The Moderating Effect of Work Motivation and Coping Strategies on Job Satisfaction and Psychological Well Being among Fire Fighters

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Abstract

Sources of occupational stress and their impact on work motivation, job satisfaction and well being were examined in a questionnaire survey of 436 UK fire fighters from four fire brigades. The role of coping strategies as a moderating factor was also tested. Levels of occupational stress had a significant negative correlation with job satisfaction. Multiple regression analysis was used to examine the moderating effect of work motivation and coping strategies on job satisfaction and psychological well being and found that there was a significant influence of coping behaviour as a moderating variable on job satisfaction. These findings provide some implications for the human resource department of the emergency workers to establish a counselling unit in order to deal with psychological problem faced by the emergency workers.

Keywords: Stress; Well being; Work motivation; Job satisfaction; Fire fighter

1. Introduction

Every year, fires and other emergencies take lives and destroy properties. Fire fighters help to protect the public against these threats by rapidly responding to emergency calls. 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 stress disorder (PTSD), resulting from witnessing traumatic events. In common with other less risky occupations, they can experience occupational stress relating to their work conditions (e.g.shiftwork) or other organisational or career issues.

While there is an extensive literature on stress in policing (e.g. Alexander & Walker, 1994; Brown, 2001; Kircaldy, Brown & Cooper, 1988), only a few empirical studies have systematically examined the causes and effects of stress in fire fighters' work. Most of these have concentrated on the specific effects of distressing events causing PTSD (Al- Naser & Everly, 1999; Corneil, 1993; Corneil, Beaton, Murphy, Johnson & Pike, 1999) rather than the more general issue of occupational stress and its effects. This article focuses on sources of stress as predictors of psychological well being (anxiety, stress and depression) and job satisfaction among UK fire fighters. It also examines the roles of work motivation and coping behaviour as moderators between exposure to occupational stressors and psychological well being/ job satisfaction.

Causes and Effects of Occupational Stress in Firefighters

A fire fighter must be well prepared both physically and mentally, as fire fighting and emergency rescue work is a very challenging and high-risk job. According to Leigh (1988), professional fire fighting is a stressful and dangerous occupation that ranks fifth in occupational mortality in the United States. Evidence suggests that most fire-fighter mortality and morbidity is related either directly or indirectly to the stressful nature of their work (Beaton & Murphy, 1993). Furthermore, Moran (2001) 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. Beaton and Murphy (1993) suggested that fire fighters' job stress is complicated and multifaceted. They developed the Sources of Occupational Stress Scale that divided the sources of occupational stress among fire fighters into 14 factors, namely sleep disturbance, job skill concerns, past critical incidents, management conflicts, apprehensions regarding personal safety, co-worker conflict, substandard equipment, reduction in force, wage and benefit worries, conveying news of tragedy, tedium, poor health habits, discrimination, family or financial strain and second job stress. Based on their study, they found that the SOOS instrument appears to have adequate reliability and concurrent validity for the fire fighters and correlated with job satisfaction and work outcomes. Results from Baker and Williams (2001) study on 78 UK fire fighters indicated that work stress (i.e. organisational stress and incident-related stress) and problem-solving appraisal accounted for 49% of the variance in psychological distress. They found that those reporting higher level of psychological distress also reported less confidence. They also found that individuals in different fire service ranks reported similar levels of organisational stress. Young and Cooper (1997) found that

poor physical health was a major stress outcome among 427 emergency service workers (fire service and ambulance services) in England. The results of the study present a picture of occupational stress, its sources and effects for both public services. The results also show that job dissatisfaction was revealed as a major problem for the ambulance service and fire service workers. Bartolo and Furlonger (2000) also investigated job satisfaction but they focused on the relationship between job satisfaction and supervisor leadership behaviour among fire fighters. In their study, the sample was selected from a privatised aviation fire service in Australia and consisted of 56 fire fighters from two stations in Victoria (n=36) and New South Wales (n=20). They used a shortened version of the Smith et.al. (1969) Job Description Index (JDI) to measure job satisfaction and the Leader Behaviour Questionnaire version 12 (LBQXII) to measure employees' perception of their superiors' leadership. The results indicated that there are significant positive relationships between co-worker satisfaction, supervision satisfaction, initiating structure and consideration leadership behaviour.

Beaton & Murphy (1993) reported that, social support at home (with family and friends) was significantly higher than satisfaction with co-worker support and low social support and / or high relational conflict (especially work) may predict adverse health outcomes among 1,703 fire fighters and 253 paramedics U.S. sample.

Other studies, Lusa, Hakkanen, Luukkonen & Viikari-Juntura (2002) examined 543 male fire fighters and rescue workers from 71 Finland fire brigades by using a cross-sectional questionnaire study. The result of their study found that the fire fighters working during the strike reported more stress than those in normal situations. However, they found that their first study conducted about perceived physical work capacity, stress, sleep disturbance and occupational accidents among Finish fire fighters during the normal situation were at the same level as compared to their second study of the Finish fire fighters work during a strike. Previous studies suggested that work motivation (Ambrose & Kulik, 1999; Deci & Ryan, 1985; Lou Lu, 1999) and coping (Moran & Colles, 1995) are the important variables predicting psychological well being.

Work motivation and coping strategies

Pinder (1998) described work motivation as a set of internal and external forces that initiate work-related behaviour; determine its form, direction, intensity and duration. It can be defined as the willingness to exert high levels of effort toward organisational goals, conditioned by the person's ability to satisfy some individual need. Given the risks, fire fighters' motivation and job satisfaction must be high for them to stay in this occupation. Thus, job satisfaction may play an important role for fire fighters in increasing their job performance. When a fire fighter has high motivation, this will perhaps improve his or her job satisfaction and psychological well being. In this study, work motivation was divided into three components, accomplishment striving, status striving and communion striving based on Barrick et.al (2002) study on the effect of motivation among sales representatives. Beaton et al. (1999) reported that fire fighters must cope with extraordinary and persistent occupational demands that are potential cumulative

Besides that this study will examine the types of coping behaviour used by UK fire fighters. The ability to cope with demands is very important in our lives. People

adapt in different ways to the environment and these differences can influence the level of psychological well being. Moran (2001) reported that appraisal of coping behaviour 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 in terms 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" (p.357). Lindy (1985) 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.

The purposes of the study are: (a) to examine the sources of stress as a predictor of psychological well being (anxiety, stress and depression) and job satisfaction among UK fire fighters and (b) to examine the roles of work motivation and coping behaviour 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 review of literature on fire fighters, proposed by Malek, Mearns & Flin (2003).

[Insert Figure 1 about here]

In this model, sources of stress are related to job satisfaction and psychological well being, and moderated by the work motivation and coping behaviour.

1.4. Hypotheses of the Study

On the basis of the foregoing overview, the following hypotheses were formulated:
Hypothesis 1
It is predicted that fire fighters who report higher levels of pressure arising from sources of stress report lower job satisfaction and poorer psychological well being.
Hypothesis 2
Work motivation and coping behaviour act as moderating variables between sources of stress and psychological well-being (anxiety, stress and depression) and job satisfaction.

Method

Procedure

The questionnaire was distributed through the officers in charge in four fire brigades in the UK. 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. Ethics approval for the study was granted by the School of Psychology Research Ethics Committee that adheres to British Psychological Society guidelines.

Measures

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

Sources of Stress. Sources of stress were measured with the Sources of Occupational Stress in Fire Fighters & 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. The respondents were asked to indicate whether they had experienced a particular type of occupational stressor within their past 10 work shifts and if they had, to indicate how 'bothered' they had been by this job-related stressor on a 1 to 10 rating scale (where 10=extremely bothered, 5=somewhat bothered, and 0=not bothered at all). Beaton and Murphy (1993) found that the overall Cronbach's α of the SOOS was 0.95 (n=2005) for US fire fighters. The scale was chosen for UK fire fighters since it appears to be comprehensive and relevant for UK fire operations (Coefficient ∂ for the present study was 0.97).

Work motivation. Work motivation was measured with The Motivational Orientation Inventory (MOI; Barrick et al., 2002). The MOI has 31 items and it is suitable for measuring three aspects of motivation. In fact, all the items have been customized for fire fighters. Accomplishment Striving (AS, 11 items), reflects an individual's intention to accomplish task and is characterized by a high task orientation (e.g. I frequently think about getting my work done). Communion Striving (CS, 8 items) represents action directed towards obtaining acceptance in personal relationships and getting along with others at work (e.g. I focus my attention on being the best fire fighter in the station). Status Striving (SS, 12 items) represents actions directed toward obtaining power and dominance within a status hierarchy at work (e.g. I care a lot about having co-workers and supervisors who are like me). Respondents indicated their level of agreement with each item on a 5-point scale (5=strongly agree, 4=agree, 3=not really sure, 2=disagree and 1=strongly disagree). Barrick et al. (2002) report Cronbach alphas of 0.91, 0.89 and 0.78 for the three sub scales (AS, SS, CS), based on a sample of 1130 university students. Coefficient ∂ for the overall of the MOI in present study was .93. The MOI was chosen in the present study since the results of the pilot study showed that the instrument had good internal reliability and was suitable for use with the Malaysian fire fighters (Cronbach's alpha .88).

Coping strategies. Coping strategies were assessed with the Coping Response of Rescue Workers Inventory (CRRWI) that contain a 32 item scale developed by Corneil (1993) to measure coping behaviours among fire fighters. The CRRWI initially developed from The Ways of Coping Inventory, which originally contained 68 items describing a broad range of behavioural and cognitive strategies that an individual might use in stressful situations. According to Corneil (1993) this instrument has been slightly reworded and shortened into 32 items by Horowitz and Wilner (1981) for use with disaster victims. Mc Cammon, Durham, Allison et al (1988) used factor analysis to obtain the four sub scales: appraisal-focused coping (search for meaning); problem focused coping (regaining mastery through individual action); emotional-focused coping (regaining mastery through interpersonal action); and self-esteem (philosophical and self-contemplation). Corneil, (1993) adapted 32

items that shortened by Horowitz and Wilner (1981) and used in his studies on Canadian fire fighters but he categorised the items into 6 components; Cognitive Appraisal, Emotion Focus; Seeking Social Support; Behaviour Change; Denial; and Philosophical Self-Contemplation. However, Beaton et al (1999) in a study on coping responses and post traumatic stress symptomatology in US urban fire service personnel categorised the Coping Response of Rescue Workers Inventory (CRRWI) into new components namely: Secondary appraisal in aftermath; Behavioural distraction & social support seeking; Cognitive behavioural avoidance and numbing; Foster positive attitudes; Cognitive positive self-talk; and Inward search-philosophical Self-contemplation. 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." The coefficient ∂ for sub scales of the CRRW1 was in the range .61 to .85 and the total coefficient ∂ was .90 (Beaton et al,1999)

Psychological well being. This was measured with the Psychological Well being Scale (PWS). The PWS is a 36 item scale adapted from three instruments namely, 12 items from the Clinical Anxiety Scale (CAS; Thyer, 1992) to measure level of anxiety (e.g. I feel calm), 12 items from the Index of Clinical Stress (ICS; Hudson & Abell, 1992) to measure level of stress (e.g. I feel over panicky) and 12 items from the Generalized Contentment Scale (GCS; Hudson, 1993) 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 PWS was used in the current study since it has been shown to have high reliability (.88). The reliability of the overall PWS for the UK fire fighters was .86

Job satisfaction. This was measured with The Job Satisfaction Scale developed by Warr, Cook and Wall (1979). The JSS was deemed to be suitable for this study as it is simple and precise and measures overall, as well as intrinsic and extrinsic job satisfaction. According to Mullarkey, Wall, Warr, Clegg and Stride (1999) the JSS has been used with a wide range of employees including those working in primary health care, shop floor manufacturing jobs, education, public service, construction work and off-shore oil installations. Respondents indicated their degree of satisfaction with each item on a 7-point scale (1=I'm extremely dissatisfied, 2=I'm very dissatisfied, 3=I'm moderately dissatisfied, 4=I'm not sure, 5=I'm moderately satisfied, 6=I'm very satisfied, 7=I'm extremely satisfied). The Cronbach's alpha coefficients for each factor show high reliability, for example for overall satisfaction (manufacturing, n=6579 the Cronbach's alpha is 0.92), for intrinsic satisfaction (manufacturing, n=6583, the Cronbach's alpha is 0.88) and for extrinsic satisfaction (manufacturing, n=6590, Cronbach's alpha is 0.83) (Mullarkey et.al. 1999). The Intrinsic Job satisfaction sub scale comprises seven items (e.g. The freedom to choose your own method of working?) and the Extrinsic Job Satisfaction sub scale was made up of eight items (e.g. your rate of pay?). Coefficient ∂ for the present study was .89 for the overall job satisfaction, .80 for the external job satisfaction and .84 for the internal job satisfaction.

Respondents
Questionnaires were distributed to 1042 personnel with 436 returned from fire fighters (all male) in operational units (42% response rate). Responses were obtained from all ranks, 324 full time fire fighters and 112 retained fire fighters. The length of the respondents' service ranged from less than one year (4%, n=16) to more than 10 years (58%, n=251). The age of the respondents ranged from 21 to 60 years old and the majority were in the range between 36 to 40 years old.

3. Results

3.1. Descriptive statistics

Descriptive statistics for all variables are presented in Table 1. Included are means, standard deviation and coefficient alphas. The results show that the internal reliabilities of measures are acceptable. The Cronbach's alphas ranged from 0.86-0.93.

3.2. Correlations

Intercorrelations among sources of stress, work motivation, psychological well being, coping strategies and job satisfaction are also presented in Table 1. The results indicated that the total of sources of stress had a significant negative correlation with job satisfaction (r=. -35, p<0.01). The results also indicated that the total of sources of stress had a significant positive correlation with psychological well being (r=. 38, p<0.01). In other words, the higher levels of pressure arising from sources of stress, the lower job satisfaction and the poorer psychological well being among UK fire fighters. Therefore, hypothesis 1 is supported by the findings.
[Insert Table 1 about here]

3.3. Regression analyses on the total of job satisfaction and psychological well being

3.3.1. Job satisfaction

Multiple regression analysis with 'Enter' method was used to examine the extent of the influence of the overall coping behaviour and the overall work motivation on the interaction between sources of stress, well being (anxiety, stress and depression) and job satisfaction. Coefficient R^2 is used to measure the contribution of psychological well being (anxiety, stress and depression), meanwhile value change of R^2 is used to see the contribution of coping behaviour and work motivation.

The results in Table 2 shows that overall coping behaviour had a significant influence on overall job satisfaction (Beta =1.22, p< .000) but not on work motivation (Beta= 40, p<. 10). Therefore, there was a significant influence of coping behaviour as a moderating variable on job satisfaction.

[Insert Table 2 about here]

3.3.2. Psychological well being

The results in Table 3 also indicated that the overall coping behaviour (Beta = .108, p< .745) and overall work motivation (Beta = -.004, p< .98) were not a significant influence on well-being. Finally, it was found that all the six components of coping behaviour and all three components of work motivation did not make a significant contribution towards well being. Therefore the hypothesis that work motivation makes a contribution to psychological well being and job satisfaction was not

supported. Only coping behaviour contributes to job satisfaction among UK fire fighters.

[Insert Table 3 about here]

4. Discussion

4.1. Overview

The overall aim of this study was to examine the relationship of sources of stress, job satisfaction and well being among UK fire fighters. First the result was found to be consistent with Beaton and Murphy (1993), where the total Source of Stress scale was found to have a significant negative correlation with job satisfaction. The present finding also showed that the "Past critical incidents" component was the top ranked for the source of stress among British fire fighters, whereas the lowest component was "Discrimination". This finding was different from the norm data of the US fire fighters where the top ranked of the SOOS was "Sleep disturbance". However the lowest ranked item was similar to the norm data of US fire fighters. Besides that the results indicate that the item 'Reduction in force, manpower, wages, and/or benefits; real or threatened' achieved the top ranked score and the lowest ranked mean score for the SOOS was the item 'Harassment based on gender, ethnicity, or age. The results present a picture of sources of stress in UK fire fighters, which is different to that in other countries for example U.S., Canada, Finland and Malaysian fire fighters. UK fire fighters also reported high levels of depression compared to levels of anxiety and levels of stress (which was lowest). Compared to other studies, e.g. in female pensioners (Adi, Malek & Haji-Yusuf, 2002), levels of anxiety and depression among UK fire fighters can be considered at an intermediate level; but levels of stress which can be considered lower (12-23=lower, 24-35=intermediate and 36-48=high). The overall well being of the UK fire fighters was also intermediate to the maximum score (Min=36, Max=144).

The results indicated that the mean score for the sub scale 'Accomplishment Striving' was higher than for other two compared to the sub scale 'Status Striving' and 'Communion Striving'. Our results also suggested that there is a significant positive correlation between communion striving, status striving and accomplishment striving and overall job satisfaction. The results are consistent with Barrick et.al. (2002) who suggested that accomplishment striving may affect performance through communion and status striving. In fact our results suggested that there is a significant relationships between accomplishment striving and job satisfaction but not between accomplishment striving and psychological well being among UK fire fighters.

The result also indicated that overall coping behaviour has a significant influence on overall job satisfaction but not on work motivation, which means that there is a significant influence of coping behaviour as a moderating variable on job satisfaction. This finding also found that 'Foster positive attitudes' was the most frequently used coping strategy by the UK fire fighters. This finding was different from a previous study by Corneil (1993) which found that 'Secondary appraisal in the aftermath" was the most frequently used coping strategy by Canadian fire fighters. Furthermore, these results corroborated a previous study (Lou Lu, 1999), which suggested that coping strategies are one of the potential moderating variables between sources of stress, well being and job satisfaction. However this study did not agree with Lou Lu (1999) that

work motivation is also one of the potential moderating variables. The study of how the fire fighters cope their stress at work is very important since Lusa et al (2002) reported that the opportunities to study how fire fighters cope their stressful situation are rare. Our results suggested that the ways which fire fighters cope with their stressful work situation at work are more important than how motivated they are.

4.2. Limitations and implications

Finally, there are several limitations to this study. First, the data were self-reported responses and were based on a fire fighters sample only. Therefore, it is not possible to extrapolate these finding 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 very focused. Goddard III and Villanova (1996) 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 constraints and it is 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. Furthermore, a number of scales had been developed for use with fire fighters investigating the variables that we interested in. Fourth, the study was conducted after industrial action had occurred in the UK.

Despite the limitations mentioned, this study has potential implications for fire fighters' stress management programmes. It is suggested that UK fire fighters can identify the best strategies to cope with their stress. Perhaps model of psychological well being will give some guidelines such as which ways are the most frequently used by UK fire fighters to managing stress at work, and tried to identified which ways are suit 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.

In conclusion, fire fighters' job satisfaction must be high for them to stay in this occupation. Thus, job satisfaction 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 job satisfaction and psychological well being. However, its depend on the individual because the people are difference as Lusa et al (2002) 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 back ground such as education.

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Figure 1: The theoretical framework for the study

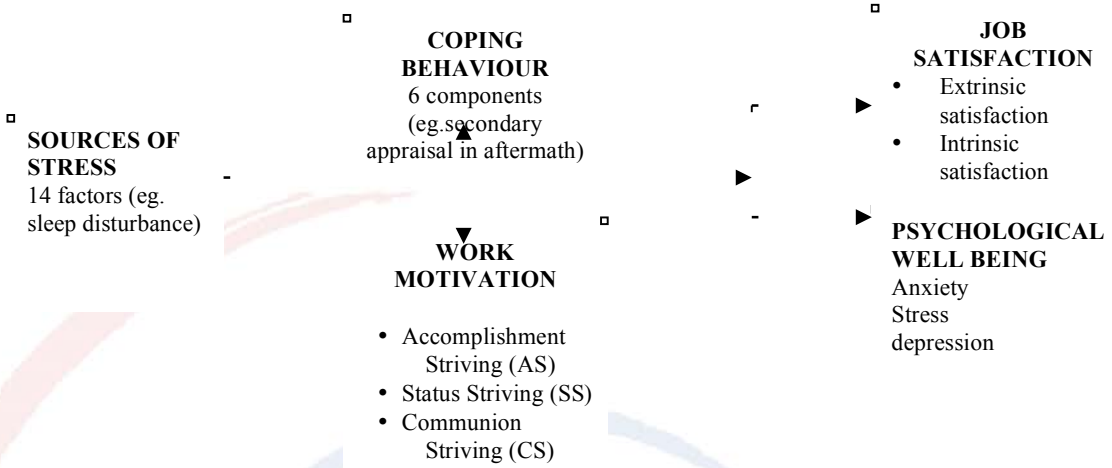

Table 1: Means, Standard Deviation, Cronbach's alpha and Pearson Correlation Coefficients of the study

	Variable	M	SD	∂	1	2	3	4	5
1	Total of Sources of stress	120.7	102.9	.97	-				
2	Total of Work motivation	96.5	19.1	.93	.02	-			
3	Total of Coping behaviour	83	14.2	.90	.21**	.29**	-		
4	Total of Psychological Well being	76.6	12.2	.86	.38**	.03	.33**	-	
5	Total of Job satisfaction	66.6	13.5	.89	-.35**	.22**	.12*	-.07	-

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

Table 2: Multiple Regression of Coping Behaviour and Work Motivation on dependent variable (Job Satisfaction)

Step	1	2	3
Overall coping behaviour- (CB)			
R^2	.112	.168	.200
$R^{2\ Change}$	.124	.044	.032
Sing. F Change	.000	.000	.000
Constant	-	-	-
Beta Sources of stress [SOOS]	-.352	-.399	-1.5
Beta Coping behaviour [CB]	-	.215	.024
Beta Sources of stress x Coping-behaviour [SOOS x CB]		-	1.22**
Work Motivation (WM)			
R^2	.125	.213	.219
$R^{2\ Change}$	.127	.086	.006
Sing. F Change	.000	.000	.109
Constant	-	-	-
Beta [SOOS]	-.357	-.368	-.749
Beta [WB]	-	.294	.199
Beta [SOOS x WB]	-	-	.403

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

Table 3: Multiple Regression of Coping Behaviour and Work Motivation on dependent variable (Well Being)

Step	1	2	3
Overall coping behaviour- (CB)			
R^2	.155	.219	.219
$R^{2\ Change}$	.158	.061	.000
Sing. F Change	.000	.000	.745
Constant	-	-	-
Beta Sources of stress [SOOS]	.397	.345	.243
Beta Coping behaviour [CB]	-	.252	.236
Beta Sources of stress x Coping-behaviour [SOOS x CB]		-	.108
Work Motivation (WM)			
R^2	.158	.160	.000
$R^{2\ Change}$	.158	.003	.000
Sing. F Change	.000	.295	.987
Constant	-	-	-
Beta [SOOS]	.397	.395	.399
Beta [WB]	-	.052	.053
Beta [SOOS x WB]	-	-	-.004

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

iafor