants may resort to crime, alcoholism, suicide, conflicts at work. [2, 15]. The relationship between irritability and marital status and employment has not been identified.

Table 3
Distribution of feelings of excitability and irritability as a manifestation of dysfunction of the autonomic nervous system among the participants of the anti-terrorist operation depending on social factors and gender

| Predictor | Excitability, irritability | | X | Odds ratio (95% CI) | P |
|-------------|--------------------------------------|---|-------|------------------------|-------|
| | Excitable n=84 (41.6%) abs (%) | Not excitable n=118 (52%) abs (%) | | | |
| Unemployed | 28 (40.0) | 42 (60.0) | 111 | 0,905 (0.502-1.632) | 0.429 |
| Employed | 56 (42.4) | 76 (57.6) | | | |
| Male | 84 (44.4) | 105 (55.6) | 9.891 | 1.800 (1.585-2.045) | 0.001 |
| Female | 0 (0.0) | 13 (100.0) | | | |
| Not married | 35 (36.1) | 62 (63.9) | 2325 | 0.645 (0.367-1.135) | 0.083 |
| Married | 49 (46.7) | 56 (53.3) | | | |

According to research presented in the literature, job loss can lead to negative consequences in the emotional sphere of the patient, his health and behavior, negatively affects the process of professional adaptation in the new socio-economic conditions [10]. Therefore, when examining the aspects of changes in the autonomic nervous system, it has been noted that the employment of a participant in the anti-terrorist operation has a significant impact on their occurrence.

Examining the influence of social factors on the development of autonomic disorders in the form of apathy and lethargy, it was found that lack of employment increases the risk of such disorders by 4.46 times, OR = 4.46 (95% CI 1.709 – 11.665), p = 0.002, at the same time marital status and gender do not determine the significant impact (Table 4).

Table 4
Distribution of feelings of apathy and lethargy as a manifestation of dysfunction of the autonomic nervous system among the participants of the anti-terrorist operation depending on social factors and gender

| Predictor | Apathy, lethargy | | X | Odds ratio (95% CI) | P |
|-------------|-----------------------------------|------------------------------------|--------|-------------------------|-------|
| | Apathy n=21 (10.4%) abs (%) | Normal n=181 (89.6%) abs (%) | | | |
| Unemployed | 14 (20.0) | 56 (80.0) | 10,607 | 4,464 (1.709-11.665) | 0.002 |
| Employed | 7 (5.3) | 125 (94.7) | | | |
| Male | 21 (11.1) | 168 (88.9) | 1,612 | 1,125 (1.070-1.183) | 0.229 |
| Female | 0(0.0) | 13(100.0) | | | |
| Not married | 7 (7.2) | 90 (92.8) | 2,025 | 0.506 (0.195-1.311) | 0.116 |
| Married | 14 (13.3) | 91 (86.7) | | | |

In determining the relationship between social factors / gender and the level of working capacity, it was found that patients who do not have a job are by 3.5 times more

likely to experience a disorder in the form of reduced work capacity than working people, OR = 3.52, (95% CI 1.807 – 6.872), p = 0.000 (Table 5).

Table 5
Distribution of feelings of apathy and lethargy as a manifestation of dysfunction of the autonomic nervous system among the participants of the anti-terrorist operation depending on social factors and gender

| Predictor | Working capacity | | X | Odds ratio (95% CI) | P |
|-------------|-------------------------------------|------------------------------------|--------|------------------------|-------|
| | Reducing n=49 (24.3%) abs (%) | Normal n=153 (75.7%) abs (%) | | | |
| Unemployed | 28 (40.0) | 42 (60.0) | 14.449 | 3.524 (1.807-6.872) | 0.000 |
| Employed | 21 (15.9) | 111 (84.1) | | | |
| Male | 49 (25.9) | 140 (74.1) | 4.450 | 1.350 (1.241-1.469) | 1.024 |
| Female | 0 (0.0) | 13 (100.0) | | | |
| Not married | 28 (28.9) | 69 (71.1) | 2.157 | 1.623 (0.848-3.107) | 0.096 |
| Married | 21 (20.0) | 84 (80.0) | | | |

According to research conducted by N.V. Danilevska, one of the most common autonomic disorders detected in the participants of the anti-terrorist operation is sleep disorders: insomnia symptoms were detected in 98.63% of cases, $p < 0.01$ [3].

In our study, we found that insomnia is by 54% more common among workers than among those who do not have permanent employment – OR = 0.469 (95% CI 0.254 – 0.868), $p = 0.011$ (Table 6).

Table 6
Distribution of insomnia as a manifestation of dysfunction of the autonomic nervous system among the participants of the anti-terrorist operation depending on social factors and gender

| Predictors | The characteristics of sleep | | X | Odds ratio (95% CI) | p |
|-------------|-------------------------------------|--|-------|------------------------|-------|
| | Insomnia n=84 (41.6%) abs (%) | Normal sleep n=118 (52%) abs (%) | | | |
| Unemployed | 21 (30.0) | 49 (70.0) | 5.918 | 0.469 (0.254-0.868) | 0.011 |
| Employed | 63 (47.7) | 69 (52.3) | | | |
| Male | 77 (40.7) | 112 (59.3) | 0.860 | 1.697 (0.549-5.245) | 0.260 |
| Female | 7 (53.8) | 6 (46.2) | | | |
| Not married | 35 (36.1) | 62 (63.9) | 2.325 | 0.645 (0.367-1.135) | 0.083 |
| Married | 49 (46.7) | 56 (53.3) | | | |

Investigating the interaction of social factors and conditions with the occurrence of autonomic disorders in pa-

tients by type of hyperesthesia, no significant reliable relationship was found (Table 7).

Table 7
Distribution of hyperesthesia as a manifestation of dysfunction of the autonomic nervous system among the participants of the anti-terrorist operation depending on social factors and gender

| Predictors | Hyperesthesia | | X | Odds ratio (95% CI) | p |
|-------------|--|------------------------------------|-------|------------------------|-------|
| | Hyperesthesia n=28 (13.9%) abs (%) | Normal n=174 (86.1%) abs (%) | | | |
| Unemployed | 7 (10.0) | 63 (90.0) | 1.338 | 0.587 (0.237-1.458) | 0.173 |
| Employed | 21 (15.9) | 111 (84.1) | | | |
| Male | 28 (14.8) | 161 (85.2) | 2.236 | 1.174 (1.106-1.246) | 0.135 |
| Female | 0 (0.0) | 13 (100.0) | | | |
| Not married | 14 (14.4) | 83 (85.6) | 0.051 | 1.096 (0.493-2.436) | 0.490 |
| Married | 14 (13.3) | 91 (86.7) | | | |

The last step was to determine the relationship between social factors and such a vegetative manifestation as the feeling of "a lump in the throat" (Table 8).

In married patients, the risk of having such a manifestation as a feeling of "a lump in the throat" is by 5.4 times higher than in single patients – OR = 5.4 (95% CI 2.226 – 13.098), $p < 0.001$. This position is confirmed by the results obtained in a study conducted by Orlovskaya O.A.,

which found that in 100% of cases, people with post-traumatic stress disorder emphasize the psychological problems of relationships with others, especially with family members [9].

At the same time, the chances of having a feeling of "a lump in the throat" are reduced by 10% in women, OR = 0.90 (95% CI 0.502 – 0.978), $p < 0.011$.

Table 8
Distribution of a feeling of "a lump in the throat" as a manifestation of dysfunction of the autonomic nervous system among the participants of the anti-terrorist operation depending on social factors and gender

| Predictors | Feeling of "a lump in the throat" | | X | Odds ratio (95% CI) | p |
|-------------|------------------------------------|------------------------------------|--------|-------------------------|-------|
| | Present n=34 (16.8%) abs (%) | Normal n=168 (83.2%) abs (%) | | | |
| Unemployed | 14 (20.0) | 56 (80.0) | 0.768 | 1.400 (0.658-2.977) | 0.246 |
| Employed | 20 (15.2) | 112 (84.8) | | | |
| Male | 28 (14.8) | 161 (85.2) | 8.534 | 0.905 (0.502-0.978) | 0.011 |
| Female | 6 (46.2) | 7 (53.8) | | | |
| Not married | 27 (27.8) | 70 (72.2) | 16.140 | 5.400 (2.226-13.098) | 0.000 |
| Married | 7 (6.7) | 98 (93.3) | | | |

Conclusions

Analyzing the prevalence of clinical manifestations of disorders of the autonomic nervous system, it was found that the first place in their structure is occupied by excitability, irritability (41.6%) and insomnia (41.6%). The second position is occupied by a decrease in efficiency (24.3%), and in third place is a feeling of "a lump in the throat" (16.8%).

As a result of statistical calculations, risk factors for clinical manifestations of disorders of the autonomic nervous system were identified, that unemployment, on the one hand, the risk of apathy increases and efficiency reduces, but on the other - the unemployed subjects have better sleep; in married people, such manifestation as a feeling of "a lump in a throat" is more often observed. Analyzing the influence of gender, it was found

that men are more likely to feel aroused, and women are less likely to feel "a lump in the throat".

References

1. Benarroch E. E. Physiology and pathophysiology of the autonomic nervous system. CONTINUUM: Lifelong Learning in Neurology. 2020; 26, 1:12-24.
2. Buriak O. O., Hinevskyi M. I., Katerusha H. L. Viiskoviy syndrom «ATO»: aktualnist ta shliakhy vyreshennia na derzhavnomu rivni. Zbirnyk naukovykh prats Kharkivskoho natsionalnoho universytetu Povitrianykh Syl. 2015; 2(43):176-181.
3. Danilevska N. V. Etiopatohenetychni ta nozostrukturalni skladovi porushen snu u viiskovosluzhbovtiv-uchasnykiv ATO. Medychna psykholohiia. 2017; 12, 4:38-40.
4. Goldstein D.S. Differential responses of components of the autonomic nervous system. Handb Clin Neurol. 2013;117:13-22. doi:10.1016/B978-0-444-53491-0.00002-X.
5. Havlovskyi, O. D., Holovanova I. A., Khorosh M. V. , Tovstiak M. M. Doslidzhennia dynamiky invalidnosti v ukraini sered uchasnykiv viiny dia vyznachennia obsiahu nadannia medychnoi dopomohy ta reabilitatsii. Klinichna ta profilaktychna medytsyna. 2019; 4,9-10: 22-30. doi:10.31612/2616-4868.3(9).2019.03.
6. Lapina M. D. Psykholohichni kryterii profesiinoi prydatnosti maibutnikh ofitseriv zapasu ZSU. Visnyk Pryazovskoho derzhavnoho tekhnichnoho universytetu: zb. nauk. prats / DVNZ «PDTU». Mariupol, 2019; 3: 31–35.
7. Low, Phillip A., ed. Primer on the autonomic nervous system. 3-rd edition. Academic Press, 2011, 730 p.
8. Neylan T. C., Marmar C. R. , Metzler T. J. [et al.] Sleep disturbances in the Vietnam generation: Findings from a nationally representative sample of male Vietnam veterans. The American Journal of Psychiatry. 1998;155(7):929–933. doi:10.1176/ajp.155.7.929
9. Orlovska O. A. Simeina adaptatsiia uchasnykiv boiovykh dii: problema psykholohichnykh chynnykiv. Zbirnyk naukovykh prats «Teoriia i praktyka suchasnoi psykholohii». 2019:32-136.
10. Pasichna V. H. Psykholohichni analiz bezrobittia yak sotsialno-ekonomichnoho yavyscha. Problemy suchasnoi psykholohii. 2016;34:406-420.
11. Putliaeva L. V. O funktsyiakh emotsyi v myslytelnykh protsessakh. Voprosy psykholohyy. 1979;1:28.
12. Rosenheck R.A., Fontana A.F. Recent trends In VA treatment of post-traumatic stress disorder and other mental disorders. Health Aff (Millwood). 2007;26(6):1720-1727. doi:10.1377/hlthaff.26.6.1720
13. Shumeiko A. P. Vydy readaptatsii i psykholeabilitatsii uchasnykiv boiovykh dii. Problemy ekstremalnoi i kryzovoi psykholohii. 2017; 21: 220-229.
14. Trad R. Kh. Fizychni vpravy, masazh, hidro- ta mekhanoterapiia u reabilitatsii khvorykh na neirotsyrkuliatornu dystoniuu : avtofef. dys. ... kand. nauk z fiz. vykhovannia i sportu : [spets.] 24.00.02 "Fizychna kultura, fizyчне vykhovannia riznykh hrup naselennia" Trad Reda Khassan ; Nats. UFViSU. K., 1999:16 s.
15. Yena I. A., Masliuk V. V., Serhienko A. V. Aktualnist i orhanizatsiini zasady medyko-psykholohichnoi reabilitatsii uchasnykiv antyterrorystychnoi operatsii. Naukovyi zhurnal MOZ Ukrainy. 2014;1: 5-16.

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