

The Moderating Effect of Coping Strategies on Job Satisfaction and Mental Health among Fire Fighters

*Mohd. Dahlan Hj. A Malek¹, Adi Fahrudin², Wan Anor Wan³, Ida Shafinaz Mohd. Kamil⁴

¹Faculty of Psychology and Education, Universiti Malaysia Sabah

²Faculty of Social and Political Sciences, University of Muhammadiyah Jakarta

³Faculty of Psychology and Education, Universiti Malaysia Sabah

⁴Faculty of Business, Economics and Accountancy, Universiti Malaysia Sabah

*dahlanam@ums.edu.my

Abstract

Sources of occupational stress and their impact on mental health were examined in a questionnaire survey of 617 firefighters. The role of coping strategies as a moderating factor was also tested. The results indicated that the overall of sources of stress had a significant positive correlation with overall mental health and there was a significant influence of coping strategies as a moderating variable between sources of stress and mental health (stress, anxiety and depression).

Keywords: *Occupational stress, mental health, coping strategies, firefighter.*

1. INTRODUCTION

A firefighter is a rescuer extensively trained in firefighting, primarily to extinguish hazardous fires that threaten property and rescue people from dangerous situations. Firefighters work to protect the community against injury, loss of life and destruction of property by fire and other disasters. In the course of their work, they can be exposed to physical, chemical and biological hazards. They also face the risk of psychological conditions such as Post Traumatic Disorder (PTSD) and physical injuries.

While, there is an extensive literature on stress in policing. only a few empirical studies have systematically examined the causes and effects of stress in firefighters' work. Most of these have concentrated on the specific effects of distressing events causing PTSD. Rather than the more general issue of occupational stress and its effects. This article focuses on sources of stress as predictors of mental health (anxiety, stress and depression) among firefighters. It also examines the roles of coping strategies as a moderator between exposure to occupational stressors and its impact on mental health.

1.1. Causes and Effects of Occupational Stress in Firefighters

A firefighter must be well prepared both physically and mentally, as firefighting and emergency rescue work is a very challenging and high-risk job. According to professional firefighting is a stressful and dangerous occupation that ranks fifth in occupational mortality in the United States. Evidence suggests that most firefighter mortality and morbidity are related either directly or indirectly to the stressful nature of their work. found that workers in emergency service organisations such as the fire brigade, ambulance service and rescue squads, are not only exposed to everyday stressors common to many work environments, but they can also face extreme stressors associated with emergency incidents such as traumatic accidents or

disasters. suggested that fire fighters' job stress is complicated and multifaceted. They developed the Sources of Occupational Stress Scale (SOOS) that assessed 14 different categories of occupational stress for fire fighters, (including sleep disturbance, job skill concerns, past critical incidents, management conflicts). They found that the SOOS instrument appears to have adequate reliability and concurrent validity for fire fighters in the USA and is correlated with job satisfaction and work outcomes. found that poor physical health was a major stress outcome among 427 emergency service workers (fire service and ambulance services) in England. Their results also show that job stress was revealed as a major problem for the ambulance service and fire service workers.

1.2. Coping Strategies

Previous studies suggested that coping is an important variables predicting mental health. The ability to cope with demands is very important in our lives. reported that fire fighters must cope with extraordinary and persistent occupational demands that are potentially cumulative. People adapt in different ways to the environment and these differences can influence the level of mental health. reported that appraisal of coping strategies is a complex phenomenon that can also involve expectations about how one will be affected and deal with future stressors. She suggested that the coping style of emergency workers could result from the type of work, rather than type of person. For example, emergency workers frequently describe their reactions at an emergency or disaster site similar to the following: “we have a job to do and we have to get on with it. We can’t afford to be upset by the things around us”. stated that this type of coping has been referred to as a “trauma membrane” that allows emergency workers to shield themselves emotionally from unpleasant or threatening scenarios.

2. OBJECTIVES OF THE STUDY

The objectives of the study are: (a) to examine the sources of stress as a predictor of mental health (anxiety, stress and depression) among fire fighters, and (b) to examine the roles of coping strategies as moderator variables. The current study will be based on the proposed theoretical framework outlined below in Figure 1. This theoretical framework of the study is based on the existing research on stress and fire fighters discussed above.

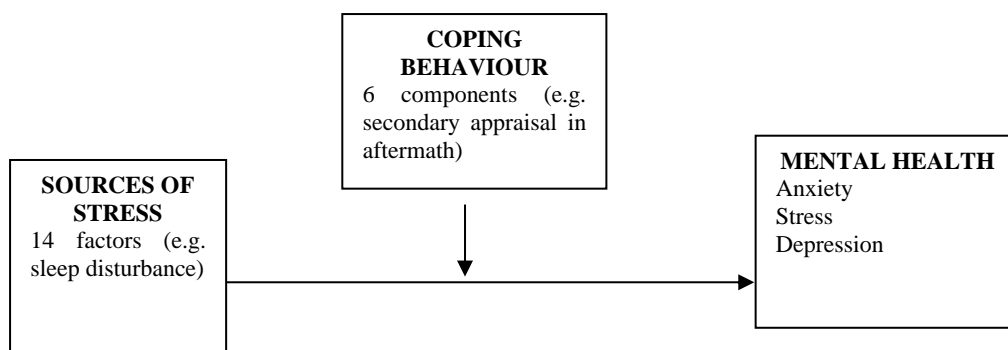


Figure 1: The theoretical framework for the study

3. HYPOTHESES OF THE STUDY

On the basis of the foregoing overview, the following hypotheses were formulated:

3.1. Hypothesis 1

It is predicted that fire fighters who report higher levels of pressure arising from sources of stress report poorer mental health.

3.2. Hypothesis 2

Coping strategies act as moderating variables between sources of stress with mental health (anxiety, stress and depression). It is predicted that coping strategies contribute to mental health.

4. METHODOLOGY

4.1 Procedure

The questionnaire was distributed through the officers in charge in six zones of Malaysian fire fighters namely Wilayah Persekutuan, Selangor, Sabah, Kelantan, Malacca and Perak. Questionnaires were sent to each station via the internal post of each brigade and were then distributed to individual members. At the time of distribution, the purpose of the survey was explained and the feedback that could be expected was described. All personal information given was treated in confidence, and no individual was identifiable.

4.2 Measures

Respondents completed a self-report questionnaire containing five scales measuring sources of stress, coping strategies and mental health. Respondents were also asked for their demographic information (age, length of service, marital status, job position and second job). Details of each scale are given below.

a. Sources of stress

Sources of stress were measured with the Sources of Occupational Stress in Fire Fighters and Paramedics (SOOS; Beaton & Murphy, 1993). The SOOS has 57 items designed to assess the types and degrees of psychosocial stressors to which fire fighters are commonly exposed (overall Cronbach's α of the SOOS was 0.95 (n=2005) for US fire fighters). The respondents were asked to indicate whether they have experienced a particular type of occupational stressor within their past 10 work shifts and if they have, to indicate how 'bothered' they have been by this job-related stressor on a 1 to 10 rating scale (10=extremely bothered, 5=somewhat bothered, and 0=not bothered at all). Beaton and Murphy (1993) used a 100-point scale but this was reduced to a 10-point scale for ease of completion and to fit better with the measurement used in the other subscales. The scale was chosen for fire fighters since it appears to be comprehensive and relevant (Coefficient $\hat{\alpha}$ for the present study was 0.97).

b. Coping strategies

Coping strategies were assessed with the Coping Response of Rescue Workers Inventory (CRRWI) that contains 32 items developed to measure coping behaviours among fire fighters. The CRRWI initially was developed from The Ways of Coping Inventory, which described a broad range of behavioural and cognitive strategies that an individual might use in stressful situations. This instrument was reworded and shortened into 32 items for use with disaster victims. adapted the 32 items for his studies on Canadian fire fighters. in a study on coping responses and post-traumatic stress symptomatology in US urban fire service personnel categorised this Coping Response of Rescue Workers Inventory (CRRWI) into six components namely: Secondary appraisal in aftermath; Behavioural distraction and social support seeking; Cognitive behavioural avoidance and numbing; Foster positive attitudes; Cognitive positive self-talk; and Inward search-philosophical self-contemplation. The coefficient $\hat{\alpha}$ for sub scales of the CRRW1 were in the range .61 to .85 and the overall coefficient $\hat{\alpha}$ was .90. The CRRWI is suitable for measuring coping behavior in the current study since it has already been used in a sample of fire fighters. The version of CRRWI used here contained 32 items and respondents indicated how frequently they use the ways to handle stress with each item on a 4-point scale (1=never, 2=rarely, 3=sometimes, 4=often). Some examples include “Be more helpful to others,” “Turn to religion or philosophy for help,” and “Put feelings out of my mind.”

c. Mental health (anxiety, stress and depression)

This was measured with the Mental Health Scale (PHS). The PHS is a 36 item scale adapted from three instruments namely, 12 items from the Clinical Anxiety Scale to measure level of anxiety (e.g. I feel calm), 12 items from the Index of Clinical Stress to measure level of stress (e.g. I feel over panicky) and 12 items from the Generalized Contentment Scale to measure level of depression (e.g. I feel downhearted). Respondents indicated their degree of agreement with each item on a 4-point scale (1=never, 2=rarely, 3=sometimes, 4=often). The PHS was used in the current study since it has been shown to have high internal reliability (.88) after a pilot study conducted on Malaysian fire fighters. administered the PHS to 222 female pensioners in Malaysia and the coefficient alpha reliability estimates were .92 for the Clinical Anxiety Scale (CAS), .80 for the Index of Clinical Stress (ICS) and .74 for the Generalized Contentment Scale (GCS).

4.3. Respondents

The questionnaires were distributed to 800 personnel with 617 returned from fire fighters (all male) in operational units (77% response rate). Responses were obtained from all ranks. The length of the respondents' service ranged from less than one year (2.8%, n=17) to more than 10 years (54%, n=336). The age of the respondents ranged from 21 to 60 years old and the majority were in the range between 41 to 45 years old.

5. RESULTS AND ANALYSIS

5.1. Descriptive Statistics

Descriptive statistics for all variables are presented in Table 1. Included are means, standard deviation, correlation coefficients and coefficient alphas. The results showed that the internal reliabilities of measures are acceptable. The Cronbach's alphas ranged from 0.86-0.97.

5.2. Correlations

Inter correlations among sources of stress, mental health and coping strategies are also presented in Table 1. The results indicated that the overall of sources of stress had a significant positive correlation with overall of mental health ($r=.34, p<0.01$). In other words, the higher levels of pressure arising from sources of stress, the poorer mental health (anxiety, stress and depression). Therefore, hypothesis 1 was supported by the findings.

Table 1: Means, Standard Deviation, Cronbach's alpha and Pearson Correlation Coefficients of the study

	Variable	M	SD	$\hat{\rho} \alpha$	1	2	3	4	5
	Malaysian fire fighters								
1	Sources of stress	206.7	111.4	.97	-				
2	Coping behaviour	86.8	12.6	.87	.13**	.13**	-		
3	Mental health	61.05	9.88	.84	.34**	-.16**	.03		

* $p<.05$; ** $p<.01$

5.3. Hierarchical Regression Analyses on the Overall of Mental health

Hierarchical regression analysis with 'Enter' method was used to examine the extent of the influence of the overall of coping strategies on the interaction between sources of stress, mental health (anxiety, stress and depression). Coefficient R^2 is used to measure the contribution towards mental health (anxiety, stress and depression), meanwhile value change of R^2 is used to see the contribution of coping strategies as a moderating variable. The analysis was carried out for the dependent variable (mental health) in which the relevant variable blocks were added in following order, step 1, step 2 and step 3.

Table 2 shows that the results of the hierarchical moderated multiple regression analysis on overall mental health of fire fighters. The change in R^2 step 1 ($\Delta R^2 = .104$) and 3 ($\Delta R^2 = .007$) reached a significant level. Therefore, the hypothesis that there is a significant influence of overall coping strategies as a moderating variable between sources of stress on overall mental health (stress, anxiety and depression) was supported for the Malaysian fire fighters.

Table 2: Summary hierarchical multiple regression analysis of the relations between sources of stress and coping strategies on mental health for Malaysian fire fighters

Predictors	β	R	R^2	T	ΔR^2
Step 1					
SOOS	.323	.323	.104	7.93**	.104**
Step 2					
CS	-.011	.323	.104	-.27	.000
Step 3					
Interaction term		.			
SOOS x CS	.557	.334	.111	2.08	.007*

* $p<.05$; ** $p<.01$

SOOS-sources of stress; SOOS-overall sources of stress; CS-overall coping strategies

6. DISCUSSION

The overall aim of this study was to examine the relationship of sources of stress and mental health among fire fighters. The results indicated that “Job skill concerns” component was the top ranked for the sources of stress and the lowest component was “Discrimination”, the same as the norm data ranking for the US sample among Malaysian fire fighters.

The result also indicated that level of depression among fire fighters was highest, whereas level of anxiety was slightly lower and level of stress was lowest. Compared to the scoring criteria (36-71=lower, 72-108=intermediate and 109-144=high), the overall mental health of fire fighters was in the lower category range (range: 36-144), so this show that overall, the fire fighters have a good level of mental health compared to norm data.

The results of the study showed that ‘Cognitive positive self-talk’ had the highest mean score, and ‘Cognitive behavioural avoidance and numbing’ had the lowest mean score. This finding was different from the norm data where the top ranked of the CRRWI component for US sample was “Foster positives attitudes. The lowest component of both the Malaysian and US sample were similar (Cognitive behavioural avoidance and numbing). However, the results indicated that the Malaysian fire fighters generally used more coping strategies compared to US fire fighters.

Furthermore, the study of how the fire fighters coped with their stress at work was very important since reported that the opportunities to study how fire fighters coped their stressful situation were rare.

7. CONCLUSION

Despite the limitations mentioned, this study has potential implications for fire fighters’ stress management programmes. It is suggested that Malaysian fire fighters can identify the best strategies to cope with their stress. Perhaps the model of fire fighter’s mental health will give some guidelines such as which ways are the most frequently used by Malaysian fire fighters to manage stress at work, and try to identify which ways are suitable for them. For example, one way to classify interventions intended to help people deal with emergency situation is to consider the level of control available to the fire fighters at that time. Moreover, the strategies for dealing with either stressors or strain outcomes ultimately require individual awareness, commitment, knowledge, skill and participation in emergency situations. In other words, the utility of stress knowledge and related skills ultimately rest in the hands of the fire fighters who are stressed and in their ability to apply their knowledge in order to cope with certain situation.

Finally, there are several limitations to this study. First, the data were self-reported responses and were based on fire fighters sample only. Therefore, it is not possible to extrapolate these findings to other occupational groups, including other emergency services. Second, this study did not deal with long-term outcomes since the respondents were asked to indicate whether they had experienced a particular type of occupational stressor within their past 10 work shifts only. Third, there is also a disadvantage in using a questionnaire design, namely that one cannot get all the data or information required, as it is very specific and focused. have stated that, a limitation of questionnaires is that the items are preset and respondents cannot fully express their opinions. However, after some consideration, the study still used a questionnaire design

because of time constraint and it was difficult to collect a great deal of specific information from a large number of fire fighters in a very short period and given these constraints a questionnaire seemed the best option.

In conclusion, fire fighters' mental health and their coping strategies are very important. Thus, mental health plays an important role for fire fighters in increasing their job performance. When a fire fighter has the best strategies to cope with stress, this will perhaps improve their mental health. However, it depends on the individual because people are different as reported that the work of fire fighters is largely based on the co-operation between them and can be problematic with individuals having different kinds of background such as education and culture.

REFERENCES

- [1] Mohd Dahlan A. Malek & Ida Shafinaz Mohamed Kamil, "A Cross Cultural Study of Psychological Wellbeing among British and Malaysian Fire fighters". International Association for Cross Cultural Psychology Conference, 2016, pp. 455-460.
- [2] Alexander, D.A., & Walker, L.G. "A study of methods used by Scottish police officers to cope with work-induced stress". *Stress Medicine*, 9, 131-138,1994.
- [3] Brown, J. & Heidensohn, F. "Gender and Policing: Comparative Perspectives". New York: St. Martin's Press, 2001.
- [4] Al-Naser, F. & Everly, G. "Prevalence of posttraumatic stress disorder among Kuwaiti fire-fighters". *International Journal of Emergency Mental Health*, 1(2), 99-101,1999.
- [5] Corneil, W. "Prevalence of posttraumatic stress disorder in a metropolitan fire department". Phd thesis, Johns Hopkins School of Hygiene & Public Health, Maryland, 1993.
- [6] Corneil, W., Beaton, R., Murphy, S., Johnson, C. & Pike, K. "Exposure to traumatic incidents and prevalence of posttraumatic stress symptomatology in urban fire fighters in two countries". *Journal of Occupational Health Psychology*, 4(2), 131-141, 1999.
- [7] Leigh, J.P. "Job Related Deaths in 347 Occupations". California: San Jose University, 1988.
- [8] Beaton, R.D., & Murphy, S.A. "Sources of occupational stress among fire-fighter/EMTS and fire-fighter/paramedics and correlations with job-related outcomes". *Prehospital & Disaster Medicine*, 8, 140-150, 1993.
- [9] Moran, C. "Personal predictions of stress and stress reactions in fire fighter recruits." *Disaster Prevention and Management*, 10(5), 356-365, 2001.
- [10] Young, K.M. & Cooper, C.L. "Occupational stress in the ambulance service: A diagnostic study". *Health Manpower Management*, 23(4), 140-147, 1997.
- [11] Moran, C. & Colless, E. "Positive reactions following emergency and disaster responses". *Disaster Prevention and Management*, 4(1), 55-60, 1995.
- [12] Beaton, R.D., Murphy, S.A., Johnson C., Pike, K. & Corneil, W. "Coping responses and posttraumatic stress symptomatology in urban fire service personnel". *Journal of Traumatic Stress*, 12(2), 293-307, 1999.
- [13] Lindy, J. "The trauma membrane and other clinical concepts derived from psychotherapeutic work with survivors of natural disasters". *Psychiatric Annals*, 15(3), 153-160, 1985.
- [14] Horowitz, M. & Wilner, N.J. "Life Events and Coping". In L. Poon (ed.), *Aging in the 80s*. Washington DC. American Psychological Association, 1891.
- [15] Mc Cammon, S., Durham, T.W., Allison, E.J. & Williamson, J.E. "Emergency workers cognitive appraisal and coping with traumatic events". *Journal of Traumatic Stress*, 1, 353-372, 1998.
- [16] Thyer, B.A. "The Clinical Anxiety Scale (CAS)". Arizona: Walmyr Publishing, 1992.
- [17] Hudson, W. & Abell, N. "Index of Clinical Stress (ICS)". Arizona: Walmyr Publishing, 1992.
- [18] Hudson, W. "The Generalized Contentment Scale (GCS)". Arizona: Walmyr Publishing, 1993.
- [19] Adi, F., Malek, Md. & Yusuf, M. "Sources of stress, coping strategies and wellbeing among female pensioners". Top Down University Project Rep. No. 2/2000, University Malaysia Sabah, Psychological Research and Social Health Unit, 2003.
- [20] Lusa, S., Hakkanen, M., Luukkonen, R. & Viikari-Juntura, E. "Perceived physical work capacity, stress, sleep disturbance and occupational accidents among fire fighters working during a strike". *Work & Stress*, 16(3), 264-274, 2002.

- [21] Goddard III, R.D., & Villanova, P. Designing surveys and questionnaires for research. In F. Leong, & J.T. Austin, (eds.) *The Psychological Research Handbook: A Guide for Graduate Students and Research Assistants*. London: Sage Publications, 1996, pp. 114-125.