

Stress and Coping Abilities of Firefighting Personnel

ABSTRACT

The purpose of this study was to identify the effectiveness of coping strategies and resources that firefighters use to combat personal and workplace stressors. One hundred fifteen firefighting personnel from 4 fire departments in Illinois and Indiana participated. The Coping Resources Inventory for Stress (CRIS) Scale measured stress levels and coping strategies. Results showed firefighters not being physically fit, lacking social support, unable to control tension, unable to structure daily activities, and experiencing low confidence.

Firefighting personnel experience stress everyday in their work settings. Their ability to cope with stress affects their capacity to function effectively in emergency situations. Society has a stake in the ability of firefighting personnel to carry out their responsibilities effectively. Given the threat of natural disasters, threats of terror, mass casualties, and major environmental incidents, society depends on the services of firefighting personnel who work long hours with little relief in these situations. Fire departments and the personnel working in those settings need to understand the stress involved and identify effective coping strategies to deal with stress.

Since the attacks in Oklahoma City, the Twin Towers, and the Pentagon, fire departments have seen the extreme effects of stress on firefighting personnel. One study has now contributed to the understanding of life changes in response to physical and psychological stress experienced by firefighting personnel after the attacks (North et al., 2002). Even before these infamous attacks, Galloucis, Silverman, and Francek (2000) recognized that stress has a negative impact on the ability to function. Physical and psychological life stressors compound the occurrence of major illnesses, such as cancer, diabetes, leukemia, and myocardial infarctions. In addition, psychological distress is prevalent among individuals suffering a traumatic life event (Rabkin & Struening, 1976). Researchers (e.g., Baker & Williams, 2001; Regehr, Hill, & Glancy, 2000; Surratt, 2001) have examined the possible relationship between stress and cognitive functioning among emergency services personnel. Regehr et al. described symptoms among emergency care workers ranging from depression and lack of cognitive functioning to second-guessing judgment on an emergency scene. They also found that emergency personnel have

recurring nightmares, flashbacks, and loss of appetite after responding to a traumatic incident.

Firefighting personnel also are exposed to stressful situations; traumatic incidents; and environmental extremes, such as heat, cold wind, and noise, all of which require adaptational measures (i.e., personal coping strategies; Lazarus & Folkman, 1984). Working under adverse conditions may increase the amount of stress that firefighting personnel experience while they are performing emergency work on scene. For example, the Cerritos air crash of 1986 was a mass casualty event causing extreme stress and psychological distress among firefighting personnel responding to the scene (Hokanson & Wirth, 2000).

Theorists have studied stress for many years. Orner (1995) studied the effects of stressors and distressors on firefighters and ambulance personnel. Orner found that firefighting personnel experience negative thoughts, depression, and intrusive and adverse psychological reactions, depending on the duration of exposure to a traumatic incident. Other factors that affect firefighting personnel include the size of a fire being fought; the amount of time fighting a fire; and witnessing child abuse, murders, mass casualties, and infant deaths.

After involvement in a disaster or a traumatic incident, firefighting personnel may be at risk for acute stress disorder leading to posttraumatic stress disorder (PTSD). Firefighting personnel may experience increased rates of psychiatric symptoms—depression, anxiety, loss of appetite, dearth of sleep, and constant worry or fear—after witnessing or experiencing a traumatic event. These symptoms can lead to a significant

increase in psychiatric problems and may require professional intervention (Clohessy & Ehlers, 1999).

Firefighting personnel are confronted with occupational and daily life stressors as they try to balance their work in life-saving efforts with the needs and demands of family life. Even though they face stress every day, little is known about how they cope. The data collected from firefighting personnel working in the very intense environments of Oklahoma City and New York City have contributed to the knowledge related to their ability to cope with stress. Those two incidents, however, are not typical of the situations that firefighting personnel face daily. Society has a vested interest in understanding how most firefighting personnel cope with stress because these men and women protect communities, schools, businesses, and homes.

Currently, there are more than one million volunteer and 185,000 professional, full-time firefighters serving in more than 21,000 fire departments (Carter, 1998). Naturally, fire departments are concerned about the effects of stress on the ability of firefighting personnel to function optimally. Firefighting personnel are impacted by mental exhaustion, lack of medical attention during a fire, inappropriate driving at high rates of speed, 24-hr shifts, interrupted sleep, lack of regular meals, and lengthy absences from home. Firefighting personnel are at risk of experiencing psychological stress because of their occupation. Firefighters do not have a uniform number of callouts throughout jurisdictions. Firefighting personnel may have a different workload when residing in metropolitan areas. On the other hand, rural fire departments may experience significantly fewer emergency calls (Bowman, 1999).

How do firefighting personnel use coping resources when faced with stress in their personal and occupational lives? The purpose of this study was to identify how firefighting personnel use coping resources when they experience stress in their personal and occupational-lives. The goal of the study was to identify the coping resources used by firefighting personnel when they experience stress in their personal and occupational lives.

Theoretical Framework

Central themes expressed in Lazarus and Folkman's (1984) theory of stress and coping focus on stress transitions and social change, and how effectively people cope with them. Environmental stressors and ecological factors may increase the amount of stress that a person experiences (Lazarus & Folkman). Previous research has identified the relationship between stress and the environment. For example, Altman and Wohlwill (1977) theorized that stress is dependent upon the combined impact of environmental, social, and physical stressors. Lazarus (1966) further emphasized that phenomena in the environment comprise many variables (i.e., extreme weather conditions) that lead to the creation of stressors. An environmental incident can cause a positive or a negative outcome for the person involved; however, stress may still be the outcome (Holmes & Masuda, 1974).

The theory of stress and coping stressors was first identified through the earlier work of Lazarus and Cohen (1977). They identified three types of stressors:

1. Mass casualty stressors (e.g., natural disasters, major catastrophes, incarceration, and other uncontrollable phenomena) affect a large number of people or victims.

2. Major changes that affect a single person or a group of people. In this case, some disasters can occur to one person or to a group of people, but the events are not as disturbing.
3. Daily hassles are the continuing, small situations or events that irritate or distress people: a sick pet, too much responsibility, and loneliness.

Firefighting personnel may experience one of or all of these stressors during an emergency or afterwards.

Firefighting personnel use diverse methods to combat stressors. Lazarus and Folkman (1984) defined coping as “constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (p. 141). Their theory conceptualizes that coping is a process that a person does in order to combat stressors. An individual who is dealing with a stressor may cope through self-atomization, that is, the person adapts to the stressor and does not require psychological effort. Another method of coping is to assume that a situation will turn out for the better, regardless of how bad conditions may be.

Coping styles may range from attempting to minimize the stressor, accepting presently stressful conditions, or trying to control the stressful environment around the situation (Lazarus & Folkman, 1984). Klinger (1977) echoed this model by suggesting that people experience increased concentration and effort while first responding to a stressor. However, anger and frustration may occur if the stressor persists, eventually leading to depression, feelings of hopelessness, and negative thoughts.

This study suggested there was a significant relationship between firefighting personnel’s coping methods and their scores on the Coping Resources Inventory for

Stress (CRIS) Scale (Matheny, Curlette, Aycock, Pugh, & Taylor, 1987). Lazarus and Folkman's (1984) theory of stress and coping identified how individuals were affected in the environment by stressors, how life's daily stressors were encountered, and how coping styles may be differentiated depending on situational aspects of the stressor. These techniques, which can be manipulated into the environment of the firefighting profession, served as the foundation for this research.

LITERATURE REVIEW

The literature review included research on studies that focused on (a) the affect of internal and external sources on firefighters' cognitive abilities, and (b) the ability of firefighters to cope with stressors they face while on the emergency scene and after the emergency has taken place. The researcher compared and contrasted past and recent studies regarding cognitive ability and coping methods.

Strategy for Searching the Literature

. Using Walden's library search, including ERIC, MEDLINE, PsycINFO, PSYCARTICLES, and CINAHL, the researcher found 36 citations on firefighters' ability to cope with stress. Not all of the literature pertained to firefighters; some included emergency workers and other isolated incidents. After an initial search of the databases, the researcher used firefighting, emergency medical technician, and paramedic as primary keywords to find other related journal articles mentioning firefighters, coping abilities, and how coping abilities are related to stress.

Other subtopics, such as humor, substance abuse, physical fitness, music, Critical Incident Stress Management (CISM), and Critical Incident Stress Debriefing (CISD) also were searched. Several of the topics yielded few results; however, the researcher found

several current and relevant articles on CISM and CISD. The same search identified lists of references and materials that could be used to support this study.

Work-Related Stress

Secondary Trauma

Other work-related factors can lead to stress, distress, and burnout. The contributions of unrelenting ambient noise, role ambiguity, uncertainty of one's job performance, and hazardous work environments may contribute to intrapersonal conflict (Maslach, 1982). Firefighting personnel may experience physical and emotional problems after returning from an emergency call or returning home for 48 hours. For example, secondary trauma is a concept that describes the effects of stress experienced by public health workers involved with traumatized individuals (Figley, 1995). The workers will visualize, conceptualize, and revisit the scene of an accident through the details told by another person. Sleep disturbances, illusive imagery, a change in attitude toward the world, and arousal are signs and symptoms of secondary trauma (Chrestman, 1995).

Hume (1966) noted that firefighting personnel experience *emotional empathy*, the process of sharing the experiences and feelings of another. This finding was supported by Carlier, Lamberts, and Gersons (2000), who concluded that police personnel who have to deal with rape victims, abuses, murders, and traumatic incidents are more likely to experience higher incidence of PTSD. In their qualitative study, Fullerton, McCarroll, Ursano, and Wright (1992) found that firefighters have an increased likelihood of experiencing psychological distress because they identify with the victims of a traumatic incident.

Research Design and Approach

The researcher used a quantitative, nonexperimental descriptive survey research design that focused on stressors related to the working environment of firefighters to investigate how firefighters use coping resources when faced with stressful personal and occupational situations. Descriptive research designs present the attributes of a group of participants and have the following limitations: (a) The findings are limited to the initial group being studied, (b) no generalizations can be made from the study, and (c) any similarities between the specific group being studied and another group cannot be assumed (Neutens & Rubinson, 1997).

Given the size of the sample (i.e., 115 participants), time was a consideration. Personal interviews, or even focus groups, both of which often are used in qualitative inquiry, are time-consuming and resource intensive. Moreover, the availability of an instrument that has been widely used and has an established validity and reliability was another reason that the researcher utilized a quantitative approach. The Coping Resources Instrument for Stress (CRIS) Scale, which is described in more detail later in the chapter, has been used to assess stress in psychotherapy and training (Matheny et al., 1987).

Target Population

The target population for this study included all firefighting personnel working in small or mid-sized fire departments in the Midwest. According to the definition of fire department size used in this study, the maximum number of firefighting personnel in small fire departments is 50; for mid-sized departments the maximum is 200 firefighting personnel.

Setting

The researcher selected four fire departments as the setting for this study. Three were classified as small fire departments; one was classified as midsized. The departments were a combination of urban and rural entities in northern Illinois, northwestern Indiana, and southeastern Indiana, and were representative of small and midsized fire departments in the Midwest. The departments had between 40 and 200 firefighting personnel serving areas with populations of 50,000 to 100,000 people.

Sample

The sample for this study was a convenience sample that included all firefighting personnel employed by the four fire departments in this study. Each department employs males and females who are exposed regularly to tragedy, traumatic events, and daily life stressors. The firefighting personnel are stationed throughout their respective cities or towns and are required to remain at their assigned station for a 24-hr shift. The firefighters perform all tasks and duties together because the department functions as a unit.

Concepts Measured by the CRIS Scale

The CRIS Scale measures six concepts to assess a person's coping resources. Form B comprised 120 questions that measured the concepts of physical health, tension control, structuring, social support, acceptance, and confidence (Matheny et al., 1987). Each concept was measured by 20 questions. The second part of the survey collected demographic data that the researcher utilized to describe the characteristics of the sample. The objective was to develop group profiles for each of the fire departments (Matheny et al., 1987). The resources can pinpoint the areas of weakness and deficits within specific

groups where firefighters may choose selected areas of training to strengthen the areas that may be deficient.

Data Collection

The researcher obtained the CRIS booklets and scan forms from the author of the instrument (Matheny et al., 1987). Once the materials were received, the researcher organized the materials into individual packets: informed consent forms, directions from the author for taking the CRIS, booklets, scan forms, and pencils. The researcher delivered the packets, flyers, and a locked box to each of the four fire departments. Participants were able to pick up the packets, which were located on a table beneath the flyer, and complete the survey at their convenience. Completed surveys were placed in the locked box. Only the researcher had keys to the boxes. The participants completed the survey individually, in a group in one location at the firehouse, or at home. As noted previously, the participants were informed of the reason for the study and the intended use of the results. The researcher also assured them that the results would be shared with them upon completion of the study. The researcher collected the completed CRIS instruments from the locked boxes on 3 different working days. Because the participants work 24-hr shifts, this schedule allowed the researcher to collect the data from three different groups of firefighting personnel while each group was working a 24-hr shift.

Calculation and Meaning of Scores

The CRIS comprises *Yes* and *No* responses. Each variable, which is dichotomous because it has only two categories, is nonorderable and discrete. Numeric values are assigned to each of the 120 questions (6 concepts x 20 questions per concept): zero for *no*

response, 1 for a *yes* response, and 2 for a *no* response. The responses from each section indicate the strength of the respondent's coping resources.

Analyzing Results

The researcher analyzed the scores for each of the six concepts and then calculated the mean scores, standard deviations (*SD*), Pearson Product Moment Correlations, and *t* tests. Form B of the CRIS Scale comprised 120 questions that measured six concepts: physical health, tension control, structuring, social support, acceptance, and confidence (Matheny et al., 1987). Each concept was measured by 20 questions. The concept used for the instrument was a 3-point Likert concept: *no response* (0), *yes* (1), and *no* (2). The maximum number of points was 186. Fifty-four questions were *yes* responses, and 66 were *no* responses. The combination of correct *yes* and *no* responses in each section indicated the strength of the coping resources. A higher score indicated more positive coping strategies.

Numeric values are assigned to each of the 120 questions (6 concepts x 20 questions per concept): zero for *no response*, 1 for a *yes* response, and 2 for a *no* response. The maximum number of points is 186. This number is based on 54 of the questions being *yes* responses (54 points) and 66 being *no* responses (132 points). The responses from each section indicate the strength of the respondent's coping resources: The higher the score, the more positive the coping responses are.

Demographics

This section of the survey collected demographic data on the participants to develop group profiles (Matheny et al., 1987) for the fire departments. The demographic section included five items: gender, age, race and ethnic group, marital status, and

occupational status. All of the firefighting personnel responding to the survey were males. Because of the small number of females who are professional firefighters, the researcher believed that the male participants accurately represented the target population.

Scores on Six CRIS Concepts

The concept of physical health, which showed that daily life activities are not affected and disabilities are few, showed firefighting personnel having a mean score of 39.46. This score is indicative of falling below the mean score in Table 1 (75.65). This score indicated a low level of physical activity and healthy perceptions.

The concept of tension control in this research showed firefighting personnel having a mean score of 49.26. The mean from Table 1 (56.15) indicated a lack of coping skills among firefighting personnel and their ability to lower their stress levels.

The concept of structuring or having the capabilities of time management, setting goals, planning, and using one's self energy to schedule daily tasks, showed firefighting personnel having a mean score of 51.91. In this instance, firefighting personnel had scored below the mean of 69.85, which revealed that planning, goal setting, and using self-motivated energy was low among the departments.

The concept of social support, or having a loving relationship with someone, the availability of family members, friends, and the ability to confide in someone, showed firefighting personnel having a mean score of 53.91. The score fell below the average mean score of 75.65. Social support from friends, family, and coworkers fell far below the mean average.

The concept of acceptance, not expecting too much from oneself, measures how the participant views the world, environment, and surrounding circumstances. The mean score of 53.04 placed firefighting personnel below the mean score of 54.60, indicating that firefighting personnel have difficulty accepting shortcomings in life, are perfectionists, and generally have a negative view on life.

The concept of confidence, or coping with situations better than most people and coping with daily life stressors, showed firefighting personnel having a mean score of 40.91. In comparing this result with the mean scores from Table 1 (67.2), firefighting personnel scored significantly lower in coping with daily life stressors.

Firefighting personnel, in terms of the data collected here, use fewer resources when coping with stressors and putting problems and concerns into perspective. They had a negative outlook on succeeding (**Table 1 about here**).

Table 1

Means and Standard Deviations of Firefighting Personnel versus CRIS Database

<u>Concepts</u>	Firefighting Personnel*	CRIS Database**	
	<i>M</i>	<i>M</i>	<i>SD</i>
Physical Health	39.4	75.6	9.48
Tension Control	49.2	56.1	11.82
Structuring	51.9	69.8	11.75
Social Support	53.9	75.6	10.43
Acceptance	53.0	54.6	10.75
Confidence	40.9	67.2	10.93

Note. These concepts were adapted from the original CRIS manual developed by Matheny et al. (1987). *N = 115 **CRIS Database = 814.

Correlations

For the purposes of this study, the correlation represented a single number from each concept describing the degree of the relationship between variables. Table 2 shows the correlations and relationships between confidence and the other five concepts. Using the Pearson Product Moment Correlation, the correlations were calculated.

Even though Pearson's R Coefficient shows, for example, confidence and acceptance at .390980, the coefficient does not show a strong linear association. However, there is a moderate linear association with the scores. No significant linear association was indicated between the correlations and the *t* tests, for example, between confidence and tension control (.147834) does not have a significant relationship (see Table 2). In this study, the correlations that were closer to zero showed no significant relationship among the concepts. For example, Confidence and Social Support do not have a strong relationship with one another. On the other hand, Confidence and Acceptance have a stronger positive correlation with one another, but this correlation does not imply a significant relationship between the two (**Table 2 about here**).

Table 2

Pearson R's Product Moment Correlation

Correlations of Firefighting Personnel

<u>Concepts</u>	<u>Correlations</u>
Confidence vs. Acceptance	.320388
Confidence vs. Physical Health	.390980
Confidence vs. Tension Control	.147834
Confidence vs. Structuring	.175733
Confidence vs. Social Support	.035950

t-Tests

For the purposes of this study, p value was assumed to be .05. The number of participants ($N = 115$) was used to calculate each value from the correlations and standard deviations. Table 3 shows the t -test scores in the six concepts with $p = .05$. During the analysis process, the means and standard deviations were calculated in this study and the national data sample. The researcher did not develop null hypotheses because it was not known that the data would not be available from the national sample (**Table 3 about here**)

Table 3

t-Test Scores and Calculations

Concepts	$(p = .05)$	t -test scores
Confidence vs. Acceptance		3.59
Confidence vs. Physical Health		4.49
Confidence vs. Tension Control		1.58
Confidence vs. Structuring		1.89
Confidence vs. Social Support		.3821

Given the fact that data were available, further analysis was done using the unpaired t tests to compare the means of the two groups. There is statistical significance, but there is a question whether it is significantly important. Table 4 shows the results of the unpaired t test. Note that Table 4 is divided into several parts. Using raw data obtained at two different points in time, from two different sample groups, the researcher obtained means and standard deviations in the six concepts of the CRIS. The standard deviations of these concepts were compared in an unpaired two-tailed t test with $p = .05$ to determine if there was a statistical significant difference (**Table 4 about here**).

Table 4

Unpaired t-Test Results $p < .05$

	Firefighting Personnel *	CRIS Database**	Firefighting Personnel *	CRIS Database**	
Concepts	Means	Means	SD	SD	<i>t</i> value
PH	39.4	75.6	9.48	20.00	19.102
TC	49.2	56.1	11.8	26.00	2.8043
Struct	51.9	69.8	11.7	22.90	8.2280
SS	53.9	75.6	10.43	23.20	9.8867
AC	53.0	54.6	10.75	23.80	0.7105
CN	40.9	67.2	10.93	27.40	10.17

* $N = 115$ **CRIS Database = 814

Summary

Firefighting personnel scored below the mean CRIS score in the national database categories nationwide. Demographic results indicated that most fire fighting personnel participating in this study were White, professional fire firefighters with a mean age of 38. The results indicated that firefighting personnel's strengths are lacking overall within all the categories. The data also inferred firefighting personnel's use of coping resources in tension control and acceptance, but are close to the national mean scores in each category. The firefighting personnel in this study scored below the means of the norm group on the six concepts.

Discussion of the Findings

Firefighting personnel in this study used six coping resources. As mentioned previously, their responses on the CRIS fell below the means in all of the concepts.

The literature supported the findings in this study, namely, that firefighting personnel are lacking in their use of coping resources to combat stress. Exposure to various extreme weather conditions (e.g., heat, cold, humidity, wind) impose adaptational measures that individuals may need to use (Lazarus & Folkman, 1984). Baker and Williams (2001) found negativity in firefighting personnel because of exposure from stressful events.

The literature supported the findings that the firefighting personnel in this study were not physically fit enough to perform their work activities. The low mean score of 39.4 (physical health) indicated that daily life activities are affected by poor health and inactivity. Poor physical health may be a consequence of heart conditions, diabetes, disabilities, and other illnesses.

Combined environmental stressors and ecological factors may increase the amount of stress that a person experiences (Lazarus & Folkman, 1984). Previous research has indicated the relationship between stress and the environment. For example, Altman and Wohlwill (1977) theorized that stress is dependent upon the combined impact of environment, social, and physical stressors.

The literature supported the findings that the study participants showed limitations in tension control. They did not feel confident in coping with stressors in their occupational and daily lives. The score (49.2, $SD = 11.8$) indicated that this sample of firefighting personnel have difficulty coping with tension. Stress levels interfere with performance while responding to emergencies.

Other work-related factors can lead to stress, distress, and burnout. Noise factors, role ambiguity, uncertainty of one's job performance, and dirty work environments may

contribute to intrapersonal conflict (Maslach, 1982). Firefighting personnel are exposed to physical and emotional problems after returning from an emergency call or returning home for 48 hours. For example, secondary trauma (Figley, 1995) is a concept that has been used to describe the effects of traumatic stress experienced by public health workers who deal with traumatized individuals. The worker visualized, conceptualized, and revisited the scene of an accident from details relayed by another person. Sleep disturbances, illusive imagery, a change in attitude towards the world, and arousal are signs and symptoms of secondary trauma (Chrestman, 1995). An additional study indicated that firefighters have an increased likelihood of experiencing psychological distress after identifying with victims of a traumatic incident (Fullerton et al., 1992).

The literature supported the finding derived from the concept of structuring that these firefighting personnel lacked the coping resources to manage, organize, and set limits. The results suggested that firefighting personnel are limited in their ability to organize and time manage their schedules.

The literature supported the finding that a lack of social support from family members, peers, and coworkers is another lost coping resource for firefighting personnel. The lack of social support may be due to stress, negativity, and the unwillingness of firefighting personnel to speak about incidents occurring at work and in daily life.

Coping styles may vary from attempting to minimize the stressor to accepting stressful conditions that are present and then trying to control the stressful environment around the situation (Lazarus & Folkman, 1984). The literature supported the findings that these firefighting personnel, given their occupation, had difficulty accepting others, accepting others with different personalities, and accepting frustrations in life. The results

of this study revealed that firefighting personnel have a negative outlook on succeeding professionally or life in general.

Cassidy and Dhillon (1997) found that problem-solving factors are directly related to frequency of illness, overall physical health, and psychological well-being. Baker and Williams (2001) concluded that some of the highest psychological distress scores are related to firefighting personnel who have low self-appraisal and those who have higher levels of occupational organizational stress. These findings also suggested a lower level of distress among firefighting personnel who are able to cope with future problem situations. The firefighting personnel in this study lacked confidence in their coping resources. They were unable to put problems and concerns into perspective, cope with arising situations, and handle the outcomes.

Correlations and t-Test Findings

According Curlette, confidence is a major influence in a person's ability to cope with stress, and an important part of coping resources overall. The correlations and *t* tests indicated either no significant linear association or moderate linear association among coping resources. Confidence, acceptance, and physical health showed moderate linear associations. The values indicated there were associations among firefighting personnel's confidence, physical health, and acceptance. Thus, confidence indicated that physical health and acceptance are moderately associated.

Confidence, tension control, structuring, and social support had no significant linear association among them in this study. Firefighting personnel's confidence did not affect tension experienced occupationally or in their personal lives.

Implications for Social Change

The organizational structure of fire departments has been in place for more than 150 years, yet it has not addressed social change. The fire service continues to rely on tactical approaches for promotion purposes (i.e., hands-on experience only, limited or no education). The need for a new philosophy in the selection of company officers who have a combination of experience and education is necessary to address social change. The impact of 9/11 set a precedent for fire departments and emergency service personnel to follow.

The complexity and demands of work, political pressure, funding issues, and scheduling increase the pressure and stress on firefighting personnel in their occupational and daily lives. Better training, education, career counseling, and managerial duty updates will assist fire departments in addressing social change. Firefighting personnel should have access to physical activity in fire stations, confidence-building social support from firefighting personnel, and group cohesiveness from their own crews to help to reduce stress.

Recommendations for Action

There are no simple solutions to organizing recommendations regarding coping resources for firefighting personnel. A physical fitness program for firefighting personnel may stimulate interest in maintaining a healthy lifestyle. Participating fire departments may communicate with nearby health clubs that may offer discounted rates for firefighting personnel willing to participate in a health program. The program could be designed to meet the lifestyles of firefighters, such as time, duration, and location in relation to the domicile.

Low-cost activities, such as physical firefighter training; Firefighters' Challenge; or intradepartmental, physically challenging activities may also be considerations to stimulate physical activity and interest. External support may also be generated from health clubs, community organizations, or sports clubs to create an incentive for maintaining physical health. The fire department can promote healthy activities to address relevance concerning stress in daily life and occupational activities.

Identifying the factors leading to stress and solving these concerns through group interaction strategies may be beneficial for firefighting personnel. Group cohesiveness may assist all members of the group to achieve a sense of welfare, contribute to better group attendance, and create a higher level of interaction. Sharing information within the group can stimulate insight into firefighting personnel's stress, address others who have similar feelings and have experienced similar situations, and assist in problem solving where needed.

Firefighting personnel who lack confidence or who feel that their occupational efforts are not worthwhile may feel that this part of the group will help them to overcome their negative feelings. The ability of firefighting personnel to disclose their concerns may give them the strength and encouragement to address their stressors concerning lack of confidence.

Fire department personnel, administration, and public officials should consider establishing programs to benefit firefighting personnel physically and psychologically. The need for community input and interaction with fire departments is also imperative to the success of these programs. The community must become aware of the dangerous conditions that firefighting personnel work under, understand how stress is related to

their occupational and daily lives, and think about possible solutions to combat physical and psychological stressors.

Implications for Future Research

Utilization of dual instrumentation would be beneficial to compare against the CRIS instrument. The Beck Depression Inventory, which emphasizes cognitive signs of depression through a 21-item Likert format of responses (0 to 3), may be compared to coping resources used by firefighting personnel and the CRIS.

Several questions were generated from the findings:

1. Will this study in other geographical regions render the same results?
2. Are social-problem solving models beneficial to the fire service and coping resources used by firefighting personnel?
3. Would a reduction in average working hours for firefighting personnel decrease the number of stressors they are experiencing?
4. If the CRIS instrument were used in its entirety (280 questions and 15 categories), would the results differentiate between incident-related stressors and in-house-related stressors?

Conclusion

The firefighting profession is now recognized as a community service. Various political, social, and geographic features have interfered with researching opportunities, usually where researchers were not aware of any extant biases. The future challenge is to place prejudices aside, reduce the amount of bias in studies, and prevent distortion during the collection of data.

Psychosocial research is more than studying traumatic events, personalities, and constricted instrumentation. Studying stress can have cultural benefits and create correlations between past and present events in the lives of firefighting personnel. Understanding the culture prior to beginning new research on trauma and stress is important in making sense of our surroundings. Firefighting personnel who are suffering with a compromised physical health status and who are lacking confidence need to be respected and studied. Both personal and social avenues are addressed, and the desire to find meaning behind knowledge is more than any study can offer.

Significance of the Study

The findings from this study are important because they will help firefighting personnel to recognize stress and think about the strategies they currently utilize to cope with stress. The more effective coping resources they have and use, the more they can reduce memory disturbances, amnesia, confusion, and poor abstract thinking while on emergency scenes. Increasing their use of effective coping resources will help to decrease feelings of guilt, frustration, depression, irritability, and emotional instability.

Expected Social Change

Officers within fire departments may be able to recognize distress and burnout symptoms experienced by firefighting personnel. They may assist with coping methods; offer suggestions for relaxation; and explain how to combat stressors prior to, during, and after a conflagration or an emergency rescue. Firefighting personnel may be able to find alternative methods to relieve stress and increase their abilities to cope with interpersonal and intrapersonal psychological stressors.

References

- Altman, I., & Wohlwill, J. G. (1977). *Human behavior and environment: Advances in theory and research*. New York: Plenum.
- Baker, S., & Williams, K. (2001). Short communication: Relation between social problem solving, appraisals, work stress, and psychological distress in male firefighters. *Stress and Health, 17*, 219-229.
- Bowman, M. (1999). Individual differences in posttraumatic distress: problems with the DSM-IV model. *Canadian Journal of Psychiatry, 44*, 21-33.
- Carlier, I., Lamberts, R., & Gersons, B. (2000). The dimensionality of trauma: A multidimensional comparison of police officers with and without posttraumatic stress disorder. *Psychiatric Research, 97*, 29-39.
- Carter, H. (1998). *Fire fighting strategy and tactics*. Oklahoma City: Oklahoma State University.
- Cassidy, T., & Dhillon, R. (1997). Type A behaviour, problem-solving and health in male and female managers. *British Journal of Health Psychology, 2*, 217-227.
- Chrestman, K. (1995). Secondary exposure to trauma and self-reported distress among therapists. In B. Stamm (Ed.), *Secondary traumatic stress: Self-care issues for clinicians, researchers, and educators* (pp. 29-36). Lutherville, MD: Sidran.
- Clohessy, S., & Ehlers, A. (1999). PTSD symptoms, responsive to intrusive memories and coping in ambulance service workers. *British Journal of Clinical Psychology, 38*, 251-265.
- Figley, C. R. (1995). Compassion fatigue as secondary traumatic stress disorder: An overview. In C. R. Figley (Ed.), *Compassion fatigue* (pp. 1-20). New York: Brunner/Mazel.
- Fullerton, C., McCarroll, J., Ursano, R., & Wright, K. (1992). Psychological responses of rescue workers: Firefighters and trauma. *American Journal of Orthopsychiatry, 62*, 371-378.
- Galloucis, M., Silverman, M. S., & Francek, H. M. (2000). The impact of trauma exposure on the cognitive schemas of a sample of paramedics. *International Journal of Emergency Health, 2*, 5-18.
- Hokanson, M., & Wirth, B. (2000). The critical incident stress debriefing process for the Los Angeles County Fire Department: Automatic and effective. *International Journal of Emergency Mental Health, 2*, 249-257.

- Holmes, T. H., & Masuda, M. (1974). Life changes and illness susceptibility. In B. S. Dohrenwend & B. P. Dohrenwend (Eds.), *Stressful life events: Their nature and effects* (n.p.). New York: Wiley.
- Hume, D. (1966). *Enquiries concerning the human understanding and concerning principles of morals* (2nd ed.). Oxford, England: Clarendon Press. (Original work published 1777).
- Klinger, E. (1977). *Meaning and void*. Minneapolis, MN: University of Minnesota Press.
- Lazarus, R. S. (1966). *Psychological stress and the coping process*. New York: McGraw-Hill.
- Lazarus, R. S., & Cohen, J. B. (1977). Environmental stress. In L. Altman & J. F. Wohlwill (Eds.), *Human behavior and the environment: Current theory and research* (n.p.). New York: Plenum.
- Lazarus, R., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer.
- Maslach, C. (1982). *Burnout: The cost of caring*. Englewood Cliffs, NJ: Prentice-Hall.
- Matheny, K., Curlette, W., Aycock, D., Pugh, J., & Taylor, H. (1987). *Coping resources inventory for stress manual*. Atlanta, GA: Health Prisms, Inc.
- Neutens, J., & Rubinson, L. (1997). *Research techniques for the health sciences* (2nd ed.). Needham Heights, MA: Viacom.
- North, C. S., Tivis, L., McMillen, J., Pfefferbaum, B., Spitznagel, E., Cox, J., et al. (2002). Psychiatric disorders in rescue workers after the Oklahoma City bombing. *American Journal of Psychiatry*, *159*, 857-860.
- Orner, R. (1995). Intervention strategies for emergency response groups: A new conceptual framework. In S. Hobfall, S. & M. de Vries (Eds.), *Extreme stress and communities: Impact and intervention* (pp. 499-521). Amsterdam: Kluwer Academic.
- Rabkin, J. G., & Struening, E. L. (1976). Life events, stress, and illness. *Science* *196*, 1013-1020.
- Regehr, C., Hill, J., & Glancy, G. (2000). Individual predictors of traumatic reactions in firefighters. *Journal of Nervous and Mental Disorders*, *188*, 333-339.
- Sirratt, D. (2001). The relationship of occupational stressors and burnout on PTSD symptoms of emergency personnel. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, *62*, 2965.

