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Original article

RELATIONSHIP BETWEEN BURNOUT AND DEPRESSION: A CROSS-SECTIONAL STUDY AMONG PUBLIC, PRIVATE EMPLOYEES AND FACTORY WORKERS

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Abstract

Introduction: Burnout is one of the most common psychological conditions that modern society is increasingly facing; it influences health status and can mediate the relationship between workload and depression.

Aim. This study aimed to investigate the predictive role of burnout with its dimensions for depression among the specified groups of workers.

Materials and methods: A self-administrated questionnaire was completed by a sample of three groups of workers to assess mental health and burnout with its three dimensions (Patient Health Questionnaire and a Maslach Burnout Inventory - General Survey). Logistic regression models were used to estimate associations between burnout and depression symptoms.

Results: The analysis indicated that the highest average PHQ-9 score had the public group 5.44±5.57 followed by the private 2.72±3.09 and the factory group 2.43±3.314. The total burnout score was 2.55±1.08, which corresponded to a moderate degree of this dimension, and the factory respondents were most affected (2.81±1.03). The multiple logistic regression determined that a low degree of exhaustion reducds the probability of depression by 0.05 times, and a high degree of lack of professional efficacy increased the probability by 10.27 times.

Conclusion: Our study has indicated that depression is predicted by burnout, especially by the lack of professional satisfaction. The use of accurate predictors could prove vital in the early detection and management of affected individuals, especially in high-risk professions. Burnout prevention and burnout reduction interventions should be made to highlight the increasing need for the development and deployment of mental health institutions and professionals respectively around the country in an effort to pay more attention to mental health.

Keywords: burnout syndrome, depressive symptoms, Maslach Burnout Inventory, Patient Health Questionnaire (PHQ-9), occupational groups

Introduction

Burnout is one of the most common psychological conditions that the modern society is increasingly facing with. It is a result of a chronic stress and is defined as a three-dimensional syndrome of exhaustion, cynicism, and diminished professional efficacy, as well as detachment from work due to prolonged exposure to work environment stressors[1]. Instead of representing a mental disorder, burnout is considered as a psychological construct that can be coded as a condition that influences health status[2]. Research has found that discrepancies between the

expectations/resources of the worker and the job demands as well as the high workload, lack of social support, and dysfunctional coping mechanisms, increase the risk of burnout[3,4]. Depression can be defined as a melancholy mood state, or as a clinical mental disorder that is non-specific in nature and can develop in any domain of life. It is multifactorial in origin (biological, psychosocial, environmental) and work factors represent one type of environmental influence[5]. Demanding work tasks and low job control increase the risk of depression[6].

Whether burnout is a form of depression or a distinct phenomenon is an object of controversy which raises the question of conceptual overlap and redundancy.The researchers found that a number of participants who ascribed their burnout feelings to their job was proportional to the those who ascribed their depressive symptoms to their job as well, indicating that there might be an overlap between burnout and depression in relation to their precursors[3,7]. Some studies confirmed that burnout probably might be a risk factor for developing depression[8]. As regards the similarity of the two constructs at a biological level, a systematic review found that burnout and depression appear to share a common biological basis[9]. The close correlation between the two entities questions the relevance of their nosological difference. Emotional exhaustion and depersonalization can be better conceived as depressive responses to adverse professional environments than as a component of a separate entity[10]. A study suggests that burnout workers may experience a number of depressive symptoms including the most severe ones[11]. In addition, work stress, which is a key role in the etiology of burnout, is also involved in the etiology of depression as well[1].

On the other hand, not all researchers seem to agree with the above notion; some of them believe that burnout and depression are two separate constructs[12]. The manifestation of burnout and depression with similar and correlating symptoms (for example, low energy and self-esteem) refers to the similar phenotype of the constructs. However, using confirmatory factor analyses, several studies have shown that burnout and depressive symptoms do not psychometrically group together[13]. Also, burnout is situation-specific, related to the working environment, while depression is context-free and can show up regardless of the circumstances of the environment. In addition, burnout and depression do not always co-exist[14].

Given the assumption that burnout is related to work and depression can develop in different areas of life, we hypothesized that workload will be more strongly associated with burnout than depression and that burnout will mediate the relationship between workload and depression.

Despite numerous studies investigating the link between burnout and depression, we are still unable to give a categorical answer to the question whether they are the same or different entities. By conducting the present study and analyzing the prevalence of burnout and depression in public, private administration, and factory workers, assessing the magnitude of the association between both entities, we aimed to provide more clarification concerning this correlation. The objectives of the study were to investigate the predictive role of the burnout dimensions for depression among the specified groups of workers.

In addition, valuable information will be provided as to whether burnout should be included in the diagnostic criteria for depression or should be integrated as a separate diagnostic entity.

The use of accurate predictors could prove vital in the early detection and management of affected individuals, especially in high-risk professions.

Materials and methods

This was a cross-sectional analytical study, conducted in a period of 3 months at the Institute of Occupational Health of the Republic of North Macedonia - Skopje, WHO Collaborating Center, supported by the Department of Psychiatry, Medical Faculty of the

University of Sofia, Republic of Bulgaria. Participation in the study was voluntary, confidential, and anonymous. All participants were introduced to the study and given a consent form, a MBI-GS, and a PHQ-9 questionnaire to complete. The Ethics Committee of the Institute of Occupational Health of the Republic of North Macedonia, Skopje, gave approval for performing the study and publishing the results obtained.
The study included a total of 248 respondents and according to the type of work, they were divided into three groups: 79(32%) private employees, 81(33%) public employees, and 88(35%) factory workers.

Burnout was measured with the Maslach Burnout Inventory - General Survey (MBI-GS)[15]. The MBI-GS consists of 16 items that form the three subscales: exhaustion (five items, Cronbach's α=0.88), cynicism (five items, α=0.83), and professional efficacy (six items, α=0.8). The items were scored on a 7-point frequency rating scale ranging from 0 (never) to 6 (daily). The total MBI-GS score with 3 degrees was for: exhaustion (low=0-9; medium=10-14; high=≥15); cynicism (low=0-6; medium=7-12; high=≥13); and lack of professional efficacy (low=≥29; medium=24-28; high=0-23). High scores on exhaustion and cynicism and low scores on the lack of professional efficacy are indicative of burnout. The items of professional efficacy were reversed (lack of professional efficacy). To assess the level of burnout, a weighted sum score of the dimensional sum scores was calculated[16]. Coefficients were formed by weighting each dimension so that the scores corresponded to the original response scale (0.4 x exhaustion + 0.3 x cynicism + 0.3 x lack of professional efficacy)[17]. Burnout was categorized as follows: no burnout (0-1.49 points: symptoms are experienced approximately a few times a year or never), moderately (1.50-3.49 points: symptoms are experienced approximately a few times a month) and severe (3.5-6 points: symptoms are experienced approximately a few times a week or daily).

Depressive symptoms in our participants were measured using the Patient Health Questionnaire (PHQ-9), which is a reliable and valid measure of depression severity)[17]. PHQ-9 questionnaire has nine items using a 4-point Likert scale (0=not at all, 3=nearly every day) assessing problems experienced by the participants over the last 2 weeks. A total score of 5-9 indicates mild depression, 10-14 moderate depression and a score of 15 or more indicates moderately severe to severe depression. A score of 10 or more has a sensitivity of 88% and a specificity of 88% for depression[18,19]. The internal consistency of the PHQ-9 questions was processed by Reliability and we got Cronbach's Alpha = 0.864.

Statistical analysis

All data were collected in Microsoft Excel (2010) and statistically processed using SPSS, version 22.0 for Windows (SPSS, Chicago, IL, USA). Pearson Chi-square test, Yates corrected, Fischer exact test and Fisher Freeman Halton exact test were used to determine the association between certain dichotomous features. Pearson correlation coefficient and Spearman's rank correlation coefficient were used to determine the relationship between numerical variables with normal/not normal frequency distribution. Dependent sample analysis was performed by McNemar Chi-square. Risk factors were quantified using Odds ratio (OR) and Confidence interval (CI). The difference between the proportions and the correlations were tested with the Percentage Difference Test and Correlation Difference *Z* test. Univariate and multiple linear regression analyses were used to assess the impact of certain parameters on the variability of the overall score for depression. The study considered any variable with a *P*-value less than 0.05 as statistically significant.

Results

The total burnout score was 2.55±1.08, which corresponded to a moderate degree of this dimension (Figure 1). The factory respondents were most affected (2.81±1.03) compared

to those from private and public sector - 2.46±1.09 and 2.36±1.08, respectively, with a significant difference between the groups (*P*=0.047).

The whole sample indicated a low degree of exhaustion (7.37±7.36). The highest average exhaustion score was observed among industrial workers (9.73±8.02), followed by public (8.83±7.79) and private groups of employees (7.37±7.36), with no significant differences between the groups.

The cynicism in the total group was represented by a medium grade of 9.35±5.76, the highest in the factory workers (9.35±5.76), followed by the public (9.12±5.35) and the private group (8.10±5.24), with no significant differences between the groups.

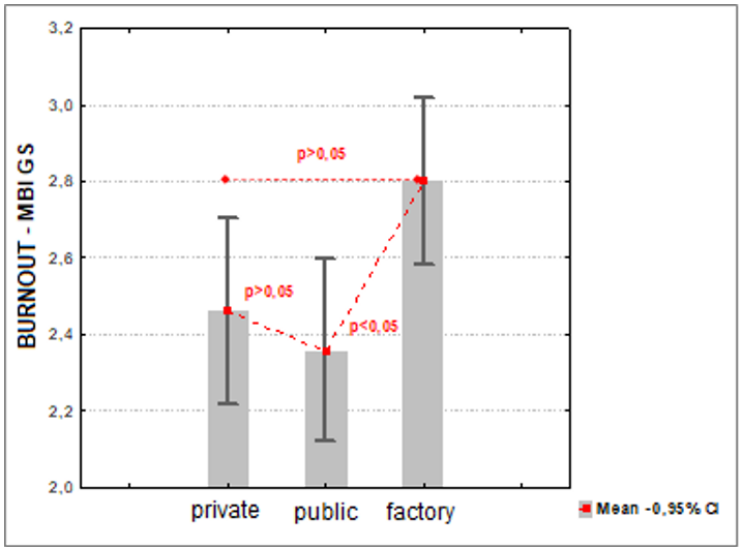

Fig. 1. MBI-GS weighted value of burnout by groups

Table 1. Prevalence of degrees of the MBI-GS dimensions by groups

MBI-GS dimensions	groups private N (%)	public N (%)	factory N (%)	total N (%)	*P*
Exhaustion - degrees					
low	56(70.89)	50(61.73)	49(56.68)	155(62.50)	Pearson Chi-square: 4.766; df=4; p=0.3121
medium	10(12.66)	10(12.35)	14(15.91)	34(13.71)	
high	13(16.46)	21(25.93)	25(28.41)	59(23.79)	
Cynicism - degrees					
low	55(69.62)	53(65.43)	56(63.64)	164(66.13)	Pearson Chi-square: 4.766; df=4; p=0.3121
medium	15(18.99)	14(17.28)	15(17.05)	44(17.74)	
high	9(11.39)	14(17.28)	17(19.32)	40(16.13)	
Cynicism - degrees					
low	55(69.62)	53(65.43)	56(63.64)	164(66.13)	Pearson Chi-square: 2.058; df=4; p=0.7251
medium	15(18.99)	14(17.28)	15(17.05)	44(17.74)	
high	9(11.39)	14(17.28)	17(19.32)	40(16.13)	
Lack of professional efficacy-degrees					
low	48(60.76)	31(38.27)	60(68.18)	139(56.05)	Pearson Chi-square: 25.361; df=4; p=0.00004**
medium	16(20.25)	11(13.58)	6(6.82)	33(12.31)	
high	15(18.99)	39(48.15)	22(25.00)	76(30.65)	
Burnout - degrees					
none	10 (12.66)	17 (20.99)	5 (5.68)	32 (12.90)	Pearson Chi-square: 11.517; df=4; p=0.0213*
moderate	57 (72.15)	53 (65.43)	61 (69.32)	171 (68.95)	
severe	12 (15.19)	11 (13.58)	22 (25.00)	45 (18.15)	

Significant *P<0.05

The analysis found a low degree of lack of professional efficacy in all respondents (29.23±7.69), but there was a significant difference between the three groups individually (*P*=0.0006). The factory workers (29.2±7.69) were in the most favorable position, followed by private (27.67±9.79) and public employees (22.09±1.63).

Table 1 shows the quantitative and categorical burnout dimensions and indicates the highest exhaustion and cynicism in the factory group of workers and the largest association with lack of professional efficacy in public workers.

18.1% of the total sample were with a severe degree of burnout while 68.9% were with moderate. Significantly the worst was the situation in the factory workers, 25% were severely and 69.3% were moderately burned out, followed by the private and public groups of employees. The degree of burnout was significantly associated with the type of institution (*P*=0.0213).

The highest average PHQ-9 score for the total sample was indicated in the public group of workers (5.44±5.57), followed by the private (2.72±3.09) and factory group of workers (2.43±3.314) with a significant difference between them (*P*=0.001) (Figure 2).

The participants with high levels of exhaustion, cynicism and lack of professional efficacy had 25.4% *vs.* 27.5% and 22% moderate to moderately severe depression (Difference test: p=0.978 *vs*. p=0.949 *vs. P*=0.929).

Since the results do not quantitatively show significant correlations, we consider the depression as a dichotomous value (<10, ≥10).

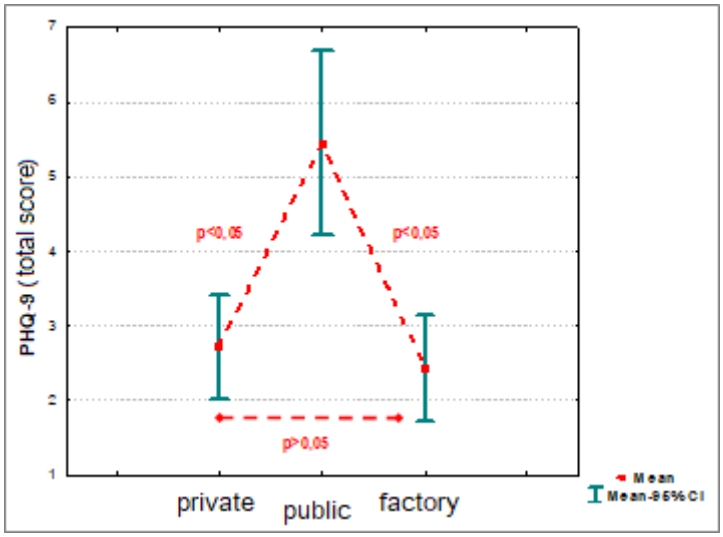

Fig. 2. Analysis of the total PHQ-9 score by groups

The univariate logistic regression, for *P*< 0.05, as significant predictors for moderate/ severe PHQ-9 depression (≥10), showed: low and high degrees of exhaustion respectively cynicism, and lack of professional efficacy (Table 2). The low degree of exhaustion, cynicism, and lack of professional efficacy were significantly negatively associated, reducing the probability of moderate/severe depression by 0.1 times *versus* 0.3 times and 0.2 times, respectively. The high degree of exhaustion, cynicism, and lack of professional efficacy were significantly positively associated and increased the probability for moderate/severe depression consequently 5 times *versus* 4.5 times and 7 times, respectively.

Table 2. Univariate logistic regression for the predictive role of burnout dimensions for moderate/severe depression

MBI-GS dimensions	PHQ-9			
	OR	**95% lower**	**CI upper**	***P***
Exhaustion - reference category/others				
low	0.138	0.053	0.357	0.000*
middle	1.969	0.732	5.301	0.180
high	5.028	11.506	11.506	0.000*
Cynicism - reference category/others				
low	0.306	0.135	0.693	0.005*
middle	1.061	0.378	2.973	0.911
high	4.552	1.924	10.770	0.001*
Lack of professional efficacy - reference category/others				
low	0.189	0.073	0.487	0.001*
middle	0.490	0.111	2.174	0.348
high	6.833	2.836	16.463	0.049*
Burnout- reference category/others				
none	0.828	0.234	2.924	0.769
moderate	0.619	0.273	1.406	0.252
severe	2.094	0.853	5.142	0.107

total PHQ-9 (≥10 *vs.* <10)

The multiple logistic regression examined the significance of the linear relationship between confirmed predictors and moderate/severe depression and whether their quantitative variability adequately predicted depression. The low degree of exhaustion reduced the probability of depression by 0.05 times (OR 0.05; 95% CI 0.05-0.90; $P<0.05$) and a high degree of lack of professional efficacy increased the probability by 10.27 times (OR 10.27; CI 1.82-57.87; $P<0.05$).

Discussion

The results showed that 18% of all participants were severely affected by burnout, and it was most pronounced in the factory group of workers, both in quantity (2.81±1.03) and as a share distribution (25% high burnout), which significantly differred from private and public employees. Also, factory workers were related with the highest levels of exhaustion and cynicism, although the differences compared to other employees were statistically insignificant.

The research hypothesis proposed that manufacturing workers belong to a special professional group whose mental health is closely linked to the working environment, modernization, and progress in the industry. They are exposed to long periods of heavy, repetitive, physical work, but still with relatively low income. Also, their long-term exposure to unaffordable occupational conditions like high temperature, dust, noise, disregard for break time, and proper neglect of eating habits makes them more tired, stressed, and susceptible to the development of somatic and mental illnesses, as well as experiencing burnout.

Similar findings confirmed our assumptions to a much greater extent: factory workers and miners in China experienced occupational burnout (86%) as a result of risk factors like sex, education, professional title, work schedule, monthly income, hypertension, age, working years, asbestos dust, benzene, etc.[20]. Also, if a person's life balance is low, it will increase the work fatigue of employees[21]. Besides the difficult working conditions, they may be exposed to low social support and reduced social contacts related to irregular working hours and night shifts. Respectively, when workers can no longer use their internal and social resources to alleviate the physical burden of work challenges, their psychological balance will be disturbed, resulting in emotional exhaustion and psychological health problems. This has been confirmed

by findings that indicate the mediating role of social support in the negative effects of burnout, especially the emotional exhaustion, which was found as the best single predictor of general health[22]. The literature showed that factory workers performing functions that are directly related to manufacturing experience significantly higher levels of exhaustion/cynicism compared to employees performing other functions. These are less satisfied with subordinate or supervisor relationships and report higher levels of exhaustion/cynicism compared to those who are more satisfied with these relationships. The same study found that exhaustion/cynicism is the only burnout dimension that is related to turnover[23].

The third dimension, the lack of professional efficiency, turned out to be quite influential in our groups with a significant difference between them. Our study pointed out that factory group of workers was with a low level of lack of professional efficiency, followed by private and public employees. This can be explained by the fact that our factory workers have serial work on machines in production related to the fulfillment of norms for which it is necessary to provide the appropriate resources and materials from the organization. Our results are in a certain contradiction with a study[24], which showed that exhaustion or cynicism interfered with professional efficacy. However, in other job contexts, inefficacy appears to develop in parallel with the other two burnout aspects, rather than sequentially. The lack of efficacy seems to arise more clearly from a lack of relevant resources, whereas exhaustion and cynicism emerge from the presence of work overload and social conflict. It seems that professional efficacy has a more direct impact on burnout.

The level of burnout in the public and private groups is lower, despite similar values of exhaustion and cynicism and a significantly higher lack of professional satisfaction, compared to the factory group of workers.

But, despite the fact that burnout is least manifested in the public work, there the changes in the subscale of professional efficiency are significantly greater, so it can be expected that in a pronounced burnout, this area is most sensitive in this professional group, as well as, perhaps low job satisfaction is not necessarily a manifestation of the burnout syndrome, but rather a condition for its development if it lasts long enough. The literature shows that when work cannot meet personal needs and expectations, stress can be experienced, resulting in a decrease in job satisfaction, occupational exhaustion, and mental illness[25], hence, it is not clear whether job satisfaction is a burnout condition or a burnout result, because the lowest job satisfaction is in the public administration.

The level of depression in the public sector is most pronounced, with a significant difference from the other groups. This fact can be interpreted as a link between severe depression and a severe lack of professional efficiency in the public sector.

The total burnout score is not very informative about the presence of depression, but different burnout subscales have different correlations with this condition. They are considered separately to have a predictive value for depression, regardless of the type of occupational group. The high degree of exhaustion, cynicism, and lack of professional success increased the probability for moderate/severe depression 5 times *versus* 4.5 times and 7 times, respectively. The multiple logistic regression confirmed exhaustion and professional efficiency as independent predictors; a low level of exhaustion was a protective factor and reduced the risk of moderate/severe depression by 0.05 times, while a high lack of professional satisfaction increased the likelihood of moderate/severe depression by more than 10 times.

It can be explained that exhaustion encourages activities to distance oneself from work as a way to deal with overload, which brings a feeling of incompetence, insecurity, and possibly shame and leads to distancing people/isolation. This is probably accompanied by indifference and discouragement, which are a step closer to depression. Some authors denote that emotional exhaustion usually emerges as the first sign of distress[26]. Another study revealed that emotional exhaustion was not only associated with work-related factors, but also with physical

activity and sleeping[27]. The result could be an eventual decrease in productivity, job satisfaction, exhaustion/cynicism, and eventually, burnout[28], which was a significant predictor of depression in our study sample. Professional efficiency is most informative about the risk of depression, and it is no coincidence that impaired professional functioning is an important part of the clinical manifestations of depression, and is considered a therapeutic target of therapy.

The incidence of burnout and depression as well as their correlations have been assessed in numerous studies. A prospective study among dentists confirmed the reciprocal relationship between burnout and depressive symptoms that the workload predisposes to depression through burnout[17]. Investigations among nurses revealed that burnout can significantly predict (42%) depression[29], and high emotional exhaustion and high cynicism as determinants of burnout were significantly correlated with depressive symptoms among medical students at Qassim University[30]. Another study also supported our hypothesis that work-related well-being spills over to general well-being, i.e. burnout with its dimensions and work engagement predict depressive symptoms and life satisfaction over time[31]. On the other side, some studies do not replicate past findings, suggesting that burnout predicts depression[1] and some others show that burnout and depressive symptoms are overlapping nosological entities[3,7].

Our findings support the notion that burnout and depression do not represent identically the same construct, but that there is an overlap between the burnout construct and depression that requires consideration as to whether primary or secondary symptoms of depression are present. Our results concur with the concept that burnout, measured by the MBI-GS (especially exhaustion and lack of professional efficacy which were confirmed by the logistic regression) can occur as a result of prolonged work stress and can contribute to the development of phycological diseases such as depression. Indeed, rather than a nosological entity that is distinct from depression, the burnout construct may reflect a psychosocial view of depression.

The limitation of this study is that obtained findings could hardly be generalizable to the entire working population due to the convenient nature of our sampling and the small sample size. Secondly, because of the cross-sectional study design, it was not possible to determine if there was a precise causal relationship. Furthermore, the overlapping of symptoms between burnout and depression, coupled with the cross-sectional nature of the study design, made it difficult to assess temporality between the two constructs. Associations obtained should be interpreted with caution. Also, we did not consider other psychosocial factors such as socioeconomic status, gender, age, marital status, and education level. Hence, further study is very essential in the matter.

Conclusion

Our study indicated that depression was predicted by burnout, especially by the lack of professional satisfaction. It does not always imply high burnout, but in our case significantly increased the risk of moderate/severe depression. The use of accurate predictors could prove vital in the early detection and management of affected individuals, especially in high-risk professions. Predictors presented here, however, require further investigation via multicentric nationwide studies, to obtain a much more general understanding of the subject. If the state of burnout is recognized as a depressive syndrome, then sufferers may be more inclined to visit a clinician when experiencing troublesome symptoms. Also, workplace interventions to reduce burnout and foster work engagement may also extend their influence beyond work and build general well-being among employees.

Our results are consistent with other research that emphasize the importance of regular health screening in the work population that allows contact with individuals suffering from symptoms of burnout and depression but that are not aware of the disease or do not have the volition to seek medical treatment. So, timely recognition and treatment are required. Considered together, the subscales of MBI-GS provide a three-dimensional perspective of

burnout and a distinct perspective on people's relationship to their work. Obtaining specific information on these three components permits a greater focus for costly organizational development initiatives, by facilitating the development of strategies confronting the organization. Maslach Burnout Inventory - General Survey (MBI-GS) and the Patient Health Questionnaire (PHQ-9) could be used for regular monitoring and evaluation of the working population with regard to the advantages of these instruments, such as indicative questions and their appropriate domain, high reliability, and validity as an important instrument for predicting poor mental health.

Conclusion

We found that the prevalence of burnout was mostly pronounced in the factory group of workers (25% were severely and 69.3% were moderately burned out) followed by the private and public groups of employees. The participants with high levels of exhaustion, cynicism, and lack of professional efficacy had 25.4% *vs.* 27.5% and 22% moderate to moderately severe depression.

The lack of professional efficiency turned out to be quite influential in our groups with a significant difference between them, and the public administration was most affected.

Measures to improve the mental health and working conditions in the administration and factory industries need to be considered.

Conflict of interest statement. None declared.

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