DOI 10.1007/s11055-018-0578-4
Neuroscience and Behavioral Physiology, Vol. 48, No. 4, May, 2018

Relationship between Burnout Syndrome and Personality Characteristics in Emergency Ambulance Crew

A. Bergmueller,[1] I. Zavgorodnii,[2] N. Zavgorodnia,[3] W. Kapustnik,[2] and I. Boeckelmann[1]

Translated from Zhurnal Nevrologii i Psikhiatrii imeni S. S. Korsakova, Vol. 116, No. 12, Iss. 1, pp. 25–29, December, 2016.

Objectives. Being an ambulance doctor is a profession characterized by high psychological and emotional loads. The aim of the present work was to determine the probability of developing professional burnout in ambulance doctors and to identify the relationship between its occurrence and the doctors' personality characteristics. **Materials and methods.** The MBI-GS questionnaire and the Freiburg personality inventory (FPI) were used in 97 ambulance doctors – 57 women and 40 men. Mean age was 37.0 ± 12.21 years. Relationships between variables were identified by correlation and regression analysis. **Results and conclusions.** The risk of developing professional burnout was detected in nine respondents (11.5%). Individual symptoms of burnout were seen in 28 doctors (35.9%). The risk of emotional burnout was not diagnosed in the ≥45 age group. These results led to the conclusion that ambulance staff in general are characterized by stable personality features but nonetheless we emphasize the need to detect the symptoms of professional burnout to prevent it and develop programs for measures increasing personal stress resistance among workers.

Keywords: professional burnout syndrome, personality profile, ambulance crew.

Ambulance doctors work in a profession characterized by high levels of psychological and emotional loading [1]. The state of health of this group of workers is affected by experience of extreme professional activity in past or experience of mental tension [2–5]. Data from a number of authors [6, 7] indicate that ambulance doctors can develop post-traumatic stress disorder. There are few reports of studies of daily stress in emergency response workers [8–11]. This also applies to professional burnout syndrome.

Data obtained from studies of other professional groups point to the existence of a connection between personality characteristics and the occurrence of professional burnout syndrome. Data reported by Pick and Leiter [12] show that the effects of personality factors constitute a relatively weak predictor of the occurrence of professional burnout syndrome. However, overall, the question of the effects of personality structure on the development of professional burnout syndrome has received insufficient study, especially in relation to the specific features of work activities. This applies to ambulance doctors. Most existing publications address the "ancillary" professions – ward sisters [13], volunteers [14–16], etc. Among articles directly addressing ambulance doctors we note the report from Pajonk et al., [17], which established a link between particular personality structures and professional burnout syndrome.

The aim of the present work was to determine the probability of developing professional burnout in ambulance doctors and to identify the relationship between its occurrence and personality characteristics.

Materials and Methods. The initial cohort included 97 ambulance doctors (57 women, 40 men).

The mean age of respondents was 37.0 ± 12.21 years (minimum 19 years; maximum 73 years). A total of 47 subjects (48.5%) were in the <35 years old age group; 23 (23.7%)

[1] Institute of Occupational Medicine, Faculty of Medicine, Otto von Guericke University, Magdeburg, Germany; e-mail: irina.boeckelmann@med.ovgu.de.
[2] Kharkov National Medical University, Kharkov, Ukraine.
[3] Department of Psychology, Zhukovskii National Aerospace University (Kharkov Aviation Institute), Kharkov, Ukraine.

TABLE 1. Distribution of Subjects by Gender and Age

Age group	Women, *n* (%)	Men, *n* (%)	Total, *n* (%)
<35 years	25 (53.2)	22 (46.8)	47 (48.5)
35–45 years	15 (65.2)	8 (34.8)	23 (23.7)
≥45 years	17 (63.0)	10 (37.0)	27 (27.8)
Total	57 (58.8)	40 (41.2)	97 (100)

TABLE 2. Values on the MBI-GS Scale in Doctors of Different Age Groups

Assessment	<35 years		35–45 years		≥45 years	
	abs.	%	abs.	%	abs.	%
Emotional exhaustion						
low	20	43.5	8	34.8	15	55.6
intermediate	8	17.4	6	26.1	9	33.3
high	13	39.1	9	39.1	3	11.1
Depersonalization						
low	19	40.4	5	22.7	12	44.4
intermediate	11	23.4	10	45.4	11	40.7
high	17	36.2	7	31.8	4	14.8
Personal achievement						
low	7	14.9	1	4.5	3	12
intermediate	3	6.4	2	9.1	3	12
high	37	78.7	19	86.4	19	76

were aged 35–45 years, and 27 (27.8%) were ≥45 years old (Table 1).

During the study, 66 doctors (71.7%) were in an official or civil marriage (partnership); 27 (27.8%) were single; 50 males (51.5%) were married; three (3.3%) were widowed, and 17 doctors (17.5%) were separated. A total of 56 subjects (57.7%) had children.

Anonymous questionnaires were run to assess social-demographic and professional data.

The following special scales were also used.

The Maslach Burnout Inventory – General Survey (MBI-GS) assesses the risk of developing burnout on the basis of three subscales: "emotional exhaustion" (EE), "cynicism" (depersonalization) (D*) and "personal achievements" (PA) [18]. The MBI-GS was used as a questionnaire containing 16 questions: five each for EE and D, and six for PA. The questions were assessed on a seven-point scale: from 0 = "never" to 6 = "every day." The respondent had to give explanations for subjective attitudes to the question variants used. At the first stage, the detection of professional burnout syndrome on each of these scales was assessed. Results were then evaluated using the Kalimo et al. classification [19]. This required transformation of the PA scale into the reduced PA scale and construction of an overall result on the following principle: total burnout score = (0.4 × EE + 0.3 × D + 0.3 × red PA).

Total scores were used to classify burnout syndrome as follows: 0–1.49 points – absent; 1.50–3.49 – partial symptomatology; 3.50–6.00 – risk of developing the condition.

The Freiburg Personality Inventory (FPI) was used for diagnosis of states and personality traits of fundamental importance for social adaptation and the control of behavior [20]. The questionnaire consisted of 114 questions formulated as statements and grouped into 12 scales: neuroticism (17 questions), spontaneous aggressivity (13), depressivity

* In the original version of the questionnaire, this scale was termed "cynicism," which in Russian does not convey the concept of depersonalization adequately. However, designating the scale in the original questionnaire as "depersonalization" does not correspond exactly with the term as used in clinical psychiatry.

TABLE 3. Results from Studies of Personality Traits Using FPI Scores in Different Age Groups

Category of personality traits	Age group, years			*p*
	<35	35–45	≥45	
Neuroticism	5.36 ± 2.079	5.83 ± 1.723	5.59 ± 0.005	0.576
Spontaneous aggressivity	5.30 ± 2.176	5.04 ± 2.225	3.96 ± 2.066	0.073
Depressivity	4.72 ± 2.184	4.65 ± 2.058	5.19 ± 1.841	0.565
Irritability	6.02 ± 1.751	5.43 ± 2.107	5.33 ± 1.941	0.169
Sociability	4.11 ± 1.272	3.96 ± 1.186	4.30 ± 1.382	0.632
Mental balance	6.60 ± 1.963	5.04 ± 2.671	5.56 ± 2.225	0.019
Reactive aggressivity	6.21 ± 2.116	5.91 ± 2.151	5.59 ± 2.099	0.528
Shyness	6.15 ± 1.615	6.48 ± 1.504	6.63 ± 1.573	0.709
Openness	6.00 ± 1.818	6.43 ± 2.171	6.04 ± 2.227	0.604
Extraversion-introversion	7.00 ± 1.588	5.70 ± 2.032	5.89 ± 1.528	0.003
Emotional lability	5.32 ± 1.795	5.65 ± 1.668	5.41 ± 1.716	0.795
Masculinity-femininity	7.06 ± 1.566	6.09 ± 1.929	6.07 ± 1.567	0.013

TABLE 4. Correlation Analysis Results

Category of personality traits, Freiburg questionnaire	MBI-GS scale		
	EE	D	PA
Neuroticism	0.35**	0.30**	Not significant
Spontaneous aggressivity	Not significant	0.21*	
Depressivity	0.30**	0.28*	
Sociability	–0.24*	–0.20*	
Mental balance	–0.23*	–0.20*	
Emotional lability	0.29**	0.25*	

Significant correlations: *$p = 0.05$, **$p = 0.01$.

(14), irritability (11), sociability (15), mental balance (10), reactive aggressivity (tendency to dominate) (10), shyness (10), openness (13), masculinity-femininity (15); there were also two supplementary scales: extraversion/introversion (12) and emotional lability (14).

Results were processed in two stages. The first stage yielded primary assessments. This involved using a template to count the numbers of "yes" and "no" responses on each scale. In the second stage, primary assessments were converted to standard assessments on a nine-point scale using a special table. After processing the study results, plots of personality profiles constructed to highlight high and low values were examined thoroughly. Low values were those in the range 1–3 points, intermediate were 4–6 points, and high values were 7–9 points.

The overall work experience of the doctors questioned was 14 ± 11.58 years (range 1–43 years). Twelve doctors (12.4%) had senior positions. Additionally, two doctors (2.1%) worked on air ambulances and were in the under-35 age group.

Before higher education, 25 doctors achieved intermediate education: 10 (40%) as nurses, nine as paramedics, and 6 as other professions. The time worked per month was 25–48 h in two people (2%), 49–72 h in four (4%), 72–96 h in eight (8%), and more than 96 h in 86 (86%).

Results and Discussion. *MBI-GS scale*. Results of assessments on the MBI-GS of ambulance doctors allowing for age are shown in Table 2.

Results obtained on the MBI-GS scale and subscales provided evidence that in the under-35 age group, indicators

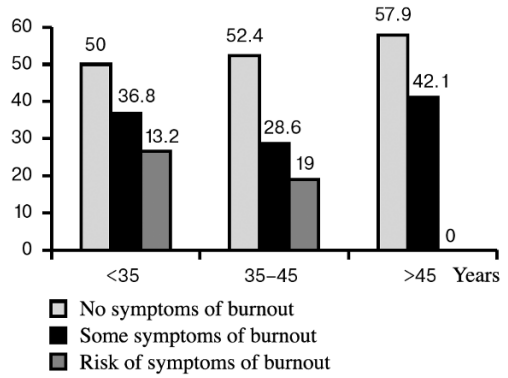

Fig. 1. Risk of emotional burnout in ambulance workers by age. The abscissa shows age groups; the ordinate shows number of workers (%).

of EE were distributed essentially uniformly between "low" and "high" levels, which can be explained by the establishment of psychophysiological mechanisms of adaptation to work in the conditions of performing responsible tasks. At the same time, high levels of EE were more characteristic of staff in the 35–45 years age group (39.1%), which may reflect increases in the disruption of compensatory mechanisms in this category of workers. The ≥45 years age group showed adaptive stability of workers to factors of the work process, which was supported by low (55.6%) measures on the "emotional burnout" scale.

Values for D showed low levels in the <35 years age group (40.4%) and gradually increased to an intermediate level (45.5%) in the 35–45 years age group. The ≥45 years age group maintained an intermediate (40.7%) level of D.

Assessment of the PA scale supported high levels in ambulance workers of all age groups. Thus, in accordance with the Kalimo et al. [19] classification of professional burnout, 13.2% of staff members in the under-35 age group and 19% in the 35–45 years age group were at risk of professional burnout. In the ≥45 years age group, which were assessed in only 78 questionnaires, 41 (52.6%) had no symptoms of burnout, 28 (35.9%) had partial symptomatology, and nine (11.5%) were at risk of burnout.

Detailed consideration of data by age (see Fig. 1) using the Kalimo professional burnout classification showed that five (13.2%) staff members of the <35 years age group and four (19%) of the 35–45 years age group were at risk of professional burnout. No subject in ≥45 years age group was in this category, which is evidence of the formation of stable psychophysiological mechanisms for supporting work activity among ambulance workers of this age group.

It is of concern that 14 (36.8%) workers aged under 35 years, six (28.6%) of those aged 35–45 years, and particularly eight (42.1%) in the ≥45 years age group showed some symptoms of professional burnout.

These data point to the need to develop and implement prophylactic measures along staff at risk of developing professional "burnout" (see Fig. 1).

The results of studies using the FPI are shown in Table 3. Assessment in terms of various categories of personality traits by age showed that most measures were in the normal ranges. However, values for "mental balance," "extraversion-introversion," and "masculinity-femininity" were significantly higher in the <35 years group than the ≥45 years age group. A decrease in the level of "spontaneous aggressivity" in the ≥45 years age group was at the level of a tendency (3.96 ± 2.066, $p = 0.073$) as compared with the <35 years age group (5.30 ± 2.176).

Correlation analysis between measures on the MBI-GS and FPI scales identified personality factors associated with burnout syndrome (Table 4).

Increases in values for the "neuroticism," "depressivity," and "emotional lability" categories were accompanied by increases in the EE and D scales. Greater values on "spontaneous aggressivity" were accompanied by greater values on the D scale – there was a positive correlation. When values on the "sociability" and "mental balance" scales were smaller, values on the EE and D scales were larger – there was a negative correlation.

The proportionate influences of personality factors on the development of burnout syndrome were assessed by regression analysis. R^2 (corrected) was 0.124. This means that personality factors accounted for 12.4% of the category "burnout syndrome."

The data presented here show that emotional burnout syndrome was diagnosed in only nine ambulance doctors (11.5%) of different ages. This is significantly lower than published data (26%). At the same time, individual features were seen in 28 subjects (35.9%). Ambulance doctors have high measures on personality traits such as neuroticism, depressivity, and emotional lability. Thus, our data indicate that the model of personality factors explained the occurrence of burnout syndrome in only 12% of cases. Features of how the working process was organized were more significant.

Thus, personality factors have limited significance in the formation of burnout syndrome in ambulance doctors. However, a generalized conclusion requires further study with the aim of establishing predictors with significant influences on the formation of burnout syndrome to identify grounds for appropriate prophylactic measures.

The authors have no conflicts of interests.

REFERENCES

1. T. Hering, I. Beerlage, and D. Kleiber, "Arbeitsanforderungen und Ressourcen im Rettungsdienst," *Z. Gesundheitspsychol.*, **19**, No. 4, 159–172 (2011).
2. A. Jonsson and K. Segesten, "Daily stress and concept of self in Swedish ambulance personnel," *Prehosp. Disast. Med.*, **19**, 226–234 (2004).
3. A. Jonsson and K. Segesten, "Guilt, shame and need for a container: A study of post-traumatic stress among ambulance personnel," *Acc. Emerg. Nurs.*, **12**, 215–233 (2004).
4. A. Jonsson, K. Segesten, and B. Mattson, "Post-traumatic stress among Swedish ambulance personnel," *Emerg. Med. J.*, **20**, 79–78 (2003).

5. C. Regehr, G. Goldberg, and J. Hughes, "Exposure to human tragedy, empathy and trauma in ambulance paramedics," *Am. J. Orthopsychiatry*, **72**, 505–513 (2002).
6. F. Teegen, "Berufsbedingte Traumatisierung bei Polizei, Feuerwehr und Rettungsdienst," *Z. Polit. Psychol.*, **7**, No. 4, 437–453 (1999).
7. D. Wagner, M. Heinrichs, and U. Ehlert, "Prevalence of symptoms of posttraumatic stress disorder in German professional firefighters," *Am. J. Psychiatry*, **155**, No. 12, 1727–1732 (1999).
8. D. A. Alexander and S. Klein, "Ambulance personnel and critical incidents: Impact of accident and emergency work on mental health and emotional well being," *Brit. J. Psychiatry*, **178**, No. 1, 76–81 (2001).
9. R. Beaton, S. Murphy, and K. Pike, "Work and nonwork stressors, negative affective states and pain complaints among firefighters and paramedics," *Int. J. Stress Manag.*, **3**, No. 4, 223–237 (1996).
10. D. W. Grigsby and M. A. McKnew, "Work stress burnout among paramedics," *Psychol. Rep.*, **63**, No. 1, 55–64 (1988).
11. T. Hering and I. Beerlage, "Arbeitsbedingungen, Belastungen und Burnout im Rettungsdienst," *Notfall Rettungsmed.*, **7**, No. 6, 415–424 (2004).
12. D. Pick and M. P. Leiter, "Nurses' perceptions of the nature and causes of burnout: A comparison of self-reports and standardized measures," *Can. J. Nurs. Res.*, **23**, 33–48 (1991).
13. M. Gillespie and V. Melby, "Burnout among nursing staff in accident and emergency and acute medicine: a comparative study," *J. Clin. Nurs.*, **12**, No. 6, 842–851 (2003).
14. A. B. Bakker, K. I. Van Der Zee, K. A. Lewig, and M. F. Dollard, "The relationship between the big five personality factors and burnout: A study among volunteer counselors," *J. Soc. Psychol.*, **146**, No. 1, 31–50 (2006).
15. P. J. Mazur and M. D. Lynch, "Differential impact of administrative, organizational, and personality factors on teacher burnout," *Teaching Teacher Educ.*, **5**, No. 4, 337–353 (1989).
16. C. M. Kokkinos, "Job stressors, personality and burnout in primary school teachers," *Brit. J. Educ. Psychol.*, **77**, No. 1, 229–243 (2007).
17. F. G. B. Pajonk, P. Cransac, A. Teichmann, and I. Weth, "Psychische Belastung in Abhangigkeit von der Personlichkeit bei Notarzten," *Arbeitsbedingungen und Befinden von Ärztinnen und Ärzten* (2010), pp. 301–311.
18. C. Maslach and S. E. Jackson, "*Maslach Burnout Inventory Manual*, Consulting Psychologists Press, Inc., Palo Alto, CA (1981).
19. R. Kalimo, K. Pahkin, P. Mutanen, and S. Toppinen-Tanner, "Staying well or burning out at work: work characteristics and personal resources as long-term predictors," *Work Stress*, **17**, 109–122 (2003).
20. J. Fahrenberg, R. Hampel, and H. Selg, "*Das Freiburger Persönlichkeitsinventar*, Hogrefe, Gottingen (1970).