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Gender-associated analysis of high-risk groups for mental health problems in law-enforcement officers

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Abstract

Background. Mental disorders prevention in specific professional groups is impossible without scientifically substantiated allocation of groups with increased neuropsychiatric and psychosomatic disorders risk. This fact indicates the need to study the gender, age and professional characteristics in law enforcement workers who already have problems with psychological adaptation.

Methods and materials. The study involved 1630 law enforcement officers (1,301 men and 329 women) who were evaluated with the Symptom Checklist-90-R (SCL-90-R). As the statistical methods were used the partial regression calculation coefficient $\eta 2$, cohort calculation risk measures, ϕ*-total Fischer transformation method, and single-factor dispersion Fisher's analysis.

Results. According to gender characteristics, the problems with psychological adaptation in men were significantly less pronounced than in women (ϕ*=1.79; p=0.37). These data were confirmed by the cohort calculation and risk measures results: men – 0.261, women – 0.349 (the psychological disadaptation risk in women was 1.3 times higher than men). There weren't any statistically significant age differences between the representatives of both gender groups with psychological adaptation disturbances and healthy ones ($\phi^* \leq 1.19$; $p \geq 0.1$). Among patients who suffered from psychosomatic diseases, were men over the age of 35 ($\phi^* \geq 2.28$; $p \leq 0.0001$) and women over 26 years old (ϕ*= 2.16; p=0.014) prevailed. There were significantly fewer people among men with psychosomatic illnesses with 4-9 years of professional working experience than in a healthy group. On the contrary, there were significantly more patients in a law enforcement workers group with 10-15 years working experience than in the healthy one ($\phi^* > 1.73$; $p < 0.0001$).

Conclusion. The risk of mental health problems in female police officers is much higher than in men. Disadaptation development is not related to the age and length of working experience in the police. Men with working experience greater than 10 years should be included in the risk group for psychosomatic diseases.

Keywords: maladaptation, psychosomatic disorders, gender differences, police officers, age factor

1 Introduction

Studies in professional adaptation have recently become particularly relevant in connection with an increase in a life intensity and in numerous biological and social factors that comprise a relationship between individuals and environment which effects on human adaptive mechanisms [1]. The scientific data states that various and diverse medical, psychological, and social factors are playing a significant role in the etiology of mental maladaptation in the form of psychosomatic diseases and pre-morbid, pre-neurotic conditions [2].

The professionals working at the Ministry of Internal Affairs meet with social constraints, high neuropsychiatric and physical stressors, frequent and intense stress. The purpose of this study was to identify the groups with increased risk for mental adaptation disorders.

We conducted a detailed, differentiated analysis of the gender structure and prevalence of partial psychological disadaptation (PPD) and psychosomatic disorders (PsD) among police officers; studied the influence of such factors as the biological age, length of service in the police, duration of work on the same position on the individual's psychological adaptation; the influence of specific gender and age risk factors on problems with psychological adjustment.

2 Methods and materials

The selection of the respondents in the study was conducted using the Psychopathological Symptom Checklist-90-R (SCL-90-R) (Derogatis L.R. et al., adapted by Tarabrina N.V.) [3]. The test has proven itself as a sensitive indicator of stress states and their psychopathological consequences in many studies. It allows evaluating the patterns of psychological symptoms in psychiatric patients and healthy individuals. The SCL-90-R consists of 90 points. Each item is evaluated on a five-point Likert scale from "0 - not at all" to "4 - very strong" depending on the symptom severity. The points are counted and interpreted in 9 main domains of symptomatic disorders: somatization (SOM), obsessive-compulsive (O-S), interpersonal sensitivity (INT), depression (DEP), anxiety (ANX), hostility (HOS), phobic anxiety (PHOB), paranoid tendencies (PAR), psychoticism (PSY); and three generalized second-order scales (distress indices): general index of symptoms severity (GSI), symptomatic disability index (PSDI), and total positive response (PSD).

For processing and analyzing the obtained results were used the following methods of mathematical statistics: the calculation of the partial regression – coefficient $\eta 2$, cohort calculation risk method, and ϕ* method – Fisher's angular transformation and Fischer's one-factor dispersion analysis [4].

This sample consisted of 1630 internal affairs employees: 1301 - men, 329 - women. As a result of SCL-90-R one-factor dispersion analysis (Table 1), the contingent was divided into three groups in each gender: group 1 - respondents with PPD; group 2 - patients suffering from PsD; group 3 – control (healthy respondents).

In the individuals from PPD group with male gender statistically significant ($p<0.001$) larger scores were observed for all SCL-90-R questionnaire scales and for the GSI, PSD, and PSDI integral indicators in compare to the PsD and control groups. As for female gender, we saw the statistically significant ($r=0.009$) higher scores on the SCL-90-R scale in the PPD group in comparison with other two groups.

Thus, the gender composition of the study groups was as follows:

- Group 1, patients who were diagnosed with partial psychological maladaptation (PPD), comprised of 126 men (70.0%) and 54 women (30.0%). This group included persons without signs of the pronounced socio-psychological disadaptation, but with the objective presence of periodic transient neurotic symptoms.
- Group 2, patients suffering from psychosomatic diseases (PsD), included 213 men (77.74%) and 61 women (22.26%). This group consisted of patients observed by internists about diseases traditionally related to the category of psychosomatoses (peptic ulcer, ischemic heart disease, arterial hypertension, neurodermatitis, etc.).
- The third group, considered as a control group, consisted of apparently healthy, adapted persons (HP); it included 962 men (81.8%) and 214 women (18.2%).

3 Results

According to the results of ϕ* Fisher's transformation criterion calculation, the mental maladaptation prevalence gender features of police officers were discovered. Number of men with psychological maladaptation (n=339; 26.07%)

was significantly (ϕ*=1.79; p=0.37) less than in female employees (n=115; 34.95%); on the contrary, number of apparently healthy individuals with male gender (962 people - 73,93%) was significantly more, than female gender (ϕ*=2.56; p=0.004).

The results of the comparison were confirmed by the cohort calculation data for the occurrence of psychological maladaptation depending on the gender identity: for men, the incidence was 0.261, for women - 0.349. Thus, the risk for development of problems with adaptation, both in the form of psychosomatic illnesses and PPD, was 1.3 times higher for women than for men.

The analysis of the association between psychological maladaptation and specific social characteristics using the partial regression criterion $\eta 2$ has shown statistically significant relationships between the PsD/PPD occurrence frequency and such characteristics as age and experience in the police service ($\eta 2 \geq 0.19$; $p \leq 0.03$) in both gender groups of police officers.

For a detailed study of the specific factors influence on the occurrence of psychosomatic diseases and partial psychological maladaptation, was performed a comparison of

Table 1: The results of sample assessment with SCL-90-R (ANOVA).

Group	Mean			PPD-PsD		PsD-control		PPD-control	
Index	PPD	PsD	Control	F	p	F	p	F	p
				Male gender					
GSI	0.53	0.13	0.05	478	1E-81	77.32	9E-18	64.64	5E-14
PST	35.12	10.08	4.06	140.7	1E-17	77.99	7E-18	157.59	1E-27
PSDI	1.23	0.93	0.79	36.91	2E-09	5.56	0.018	14.4	1E-04
SOM	0.63	0.21	0.08	429.4	3E-75	66.67	1E-15	54.19	3E-12
O-C	0.67	0.18	0.08	542.4	6E-09	42.88	1E-10	85.11	2E-17
INT	0.7	0.17	0.09	508.5	1E-85	32.92	1E-08	93.31	1E-18
DEP	0.5	0.13	0.04	370.5	6E-67	57.83	8E-14	48.69	3E-11
ANX	0.52	0.11	0.03	391	7E-70	51.01	2E-12	55.48	2E-12
HOS	0.53	0.14	0.04	375.6	1E-67	50.59	3E-12	48.06	4E-11
PHOB	0.28	0.03	0.01	133.4	2E-28	6.65	0.01	25.83	8E-07
PAR	0.66	0.2	0.08	420.1	6E-74	34.32	7E-09	59.16	5E-13
PCY	0.26	0.04	0.01	106.8	2E-23	20.51	7E-06	18.57	2E-05
ADD	3.58	0.99	0.35	381	2E-68	46.48	2E-11	51.2	1E-11
				Female gender					
GSI	0.31	0.16	0.05	249.9	1E-35	13.83	4E-04	35.55	1E-08
PST	23.34	12.68	3.94	366.1	7E-45	13.1	6E-04	38.09	4E-09
PSDI	1.23	0.96	0.82	13.58	3E-04	4.11	0.046	2.34	0.128
SOM	0.36	0.21	0.08	65.53	9E-14	4.92	0.03	19.39	2E-05
O-C	0.46	0.2	0.07	186.7	2E-29	17.32	8E-05	21.92	6E-06
INT	0.48	0.24	0.09	168.1	2E-27	11.93	9E-04	19.4	2E-05
DEP	0.3	0.16	0.04	110.5	2E-20	7.57	0.007	23.82	2E-06
ANX	0.2	0.1	0.03	92.28	8E-18	7.01	0.01	20.4	1E-05
HOS	0.29	0.12	0.05	67.17	5E-14	10.95	0.001	9.61	0.002
PHOB	0.11	0.05	0.01	37.32	6E-09	3.38	0.07	12.62	5E-04
PAR	0.54	0.25	0.06	188.7	1E-29	14.08	3E-04	32.19	5E-08
PCY	0.11	0.05	0.01	38.93	3E-09	2.41	0.125	20.19	1E-05
ADD	2.03	1.24	0.38	75.53	2E-15	2.6	0.111	14.17	2E-04

their structure among police officers depending on gender (Table 2).

According to the results of the **φ*** Fisher angular transformation (Table 3), in the PsD male gender group, the number of police officers aged 20-25 (n=5; 2.35%) was significantly ($\phi^* \geq 1.68$; $p \leq 0.03$) lower than in the PPD (n=35; 27.78%) and HP groups (n=271; 28.17%); this difference was not observed in females ($\phi^* \leq 1.2$; $p \geq 0.09$). In both gender groups, there weren't statistically significant differences in the number of employees aged 26-35 between individuals with psychosomatic disorders and healthy volunteers ($\phi^* \leq 1.19$; $p \geq 0.1$); but number of those >35 years old were significantly higher in the PsD in compare to HP group ($\phi^* \geq 1.72$; $p \leq 0.0001$).

Within both genders, in none of the age groups there weren't any statistically significant differences between the number of persons with PPD and HP ($\phi^* \leq 1.19$; $p \geq 0.1$).

When analyzing the age distribution of respondents (Table 3), it was shown that persons aged 26-35 years old with male gender had predominated in the PPD group ($\phi^* \geq 2.02$; $p \leq 0.0001$); as for female gender, statistically significant difference was not observed within the allocated age categories ($\phi^* \leq 1.04$; $p \geq 0.1$).

In PsD group, the greatest number of patients within the male gender was over the age of 35 ($\phi^* \geq 2.28$; $p \leq 0.0001$), and in the female gender - over 26 years (ϕ^*=2.16, p=0.014). The greatest number of both men and women classified as HP group was at the age of 26-35 years ($\phi^* \geq 2.28$; $p \leq 0.0001$).

The results of the analysis suggest that the risk of partial psychiatric disadaptation doesn't have age specificity for both genders of the study contingent. At the same time, older police officers were more likely to develop psychosomatic diseases; greater risk was observed in men over 35 and women over 25.

Analysis of the length of service in the police and the length of service in the occupied position has shown differences in study groups gender structure. The number of men with PPD and 1-3 years' service in the police (n = 35; 27.78%) was significantly lower (ϕ^*=1.68; p=0.008), and with more than 15 years of service (n=15; 11.9%) was significantly higher ($\phi^* \geq 1.89$; p<0.0001) than those with PsD (n=5; 2.35% and n=72; 33.8%, respectively). In addition, within the male gender the proportion of people with a service record of 4-9 years in the PsD group (n=40; 18.78%) was significantly smaller (ϕ^*=1.73, p=0.0001), and with the length of service 10-15 years (n=96; 45.07%) was significantly larger (ϕ^*=2.56; p<0.0001) than in the practically healthy individuals (n=301; 31.29% and n=294; 30.56%, respectively). In female gender, there weren't any statistically significant differences among the PPD, PsD and HP groups ($\phi^* \leq 1.22$; $p \geq 0.054$).

With further pairwise comparison of patients with PsD, depending on the length of service in the police, it was demonstrated that in males the least number of patients had a service record of 1-9 years, and the largest one - 10 years or more ($\phi^* \geq 1.75$, $p \leq 0.043$); within females there weren't any statistically significant differences in the distribution by service duration ($\phi^* \leq 1{,}49$; p>0,1). A similar comparison of patients with PPD indicates the absence of an association between regular service time and the occurrence of psychological disadaptation ($\phi^* \leq 1.53$; p>0.1). Among the healthy individuals regardless of gender, prevailed employees with 4 to 9 years of service experience, and the number of young specialists with 1-3 years of experience ($\phi^* \geq 1.7$; p<0.0001) were the least.

Thus, into the high-risk group regarding psychosomatic diseases can be included male police officers with a total length of service more than 10 years. In women, the risk of PsD development is not related to the length of service. At the same time, the risk of partial psychological disadaptation is not related to the length of service in the internal affairs institutes, regardless of gender.

It was found that in the control group (healthy individuals) the number of males who served in the current position for 1-3 years was significantly higher in comparison to PPD group ($\phi^* \geq 2.15$; p<0.0001). In the PMD group, there were significantly more such patients ($\phi^* \geq 1.67$; p<0.0001) than in the PSD group (Table 2). The number of employees who served from 4 to 6 years was significantly higher in the PsD group than in PPD and HP groups without statistically significant differences between them (ϕ^*=0.18; p>0.1). Among females, there weren't any statistically significant differences between the study groups depending on the length of service in the occupied position ($\phi^* \leq 1.04$; p>0.1).

In addition, the number of persons with experience in the current position for 1-3 years was significantly greater ($\phi^* \geq 3.53$; p<0.0001) in males from PPD group and females from HP group ($\phi^* \geq 3{,}43$; p<0.0001) in comparison to those who served 4 or more years. In PsD group, there were no statistically significant differences in length of service in the

Table 2: Distribution of respondents by age and length of service.

Gender	Male						Female					
Group	PPD		PsD		HP		PPD		PsD		HP	
Index	Abs.	%	Abs.	%	Abs.	%	Abs.	%	Abs.	%	Abs.	%
Age												
20-25	35	27.78	5	2.35	271	28.17	17	31.48	5	8.20	66	30.84
26-35	61	48.41	84	39.44	402	41.79	23	42.59	24	39.34	120	56.07
>35	30	23.81	124	58.22	289	30.04	14	25.93	32	52.46	28	13.08
Length of service in internal affairs institutions												
1-3	35	27.78	5	2.35	208	21.62	19	35.19	2	3.28	53	24.77
4-9	31	24.60	40	18.78	301	31.29	19	35.19	27	44.26	87	40.65
10-15	45	35.71	96	45.07	294	30.56	8	14.81	16	26.23	58	27.10
>15	15	11.90	72	33.80	159	16.53	8	14.81	16	26.23	16	7.48
Length of service in the current position												
1-3	75	59.52	66	30.99	430	44.70	26	48.15	27	44.26	113	52.80
4-6	23	18.25	76	35.68	191	19.85	17	31.48	23	37.70	55	25.70
>6	28	22.22	71	33.33	341	35.45	11	20.37	11	18.03	46	21.50

Table 3: The results of ϕ* Fisher's angular transformation depending on the age and length of service.

№*	PPD-PsD		PPD-HP		PsD-HP		Group	PPD		PsD		HP	
	M	F	M	F	M	F	Gender	M	F	M	F	M	F
Age													
A	1.68	1.20	0.05	0.05	1.80	1.29	A-B	2.02	0.72	2.28	1.58	3.65	3.36
B	1.08	0.23	0.97	1.19	0.40	1.51	A-C	0.36	0.34	3.13	2.16	0.49	1.94
C	3.52	1.72	0.73	1.00	5.36	3.40	B-C	2.33	1.04	2.67	0.98	3.18	4.54
Time of service in internal affairs institutions													
1	1.68	1.22	0.78	0.85	1.46	0.94	1-2	0.29	-	1.24	1.49	2.44	1.96
							1-3	0.76	1.14	2.54	0.95	2.25	0.28
2	0.59	0.62	0.79	0.45	1.73	0.33	2-3	1.04	1.14	3.06	1.21	0.19	1.70
							1-4	1.31	1.14	2.02	0.95	1.23	1.71
3	1.06	0.66	0.68	0.81	2.56	0.07	2-4	1.23	0.78	1.75	1.21	3.57	3.05
4	1.89	0.66	0.49	0.55	-	-	3-4	1.53	-	1.48	-	3.39	1.92
Length of service in the current position													
I	3.45	0.28	2.38	0.43	2.15	0.80	I-II	3.69	1.10	0.59	0.47	6.22	3.43
II	1.67	0.41	0.18	0.46	2.63	1.04	I-III	3.53	1.66	0.29	1.62	2.61	3.79
III	1.12	0.14	1.49	0.08	0.34	0.26	II-III	0.35	0.66	0.30	1.21	3.89	0.50

* Age: A - 20-25 years; B - 26-35 years; C - over 35 years. Service experience: 1 - 1-3 years; 2 - 4-9 years; 3 - 10-15 years; 4 - more than 15 years. Length of service on the current position: I - 1-3 years; II - 4-6 years; III - more than 6 years.

current position, regardless of gender ($\phi^* \leq 1.62$; p>0.1).

4 Conclusion

In the internal affairs institutions, the risk of mental disorders for females is much higher than for males. At the same time, the state of partial psychological disadaptation among police officers does not have age and gender specificity and is not related to the length of service in the internal affairs institutions.

The risk of psychosomatic illness is related to the age factor. PsD is more common among police officers in older age groups than in younger ones. The highest risk for psychosomatic disease was observed in male police employees with a service experience more than 10 years. For women, the PsD development risk wasn't related to the length of service. The absence of association is probably because female police officers with age were more engaged in a family life, which served as a protection to problems related to the service. On the contrary, male police officers, as they accumulate professional experience, do not change their behavioral and emotional patterns as well as professional priorities. Most likely, this gender feature explains increased psychosomatic diseases incidence in males after several years of service as police officers.

5 Additional information

5.1 Competing interests

The author declares that no competing interests exist.

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