A study of burnout in accident investigators in the US mining industry

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Abstract: The Maslach Burnout Inventory (MBI) was administered and scored for 154 Mine Safety and Health Administration (MSHA) employees from the US Department of Labor. These employees serve as accident investigators for serious accidents and fatalities as part of their job duties. During a workshop on stress designed for them, subjects volunteered anonymous written anecdotes, confirming and illustrating the findings. The subjects represented locations across the USA and all mining commodities: coal, metal, non-metal, stone, and sand and gravel. The Maslach Burnout Inventory assesses three aspects of experienced burnout: emotional exhaustion, depersonalisation, and reduced personal accomplishments. The *average* results of the scores for each of the three subscales for the study group of MSHA accident investigators fell in the moderate range. These scores show that the subject population was at some risk for emotional exhaustion and depersonalisation, tending toward burnout. The group evidenced a lower sense of personal accomplishment in their jobs, indicating a higher risk for burnout. From this outcome accident investigators may be at moderate (*note: this does not mean average*) risk for burnout. The authors recommend follow-up with this population – specifically in training to work with grieving families; and greater organisational support for the accident investigators in this area would be appropriate.

Keywords: Burnout; accident investigators; occupational safety and health; job stress.

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1   Introduction

In work environments in the mining industry, an accident investigator has an important job to do. He or she needs to have specific skills and sometimes find themselves in

conflicting roles. An accident investigator is expected to uncover the facts, be totally objective, non-judgmental, analyse the data, and reach a conclusion as to the cause of the accident. All of these tasks are performed within time constraints, while responding to the hierarchy in his/her organisation, the needs of the local authorities, and the concerns of the workers and management at the accident site. He or she must take responsibility for the conclusion of the investigation, and sometimes represent the facts in a court of law or to the victim's family. In addition, the nature of the work places accident investigators in unexpected situations, as is illustrated in the following experiences of investigators of fatal accidents in the mining industry.

> "I was sent to one accident where a miner was buried under a large roof fall (in an underground mine). By the time I got there, which was around 10:00 pm they had not yet been able to locate the miner. I had been told that the accident had occurred early that morning and the miner was presumed dead. As I was in the parking lot with a co-worker getting equipment out of the trunk to prepare to go underground, a kid about thirteen years old rode up to us on a bike and he said, 'Are you guys going to find my brother?' I was caught completely off guard and am not sure what I said to the kid - but I will never forget his question."   (Roger P.) [1]

> "(The) ... most difficult experience was to deliver the final fatality report to the family of the worker who was killed. I didn't know what to expect or how to handle the situation. It worked out ok, but the time leading up to the actual meeting was very stressful."   (Duane W.)

> "I experienced . . . the stress of interviewing a severely injured individual while he was still in the hospital a month after the accident. I felt sorrow for the victim and had difficulty asking him questions about the accident which had injured him so seriously."   (Andy S.)

> "After a surface mine explosion, we found hundreds of body parts. The more you looked, the more you found. Afterwards it was hard to walk through a field without expecting to see something nasty. We couldn't reach the tops of damaged structures because it was too unsafe, but the vultures could. The presence of vultures on top of structures and sailing overhead left a feeling of helplessness and cruelness that no one would talk about... ."   (Karl W.)

These are very competent trained professionals explaining normal human reactions to difficult circumstances. These are similar to reactions by professional emergency personnel who respond to natural and man-made disasters.

1.1   The human stress response

Stress is a normal human characteristic. Although there is imperfect agreement on the nature of human stress, there are some basic shared concepts. Hans Selye [2], an Austrian endocrinologist, described a consistent pattern of mind-body reactions in 1926. He referred to this pattern as the rate of 'wear and tear' on the body and coined the term stress, which refers to the general response of the body to any demand placed upon it. This demand Selye referred to as the *stressor*. The stressor leads to a *stress response*. The stress response in turn can lead to stress-related disease (see Figure 1).

Figure 1   The stress response

| Stressor ⟶ Stress Response ⟶ Stress-Related Disease |
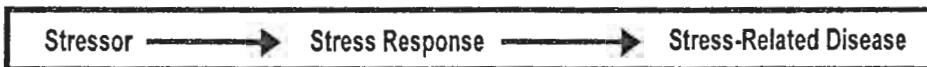
A stressor can be either psycho-social or biogenic. Psycho-social stressors are environmental events wherein the individual interpretation plays a key role in the onset of the response. Biogenic stressors involve stimulants such as caffeine, nicotine, and amphetamines. Biogenic stressors initiate the stress response directly, whereas psycho-social stressors initiate the response indirectly. Those psycho-social stressors interpreted as threatening by the individual will initiate a stress response. For example, Cannon [3] described the fight or flight response, a physical response elicited by *perceived* potentially dangerous situations.

There are two stress categories: *traumatic stress* and *cumulative stress*. Anyone coming into contact with an incident that is perceived as threatening, or that threatens his or her core psychological values and beliefs, may experience traumatic stress. But, *individual workers such as emergency room workers, police officers, firefighters, disaster workers, and military personnel face traumatic stress* more frequently because of the environments in which they work. This type of stress is directly related to a critical incident and sometimes referred to as critical-incident stress. Critical-incident stress may result in physical and psychological reactions including sleep, eating, social disturbances, nightmares and sometimes flashbacks. With a severe reaction to a critical-incident, the inability of the individual to adjust to the critical-incident, may result in Post-traumatic Stress Disorder (PTSD).

The Diagnostic and Statistical Manual of Mental Disorders (fourth edition) [4] defines the essential feature of PTSD as the development of characteristic symptoms following exposure to an extreme traumatic stressor involving direct personal experience of an event. This event involves one or more of the following:

- actual or threatened death or serious injury
- threat to one's physical integrity
- witnessing an event that involves death or injury
- threat to the physical integrity of another person
- learning about unexpected or violent death, serious harm
- threat of death or injury experienced by a family member or other close associate [4].

The person's response to the event usually involves intense fear, helplessness, or horror (or in children, the response must involve disorganised or agitated behaviour). The characteristic symptoms resulting from the exposure to the extreme trauma include:

- persistent re-experiencing of the traumatic event
- persistent avoidance of stimuli associated with the trauma
- numbing of the general responsiveness
- persistent symptoms of increased arousal

The full symptom picture needs to be present for more than one to three months and the disturbance must cause clinically significant distress or impairment in social, occupational, or other important areas of functioning. Prolonged duress stress disorder (PDSD) is cumulative in nature but may lead to PTSD manifestations rather than the more passive and withdrawn exhaustion characteristic of burnout.

The second and more common type of stress is the day-to-day, *cumulative stress*. Cumulative stress also has health consequences and may lead to burnout. Pines and Aronson [5] defined burnout as "a state of physical, emotional, and mental exhaustion caused by long-term involvement in emotionally demanding situations."

Obtaining a measurement of stress due to specific work conditions is difficult because stress in other parts of an individual's life impacts the work life. Thus, many researchers are moving toward lifestyle stress measures. Building on the work of others, Hurrell and Murphy [6] presented a model of job stress and health. To provide a framework for the reader, this model is presented in Figure 2. As the figure shows, job stress is seen as a situation in which the working condition interacts with the individual worker characteristics and results in a disruption, which can lead to a variety of illnesses.

By their nature, certain jobs are more prone to stress than others. For example, people working in emergencies and disasters may be thought of as normal people exposed to abnormal circumstances. When these people respond to a medical emergency, a natural disaster, a terrorist threat, or an underground mining accident, they are exposed to traumatic situations. Whether these people are first responders, happen to be on the scene, or highly trained professionals such as rescue teams or emergency personnel, these workers experience normal human responses to their circumstances. As a result, these workers tend to be at higher risk for occupational stress illnesses. Certain mine industry workers may well fall into this category of higher risk because of the hazardous, changing, dynamic environment in which they must work and the types of tasks they do daily on the job. The subject population of mine accident investigators falls into this higher risk category for both cumulative and critical-incident stress. These mine accident investigators do not perform this duty full time. Most are federal mine safety and health inspectors who may find they are assigned to an investigation when an accident occurs. The number of investigations an individual inspector performs may vary widely. In addition, the subjects were asked to respond according to the accident investigation aspects of their jobs, thus the authors expected more distress in this area than if measuring the overall job stress.

1.2   Overview of stress on the job

American workers are working harder and longer than they have in the past two decades just to maintain their standard of living [7]. The result may be a workforce more at risk for psychological, physical, and behavioural health problems. During recent healthcare reform discussions in regard to US workers, the costs associated with work-related chronic ill health were described as representing a massive drain on the economy, with occupational stress cited as a reason for the rapid increase in compensation claims [8]. The fact that disability due to job stress alone, without evidence of any physical injury or illness, is now a compensable condition in about one-half of the states in the USA [9] adds to potential future economic costs. At the *Work, Stress, and Health '99 Conference*, sponsored by the American Psychological Association and the National Institute for Occupational Safety and Health (NIOSH), it was noted that absences due to stress-related

illnesses are a growing concern to US business and government. This concern is because of the impact on production and the economy, plus the overall public health consequences of the need for increased mental health awareness and services.

Figure 2   Model of stress and health
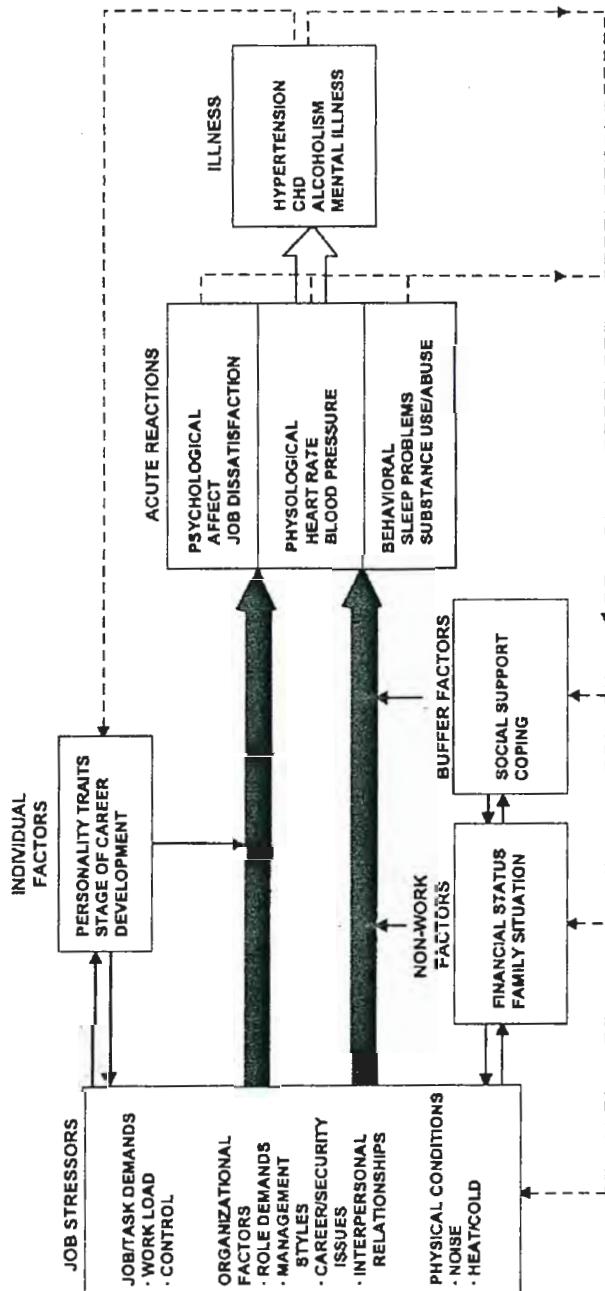
Source: Hurrell and Murphy [6]

The study of occupational stress was given a new focus in the 1970s when US Public Law 91-595 established the National Institute for Occupational Safety and Health. The mission of NIOSH is to ensure a safe and healthy workplace for America's workforce. To carry out this mission, the agency conducts research and makes recommendations for the prevention of work-related disease and injury. Recently, NIOSH has identified 21 research priorities including the organisation of work that encompasses work-related psycho-social stressors [10].

The issue of stress on the job provided a focus for The American Psychological Association and NIOSH when they joined together at the *Stress in the Nineties Conference* in the beginning of 1990 and declared the 1990s the "Decade of Stress." They supported work resulting in a growing body of research on stress on the job. Most of the studies focus on office workers, with a limited number of studies on disaster first responders – firefighters, police, and medical workers. The former studies tend to address cumulative stress and the latter tend to cover traumatic stress from natural or man-made disasters.

There has been limited work in the mining industry regarding critical incident stress in mine disasters and mine rescue [11,12]. Although the subject population of mine accident investigators in this study may be exposed to a critical incident such as a mine explosion, major underground roof fall, or surface mine highwall fall, exposure to day to day cumulative-type stress, which can lead to burnout, is more likely. The accident investigator is not at the scene at the time of the critical incident. Thus the exposure is during the ensuing days as the investigation is being conducted. This is consequently the first study of Mine Safety and Health Administration (MSHA) accident investigators with respect to worker burnout.

1.3   Danger in the mining industry

Mining is one of the most dangerous occupations in the world (Figure 3). Historically, mining has been the industry sector with the highest fatal and nonfatal injury rates [13]. Even today, mining is the industry sector with the highest fatal injury rate, more than five times the national average. The mining industry in the USA is highly regulated under Title 30 Code of Federal Regulations, and has a separate government agency, the Mine Safety and Health Administration. MSHA is part of the US Department of Labor and is responsible for enforcing the laws concerning mining. In addition, the National Institute for Occupational Safety and Health, under the Department of Health and Human Services, includes an Office for Mining Safety and Health Research. This office is charged with providing for the safety and health of the nation's miners through research. According to the MSHA injury data reported under 30 CFR, Part 50, in a recent ten-year period (1989-1998), there were 240,499 injuries in the mining industry in the USA. This included 988 fatalities, 161,841 non-fatal injuries with days lost, and 77,670 non-fatal injuries with no days lost.

Figure 3 Mine explosion at the portal

2 Role of MSHA inspectors

MSHA inspectors carry out the day-to-day mine inspections and enforce the mining safety and health regulations passed by Congress. When a serious injury or fatality occurs at a mine site, some of these mine inspectors are given a collateral duty as accident investigators. They become responsible for conducting an investigation into the accident, determining the cause of the accident, and making recommendations of any violations. Many mining fatalities are a result of falls of ground. In underground mining, this refers to the fall of the roof onto the victim; in surface mining it is the fall of part of the wall around the mining pit. In addition, numerous accidents involve the heavy machinery used to extract the mineral from the earth. These accidents are sudden and usually the injuries are traumatic to the body.

Within the last several years, an additional task of meeting with the families of the victims to present the official report has been imparted to the investigators. Approaching this sometimes emotional and difficult task of presenting the report to grieving family members while completing the principal task of fact-finding presents a challenge to the accident investigators and has created a conflict of roles for some investigators.

The consequences of burnout due to these stressors are potentially problematic for both the individual and the organisation. Burnout can result in work of less quality, job turnover, absenteeism, and low morale. In addition, burnout is correlated with various self-reported indices of personal dysfunction, including physical exhaustion, insomnia, increased use of alcohol and drugs, and marital and family problems [14].

3   The instrument

The Maslach Burnout Inventory is a self-administered measure containing three subscales that assess the different aspects of experienced burnout: emotional exhaustion, depersonalisation, and reduced personal accomplishments. Subjects usually take 10-15 minutes to complete the inventory. According to Maslach [14] burnout is a syndrome of emotional exhaustion, depersonalisation, and reduced personal accomplishment. A key aspect of the burnout syndrome is increased feelings of *emotional exhaustion*. As emotional resources are diminished, there is a feeling that the worker can no longer give of him/herself at a psychological level. Another aspect of the burnout syndrome according to Maslach is the development of *depersonalisation*, which includes negative and cynical attitudes and feelings. A third aspect of the burnout syndrome, *reduced personal accomplishments*, refers to the tendency to evaluate oneself negatively, particularly with regard to one's work interactions with people.

Each of these three aspects is measured on separate subscales. The *Emotional Exhaustion* subscale assesses feelings of being emotionally overextended and exhausted by one's work. The *Depersonalisation* subscale measures a negative feeling and personal response toward recipients of one's service. The *Personal Accomplishment* subscale assesses feelings of competence and achievement in one's work. The frequency that the inventory respondent experiences feelings related to each subscale is assessed across a seven-point, fully anchored response format.

Burnout is conceptualised as a continuous variable, ranging from low to moderate to high degrees of experienced feeling. It is not viewed as a dichotomous variable, which is either present or absent. A high degree of burnout is reflected in high scores on the Emotional Exhaustion and Depersonalisation subscales and in a low score on the Personal Accomplishment subscale. A moderate degree of burnout is reflected in moderate scores on the three subscales. A low degree of burnout is reflected in low scores on the Emotional Exhaustion and Depersonalisation subscales and in a high score on the Personal Accomplishment subscale. The Maslach Burnout Inventory has been found to be reliable, valid, and easy to administer. A subject responds to 22 statements using a seven-point Likert scale ranging from never (0) to everyday (6). There were nine statements scored on the Emotional Exhaustion subscale, five statements were scored on the Depersonalisation subscale, and eight statements were scored on the Personal Accomplishment subscale. Examples of statements are found in Figure 4.

Figure 4   Example of Maslach burnout inventory statements

HOW OFTEN:	0	1	2	3	4	5	6
	Never	A few times a year or less	Once a month or less	A few times a month	Once a week	A few times a week	Every day

| HOW OFTEN 0-6	Statements:
_____	I feel I'm positively influencing others people's lives through my work.
_____	In my work, I deal with emotional problems very calmly.
_____	I've become more callous toward people since I took this job.
_____	I feel emotionally drained from my work.

4   Subjects and method

The subjects for the present study were 169 MSHA accident investigators from locations across the country and representative of all mining commodities: coal, metal, non-metal, stone, and sand and gravel. Of the 169 subjects, 167 were male, a demographic that is reflective of the mining industry. The subjects were participating in a two-week training class that included a three-and-a-half hour workshop entitled, *Stress, Coping and Grief for Accident Investigators* given by one of the researchers. Two separate two-week training sessions were offered, one in the spring and one the following winter. Each training session consisted of four randomly selected groups, providing a total of eight subject groups. Comparisons were made between the spring and winter groups, the eight individual groups were compared to each other, and each group was then compared with the overall average scores on the three subscales. The overall group was also broken down into four age groups for comparison purposes. No significant statistical differences were found between any of the groups.

The Maslach Burnout Inventory was administered to the subjects. The instrument was passed out at the very beginning of class, before introductions, and the students were asked to fill it out voluntarily. They were asked to include their age and years of experience in accident investigation (including experience outside the agency). Fifteen of the accident investigators' responses were excluded from the analysis (four investigators did not complete their surveys; four did not note their experience; two did not note their age; and five did not note their age or experience).

The ages of the investigators (see Figure 5) ranged from 26 to 67 years, with an average age of 48 years and a standard deviation of 6.62. The ages of the investigators by category included 10% under the age of 40; 43% were age 40-49; 44% were age 50-59; and 4% of the investigators were age 60 and over.

Figure 5   Years of age and experience of MSHA investigators in study
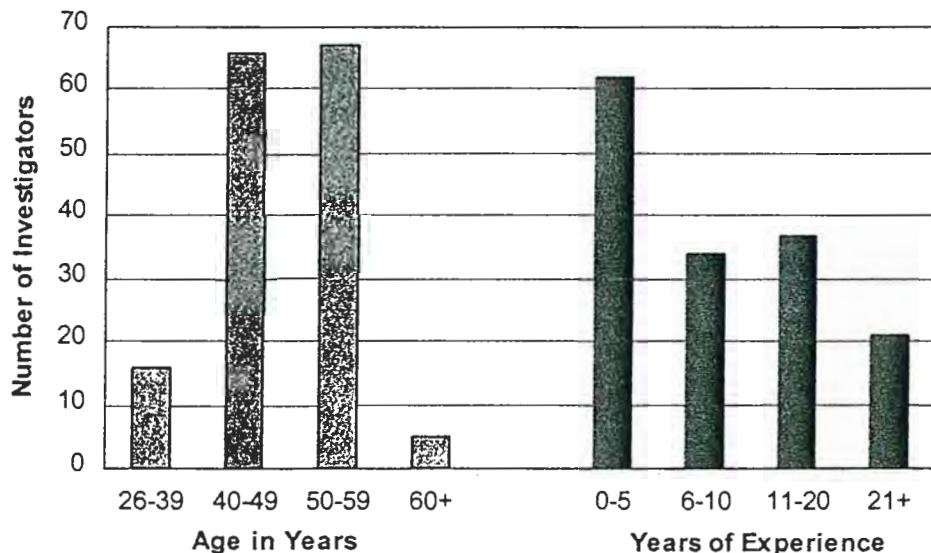
The group of investigators had 1,558 total years of experience, or an average of 10.1 years with a standard deviation of 8.29. The range was from 0 years (5 investigators) to one investigator having a high of 33 years of experience. The median was eight years experience, and the mode was one year of experience (14 investigators). There were 96 investigators (62% of the overall group) with ten years of experience or less; 24% had 11-20 years of experience; and 14% had 21 years or more of experience.

Analysis of variance, correlation analysis, and multiple linear regression analysis were performed on the data. The data were also analysed by creating XY (scatter) charts with linear trend lines to illustrate the Emotional Exhaustion, Depersonalisation, and Personal Accomplishment scores in relation to the age and experience of the investigators.

5   Results

The authors observed that at the 0.05 critical level, the null hypothesis must be accepted (i.e., there is no correlation between either age or experience and Emotional Exhaustion, Depersonalisation, or Personal Accomplishment).

Further analysis between the relationships of the three aspects of burnout revealed that when Emotional Exhaustion rises, Depersonalisation also tends to rise, while Personal Accomplishment tends to fall. On the three respective subscales, these scores are all indicators of movement from a lower to a higher degree of burnout. Maslach states that given our limited knowledge about the relationships among the three aspects of burnout, the scores for each subscale are considered separately and are *not* combined into a single, total score.

The results of the scores for each of the three subscales of the MBI (Emotional Exhaustion, Depersonalisation, and Personal Accomplishment) fell in the Moderate range (Figure 6). This indicates that the accident investigators are experiencing moderate levels of burnout. Low, moderate, and high are all indicators that the respondents are experiencing some level of burnout.

Figure 6   Average scores on each subscale of the Maslach burnout inventory. Different shadings on each of the subscales represents low, moderate and high burnout
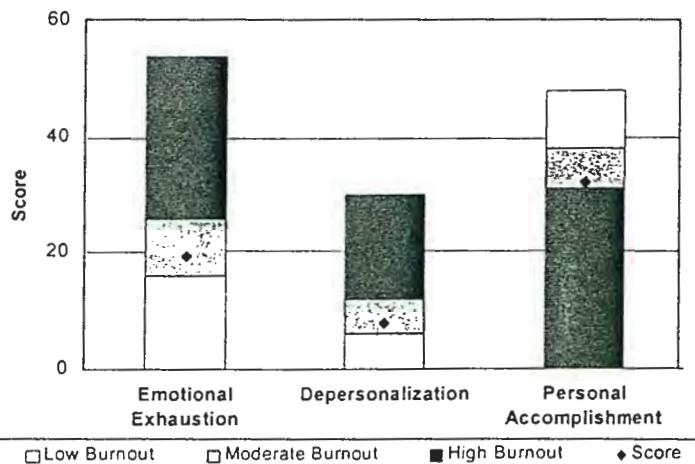
The accident investigators scored in the lower half of the Moderate range for Emotional Exhaustion. These scores indicate that the investigators are feeling a moderate level of being emotionally overextended and exhausted in their work.

The Depersonalisation score fell toward the lower end of the Moderate range on the subscale. The score was 1.8 points from the characterisation indicating a lower level of burnout. The need to depersonalise may be interpreted as a necessary component in accident investigation. In other words, purposefully trying to remove oneself from the personal/human aspect of the job may facilitate successful completion of the job.

The Personal Accomplishment aspect is scored in the opposite direction from Emotional Exhaustion and Depersonalisation. The Personal Accomplishment score was in the upper end of the Moderate range, which was 1.1 points from the characterisation, representing a high level of burnout. This indicates that many of the accident investigators do not feel personal satisfaction and a sense of accomplishment in their jobs.

6   Anecdotal data

Discussion of stress and grief may often trigger specific situations or memories for individuals. Opportunities to share reactions and experiences were a part of the workshop, and at the end of the workshop the groups were given an opportunity to anonymously share their experiences in writing. Several major themes emerged in this shared experience that reflect the stress held by accident investigators. One theme was the demands placed on the investigator from within the organisation. Another theme dealt with interactions with grieving families. Finally, a personal theme covering coping with some of the more philosophical issues concerning death, grief, family values, and personal safety were found.

The need for the latest information becomes crucial after a serious accident or fatality in a mine. Information on miner injury and mine conditions direct the initial rescue effort and allow headquarters to direct the appropriate equipment and skilled workers to the scene. Unfortunately, continual demands from headquarters for information can interrupt and slow down the investigation and report-formation process, and give a message of lack of trust to the investigator. The following quoted experiences reflect organisational issues. Two investigators in separate experiences noted:

> "Management is 90% of the stress. They want pictures, a preliminary report, and a video immediately. There is inquisition about what you did every minute and what you 'should be doing.' You feel as if they are second guessing you and they don't trust you. If a preliminary report is important to headquarters, then it should be formalised and part of the process ... [I] understand that they need information, but if I keep getting calls, it interrupts my work."   (Ben C.)

> "During the middle of an investigation when I thought I had resolved all questions and pretty well had answers as to how the accident happened, a high official (in the agency) called and asked it there was any truth that the body may have been moved. This really upset me and I asked him where he got this information and he said it was 'just a rumour'."   (Albert K.)

Karasek [15] suggested that the amount of work is not as critical to worker health as the interaction of workload and the amount of control a worker has over the work and related work processes. This is referred to as 'decision latitude'. Demands placed upon the

worker, especially from conflicting or unclear tasks, contributed to worker stress. As one worker reported:

> "I was asked by management to go to the deceased miner's home and spend some time with his family. At the time it was not clear to me what I was supposed to do. Things went ok, except it was very hard for me not to get emotionally involved. The victim was a young man in his 20s. I now understand why it was so difficult [relating to information provided in class concerning death at a young age]. It was one of the hardest things I've had to do since I have been with ...." [the agency].   (Bill N.)

The depersonalisation score on the inventory suggested the need for the accident investigators to remove themselves from the personal/human aspect of the job. This need would be in direct conflict with the assignment of meeting with the family of the deceased. Continuing in this vein, the majority of anecdotes dealt with the exchanges with the family of the accident victim and various strategies employed to interact successfully. One worker reported:

> "My method of self-preservation is to distance myself from the emotional side of the incident. This may seem cold, but in no way means that I'm uncaring or unfeeling."   (Rob F.)

As noted, the Maslach Inventory evidenced this trait in the moderate depersonalisation scores, indicating that emotional distancing is evident in this population. The above example may indicate that this characteristic is a coping mechanism for this accident investigator.

Many of the accident investigators shared personal experiences triggered by the work experience of investigating a fatality. Many related the impact of their own personal family deaths, some indicating that their own loss had made it easier to interact with the victim's family, for others, it was more difficult. Others spoke of the more human philosophical and religious issues concerning death:

> "... Two years ago a man was killed in an accident at the mine ... in the two days following the accident I wrestled with many questions ... my relationship with God, was I ready to die, since we all do not know when we will die."
>   (Robert O.)

> "During the on site investigation of a miner who I knew personally in the community, my mine light kept reflecting off a spot of his blood left at the scene. The blood had a fluorescent flow as if it was crying out to me to do something to prevent a recurrence. I promised that day (to a dead man) to be on guard for potential conditions and be very aggressive in efforts to prevent (the loss) of another life. I often remember that glow of blood which also prompts a rededication of my efforts."   (Alvin J.)

One of the characteristics of the mining industry is that it is a small, close-knit community. Many people in the industry know each other, are related to each other, or are good friends. Mines are not typically located near large cities, but mostly in rural areas near small towns. Thus, when there is an accident, it can impact on the entire mining community. Although workers are assigned investigations in geographic locations different from their day-to-day work location, many of the subjects had experienced knowing the victim or family:

> "After the recovery of the last body ... we [the rescue team] were on our way outside. It was a cold, clear night and you could see the lights outside from inside the mine. I felt very strange inside and worried what I was going to say to the family ... I could hear people crying and praying. What I was worried about the most was that the young man killed in the roof fall was my friend who had worked for me some years before. I knew his family and they knew me. I didn't know who he was until we almost had him out of the roof fall."
>
> (Billy J.)

Another example of this community characteristic can be found in the following examples:

> "A fatal accident occurred where the owner of a small mine was killed ... the second person at the scene was the victim's nineteen year old son, who helped in the rescue attempts."   (Sally Y.)

> "Recently, I investigated a fatality where a driller had been killed by a falling rock. The driller, a woman, was a drilling partner with her husband. He was standing just a few feet from her when she was killed. He told us during the interviews that he knew she was dead, but he just held her for a while before getting help. The interview was the toughest that I have ever experienced."
>
> (Fred B.)

The stress themes discussed are specific to this population and thus it is inappropriate to generalise the data. The three themes of the demands of the organisation itself, dealing with the victim's family and past personal experiences triggered by the work contribute to the accident investigator's stress levels and potential burnout. One worker, in summing up his experience, wrote:

> "After one investigation I actually sat back and reflected on how accidents can happen to anyone including myself. I felt I had to get home right then to see my wife and children and spend time with them. I then had fears for several days that my wife or children may be involved in an accident of some sort ...."
>
> (Kenny P.)

This is a normal reaction, though certainly stressful, for an individual in such circumstances.

7   Conclusion and recommendations

The study group of MSHA accident investigators indicated a tendency toward emotional exhaustion and depersonalisation on the burnout subscales. In addition, they evidenced a moderate to low sense of personal accomplishment in their jobs. Thus, this is a group at moderate risk for burnout. As burnout is conceptualised as a continuous variable, ranging from low to high – as opposed to a dichotomous variable which is either present or absent – one would hope for a result of low tendency in a subject population.

Overall, this subject group tended toward burnout, measuring in the moderate range. In examining the data from the students' self-report written anecdotes, three major themes reflecting factors that may contribute to the accident investigators' stress were found. These themes were meeting the demands placed on the investigator from within the organisation, dealing with the grieving families, and the past personal death experiences of the investigator. A key finding was that the accident investigators did not evidence a strong sense of personal accomplishment and importance in the job they were

doing when investigating the accidents. This appears to be a reflection, *perceived or real,* of the demands of the organisation on the accident investigator during an investigation and the support and trust evidenced at the time of the investigation.

The MSHA organisation was aware of the headquarters-field communication problems and specific needs of each before this study, and has been actively involved in developing strategies to remedy the problem. The workshop for the accident investigators was evidence of their pro-active stance.
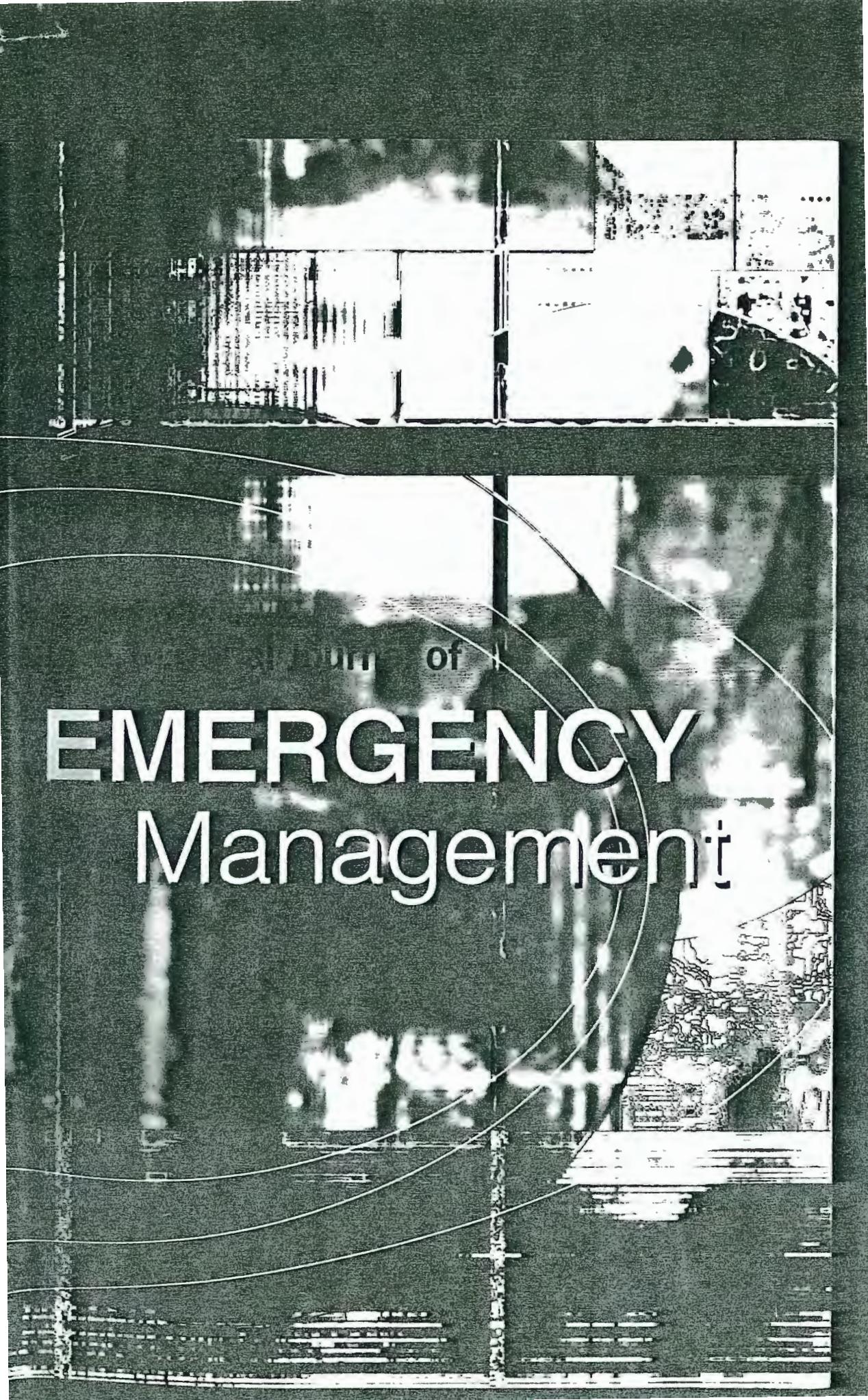
The authors suggest that the procedure, expectations, and support network during an investigation be reviewed. The anecdotal reports suggest that the organisation re-evaluate the communication process in the field between headquarters and the investigation site. Generally, the anonymous reports indicated that the organisation provides support in getting the job done, but that it also may contribute to slowing down the process and thus contribute to worker burnout.

Based on the anecdotal reports, the authors suggest that specific training in working with grieving families, including better interaction skills, role playing, crisis management and decision-making under stress be incorporated into the general accident investigator training. In addition, greater organisational support such as direct supervisor training on support behaviours for the accident investigators, an evaluation of the initial information needs and demands on the on-site investigator in the first 48 hours is recommended. A further recommendation would be to enable further opportunities for the investigators to learn from each other's experiences. This allows for a psychological debriefing effect that can assist in reducing stress. Engaging local community mental health and/or pastoral services can help investigators, respondents, and grieving families. The subject agency, MSHA, evidenced awareness of the stress issue as reflected in their request for a workshop on stress, grief and coping--a positive step for the mining accident investigators and a model for organisations with similar investigative responsibilities.

References and Notes

1   Names are fictitious and identifiers have been eliminated.

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