ISSN: 2230-9926

Available online at http://www.journalijdr.com

IJDR

International Journal of Development Research
Vol. 07, Issue, 11, pp.16906-16910, November, 2017

ORIGINAL RESEARCH ARTICLE **OPEN ACCESS**

OCCUPATIONAL STRESS AND DEPRESSION IN MILITARY FIREFIGHTERS

[1]Marcelo Sampaio Ocampos, [1]*Alexandra Maria Almeida Carvalho Pinto, [1]Maria Lucia Ivo, [1]Elenir Rose Jardim Cury Pontes, [2]Luciana Contrera, [1]Caroline Neris Ferreira Sarat, [3]Nayla Cristina Santiago da Silva and [1]Valter Aragão do Nascimento

[1]Graduate Program on Health and Development in West Central Region, Federal University of Mato Grosso do Sul, 79070–900, Campo Grande, MS, Brazil
[2]Master Program in Nursing, Federal University of Mato Grosso do Sul, 79070–900, Campo Grande, MS, Brazil
[3]State Agency of Administration of the Penitentiary System - Secretariat of Justice and Public Security of Mato Grosso do Sul, 79.011-190, Campo Grande, MS, Brazil

ARTICLE INFO

Article History:
Received 29th August 2017
Received in revised form
15th September, 2017
Accepted 10th October, 2017
Published online 29th November, 2017

Key Words:
Emergency Responders;
Occupational Health;
Occupational Risks;
Job Satisfaction.

ABSTRACT

Firefighters are susceptible to depression because at work they constantly face situations involving human suffering. Objective: To study occupational stressors and the occurrence of symptoms suggestive of depression. Materials and Methods: Cross sectional study with 181 firefighters of Mato Grosso do Sul – Brazil. The instruments were used: Work Stress Scale, Beck Depression Inventory and a Social Demographic Questionnaire. Results: 52.5% of the firefighters were classified in the high and moderate levels of occupational stress. The prevalence of depression was 13.3%, in the mild and moderate depression levels. Prevalence of symptomatology suggestive of depression is approximately three and a half times higher in unsatisfied firefighters compared to satisfied workers (p=0.050), and four times higher in firemen with high or moderate stress compared to professionals with mild stress (p=0.014). Conclusion: Job dissatisfaction and occupational stress increase the prevalence of symptoms suggestive of depression in firefighters. It is necessary to improve the working environment to reduce these problems.

Corresponding author

Citation: Marcelo Sampaio Ocampos, Alexandra Maria Almeida Carvalho Pinto, Maria Lucia Ivo, Elenir Rose Jardim Cury Pontes, Luciana Contrera, Caroline Neris Ferreira Sarat, Nayla Cristina Santiago da Silva and Valter Aragão do Nascimento, 2017. "Occupational stress and depression in military firefighters", *International Journal of Development Research*, 7, (11), 16906-16910.

INTRODUCTION

Firefighters are professionals who take responsibility for responding to situations and the working environment can be a risk to their health (Vara and Queirós, 2009). In this perspective, the basic activities developed in the area of firefighting and rescue expose the firefighters to the risks caused by situations of urgency and emergency. The International Labor Organization (ILO) recognizes that practically all occupations suffer from occupational stress, but preponderate those related to emergency situations. Among the professions with the highest levels of stress, emergency ones are practically at the top of the list (Bellusci, 2003).

Military firefighters are often subject to health-threatening factors such as stress, work overload, alternating shifts, among others. This is because they have a profession that demands a high degree of physical and mental commitment during operational activities. The fireman tends to experience uncertainties because he/she does not know what kind of occurrence may occur during his/her work shift, which causes him/her to assume an alert posture due to the characteristics of the dynamics of his/her work (Prado, 2011). Occupational stress, defined by the International Labor Organization as a set of phenomena that can affect the health of the worker, and which has as main stressors those that involve the human relations, system and work environment, as well as, organizational and administrative aspects (Costa *et al.*, 2003).

The Fire Department service involves civil defense, fire prevention, firefighting, search, rescue, and relief activities. Rescue is a set of operations involving the removal of people or property from a dangerous situation (fire, drowning, collapse) to a safe condition. Firefighting is the service of eliminating fires in diverse environments such as buildings, vehicles and vegetation (Mato Grosso do Sul, 2016). Stressful events may be related to depression. Dormann (2002) states that the depressive episode may be associated with a recent stressful event. The risk factors most associated with depression are: family history, events in childhood, aspects related to personality, social isolation and unpleasant experiences in daily life. The combination of genetic factors, early stress and continuous stress can determine a person's vulnerability to psychiatric disorders, such as depression. Monteiro *et al*. (2007) report that the population is often thrilled to see the firefighter in action, either in person or in the media. However, the emotions and feelings aroused in the fireman during his service are little seen and understood, being in most cases even hidden by them. Based on references to the profession that resemble the life and assets of others, such as "being a firefighter is serving, serving, always serving!"; "to be a firefighter is to have love for the lives of others", the firefighter profession carries a load of much physical, emotional, psychological and social exigency.

Lima *et al*. (2015) found that because firefighters perform activities where they are exposed to traumatic events, related to the physical or psychological nature of the victims, firefighters already receive a negative influence after performing at the event, which causes changes in their mental health, with reports of symptoms such as insomnia and anxiety. Paschoal and Tamayo (2005) constructed an instrument based on organizational stressors of a psychosocial nature, and elaborated items that also contemplate a reaction to the stressor, seeking to serve a assorted group of occupations and that could be applied in several organizational environments, which was identified as the Work Stress Scale (WSS). Occupational exposure to the aforementioned events increases the probability of depression in subjects exposed to the mentioned situations (Ginzburg, 2010). The Beck Depression Inventory (BDI) (Beck *et al*., 1961) was developed and standardized to be used as a self-assessment measure of depression, applied to the general or specific population without any diagnostic pretension, and may be used in the clinic and research. It was validated for the Brazilian Portuguese (Gorestein and Andrade, 1998). Based on the recognition of scholars such as Sato (1991), Murta and Tróccoli (2007), Carvalho and Malagris (2007) and Monteiro *et al*. (2007) of how firefighters and other professionals that deal with emergency health situations are more susceptible to the development of disorders, such as depression. Also considering the specificities of the firefighter's work, classified as highly stressful (Szubert and Sobala, 2000, Murta and Tróccoli, 2007, Monteiro *et al*., 2007). Based on these studies and in the experience of one of the authors who works for 20 years in the Fire Department of Mato Grosso do Sul, the question of the present research has arisen: can stressors at work develop symptoms suggestive of depression in firefighters of the operational service?

MATERIALS AND METHODS

Campo Grande, with 786,797 inhabitants, is the capital of the state of Mato Grosso do Sul – Brazil.

The Metropolitan Command of the Campo Grande Military Fire Brigade is responsible for eight operational units, distributed between the 1st Fire Brigade (southern area) and the 6th Fire Brigade (northern area). This observational, analytical, cross-sectional study had as target population firefighters of the operational service. These professionals serve the population, in fire extinguishing services, pre-hospital care and rescue, in scales of 24 hours for 72 hours. Firefighters on vacation, with health leave or in training were excluded from the study. From the finite population of 252 operational firefighters, a sample of 152 firefighters was obtained, with a 95% confidence interval, an expected proportion of 50% (for being unknown) and 20% increase for eventual losses, which resulted in 181 individuals who participated in the research.

Data collection was performed at the eight quarters, between March and April of 2017. Three instruments were used:

Socio-demographic questionnaire: with questions related to social variables (age, gender, marital status and education) and work (length of service, post or graduation, satisfaction with the profession).

Work Stress Scale (WSS): a scale that addresses aspects related to the work process, including interpersonal and organizational aspects. It is an instrument that measures general occupational stress, can be applied in different work environments and for various occupations. It consists of 23 items that address stressors and emotional reactions constantly associated with work. Likert scale, with 23 assertions, with values from 1 to 5 points (1 - totally disagree, 2 - disagree, 3 - partially agree, 4 - agree, 5 - totally agree). The total score is obtained by summing the values of the 23 items, which results in the score from zero to 115 points. Scores with higher values mean a high level of stress. Minimum and maximum values of WSS were standardized on a scale of 0 to 100 points, using the formula below. In addition, stress levels were divided into three distinct categories: low (0 to 33.3), moderate (33.34 to 66.66) and high (66.6 to 100).

$$\text{WSS} = 100 * \left(\frac{\text{Sum} - \text{Min}}{\text{Max} - \text{Min}}\right)$$

Where:
Sum = sum of valid answers
Min = smallest sum of valid answers
Max = largest sum of valid answers

Beck Depression Inventory (IDB): developed and standardized to be used as a self-assessment measure of depression, for general and specific population, has no diagnostic pretension, used in clinical and research (Beck *et al*., 1961). This research used the validated version for Brazilian Portuguese (Gorestein and Andrade, 1998). The IDB contains 21 groups of affirmations about sadness, pessimism, feeling of failure, lack of satisfaction, guilt, punishment, self-deprecation, self-accusations, suicidal thoughts, crying crises, irritability, social withdrawal, indecision, distortion of body image, inhibition to work, sleep disturbance, fatigue, loss of appetite, weight loss, somatic concerns and decreased libido. The participant should carefully read the statements of each group and choose the one that best describes what has made sense in the last week, including the day of collection. In each group the degree of intensity of the affirmations ranges from 0 to 3.

The overall score is calculated by summing the values of the questions, and ranges from 0 to 63 points. In order to classify the intensity of the symptoms, the following levels were considered: normal (less than 15 points), dysphoria (15 to 29 points), moderate depression (20 to 29 points) and severe depression (30 points or more). Chi-square, Chi-square test for trend, and Fisher's exact test were used to verify the possible associations between the study variables. Prevalence ratios were calculated, with the respective 95% confidence intervals. To estimate the adjusted prevalence ratios, Cox Regression (with time equal to one unit) was used, for the variables with a significance of less than 20%. Statistical Program for Social Sciences (SPSS), version 22.0 for Windows, was used.

RESULTS

A total of 181 firefighters participated in the study, 71.8% of the study population. The highest percentage of firefighters was in the age group of 40 to 49 years, the age ranged from 19 to 55 years, with a mean of 38.2 years ± 8.8 (standard deviation). Male firefighters (90%) predominated. Regarding education, there was a higher percentage of secondary education (61%) followed by higher education (37%). About the marital status, 67% were married. Regarding the rank or grade in the military firefighter's career, 43% were sergeants and 30% soldiers. There were a higher percentage of firefighters with more than 10 years of service.

Table 1. Number and percentage of firefighter according to factors associated with the occurrence of depression (n=181)

Variables	Depression				PR [1] (IC 95%)	*p*
	Yes		No			
	Nº.	%	Nº.	%		
Gender						
Female	5	26.3	14	73.7	1	[2] 0.142
Male	19	11.7	143	88.3	2.24 (0.95-5.32)	
Age range (years)						
19 - 24	-	-	13	100.0	-	[3] 0.820
25 - 29	7	22.6	24	77.4	-	
30 - 39	4	9.5	38	90.5	-	
40 - 49	11	13.6	70	86.4	-	
50 - 60	2	14.3	12	85.7	-	
Education						
Primary/High school	13	10.8	99	89.2	1	
Undergraduate/ Graduate	11	16.4	58	83.6	0.73 (0.35-1.53)	[4] 0.404
Marital status						
Married	13	10.7	108	89.3	1	[4] 0.366
Single	9	18.4	40	81.6	0.58 (0.27-1.28)	
Divorced/other	2	18.2	9	81.8	0.59 (0.15-2.29)	
Rank						
Sublieutenant	1	5.9	16	94.1	1	[4] 0.791
Sergeant	11	14.3	66	85.7	0.41 (0.06-2.98)	
Cadet	5	15.6	27	84.4	0.38 (0.05-2.97)	
Soldier	7	12.7	48	87.3	0.46 (0.06-3.50)	
Work time (years)						
0 - 5	5	12.2	36	87.8	1	
>5 - 10	4	14.3	24	85.7	0.85 (0.25-2.90)	
>10 - 20	8	10.0	72	90.0	1.22 (0.43-3.49)	[3] 0.362
>20 - 25	4	20.0	16	80.0	0.61 (0.18-2.03)	
>25 - 30	3	25.0	9	75.0	0.49 (0.14-1.75)	
Job satisfaction					-	
No	3	42.9	4	57.1	1	
Yes	21	12.1	153	87.9	3.55 (1.38-9.13)	[2] 0.050
Occupational stress						
High	3	30.0	7	70.0	1	[3] 0.002
Moderate	17	19.1	72	80.9	1.57 (0.56-4.44)	
Low	4	4.9	78	95.1	6.15 (1.60-23.6)	

Note: $p \leq 0.05$, statistically significant difference (*p*-value in bold letter).
[1] PR = Prevalence ratio. [2] Fisher's Exact Test. [3] Chi-square test for trend. [4] Chi-square test.

Table 2. Multivariate analysis for the prevalence of symptomatology of depression in firefighters (n=181)

Variables	*p*	Prevalence ratio (PR)	PR (IC 95%)
Stress (high and moderate versus low)	**0.014**	3.87	1.32 - 11.4
Job satisfaction (No versus yes)	**0.050**	3.45	1.00 - 11.9
Gender (female versus male)	0.083	2.43	0.89 - 6.64

Note: Cox Regression. $p \leq 0.05$, statistically significant difference (*p*-value in bold letter).

Test statistics were considered significant when the *p* value was equal to or less than 0.05. The research was authorized by the Metropolitan Fire Department and approved by the Human Research Ethics Committee of the Federal University of Mato Grosso do Sul.

The majority (96%) reported being satisfied with the work of firefighter. The assessment of occupational stress according to the mean of the scores was 57.4 ± 16.3 (standard deviation). According to the standardized TSE score, 10 (6%) firefighters were classified as having high occupational stress (above 66.6

points), 85 (47%) at the moderate level (33.4 to 66.6 points), and 86 (47%) at the low level (0 to 33.3 points). There was no significant association between the level of stress (low or moderate and high) with the following variables: gender, age group, education, marital status, post or graduation, length of service and satisfaction at work, ($0.138 \leq p \leq 0.767$). The prevalence of depression was 13.3% (95% CI: 8.3%-18.2%). Of the 181 participants, 157 (87%) had no symptoms of depression (score below 15 points), 12 (7%) had mild depression / dysphoria (15 to 19 points), 11 (6%) moderate depression (20 to 29 points) and one firefighter presented severe depression (with 30 points). The mean scores on the depression scale were 7.8 ± 6.1 (standard deviation). As shown in Table 1, there was no association between the occurrence of depression symptoms and the following variables: gender, age, education, marital status, post or graduation and length of service ($0.142 \leq p \leq 0.820$). However, there was a significant difference in depression among firefighters dissatisfied with work ($p = 0.050$) and among those with high occupational stress ($p = 0.002$). The multivariate analysis (Table 2) indicated that the prevalence of symptomatology of depression was approximately 3.5 times higher in firefighters who were not satisfied with work compared to satisfied workers, and 4 times higher in firefighters with high or moderate stress compared to professionals with mild stress.

DISCUSSION

The operational military firefighter of Campo Grande-MS is satisfied with his profession, as shown by most of the participants (96%). A research conducted in Finland with 260 firefighters showed that 89% were satisfied with their work (Kalimo *et al*., 1980). A study developed in Rio Grande do Sul-Brazil showed considerations about satisfaction of the profession, revealed in the phrases "what led me to this profession was the satisfaction in being able to help other people", "passion for the profession" and "satisfaction is in providing a good service to other people and the community in general", "risking your life for the sake of others " (Monteiro *et al*., 2007). On the profile of the operational military firefighter of Campo Grande-MS: predominant male (90%), in the age group of 40 to 49 years (45%), married (67%), with high school (61%), sergeant (43%) and ten to 20 years of working time (44%). Studies developed in Brazil with the same population found a similar profile (Lima *et al*., 2015; Almeida *et al*., 2015; Oliveira, 2010).

Firefighters are susceptible to hazards and labor factors such as heat, noise, biological and chemical agents, prolonged shifts that can trigger occupational illnesses, and among these, stress (Almeida *et al*., 2015). In this study, the mean of occupational stress scores was 57.4 ± 16.3. These results are similar to firefighters of São Paulo-Brazil, using the same scale, which found 57.23 ± 18.02 (Marques, 2012). Regarding the level of occupational stress of the firefighter of Campo Grande-MS-Brazil, high and moderate added up 51.5%. In Santa Maria-RS, also Brazil, the moderate level of occupational stress predominated in 63.64% of the firefighters. This situation worried the authors because, if interventions are not performed to minimize stress, it may intensify (Almeida *et al*., 2015).

The prevalence of symptomatology suggestive of depression is four times higher in firemen with high or moderate stress compared to professionals with mild stress (p=0,014). A study with Public Safety professionals from the State of São Paulo - Brazil mentions that prevention and treatment of stress can reduce the frequency of work accidents, improve productivity and efficiency of the service, and consequently increase the commitment of the professionals, generating a strong bond with the Corporation (Vasconcelos, 2011). In this study, the prevalence of depression was 6.7%, distributed in the levels of moderate and high depression (cutoff equal to or greater than 20). Similar results were obtained in a study that evaluated depression in 303 firefighters in a city of Minas Gerais, Brazil, and found evidence of depressive symptomatology (cutoff equal to or greater than 19) in 9.9% of firefighters (Oliveira, 2010). Another study conducted in Belo Horizonte-MG-Brazil, with 711 firefighters, investigated the prevalence and factors associated with depression, and the prevalence of depression was 5.5% (Lima *et al*., 2015). In the results, it was observed that the prevalence of symptomatology suggestive of depression is four times greater in firemen with high or moderate stress compared to professionals with mild stress (p=0,014). In the multivariate analysis it remained that the prevalence of symptomatology suggestive of depression is approximately three and a half times higher in firefighters not satisfied with work compared to satisfied (p=0,050). A stressor that may bring dissatisfaction with the profession, and was observed in the study, was the relative little prospect of career growth. Under a State law, the professional ascension of military firefighters will only occur for length of service and seniority, thus extinguishing the internal exams for promotions based on intellectual merit (Mato Grosso do Sul, 2015). In another study with firefighters, dissatisfaction with the monetary factor appeared in the phrase "we received six Reais to buy food for every 24 hours of work" (Murta eTroccoli, 2007, p. 47).

Conclusion

The operational military firefighter, in his day-by-day work, presents extreme emotions, from the happiness in saving a life to the suffering of a death. Thus, this study studied occupational stress and the occurrence of symptomatology suggestive of depression, and concluded:

- The operational military firefighter of Campo Grande-MS is predominant male, in the age group of 40 to 49 years, married, with high school, sergeant, and ten to 20 years of working time, and he is satisfied with his job.
- The firefighter has a moderate level of occupational stress.
- There was no significant association between the level of stress (low, moderate and high) with the variables: gender, age, education, marital status, rank, working time and job satisfaction.
- The prevalence of depression was 13.3%, in the mild and moderate depression levels.
- The prevalence of symptomatology of depression was higher in unsatisfied firefighters compared to satisfied workers, and in firefighters with high or moderate stress compared to professionals with mild stress.
- The social relevance of this study is in the identification of the occupational stressors in the investigated corporation, which may be influencing the stress and consequently the symptoms suggestive of depression in the firemen. Finally, firefighters in this study are satisfied with their professional choice, even if it involves risk situations, either for the victims or for the professionals themselves. In this way, it is suggested that those responsible for the Corporation evaluate the

main stressors identified here, to prioritize actions that impact on the reduction of firefighters' stress.

REFERENCES

Almeida, D.M., Ibdaiwi, T.K.R., Lopes, L.F.D., Costa, V.M.F., Possamai, L.O. 2015. Estresse ocupacional na perspectiva dos bombeiros da cidade de Santa Maria/RS. ReCaPe Revista de Carreiras e Pessoas São Paulo. v. V, n. 01 - Jan/Feb/Mar/April.

Beck, A.T. *et al*. 1961. An inventory for measuring depression.Archives of General Psychiatry, Philadelphia, v. 4, p. 561-571, Jun.

Bellusci, S.M. 2003. Doenças profissionais ou do trabalho. 5. ed. São Paulo: Editora SENAC São Paulo.

Costa, J.R.A., Lima, J.V., Almeida, P.C. 2003. Stress no trabalho do enfermeiro. Revista da Escola de Enfermagem da USP, São Paulo, v. 37, n. 3, p. 63-71, sept

Dormann, C., Zapf, D. 2002. Social stressors at work, irritation, and depressive symptoms: accounting for unmeasured third variables in a multi-wave study. *J Occup Organ Psychol;* v. 75, n. 1, p. 33-58.

Ginzburg, K., Ein-Dor, T., Solomon, Z. 2010. Comorbidity of posttraumatic stress disorder, anxiety and depression: a 20-year longitudinal study of war veterans. *J Affect Disord; n*. 123, p. 249-257.

Gorestein, C., Andrade, L. 1998. Inventário de depressão de Beck: propriedades psicométricas da versão em português. *Rev Psiq Clin*; v. 25, n. 5, p. 245-250.

Kalimo, R., Lehtonen, A., Daleva, M., Kuorinka, I. 1980. Psychological and biochemical strain in firemen's work. *Scand J Work Environ Health,* v. 6, n. 3, p. 179-187.

Lima, E.P., Assunção, A.A., Barreto, S.M. 2015. Prevalência de depressão em bombeiros. Cad. Saúde Pública, Rio de Janeiro, v. 31, n. 4, p. 733-743.

Marques, G.M. 2012. Stress e enfrentamento em uma equipe de bombeiros, 200p. Ph. D. Thesis, Escola de Enfermagem da Universidade de São Paulo, São Paulo.

Mato Grosso do Sul. Corpo de bombeiros militar de Mato Grosso do Sul. Atendimento do CBMMS. Availablein: < http://www.bombeiros.ms.gov.br/index.php?inside=1&tp=3&comp=4534&show=874.>

Monteiro, J.K., Maus, D., Machado, F.R., Pesenti, C., Bottega, D., Carnie, L.B. 2007. Bombeiros: Um Olhar Sobre a Qualidade de Vida no Trabalho. Psicologia Ciência & Profissão, v. 27 n. 3, p. 554-565.

Murta, S.G., Tróccolli, B.T. 2007. Stress ocupacional em bombeiros: efeitos de intervenção baseada em avaliação de necessidades. Estudos de Psicologia (Campinas). v. 24, n. 1, p. 41-51.

Oliveira, P.A. 2010. Habilidades sociais, depressão, ansiedade e alcoolismo em bombeiros: um estudo correlacional. Master dissertation. 90f. São Carlos: UFSCar.

Paschoal, T., Tamayo, A. 2005. Impacto dos valores laborais e da interferência família: trabalho no estresse ocupacional. Psicologia: *Teoria e Pesquisa. Brasília,* v.21, n.2, p. 173-180.

Prado, J.S. 2011. Estresse e qualidade de vida em bombeiros militares. 2011. 79 f. Master dissertationin psicology - Programa de Mestrado em Psicologia, Universidade Católica Dom Bosco, Campo Grande.

Sato, L. 1991. Abordagem psicossocial do trabalho penoso: estudo de caso de motoristas de ônibus urbano. Master dissertation in social, São Paulo: PUC.

Szubert, Z., Sobala, W. 2000. Accidents and their health effects in firemen of rescue and firefighting teams. Med Pr, v. 51, n. 2, p. 97-105.

Vara, N., Queirós, C. 2009. Burnout – Um risco no desempenho e satisfação profissional nos bombeiros que trabalham na emergência pré-hospitalar. Territorium, v. 16, p. 173-178.

Vasconcelos, T.S. 2011. Programas de gerenciamento do estresse e qualidade de vida no trabalho na área de segurança pública. In: Rossi, A.M.; Perrewé, P.L.; Meurs, J.A (Org.). Stress e qualidade de vida no trabalho: stress social – enfrentamento e prevenção. São Paulo: Atlas.

****