The risk of high-risk jobs

Psychological health consequences in forensic physicians and ambulance workers

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The risk of high-risk jobs

Psychological health consequences in forensic physicians and ambulance workers

Het risico van risicovolle beroepen

Gevolgen voor de psychische gezondheid bij forensisch artsen en ambulancemedewerkers

(*met een Nederlandse samenvatting*)

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Contents

1. The risk of high-risk jobs: Psychological health consequences in forensic physicians and ambulance workers

1.1. Introduction

Policemen, firefighters, employees of money transport firms and bank employees are frequently confronted with critical incidents in their work. These critical incidents may be described as unusual occurrences involving exposure to events that are sudden, overwhelming and emotionally challenging. Examples are acts of violence, disasters, and confrontations with wounded, dying or dead persons. Policemen have to deal with shooting incidents and aggressive citizens, ambulance personnel have to assist seriously sick, wounded, or dying patients. Firefighters have to take action during the dangerous impact of a fire. Employees of banks and money transport companies are at risk of becoming victims of robberies. All these persons may be involved in overwhelming situations in which their own life's may be at risk.

Some professionals are repeatedly exposed to these potentially traumatic events. Thus, it can be assumed that such exposure may well lead to dysfunctional or pathological reactions, such as posttraumatic stress disorder, depression, chronic fatigue or anxiety. In contrast, a positive outcome at both the personal and professional level can even result from working in an emergency or disaster context (Paton, 1996). For example, an enhanced sense of professionalism or strong affective links with significant others, such as colleagues or spouses, may be such positive outcomes. However, under certain circumstances, critical incidents can result in emotional reactions that prevent the employees from performing their role at the level they would have expected either at the moment of the experience itself or afterwards.

In this thesis the psychological health consequences of acute and chronic stressors are investigated in a representative sample of forensic physicians and of ambulance workers.

1.1.1. Exposure to major events

Research among police officers involved in a shooting incident in which physical injury or death had taken place five to twelve years prior to the study showed that 27% met the DSM-III criteria for posttraumatic stress disorder; at the moment of the research the criteria were still applicable for 19% of the police officers (Gersons, 1989). A study among firefighters exposed to bush fires that devastated large areas in Australia demonstrated that 36% suffered from posttraumatic stress disorder four months after the disaster (McFarlane, 1992).

Exposure to extreme events can trigger feelings and emotions that, though normal in the context of a traumatic experience, may be difficult to understand and manage. Theoretically two important psychological responses to traumatic events can be distinguished: intrusions and avoidances (e.g., Horowitz, 1976). Intrusions are manifested in a preoccupation with the traumatic experience, repeated thoughts about the experience, related pangs of emotions, nightmares about the experience and a recurrent need to talk about it. At the same time, numbing and avoidance responses can be considered as attempts to block out intrusive images (Creamer, 1995; Herman, 1992). Examples are: emotional numbness, loss of interest, refusal to talk about the experience, and avoidance of locations reminding one of the experience. If these symptoms continue over time, dysfunctional reactions, such as posttraumatic stress disorder and depression, can occur which, in turn, affect both well-being and organizational performance.

However, the fact that employees in medium or high-risk occupations might experience symptoms similar to those that they assist remained unrecognized for a long time (Paton & Smith, 1996). The last decade has witnessed a growing recognition that the professionals who are called upon to assist those involved with extreme events can themselves become victims.

The focus of most studies on the types and consequences of traumatic workplace exposures has been on relatively rare events, such as airplane crashes, shipping disasters or earthquakes (Beaton, Murphy, Johnson, Pike, & Corneil, 1998). Studies of such events have shown that these acute stressors may lead to serious mental disorders, in particular posttraumatic stress disorder (Mitchell & Dyregrov, 1993). Several empirical studies (see e.g., McFarlane & Papay, 1992; Ursano, Fullerton, Kao, & Bhartiya, 1995) have shown that these relatively rare events negatively affect the psychological well-being of the workers. Most individuals who are exposed to these disturbing events develop symptoms, such as re-experiencing the event, avoiding to talk or think about it, and increased emotional arousal in the early aftermath of the event. Other symptoms may develop: troubles at home, poor work performance, absenteeism, fatigue and getting irritated easily. Such symptoms may persist for months, or even years. Generally, however, over time the intensity of the initial response decreases substantially (Grace, Green, Lindy, & Leonard, 1993; McFarlane & Papay, 1992).

1.1.2. Frequent exposure to acute stressors

Having described the consequences of relatively rare events, the question remains how do workers cope with acute stressors to which they are repetitively exposed? The first research question in this thesis is: "What is the impact of acute stressors on psychological health of medium or high-risk professionals?" Are employees who are frequently exposed to critical incidents more vulnerable to health symptoms, such as posttraumatic stress responses: i.e. intrusions and avoidances? According to Beaton and Murphy (1995), repetitive exposure to trauma is potentially cumulative and threatens health and well-being.

There are two opposing perspectives on the impact of critical incidents on health. The "inoculation theory" states that the experience of a critical incident makes it easier for the victim to cope with later incidents. It suggests that the more experiences, the more resiliency and consequently the fewer the problems. The earlier experience "immunizes" the victim for the effects of later experience. The alternative theory, labeled as "vulnerability perspective", states that a critical incident will make a victim more vulnerable for the consequences of later exposure to critical incidents.

1.1.3. Chronic stressors

This thesis focuses on the impact of so-called acute stressors, but also on the consequences of chronic job stressors. We are interested in the psychological health consequences of both types of stressors. Thus, the second research question is: "What are the consequences of chronic stressors on psychological health?" Many employees have to deal with chronic stressors such as work overload, role conflict or lack of autonomy. Marmar, Weiss, Metzler, Ronfeldt, and Foreman (1996) suggested that frequent operational duties could be just as stressful for emergency workers as involvement with disasters. For example, ambulance workers reported high levels of chronic stressors, such as a time pressure and shift work (Clohessy & Ehlers, 1999). Alexander and Klein (2001) found that ambulance workers were highly satisfied with the characteristics of their job, but they were less satisfied with external features of their organization, such as the lack of support by management. Implications of these sources of work-related stress include the effects on employee satisfaction and productivity, mental

and physical health, absenteeism, and the potential for employer liability (for a review, see Tennant, 2001).

There are no specific theories about work-related trauma (Paton & Smith, 1996). More general theories (described later in this chapter) concerning the aftermath of traumatic experiences can, however, help us to understand the consequences of critical incidents. Moreover, there are no theories that specifically combine acute and chronic stressors. The distinction between the study of acute and chronic stress is important, because concepts related to chronic stress may be inappropriate in understanding demands and responses associated with acute stress, and present a different framework with which to understand the demands associated with acute stress (Newton, 1989).

1.1.4. Acute and chronic job stressors

In the field of occupational health psychology researchers have mostly focused on the negative effects of long-term work characteristics, in particular chronic work-related stressors. However, the role of acute, intense stressors is often neglected. Researchers in the field of clinical psychology have focused on these acute stressors, but the role of chronic work stressors in relation to psychological well-being is ignored.

In the current research project we attempt to integrate the knowledge of both research fields, i.e. clinical psychology on the one hand and organizational and health psychology on the other hand, to get a better understanding of the process of coping with acute and chronic stressors in the work situation. The third research question in this project addresses: “How do acute and chronic stressors interplay in the psychological health of these workers?” Is coping with an acute stressor more difficult if an employee experiences high levels of chronic stressors? In our opinion drawing on the more extensive literature on occupational stress phenomena, including burnout, may provide insights into the nature of stress reactions in medium or high-risk professions and the process underlying the development of stress reactions.

1.1.5. Societal relevance

In the present study we explore the consequences of acute stressors and chronic stressors in samples of medium or high-risk professions. These consequences also have a societal impact. Since

1995 the number of hold-ups in the Netherlands has increased and in 1998, 1,966 hold-ups took place in various establishments, including banks, petrol stations, and shops (Keus, 1999). Thus, critical incidents in the work setting and their consequences are a serious problem. Dutch legislation has prompted industrial life to become more concerned with these topics. Since the introduction of the Working Conditions Act (the "Arbo wet") in 1994, employers are obliged to take care of employees affected by critical incidents (Schaufeli & Kompier, 2001). In addition, employers have to develop preventive procedures to protect employees from critical incidents and their aftermath. If an employee is confronted with a critical incident and suffers from it, the employer must make a plan to prevent further suffering. Intervention, such as counseling or other forms of psychological support, could be an element of this plan.

Moreover, many employees suffer from both psychological and physical health problems caused by chronic stressors. In the Netherlands, stress-related disorders constitute a major social problem: about 34% of the disability pensions for work incapacitated individuals are allocated because of mental health problem, mostly related to stress (LISV, 2001). As a consequence, the costs of stress-related disorders in the Netherlands are high: in 1995, approximately 2.1 billion Euros were expended on sickness and disability benefits due to mental problems, and another 86 million Euros on the accompanying medical consumption (Koningsveld & Mossink, 1997).

1.1.6. Content of this chapter

This thesis is aimed at combining the research fields of clinical psychology concerning acute job stressors and the field of organizational health psychology concerning chronic job stressors. This introduction gives an overview of the literature addressing the important concepts in this thesis. Thus, this chapter includes: 1) An introduction to the concepts of stress and stressors. Important issues related to the concepts are presented and a brief description of potential stressors is given. 2) A description is given of the process of coping with critical incidents and some theories on adaptation after traumatic events are described. 3) Attention is paid to chronic stressors and the psychological health symptoms associated with chronic job stressors. 4) Finally, an outline of this thesis is presented.

1.2. Stress and stressors

The concept of stress has been defined as a negative emotional experience accompanied by predictable biochemical, physiological, cognitive, and behavioral changes that are directed either towards altering the stressful event or accommodating to its effects (Baum, 1990). Initially, researchers focused on stressful events themselves, i.e. the “stressors”. The study of stressors has helped to define some conditions that are more likely to produce stress than others, but a focus on stressful events cannot fully explain the various responses.

In the interactional tradition, psychological stress is defined as the relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being (Lazarus & Folkman, 1984). Two critical processes that mediate this person-environment relationship are cognitive appraisal and coping. It is not the stimulus itself that determines one’s response, but how one evaluates the stimulus and the emotions this arouses. Coping is the process by which one manages the demands and emotions generated by that which is appraised as stressful (Lazarus & Folkman, 1984). The role of perception is important. If an individual does not perceive and interpret a situation as stressful, then the situation is not a stressful situation.

According to this theory of Lazarus and Folkman (1984), when individuals confront a new or changing environment, they engage in a process of primary appraisal to determine the meaning of an event. Events may be perceived as positive, neutral, or negative in their consequences. Negative or potentially negative events are further appraised for their possible harm, threat, or challenge. At the same time that primary appraisals of stressful circumstances are occurring, secondary appraisal is initiated. Secondary appraisal is the assessment of one’s coping abilities and resources as to whether they will be sufficient to meet the harm, threat, and challenge of the event. The subjective experience of stress is a balance of between primary and secondary appraisal. When harm and threat are high and coping ability is low, substantial threat is felt. When coping ability is high, stress may be minimal.

1.2.1. Potential stressors

Taylor (1999) summed up some characteristics of potential stressors that make them more likely to be appraised as stressful. 1) *Negative events* are more likely to produce stress than are positive events. Many events have the potential to be stressful because they present individuals with extra work or special problems that may tax or exceed their resources. 2) *Ambiguous events* are perceived as more stressful than clear-cut events. When a potential stressor is ambiguous, a person has no opportunity to take action and must then devote energy to try and understand the stressor. An example of an ambiguous stressor could be role ambiguity reported by workers, which can result e.g. from a lack of clear task guidelines and/or clear standards of performance, or contradictory guidelines. Role ambiguity was uniformly reported as one of the major factors contributing to work-related stress (Maslach, Schaufeli, & Leiter, 2001). 3) *Overloaded* individuals are more stressed than individuals with fewer tasks to perform. Individuals who have too many tasks in their lives report higher levels of stress than those who have fewer tasks. For example, one of the main sources of work-related stress is job overload: the perception that one is responsible for doing too much in too short a period of time. 4) Individuals may be more vulnerable to stress in *central life domains* than in peripheral ones, because important aspects of the self are overly invested in central life domains. 5) *Uncontrollable or unpredictable events* are also more stressful. When individuals feel that they can predict, modify or terminate an aversive event or feel they have access to someone who can influence it, they experience it as less stressful, even if they actually do nothing about it.

The characteristics of potential stressors have been described, because they are characteristic for the stressors dealt with in this thesis. Based on these characteristics one may conclude that exposure to both acute and chronic stressors is perceived as more stressful.

1.3. Coping with critical incidents

Acute stress derives from particularly stressful episodes or events that involve a sudden and unexpected onset, are relatively short lived in duration, and manifest in emotional disturbances almost immediately after the event (Evans & Coman, 1993; Kleber & van der Velden, 2003). Examples of acute stressors in the workplace include exposure to a

dangerous condition, radical changes in company structure, a technical problem, or role changes.

According to Kleber and Brom (1992), there are three important aspects that are characteristic for an individual confronted with an acute stressor: 1) *Powerlessness*: During a critical event, an individual has hardly any influence or control over the occurrence and the development of the event. The event is so overwhelming that the individual feels completely helpless. 2) An *acute disruption* of one's existence: The event throws the individual, often from one moment to the next, into a completely different situation, which crudely disrupts the course of daily existence. The existing certainties of life have disappeared. The world of someone who has been struck by a shocking or traumatic event suddenly looks different. The self-image and the image of the environment no longer adequately fit the new situation. The powerlessness, experienced as a consequence of a traumatic event, implies a confrontation with one's own vulnerability (Janoff-Bulman, 1989, 1992). 3) *Extreme discomfort*: Stressful life events are accompanied by extreme feelings of discomfort. Unpleasant events are significantly correlated with psychological problems and illness.

These three elements of powerlessness, acute disruptions and extreme discomfort are the result of an interaction between the demands of the environment on the one hand and the skills, expectations and characteristics of the individual on the other hand. Some circumstances lead to such disturbances more readily than others: i.e. one individual more readily experiences an event as traumatic than another.

1.3.1. Theories on coping with traumatic stress

There are no specific theories on work-related trauma, but we will discuss some general theories on coping with traumatic stress. We selected these theories because they were most often used in empirical research on the psychological health consequences of critical incidents. Moreover, the focus of these cognitive theories is on psychological processes rather than on psychopathology. The cognitive theories are attractive from a cultural and societal perspective on trauma because they explain the inter-relationships between cultural and social variables, as well as between individual behavior and experience (Kleber, Figley, & Gersons, 1995).

One of the pioneers in the field of traumatic stress is Horowitz (1976). He proposed an information processing theory that suggested that traumatic events overwhelm the cognitive information processing system. A subsequent dysfunctional period arises as the individual attempts to incorporate the atypical trauma data within his or her operational schemata. By increasing the sophistication of the schematic base, individuals would be better able to assimilate traumatic events and reduce the likelihood that exceptional work-related events would overwhelm their information processing system (Paton, 1996). This model also emphasized the potential role of intra-individual factors such as cognitive style and coping style. In this theory the alternation between two important psychological processes (intrusion and denial) is considered typical of the psychological coping process. As mentioned before, intrusion refers to re-experiencing the traumatic event. It takes a number of forms, the most common being the involuntary recollection of the stressor: i.e. the individual continuously deals with what has happened; memories surface again and again. Repetitive dreams and nightmares about the event are also a common way in which thoughts, feelings and images related to the event are re-experienced. The opposite psychological process of denial, has to do with a general numbing of psychic responsiveness. It is expressed by not wanting to talk about it, by avoiding the location of the event, and other avoidances behaviors such as diminished interest in significant activities and emotional numbness.

In the information processing theories (Creamer, 1995; Kleber & Brom, 1992) inspired by Horowitz, this alternation between intrusion and denial is seen as a normal and functional process in coping with the traumatic event. Old certainties and expectations that have been overthrown by the event need to be replaced by new ones. This can not be done at once because the victim would then be overwhelmed by emotions; the victim lets the traumatic experience slowly permeate. Intrusion, being preoccupied by the event, is alternated by denial, avoiding memories of the event. In an adaptive way, the magnitude of these alternations decreases with time as the implications of the experience are worked through. This coping process takes time but, gradually, the event is fitted into the life of the victim. The process is completed when the person suffers only rarely or not at all from intrusion and denial or other symptoms related to the event, such as

hypervigilance and jumpiness. The person can think about the event without being overwhelmed by emotions, and the memory of what has happened no longer has to be avoided (Kleber & van der Velden, 2003). However, as mentioned before, not all individuals are able to cope with the experience in this way. Consequently, they may suffer from posttraumatic symptoms, in particular intrusions and avoidance as well as depression, anxiety or fatigue.

Taylor (1983) proposed a theory of cognitive adaptation to threatening events. When an individual has experienced a personally threatening event, the readjustment process focuses around three themes: 1) a search for a meaning in the experience, 2) an attempt to regain mastery over the event in particular and over one's life in general, and 3) an effort to enhance one's self-esteem through self-enhancing evaluations (Taylor, 1983). Search for meaning involves attempts to understand the event, its cause and its significance. Gaining mastery over the event involves gaining control over the event and one's life. Beliefs over personal control are involved, such as thoughts of preventing similar events from happening again as well as developing strategies for managing the current event. The themes of self-enhancement involves intrapsychic attempts to find ways of feeling good about oneself again, in spite of the victimizing event which often reduces self-esteem.

Searching for meaning is an important element in the cognitive-oriented approaches to coping with traumatic events. Victims look for a way of understanding the situation by means of interpretations of what has happened to them (Frankl, 1959; Silver, Boon, & Stones, 1983). They try to regain control over their own life. In the cognitive-oriented approaches to coping with traumatic stress much attention is paid to ways of attributing meaning and replacement of old ideas by new ones (Kleber & Brom, 1992; McCann & Pearlman, 1990).

Janoff-Bulman (1989, 1992) suggested that individuals operate on the basis of unquestioned assumptions (e.g., about one's sense of invulnerability), fundamentally benign, about the world that may be shattered by the experience of a traumatic event. The cognitive task confronting someone who has experienced such an event is to assimilate and integrate the new negative experience. In the case of traumatic negative events, however pre-existing assumptions may no longer be

viable. Victims are faced with a dilemma: they must reconcile their prior assumptions that are no longer adequate and the negative experience that is too overwhelming to ignore. Therefore, they must revise and rebuild their basic assumptions.

1.4. Chronic job stressors

Besides acute stressors, chronic job stressors may play a role in the development of health symptoms. Scientists in the field of organizational and health psychology mainly focused on the role of chronic job stressors in relation to health and well-being. Examples of those chronic stressors are lack of autonomy, work overload, role ambiguity, and lack of social support. These chronic stressors endure for a long period of time and are relatively permanent characteristics of the working environment. Chronic stressors may have psychological health consequences: a person may be irritated, depressed or tired, and levels of blood pressure and cholesterol may rise. Other consequences of chronic stressors may be employee turnover, absenteeism, and early retirement from employment. As noted before, overloaded individuals are more stressed than individuals with fewer tasks to perform. Individuals who have too many tasks (overload) report higher levels of stress than those who have fewer tasks (Taylor, 1999). Overloaded employees are less able to cope with the situation than less loaded employees. Job overload is one the main sources of work-related stress and these stressors negatively affect the mental health of the employees.

1.4.1. Burnout

Helping individuals who experience major life problems constitutes a major challenge to many health professionals. Such work can be rewarding, for example, when patients show gratitude after consultation, or when they recover (Maslach, 1993). Unfortunately, the everyday reality is that health professionals are regularly confronted with patients who do not follow their advice, make impossible demands, resist change, and who sometimes even lie, cheat, and manipulate (Cherniss, 1995). This situation may progress into a chronic disequilibrium, whereby caregivers feel that they continuously have to put more into the relationships with their recipients than they receive in return. Pines and Aaronson (1988) formulated the following definition of burnout: “Burnout is a state of physical, emotional and mental

exhaustion caused by long-term involvement in situations that are emotionally demanding."

Burnout is a prolonged response to the chronic stress of dealing with other individuals, particularly when they are troubled or having problems (Maslach, 1993). The three key dimensions of burnout are an overwhelming exhaustion, feelings of cynicism and detachment from the job, and a sense of ineffectiveness and lack of accomplishment. The exhaustion component represents the basic individual stress dimension of burnout. It refers to feelings of being overextended and depleted of one's emotional and physical resources. The depersonalization (or cynicism) component represents the interpersonal context dimension of burnout. It refers to a negative, callous, or excessively detached response to various aspects of the job. The reduced efficacy or accomplishment component represents the self-evaluation dimension of burnout. It refers to feelings of incompetence and a lack of achievement and productivity at work. Exhaustion is often considered the central quality of burnout and the most obvious manifestation of this complex syndrome. When individuals describe themselves or others as experiencing burnout, they are most often referring to the experience of exhaustion (Maslach, Schaufeli, & Leiter, 2001).

Burnout can be considered as a final stage in a breakdown in adaptation that results from the long-term imbalance of demands and resources, and thus from prolonged job stress (Brill, 1984). Burnout is positively related to qualitative job demands, such as lack of autonomy and role problems, and more specifically to role ambiguity and role conflicts. Also quantitative job demands, such as work overload, are associated with burnout. Two specific work characteristics, both of a chronic nature, have been identified for burnout: 1) a bureaucratic work organization, and 2) emotionally demanding relationships with recipients (Schaufeli & Buunk, 2003).

The absence of job resources has also been studied in relation to burnout. Lack of social support is linked to burnout, especially lack of support from supervisors is important in the development of burnout. In addition to social support, the other job resources being studied concern information and control e.g. not getting feedback about the job and no participation in decision making are related to burnout.

Burnout has been associated with various forms of job withdrawal, e.g. absenteeism, intention to leave the job, and actual turnover. However, for employees who stay on the job, burnout leads to lower productivity and effectiveness at work. Consequently, it is associated with decreased job satisfaction and a reduced commitment to the job or organization. As the jobs of professionals in critical occupations are by definition emotionally demanding due to confrontations with acute stressors, we think it advisable to focus on burnout in these professionals.

1.4.2. Fatigue

Fatigue is a common complaint. In recent years, prolonged fatigue has attracted attention in the occupational (mental) health research (Meijman & Schaufeli, 1996), since it may affect one's performance and functioning in the occupational and in the home setting, and may lead to sickness, absenteeism and work disability (Schroër, 1997). High levels of fatigue appeared to put workers at risk for sick leave and for work disability (Bültmann, de Vries, Beurskens, Bleijenberg, Vercoulen, & Kant, 2000).

Although there is little information about psychosocial work characteristics associated with fatigue, high work demands and role conflicts are related to high levels of fatigue (Hardy, Shapiro, & Borrill, 1997). When an individual experiences stress, numerous cognitive and emotional processes (e.g. concentration, attention span memory, effort and arousal, and energy level) may be negatively affected (Lazarus & Folkman, 1984). Coping with stressful situation demands time and energy from the victim. The individual becomes tired and exhausted after even minor activities. Bültmann, Kant, Kals, Beurskens, and van den Brandt (2002) found a strong association between fatigue and psychological distress. In the current research project fatigue is an interesting symptom to investigate since it is probably related to both acute and chronic job stressors.

1.5. Content of this thesis

The aim of the current research project is to combine and integrate the research field on both acute stressors and chronic job stressors. The studies included in this thesis focus on the prevalence and characteristics of health symptoms as a consequence of acute and chronic stressors in professionals in medium or high-risk professions.

Chapter II addresses one of the main instruments used in this research project. The main aim here is to evaluate the construct validity of the Dutch version of the Impact of Event Scale (IES; Horowitz, Wilner, & Alvarez, 1979; Schokverwerkingslijst; Brom & Kleber, 1985). The IES is widely used in research on the aftermath of traumatic events and focuses on the two characteristic posttraumatic responses, i.e. intrusion and avoidance. The IES plays a central role in this thesis and its reliability and structure is evaluated in three population samples.

In Chapter III and Chapter IV, the psychological health consequences of acute and chronic job stressors are examined in two samples of workers regularly exposed to acute job stress. We selected forensic physicians and ambulance personnel since these professionals are frequently confronted with acute stressors in their jobs. Moreover, in the Netherlands the position of forensic physicians is unique, because they perform their tasks in shifts in combination with either a part-time or full-time job at a public health service. Their task as forensic physician is an extra duty, making them more vulnerable for chronic work stress, especially because they perform this duty in shifts. In addition, as far as we know, the forensic physicians have never been studied in relation to acute and/or chronic job stressors. Ambulance workers are another neglected group among the high-risk professionals. Most research has focused on, for example police officers or firefighters, but ambulance workers are more often involved in critical incidents than either the police or firefighters (James & Wright, 1991). Both these two studies have a cross-sectional design.

Chapter V and Chapter VI deal with the prediction of health symptoms due to acute and chronic stressors in forensic physicians and ambulance workers, respectively. Both studies have a longitudinal design, because one aim is to draw causal conclusions.

General conclusions about the main questions posed and addressed in this thesis are presented in Chapter VII.

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2. Construct validation of the Dutch version of the Impact of Event Scale

Psychological Assessment (in press)

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Abstract

The Impact of Event Scale (IES) is a worldwide used self-report measure to assess the frequency of intrusive and avoidant phenomena after experiencing a variety of traumatic experiences. The two subscales, intrusion and avoidance, refer to general psychological processes that alternately facilitate recovery, but that are also central in posttraumatic stress disorder. The purpose of this article is to assess the psychometric value of the Dutch version of the IES in several samples of individuals who had experienced various traumatic stressors. The reliability and structure of the IES were evaluated in three different samples (N total = 1,588): (a) participants who had experienced a traumatic event at work; (b) participants who were survivors of the Second World War; and (c) participants who were victim of a road accident or of a shipping disaster. The reliability of the Dutch version of the Impact of Event Scale was adequate across the various stressors. The construct validity was assessed using confirmatory factor analysis (CFA). Outcomes revealed a robust structure over the various samples generally supporting the composition of the original IES. These results provide further evidence that the IES is a valuable instrument for assessing the impact of trauma across a range of populations.

2.1. Introduction

Until traumatic experiences such as rape, combat, disasters, and acts of violence are assimilated and integrated into existing views of the world, they produce an oscillation between intrusive and emotionally upsetting recollections on the one hand and numbing and avoiding strategies on the other hand. This interaction between intrusion and avoidance has been emphasized by many authors in the trauma field (Horowitz, 1976; Van der Kolk, McFarlane, & Weisaeth, 1996).

Intrusions are manifested in a preoccupation with the traumatic experience, repeated thoughts about the experience, related pangs of emotions, nightmares about the experience and a recurrent need to talk about it (e.g., Horowitz, 1976). These intrusions are associated with distress, but are also conceptualized as forms of processing the trauma. According to cognitive models of trauma (e.g., Creamer, 1995; Kleber & Brom, 1992), the exposure to trauma-related memories allows associations between stimulus and response components to weaken and prompts modification of the meanings associated with the incident (e.g., individuals learn that they are not always vulnerable to a recurrence). At the same time, the numbing and avoidance responses are considered as attempts to block out intrusive images (Creamer, 1995; Herman, 1992). Examples are: emotional numbness, a loss of interest, the refusal to talk about the experience, the avoidance of locations reminding of the experience. These responses may be conceptualized as coping strategies, albeit often maladaptive, in response to discomfort resulting from intrusive memories. The degree of avoidance may be reinforced by familial or societal expectations not to discuss the trauma (Kleber, Figley, & Gersons, 1995).

Cognitive conceptualizations of posttraumatic reactions (e.g., Chemtob, Roitblat, Hamada, Carlson, & Twentyman, 1988; Foa, Steketee, & Rothbaum, 1989; Janoff-Bulman, 1985) propose that activation of the traumatic memories, and the incorporation of new information, allow for processing to take place. Thus, although activation of the thoughts and the feelings associated with the trauma will result in high symptom levels, they will lead to reduced symptom levels in the future as the memories are modified. At the same time, intrusion and avoidance are painful and in the long run often dysfunctional (Shalev & Yehuda, 1998). High levels of intrusion and

avoidance are used as essential indicators of posttraumatic stress disorder (PTSD; American Psychiatric Association, 1994).

Horowitz and associates (Horowitz, Wilner, & Alvarez, 1979) introduced the Impact of Event Scale (IES), a self-report inventory to assess these characteristic responses to traumatic stressors. This instrument was built on earlier observations of the link between traumatic life events and subsequent psychological symptoms (Breuer & Freud, 1952; Horowitz, 1976; Kardiner, 1941). The IES (15 items) was developed to assess current subjective distress for any major life event. The first dimension is intrusion (intrusively experienced ideas, images, feelings, or bad dreams; 7 items) and the second dimension is avoidance (self-reported avoidance of certain ideas, feelings, or situations; 8 items). The scale provides subscores for these dimensions of response sets as well as a total subjective stress score. In a sample of adults who sought psychotherapy as a result of disturbances due to a serious life event, the psychometric characteristics of the IES were examined by Horowitz et al. (1979). The scale showed satisfactory psychometric properties. The reliability coefficient for intrusion was .79, and for avoidance .82.

Since its introduction, the IES has been used worldwide in relation to various traumatic experiences and in different samples. The inventory was found to be very valuable in many studies on trauma victims and on outcomes of various trauma interventions. It is probably the most popular trauma-specific questionnaire worldwide (cf. Joseph, 2000; Sundin & Horowitz, 2002). The questionnaire had been translated into several languages, for example Hebrew (e.g., Schwarzwald, Solomon, Weisenberg, & Mikulincer, 1987), Swedish (e.g., Larsson, 2000), Croatic (e.g., Dyregrov, Kuterovac, & Barath, 1996), Arabic (e.g., Dyregrov, Gjestad, & Raundalen, 2002), Bosnian (e.g., Mooren & Kleber, 2001), and German (e.g., Schnyder, Moergerli, Klaghofer, & Buddeberg, 2001). The purpose of this paper is to assess the reliability and the factor structure of the Dutch version of the IES in various samples in The Netherlands (Brom & Kleber, 1985).

2.1.1. Issues with regard to the subscales of the Impact of Event Scale

A central issue concerns the structure and homogeneity of the scale. A number of studies have indicated that the two-factor structure is not as equivocal as originally assumed. First, Zilberg, Weiss, and

Horowitz (1982) studied two samples of outpatients who sought help after the death of their parent (n = 35) and field subject volunteers (n = 37). Principal component analysis (PCA with Kaiser criterion) revealed three principal components, but the third component explained only 6% of the variance. Therefore, they decided to drop the third component and performed a forced two-component PCA. They found the original structure designed by Horowitz et al. (1979) in this sample. The subscales of the IES indicated high internal consistency (ranging from .79 to .92) for both samples across repeated measurements in time and at varying average levels of subscale scores.

Brom and Kleber (1985) examined the psychometric properties of the Dutch version (translated as the *Schokverwerkingslijst*, abbreviated as SVL) in a sample of 105 individuals attending psychotherapy after various traumatic events. The internal consistency coefficient for intrusion was .72 and for avoidance .66. Although they found some evidence for three factors (a second smaller factor within the avoidance factor), the two dimensions, intrusion and avoidance, were confirmed by factor analyses and cluster analyses. Two of the items (items 6 and 8) were not consistent, as their content did not load on the target dimension of the scale. The authors decided to drop those in summarizing the subscale scores. This revised version has been used in many studies in The Netherlands (e.g., Brom, Kleber, & Defares, 1989; Brom, Kleber, & Hofman, 1993).

In Israel a slightly different factor structure than the original one was found in several studies on the Hebrew translation of the IES. The study of Schwarzwald and colleagues (1987) focused on men who had been exposed to combat-related trauma. Three samples were studied: (a) participants who had participated in combat and had been identified as suffering from combat stress reaction (n = 382); (b) controls who had participated in the same battles and were matched on relevant socio-demographic characteristics, but had not shown stress symptoms (n = 334); and (c) combat-ready participants who were similar to the other two samples, but had not actually participated in battle (n = 88). PCA (with Kaiser criterion) was used to examine the underlying structure of the IES. A three-factor solution was found with the third factor accounting for 7% of the total variance. Consistent with the research of Brom and Kleber (1985) and Zilberg et al. (1982) the third factor was dropped, and a forced two-factor solution was performed by PCA. Two

avoidance items (item 8 and 15) did not yield sufficient loading in either of the obtained factors. Whereas the avoidance factor reflected behavioral-cognitive avoidance, these two items tapped emotional avoidance or numbing. Coefficients of internal consistency for 9 items of the intrusion factor (α = .91) and for the 4 items of avoidance (α = .84) indicated a high level of reliability.

Joseph, Williams, Yule, and Walker (1992) examined the structure of the English IES in a sample of survivors of disasters at sea. The first sample consisted of 37 adult survivors of the Herald of Free Enterprise disaster (in Belgium) and the second consisted of 35 adult survivors of Jupiter cruise ship disaster (in Greece). Three factors were found in the scree plot of eigenvalues. The results were similar to those found by Schwarzwald et al. (1987): the items 8 and 15 did not load on either the intrusion or avoidance dimensions, but emerged as a separate factor. In line with the studies above, there appeared to be a distinction between two types of avoidance: either active versus passive or emotional versus cognitive. As the third factor explained only 7.6% of the variance, the authors adopted the decision of Zilberg et al. (1982) to drop this factor. Items 2 and 12 were found to have ambiguous loadings.

In examining the factorial structure of the IES, most studies used an exploratory factor analysis (for an overview, see Joseph, 2000). However, confirmatory factor analysis (CFA) is more appropriate to evaluate the hypothesized structure. With CFA the relationships between the responses, the observed variables, and the factors, the latent variables, are explored using theoretical considerations as a point of departure.

Recently, three studies were conducted assessing the factor structure of the Impact of Event Scale using CFA. Shevlin, Hunt, and Robbins (2000) examined the structure of the IES in a sample of World War II veterans (n = 657) and Korean War veterans (n = 22) who had experienced combat 40-50 years earlier. They specified three confirmatory factor analytic models on the basis of theoretical considerations and earlier research. The best fitting model specified a two-factor model with additional cross-factor loading for item 2 and 12. The fit indices (RMSEA = .06, SRMR = .04) indicated adequate model fit.

Larsson (2000) analyzed the Swedish translation of the IES using CFA in a sample of individuals who had witnessed a mass murder of seven people (N = 321). The first tested model was based on the two components of the original IES, but this model did not provide an acceptable outcome (RMSEA = .13, GFI = .84). In addition, a model with one latent variable was tested. This model was too simplistic for the data. The fit indices (RMSEA = .12, GFI = .80) did not indicate adequate model fit. On the basis of modification indices a model with one general factor and three subordinate specific factors Intrusion, Avoidance and Sleep Disturbance was developed. This model was considered to be psychologically meaningful. The statistical goodness-of-fit of the model was acceptable (RMSEA = .06, GFI = .95).

Amdur and Liberzon (2001) tested the factor structure of the IES in a clinical sample of male combat veterans with chronic PTSD (N = 195). The two-factor structure including Intrusion and Avoidance deviated significantly from good fit. On base of an exploratory factor analysis alternative models were identified. A four-factor model with Intrusion, Effortful Avoidance, Sleep Disturbance and Emotional Numbing fitted significantly better (item 9 “I tried not to talk about it” was dropped). The statistical goodness-of-fit was good (RMSEA = .03, AGFI = .92).

Another psychometric issue has to do with the nature of the samples used in IES studies. Unfortunately, most studies were conducted on clinical samples, in particular patient samples and comparable samples, such as applicants for war pensions. By definition, these people suffer from mental disturbances related to traumatic experiences, most notably posttraumatic stress disorder. However, the association between extreme stresses and posttraumatic stress disorder is certainly not a direct and monocausal connection (Kleber et al., 1995; Yehuda & McFarlane, 1995). Only a minority of people confronted with violence, terror and calamities has been found to suffer from trauma related disorders and only a portion of these disorders have been found to be posttraumatic stress disorder. In systematic overviews of random samples of victims of major events (Brom, Kleber, & Witztum, 1991) and epidemiological research (Breslau, 1998) prevalence rates of approximately 10 to 25 percent of PTSD are mentioned. Unfortunately, there have been only a few studies using the IES in random samples of people confronted with disaster, rape, and combat. In spite of the many

studies using the IES, it is unclear whether the instrument is suitable for these samples and whether a similar factor structure is revealed.

A next issue related to the construct validity of the IES is its widespread use to assess the aftermath of a diversity of traumatic experiences. The stressors vary from death of a parent (Horowitz et al., 1979) to floods (Green et al., 1994), earthquakes (Lundin & Bodegard, 1993), accidents (Malt, Hoivik, & Blikra, 1993) and World War II (Bramsen, 1995). However, it is remarkable that no study has yet determined possible differences in responses, as assessed by the IES, to these various stressors. It is worthwhile to examine the possible differences in responses of victims after exposure to various kinds of events.

Finally, the IES has been repeatedly used in different countries (e.g., Norway, The Netherlands, Great Britain, Germany, Bosnia-Herzegovina). An adequate examination of the reliability and structure of a non-English version (in this case: Dutch) compared to the original inventory from the United States is warranted.

2.1.2. Goals of this study

The purpose of this study is to analyze reliability and construct validity of the Dutch version of the IES in different samples confronted with various kinds of traumatic incidents. Confirmatory factor analytic methods will be used. This allows for the a priori specification of alternative factor models and statistical tests to evaluate the fit of the specified model. In addition, it is possible to test the equivalence of the IES across various samples. Although this article is primarily focused on the internal structure of the Dutch IES, we will also examine the convergent validity in order to provide insight in the relation of the IES with other mental health indicators. Specifically, we address the following issues with regard to the internal structure:

1. On the basis of theoretical considerations and former research, several factor models (a one-dimensional model, the original two-factor structure, a three factor model and additional models on the basis of modification indices) are specified. Their fit is evaluated in a sample of individuals who were confronted with various sorts of traumatic events (i.e., work-related and war-related acts of violence and confrontations with an accident or disaster).

2. Comparing independent samples of trauma-stricken people, the equivalence of the IES is tested. Is the best fitting model equivalent across different samples, that is, can similarity of the IES-scale structure concerning different kinds of traumatic incidents be confirmed?

2.2. Method

2.2.1. Selection of samples

For the analyses described in this article, studies were included that used the Dutch version of the Impact of Event Scale (SVL) during the past decade. The data were gathered in all research projects on traumatic conducted either by the Dutch Institute for Psychotrauma and/or Utrecht University (published before 2000). For the purpose of this validation study, only cases with completed SVL were included.

2.2.2. Participants

Participants of the different studies were recruited in three general ways: they were either asked to participate in work-related projects (I), in a comprehensive study on the late consequences of the Second World War and migration (II), or in studies on the impact of a disaster (III). Table 1 provides an overview of demographic data of all respondents.

Table 1 Demographics of the respondents (N = 1,588) in the studied groups and experiences of violence and threat among the respondents in the different groups

Sample	Sub sample [1]	n	Year of study	n men (%)	n women (%)	M age (SD)	Partner (%)	No partner (%)	Type of violence or threat
I	a	56	'90	35 (62.5)	21 (37.5)	38.0 (9.38)	43 (79.6)	11 (20.4)	Directly or indirectly subjected to violence and/or threat
	b	173	'95	111 (64.2)	62 (35.8)	35.1 (9.69)	136 (78.6)	37 (21.4)	Directly or indirectly subjected to violence and/or threat
	c	148	'90	70 (47.3)	78 (52.7)	34.1 (11.34)	131 (88.5)	17 (11.5)	Robberies
	d	52	'91	52 (100.0)	0	38.5 (7.96)	45 (86.5)	6 (11.5)	Robberies
	e	29	'94	25 (86.2)	4 (13.8)	36.5 (9.67)	27 (93.1)	2 (6.9)	Continuous stress, potential hazardous incidents
	f	123	'95-'98	63 (51.6)	59 (48.4)	36.6 (9.33)	110 (90.2)	12 (9.8)	Various stressful events: (bank)robberies, sexual assault, maltreatment, taken hostage, threat, confrontation with dead bodies and injuries
II	g1	316	'95	164 (51.9)	152 (48.1)	58.8 (5.02)	194 (61.4)	122 (38.6)	Second World War: German occupation
	g2	227	'95	111 (48.9)	116 (51.1)	58.6 (4.44)	113 (49.8)	114 (50.2)	Second World War: Japanese occupation, revolution period (Bersiap) and migration
	g3	237	'95	132 (55.9)	104 (44.1)	60.6 (3.94)	121 (51.1)	116 (48.9)	Second World War: Japanese occupation, revolution period (Bersiap) and migration
	g4	56	'95	31 (55.4)	25 (44.6)	58.2 (4.16)	25 (44.6)	31 (55.4)	Second World War: Japanese occupation, revolution period (Bersiap) and migration
III	h	137	'86-'87	83 (60.6)	54 (39.4)	36.9 (16.10)	71 (51.8)	66 (48.2)	Traffic accident
	i	34	'94	17 (50.0)	17 (50.0)	54.8 (10.83)	31 (91.2)	3 (8.8)	The sinking of the cruise ship The Achille Lauro near the coast of Somalia

1a) civil social services, b) department store, c) banks, d) money transport concern, e) air traffic control, f) EMDR study, g1) comparison group of people who spent their youth in The Netherlands during WWII, g2) child survivors from the former Dutch Indies, g3) child survivors from the former Dutch Indies who applicated for (im)material help, g4) child survivors from the former Dutch Indies who received psychotherapy, h) traffic accidents, and i) a shipping disaster

2.2.2.1. Work-related trauma.

First, samples on work-related trauma focused on high-incident organizations (sub-samples a-f, see Table 1), that is, participants worked in professions that involved a high stress level or risk for experiencing critical events.

Sub-sample (a) consisted of all employees working at one of the main departments of the civil social services of the city of Amsterdam (n = 56, Eland, Kleber, ten Veen, van der Velden, & Steinmetz, 1990). The study combined interviews and standardized questionnaires (including the IES). It was directed at obtaining insight in the kind and magnitude of experienced violence in relation to individual functioning. During the year before the study, almost half of the participants had experienced violence directly. For instance, a (fake) weapon was pointed at them or a part of the furniture was thrown towards them, they were held, yelled at, kicked or taken hostage. An equal number of employees had been a witness to these acts being directed at others. The response rate was high (88%). Most of the participants were male and the mean age was 38.0 years (SD = 9.38). A second study was conducted among a randomly selected sample of employees of a large department store (sub-sample b, n = 173, Van der Velden, 1996). The project investigated the impact of unsafe or violent situations on the health of the employees. Assessment methods were questionnaires. More than half of the participants had been subjected to direct violence while others had been a witness to the violent scene (client threatened to hurt another person (e.g., colleague)). Examples of direct confrontations were being yelled at by a client, being held or hit by a client, being threatened with a knife, gun, or sexual violence, or being threatened to be killed. The overall response rate was high: 86% participated in an interview and returned the questionnaire. Men were better represented (64.2%) in this sample than women (35.8%). The estimated average age was 35.1 years (SD = 9.69).

Sub-sample c encompassed all professional employees of a medium-sized Dutch bank organization who had experienced a bank robbery (n = 148, Van der Velden, van der Burg, Steinmetz, & van den Bout, 1992). Assessment methods were interviews and standardized interviews. For one out of four victimized employees the robbery took place less than six months ago, for others more time had passed. In

most cases, the victims (75.7%) were directly assaulted. They were yelled at, kicked, stabbed with a knife or shot at. The number of robberies among employees varied between one and five (or more). The average number of years that have passed since the last robbery was 5 years (SD = 4). Slightly more female (52.7%) than male employees (47.3%) participated; 30% of the men and 23% of the women had experienced a robbery more than once (range 1-4). The response rate was 71%. Mean age was 34.1 years (SD = 11.34).

The fourth sub-sample (d) consisted of a randomly selected sample of employees of the largest money transport company in The Netherlands (n = 52, Van der Velden, Eland, ten Veen, & Kleber, 1991). Filling out the IES was part of a study to investigate the relationship between confrontation with robberies of money transports and employees' health. Included were participants who stated that they had been (witness to) forced to hand over money of goods during work, one to five or more times. They were all men with an average age of 38.5 years (SD = 7.96).

The fifth sub-sample (e) consisted of employees of Air Traffic Control Netherlands (n = 29, Van der Velden & Kleber, 1995). A study combining interviews and questionnaires (including the IES) was conducted to assess the prevalence of and type of psychological reactions to acute stressful events among a small, but representative sample of officers and their assistants in this highly stress provoking field of work (response rate 83%). All participants in this study reported that they had been confronted with near-disasters as well as hazardous incidents during their work. Examples of such incidents were acute technical problems with pilots, daily peeks in the air traffic or bad weather. For 43.8% of the controllers, the most (recent) stressful event had taken place less than two years ago. Most of the participants were men (n = 25, 86.2%), the average age of all respondents was 36.5 years (SD = 9.67).

The final sub-sample with regard to work included (f) consisted of people working for various companies, such as banks, police departments, security agencies and fire fighting departments (n = 123, Van der Velden & Kleber, 2002). They were randomly selected from the therapy files of the Institute for Psychotrauma. These patients were all subjected to a controlled Eye Movement Desensitization and

Reprocessing (EMDR) therapy. Most of the respondents who participated in the study had experienced one or more stressful events in or during their work (85%). Relatively frequently occurring events were being threatened, confrontation with dead bodies, robberies, maltreatment, being confronted with injuries, taken hostage or sexual assault. More men (51.6%) than women (48.4%) participated and the mean age was 36.6 years (SD = 9.33). Before and after treatment they completed a set of questionnaires, including the IES. Only the pre-treatment data were included here.

2.2.2.2. War-related trauma

The second sample was derived from a comprehensive research project on health and adjustment of survivors of Second World War in the Former Dutch Indies, living in the Netherlands at the time of study in 1994-1995 (sub-samples g1-4, see Table 1, Mooren & Kleber, 1996). In this study four sub-samples were analyzed. The first two sub-samples were random samples of the community registers of seven cities in the Netherlands; one sub-sample consisting of all child survivors born in the Former Dutch Indies who survived the hardships of the Japanese occupation and who came to the Netherlands in the 1940s and 1950s (study g2, n = 227), the other constituted by a matched comparison group of people born in the Netherlands who spent WW II here (sub-sample g1, n = 316). All respondents were selected irrespective of whether they received help or not. Participants in the third sub-sample were randomly selected via the National Institute for Pensions and Allowances for the provision of material and immaterial help to survivors of WW II in the Netherlands (g3, n = 237). Participants in the last sub-sample were randomly selected patients of a national clinic that specialized in the treatment of mental health disturbances related to WWII (g4, n = 56). These last two sub-samples were considered clinical groups as opposed to the two community groups. These child survivors were selected at a mean age of 60 years. The response rates of the four sub-samples were respectively 34% (g1), 47% (g2), 55% (g3) and 75% (g4).

The participants in this sample had to trace their memories for experiences that had happened to them in either Second World War or the subsequent period of decolonization. Examples of experiences that were noted by many participants were: serious injury, a serious illness,

loss of family members, destruction of property, having been in a line of fire, maltreatment or abuse, and being a witness to the abuse of a family member.

2.2.2.3. Disasters

The third sample stemmed from two studies on the consequences of experiencing a traffic accident (sub-sample h), and a shipping disaster (sub-sample i). Sub-sample h (n = 137, Brom et al., 1993) assessed the impact of experiencing a traffic accident on individual well being. Victims of traffic accidents in a large city of the Eastern part of The Netherlands were randomly selected from police registers and were assigned to either a counseling or a control condition. Response rates were different for both conditions; 13% (n = 68) and 36% (n = 83) respectively (M age = 36.9, SD = 16.1). The severity of the accident was established by rating the police reports by independent judges. More than half of all accidents were rated as rather severe, a restricted number as very severe (4% of the control group, 15% of the counseling group). Measurements, including the Dutch version of the IES, were carried out one month after the accident.

Sub-sample i (Van der Velden & Kleber, 1997) focused on the consequences of a shipping disaster (the sinking of the Achille Lauro, a large Italian cruise ship) in 1994. Approximately one month after the disaster, all Dutch survivors were asked to fill out a set of questionnaires (including the IES). Among the victims of the explosion and subsequent sinking of the cruise ship, almost a quarter reported having physical injuries caused by the disaster, such as breathing problems, wounds on the legs and bruises. Several respondents reported severe anxiety and the fear of dying. In particular, great distress had been caused by the appearance of thick smoke, the absence of fire alarms, not being informed clearly and the absence of supervision. Thirty-four completed questionnaires were available for analysis (response rate 70%). An equal number of men and women participated with a mean age of 55 years (SD = 10.8; range 20-71).

2.2.3. Measurements

The participants in all samples answered the Dutch version of the Impact of Event Scale (SVL) (Brom & Kleber, 1985; Horowitz et al., 1979). A copy of the Dutch version is included in Appendix I. The Dutch IES was developed after careful translation and back-translation into

Dutch. Intrusion (7 items) refers to the tendency to be triggered by stimuli associated with the traumatic event(s), while avoidance reflects the tendency to avoid situations that are reminders of what happened (8 items). For every statement the respondent answered on a four-point scale whether this was present – not at all (0), rarely (1), sometimes (3) or often (5) during the past seven days. Subscale indices were obtained by summing the item scores.

All items referred to the specific experienced event(s). For the work-related samples (I a-f), respondents had to take the most recent incident in mind. In the war-related project, base of reference was the period of Second World War and subsequent revolution period, including specific incidents. In the samples assessing the consequences of road accidents and the shipping disaster (III h and i), the particular accident or disaster was referred to.

In addition, in most sub-samples the validated Dutch version of the Symptom Checklist (SCL-90; Derogatis, 1983; Dutch version: Arrindell & Ettema, 1986) was used to obtain an indication of subjective current mental health. Subscales assessed feelings of agoraphobia (7 items), anxiety (10 items), depression (16 items), the presence of sleeping problems (3 items), somatic complaints (12 items), insufficiency of thinking and acting (9 items) and problems in the interpersonal sphere, specified as feelings of hostility (18 items) and distrust (6 items). A total score reflects generalized psychosocial malfunctioning. This questionnaire was used in the following (sub-)samples: banks (sub-sample c), money transport concern (sub-sample d), EMDR-study (sub-sample f) and the study on war related trauma (sample II). In the study on victims of traffic accident (sub-sample h) a shortened version of the SCL-90 was used. Furthermore, in the study on war related trauma, symptoms of dissociative thought were assessed using the Dutch translation of the Dissociation Experience Scale (DES; Bernstein & Putnam, 1986). Participants judged the accuracy of 28 statements by indicating the proportion of time on a line of ten centimeters. The total score on the DES was used to assess the distinctive posttraumatic response of dissociation (Van der Kolk et al., 1996).

2.2.4. Analyses

Means and standard deviations were computed per item. Besides, in line with previous publications (Horowitz et al., 1979; Schwarzwald et

al., 1987; Zilberg et al., 1982) frequencies of endorsement for each individual item were given. Endorsement is an item response larger than zero. Cronbach's alphas were computed to test the internal consistency of the factors. Data were analyzed using the Statistical Package for Social Sciences (SPSS 10.0).

To study the structure of the Dutch version of the IES, a series of confirmatory factor models were specified and estimated using AMOS (version 4.01, Arbuckle & Wothke, 1999). Using AMOS, raw data can be analyzed. The parameters were estimated using maximum likelihood. To examine how close competing models fit the data, several fit indices were calculated (Hu & Bentler, 1995, 1999). The first is the traditional goodness of fit index chi-square (χ^2). In addition, two other fit indices are reported that counteract problems associated with the χ^2, such as the influence of sample size. Those indices are the Confirmatory Fit Index (CFI), and the root mean square error (RMSEA). The CFI should be larger than .95. The RMSEA values less than .05 indicate good fit and values as high as .08 represent reasonable fit (MacCallum, Brown, & Sugawara, 1996).

The first model specifies a single factor model; one latent variable containing all 15 manifest variables (Hendrix, Jurich, & Schumm, 1994). The measurement error terms would be uncorrelated. Model 2 specifies two correlated factors with the intrusion items (items 1, 4, 5, 6, 10, 11 and 14) loading on the first factor (Intrusion) and the avoidance items (items 2, 3, 7, 8, 9, 12, 13 and 15) loading on the second factor (Avoidance). The intrusion items would have zero loading on the Avoidance factor and the avoidance items would have zero loading on the Intrusion factor. The measurement error terms would be uncorrelated. A schematic representation of this two-factor model is presented in Figure 1.

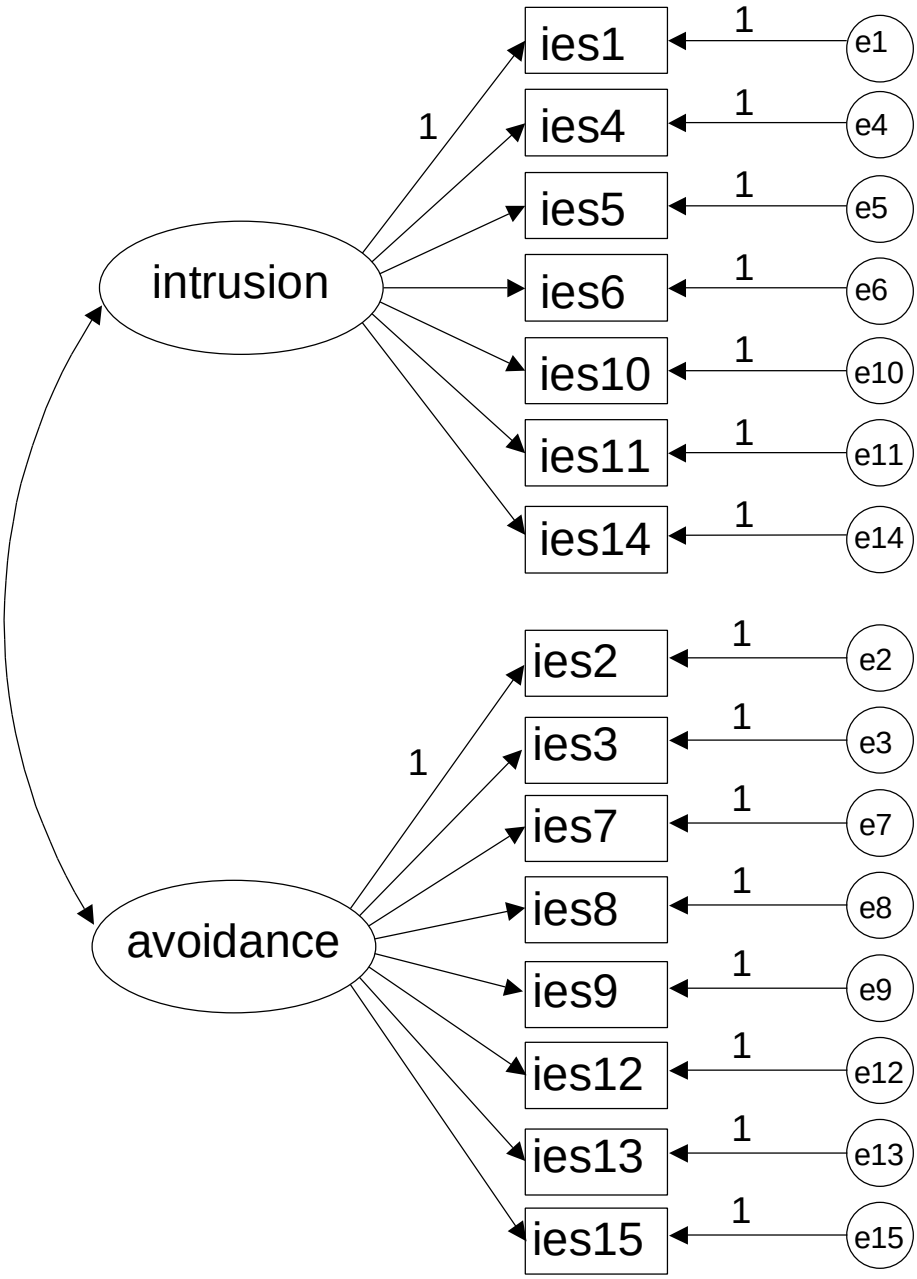

Figure 1 Hypothesized model of factorial structure of the Impact of Event Scale

Additional models were tested on the basis of the modification indices and a model with three factors (intrusion, avoidance and numbing) was tested. These models were tested in the total sample (N

= 1,588). Next, the best fitting model found in the total sample was tested in the three samples. Finally, multiple group analyses were conducted to investigate whether the adequate fitting model was equivalent across the three samples.

2.2.5. Results

2.2.5.1. Endorsement, means and standard deviations

Endorsement, means and standard deviations of single items, subscales and total score on the IES are given in Table 2. The three samples significantly differed on the intrusion ($F(2,1585) = 5.6$, $p < .01$) and avoidance ($F(2,1585) = 4.6$, $p < .05$) and the total score ($F(2,1585) = 5.0$, $p < .01$) of the IES. Post-hoc tests indicated that the scores of the sample of participants who were confronted with work related events were significantly lower on the subscale intrusion and on the total score of the IES than the two other samples (war and disaster). The scores on the subscale avoidance were significantly lower in the sample of participants of work-related events compared to those of the sample of participants of war-related events.

Table 2 Endorsement, mean and standard deviation of the single items, subscales and total score of the IES in all three samples

	Sample I			Sample II			Sample III		
	% endorsement [1]	Mean	SD	% endorsement	Mean	SD	% endorsement	Mean	SD
IES1: I thought about it when I didn't mean to	58.5	1.8	1.9	51.3	1.7	2.0	71.9	2.3	1.9
IES2: I avoided letting myself get upset when I thought about it or was reminded of it	37.2	1.1	1.7	29.5	1.3	1.8	40.4	1.3	1.9
IES3: I tried to remove it from memory	38.0	1.3	1.9	38.0	1.4	2.0	40.9	1.4	1.9
IES4: I had trouble falling asleep or staying asleep because of pictures or thoughts about it came into my mind	33.7	1.0	1.7	34.0	1.1	1.8	42.7	1.6	1.9
IES5: I had waves of strong feelings about it	48.5	1.4	1.7	44.6	1.4	1.8	63.2	1.7	1.7
IES6: I had dreams about it	26.2	0.7	1.4	35.2	1.1	1.7	29.2	0.8	1.5
IES7:I stayed away from reminders of it	24.4	0.8	1.6	34.1	1.2	1.9	22.8	0.7	1.5
IES8: I felt as if it didn't happened or it wasn't real	19.6	0.6	1.3	22.0	0.6	1.4	38.6	1.3	1.9
IES9: I tried not to talk about it	27.0	0.8	1.5	36.2	1.2	1.9	26.3	0.8	1.6
IES10: Pictures about it popped into my mind	53.0	1.6	1.8	54.9	1.8	1.9	67.8	2.2	1.9
IES11: Other things kept making me think about it	48.0	1.4	1.7	50.8	1.7	2.0	65.5	1.9	1.8
IES12: I was aware that I still had a lot of feelings about it, but I didn't deal with them	33.9	1.0	1.6	41.0	1.3	1.8	37.4	1.0	1.6
IES13: I tried not to think about it	35.6	1.13	1.8	39.0	1.3	1.9	40.9	1.18	1.8
IES14: Any reminder brought back feelings about it	41.8	1.22	1.7	45.9	1.7	2.1	52.0	1.53	1.8
IES15: My feelings about it were kind of numb	22.2	0.58	1.7	27.9	0.9	1.6	35.1	0.83	1.4
IES-intrusion**		9.1	10.0		10.4	11.5		12.1	9.3
IES-avoidance*		6.4	8.6		7.9	9.8		7.6	7.5
IES-total**		15.5	17.7		18.2	20.4		19.7	15.0

1)% endorsement is percentage of item responses greater of zero

* $p < .05$, ** $p < .01$

2.2.5.2. Reliability

Cronbach's alphas were calculated for the total sample and the three samples (Table 3). The reliability coefficients ranged from .85 to .95 for the subscale intrusion, from .77 to .91 for the subscale avoidance and from .87 to .96 for the total score. In all samples the internal consistency of the subscales and the total of the IES was good.

Table 3 Cronbach's alpha of the subscales and the total score of the Impact of Event Scale in the total sample (N = 1,588) and the three samples

	Intrusion	Avoidance	Total score
Total sample (N = 1,588)	.93	.90	.95
Sample I (n = 581)	.93	.89	.94
Sample II (n = 836)	.95	.91	.96
Sample III (n = 171)	.85	.77	.87

2.2.5.3. Confirmatory Factor Analysis

CFA in the total sample. Model 1 is a model with one latent variable, a general factor containing all 15 manifest variables and Model 2 is based on the two components of the original IES (intrusion and avoidance). These models were evaluated in the total sample (consisting of the three samples; N = 1,588) using CFA. Table 4 reports the fit indices for the confirmatory factor models. The chi-square statistic indicated that Model 2 represented a significant better explanation of the data than Model 1 (χ^2_{diff} (1, N = 1,588) = 769.38, $p < .05$).

On the basis of modification indices a third and a fourth model were tested. The modification indices suggested that item 2 should be fitted on the subscale Intrusion ("I avoided letting myself get upset when I thought about it or was reminded of it"). In Model 2a, item 2 loaded on the first factor (Intrusion) and in Model 2b this item loaded on both factors. As Table 4 shows, Model 2a and 2b appeared to be better than Model 2. The improvement of Model 2a over Model 2 could not be tested, because the same number of degrees of freedom were involved. The chi-square was lower; the CFI and the RMSEA were the same. Model 2b showed a significant improvement with regard to Model 2 (χ^2_{diff} (1, N = 1,588) = 108.46, $p < .05$). Earlier research on the structure of the IES (Brom & Kleber, 1985; Schwarzwald et al., 1987; Joseph et al., 1992) indicated that there could be a third factor; numbing consisting of two items (item 8 and 15). Finally, a fifth model (Model 3) with 3 factors, intrusion, avoidance and numbing was tested. The

results of this analysis are presented in Table 4. Although there appeared to be a slight improvement, we decided to accept the original structure introduced by Horowitz et al. (1979), since the numbing factor only existed of two items.

Table 4 Fit indices for confirmatory factor models of the Impact of Event Scale (N = 1,588) in the total sample, in three samples (work-related events (n = 581), experiences with war (n = 836), and exposure with a disaster (n = 171)) and the multigroup analyses

Model	χ^2	df	p	RMSEA	CFI
Total sample (N = 1,588)					
Model 1	1839.72	90	< .05	.11	.90
Model 2	1070.34	89	< .05	.08	.94
Model 2a	1044.87	89	< .05	.08	.94
Model 2b	961.88	88	< .05	.08	.95
Model 3	957.32	87	< .05	.08	.95
Sample I (n = 581)					
Model 2	546.34	89	< .05	.09	.92
Sample II (n = 835)					
Model 2	717.11	89	< .05	.09	.94
Sample III (n = 171)					
Model 2	179.30	89	< .05	.08	.90
Model 2c	147.92	76	< .05	.07	.91
Multigroup					
Model 2*	1586.53	295	< .05	.05	.93
Model 2**	1583.07	294	< .05	.05	.93
Model 2***	1548.48	294	< .05	.05	.93
Model 2****	1561.99	293	< .05	.05	.93

RMSEA = Root-mean-square error of approximation, CFI = Confirmatory Fit Index

Model 2a: item 2 loads on Intrusion in stead of avoidance; Model 2b: item 2 loads on Intrusion and Avoidance; Model 2c: Additional CFA on IES (original model without item 8); Model 3: 3 factors: intrusion, avoidance and numbing; Model 2* most restrictive model; Model 2** item 8 free in Sample III; Model 2*** correlation in Sample III free and Model 2**** item 8 and correlation free in Sample III

Although the chi-squares presented in Table 4 were significant for all tested models, this should not lead to a rejection of any model as a large sample size increases the power of the test. In other words, in large samples the chi-square tends to be significant, while the model fits the data. In these cases, inspection of the other fit indices is warranted. The other fit indices (e.g., RMSEA and CFI) suggested that Model 2 represents an adequate explanation of the data. In further analyses we

focused on the original structure of the IES (Model 2). Table 5 presents the factor loading of the original structure of the IES in the total sample.

Table 5 Latent variables (factors) in the final model (original structure) and their manifest items (N = 1,588) and in the three samples (work-related events (n = 581), experiences with war (n = 836), and exposure with a disaster (n = 171))

Item's Factor Loadings				
Items	Total sample	Sample I	Sample II	Sample III
Intrusion				
1	.81	.82	.85	.64
4	.80	.78	.84	.76
5	.85	.85	.88	.71
6	.76	.73	.82	.57
10	.84	.84	.86	.74
11	.78	.77	.81	.60
14	.86	.83	.89	.70
Avoidance				
2	.76	.74	.80	.67
3	.80	.80	.81	.76
7	.77	.75	.81	.51
8	.44	.50	.49	.13
9	.73	.66	.80	.48
12	.75	.74	.78	.51
13	.87	.85	.90	.84
15	.59	.60	.61	.43

2.2.5.4. CFA in the three samples

The original structure of the IES was examined in the three samples separately. Table 4 represents the fit indices for the factor models in the three samples. The fit indices indicated adequate fit in Sample I and II i.e. the samples with victims of work-related and war-related events. In the third Sample (sample of disaster-related events) item 8 ("I felt as if it didn't happened or it wasn't real") was found to be not significant. An additional CFA testing an adjusted original model (without item 8) was conducted. Table 5 presents the factor loading of the original structure of the IES in the three samples.

2.2.5.5. Multiple group analyses

In order to test equivalence of structure of the IES across the three samples, a multiple group analysis was carried out. According to the most restrictive model, the three samples were expected to have exact

similar population covariance matrices. In addition, a less restrictive model was tested. The fit indices of the multiple group analyses are presented in Table 4. Firstly, the most restrictive model hypothesizing similarity of factor loadings was tested; all loadings were constrained. This model revealed adequate fit. On the bases of the analyses in the separate samples, there was an indication that the structure in the sample with individuals who were confronted with a disaster (Sample III) was different from the structure in the sample with individuals who were confronted with work-related incidents (Sample I) or victims of war (Sample II). Item 8 had a nonsignificant loading and the correlation between Intrusion and Avoidance was quite different in Sample III (.68) compared to Sample I (.87) and Sample II (.90). In the following analyses the parameters were constrained in Sample I and Sample II, but in Sample III one or more parameters were free (Model 2**: item 8 free in Sample III, Model 2***: correlation between Intrusion and Avoidance free in Sample III, and Model 2****: both parameters free in Sample III). These three additional models were compared with the most restrictive model (Model 2*). Both models 2*** and 2**** showed a better fit (Model 2* versus Model 2**: χ^2_{diff} (1, N = 1,588) = 3.46, N.S., Model 2* versus Model 2***: χ^2_{diff} (1, N = 1,588) = 38.05 $p < .05$, Model 2* versus Model 2****: χ^2_{diff} (1, N = 1,588) = 24.54, $p < .05$). Once again, the structure in the sample with victims of a disaster was slightly different from the structure in the samples with work-related or war-related traumatic experiences.

2.2.5.6. Convergent validity

Convergent validity was examined by computing Pearson correlations between on the one hand the subscales of the IES and the total score and on the other hand the total score on the DES and the scores on the various subscales of the SCL-90 (see Table 6). The correlations between IES and DES were significant and moderately positive. Respondents who reported more intrusive and avoiding symptoms on the IES, also reported more dissociative symptoms. The correlations between the IES subscales and the SCL-90 subscales were also significant and moderately positive. All correlations varied between .42 and .70. The subscales Anxiety and Depression as well as the SCL-90 total score showed the largest correlations with intrusion, avoidance and the IES total score.

Table 6 Pearson correlations between IES scales and other scales (SCL-90 and DES) in the three samples

	Sample I (n = 323)			Sample II (n = 836)			Sample III (n = 137)		
	intrusion	avoidance	IES total	intrusion	Avoidance	IES total	intrusion	avoidance	IES total
Agoraphobia[1]	0.49[2]	0.52	0.54	0.53	0.49	0.54			
Anxiety	0.63	0.64	0.68	0.62	0.58	0.63			
Depression	0.61	0.67	0.58	0.59	0.54	0.59			
Somatic complaints	0.54	0.56	0.62	0.61	0.57	0.57			
Insufficiency	0.55	0.62	0.56	0.56	0.52	0.57			
Distrust	0.48	0.58	0.54	0.52	0.51	0.51			
Hostility	0.48	0.54	0.61	0.51	0.48	0.52			
Sleep disturbances	0.59	0.55	0.57	0.55	0.51	0.51			
General health symptoms	0.63	0.69	0.70	0.64	0.60	0.65	0.66	0.50	0.66
Dissociation[3]				0.44	0.42	0.45			

1) Assessed by the SCL-90

2) All correlations were significant at $p < .001$

3) Assessed with the DES

2.3. Discussion

In this study support was found for the construct validity of the Dutch version of the Impact of Event Scale (IES) across different samples of people stricken by violence, calamities or war. The two-factor model of intrusion and avoidance originally formulated by Horowitz et al. (1979) was found to describe the data adequately. This finding is relevant, since the IES concerns a popular and widely used instrument in heterogeneous groups of victims of violence, accidents and (man-made) disasters (see for reviews Joseph, 2000; Sundin & Horowitz, 2002; Weiss & Marmar, 1997).

The scale indicates the extent to which people are bothered by memories of a major life event and other characteristic reactions to a traumatic experience. It has been shown that the scale is able to measure changes in reactions to traumatic events reliably (Sloan, 1988). Moreover, the instrument has been successfully used in the evaluation of therapeutical treatments of trauma-related disorders, particularly posttraumatic stress disorder (Brom et al., 1989; Resick, Jordan, Girelli, & Hutter, 1988). Correlations between IES scores and the presence of PTSD are very high (e.g., Maercker & Schützwohl, 1998). Furthermore, the IES is an attractive instrument for its solid theoretical background, in accordance with both the classical theories on the consequences of traumatic experiences (Breuer & Freud, 1952; Janet, 1973) and the modern cognitive approaches to the sequelae of traumatic events (Brewin, Dagleish, & Joseph, 1996; Creamer, 1995; Horowitz, 1976). The emphasis in these various theories is on the oscillation between intrusion and avoidance. As such, the IES is an operationalization of these theories.

It was found in our study that the structure in the data was adequately described by the two factors of intrusion and avoidance in independent groups of people that had experienced different traumatic incidents. Both factors as well as the entire scale were found (statistically) reliable in the comprehensive data set. This implies that the use of the IES as an instrument with regard to posttrauma responses is warranted. It validly assesses coping tendencies after a bank robbery, the sinking of a ship or experiences of war (see also Shevlin et al., 2000). The robustness of the structure of the scale across different

groups of people stricken by violence, war or calamities has not been demonstrated before.

Although the two-factor model described the data satisfactorily, some deviations were found. In particular among people who had been involved in traffic accidents or in a shipping disaster, a relative modest correlation between intrusion and avoidance, as well as ambiguous factor loadings of two particular items (item 2 “I avoided letting myself get upset when I thought about it or was reminded of it”, and item 8 “I felt as if it hadn’t happened or it wasn’t real”) were revealed. The ambiguousness of item 2 has been repeatedly referred to (cf. Joseph, 2000). It is probably due to its long formulation and double message content. Item 8 (and in other studies item 15 as well) has been suggested either to be difficult to comprehend or to belong to an independent factor of passive or emotional avoidance (numbing). However, in our large data set there was not enough evidence for this third factor. A model with three factors showed a marginal better fit than the model with the original structure. With regard to item 8 we found a comparatively high mean and endorsement in the sample of accidents. These feelings of derealization with regard to traffic accidents and the sinking of the cruise ship appeared more prevalent in these survivors than in people struck by war or work-related incidents. Besides, the participants in the accident samples filled out the IES one month after the event. This is in contrast with the respondents in the two other samples for whom more time had passed before they answered the items. The effects of the time interval between events and responding to the IES clearly demands scientific study. It may also account for the comparatively modest association between intrusion and avoidance in the sample concerning accidents. It can be argued that over time the differentiation between intrusion and avoidance as independent factors weakens. Some evidence supporting this hypothesis was reported by Zilberg et al. (1982).

Convergent validity was studied by examining the relationship between the IES on the one hand and self reported mental health problems (as assessed by the SCL-90 and its subscales) and dissociation (as assessed by the DES) on the other hand. The correlations between the IES and the DES were moderate. They were found to be slightly higher than the correlations mentioned by Amdur and Liberzon in their study of combat veterans (2001). Correlations between the IES scores

and the various subscales of the SCL-90 were also moderate. As posttraumatic stress responses are closely related to anxiety (PTSD is an anxiety disorder) and depression (Kleber & Brom, 1992; Van der Kolk et al., 1996), these subscales of the SCL-90 were found to show the highest correlations with the IES. These results indicated adequate convergent validity. The IES assessed information that was related with but not captured by inventories assessing associated mental health symptoms (see for a review Sundin & Horowitz, 2002).

Our study has limitations. The focus has been primarily on construct validity as indicated by the analysis of the structure using confirmatory factor analysis. No conclusions can be drawn with regard to the criterion validity, since data were not compared to clinical interviews. From other research (Sundin & Horowitz, 2002), it is known that the IES shows a strong relation with observer-diagnosed PTSD. Another limitation concerns the fact that our samples differed to some extent with respect to number, sex and age of participants and to procedures followed.

Comprehensive samples, combining clinical as well as non-clinical groups, were analyzed in this study. It may be hypothesized that there are qualitative and not only quantitative differences in the responses of patients and non-patients. Clinical respondents may have a view on health related issues that is colored by their being ill. Items such as the questions in the IES may be perceived differently by patients as opposed to healthy respondents (Vassend & Skrondal, 1999). Although we did not specifically examine these differences in responses across the various samples, future research is recommended to address this issue.

The intensity of responses is not only determined by the severity of traumatic events, but may also be influenced by the specific cultural background of the participants. The cross-cultural validity of well-known standardized questionnaires is not self-evident (see Knipscheer & Kleber, 1999). Nevertheless, the scale structure of the Dutch version of the IES was found to be comparable to the reports published earlier on versions in Bosnian, Croatian, English or Hebrew (Dyregrov, Kuterovac, & Barath, 1996; Mooren & Kleber, 2001; Schwarzwald et al., 1987; Zilberg et al., 1982). The scale structure was found to be comparable to the structure of other translations of the IES.

Based on our findings we recommend further use of the original two-factor structure. The implication is that comparison with international studies is possible. We came across some suggestions to modify the factor structure that could improve the model underlying the IES. These modifications were minor, however. Therefore, we recommend further use of the original two-factor model. This model also revealed adequate fit. It can be concluded that the Dutch Impact of Event Scale is a valid instrument with a robust factor structure. Empirically, support has been provided in this study for the valid distinction between intrusion and avoidance in the aftermath of violent experiences.

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3. Critical incidents and chronic stressors at work: Their impact on forensic doctors

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Abstract

Workers in medium or high-risk professions are often confronted with critical incidents at the workplace. The impact of these acute stressors may be serious and enduring. Many workers also experience chronic job stressors, such as work overload or role conflicts. This study examined the frequently neglected relationship of acute and chronic stressors with self-reported health symptoms, such as posttraumatic responses, fatigue, and burnout. This association was investigated in a sample of forensic doctors in the Netherlands (N = 84). It was found that the more traumatic events the respondents experienced, the more problems they reported in coping with the traumatic events. Chronic job stressors were associated with posttraumatic responses (intrusions and avoidances) and with burnout and fatigue.

3.1. Introduction

Researchers in occupational health psychology have focused predominantly on the negative effects of long-term work characteristics, in particular chronic work-related stressors, such as the consequences of job overload, role conflicts, and insufficient social support in organizations. These stressors have various consequences for the physical and mental health of the employee, such as fatigue, absenteeism, or burnout.

Workers in so-called medium or high-risk professions, such as police officers, firefighters, and bank employees, are often confronted with critical incidents. Examples of incidents are acts of violence, robberies, disasters, and confrontations with dying or dead people. Until recently, research in the field of traumatic stress merely focused on the consequences of critical incidents for the *direct* victims. Those who rush to help others after disasters or accidents were thought to be trained well enough not to succumb to the emotional effects of witnessing human carnage, destruction, or the pain of the survivors. They were considered exempt from the psychological sequelae that befell the victims and survivors. However, research with emergency personnel, such as firefighters, paramedics, police officers, and disaster rescue workers, clearly indicates that these helpers may also suffer from an array of psychological, social, and physical reactions that may be extremely painful (Mitchell & Dyregrov, 1993). Moreover, a growing scientific interest has arisen in those workers in medium or high-risk professions who are frequently confronted with critical incidents (see Alexander & Wells, 1991). For example, police officers, ambulance employees, and firefighters are regularly confronted with violence, accidents, or other shocking events.

Dutch legislation has prompted industrial life to be concerned with these topics. Since the introduction of a Working Conditions Act in 1994, employers have been obliged to take care of employees affected by critical incidents (Schaufeli & Kompier, 2001). Moreover, employers have to develop preventive procedures to protect employees from critical incidents as well as their aftermath. If an employee is confronted with a critical incident and suffers from it, the employer has to arrange an intervention, such as counseling or other forms of psychological support.

Emergency service personnel often have high levels of exposure to the stressors that are implicated in the development of posttraumatic stress disorder (PTSD) and other (posttraumatic) psychological difficulties (Weiss, Marmar, Metzler, & Ronfeldt, 1995). As a result, they may suffer from incident-related symptoms, such as reexperiencing the event, avoiding talking or thinking about the event, and experiencing increased emotional arousal. Other symptoms may also develop, for example, troubles at home, poor job performance, absenteeism, pain, fatigue, and getting irritated easily. In addition, people may suffer from anxiety, depression, and insomnia after a critical event.

In a Dutch study it was found that employees in a psychiatric hospital were often confronted with aggressive incidents in which they felt threatened. Afterward, they had significant agoraphobic and depressive symptoms. Also, employees who had experienced aggressive incidents showed significantly more hostility and more general psychological disturbances than a Dutch reference group (Van der Velden & Herpers, 1994). In a longitudinal study, Bakker, Schaufeli, Sixma, Bosveld, and van Dierendonck (2000) found that general practitioners who had been harassed by their patients showed higher burnout levels after 5 years. Another study examined police officers involved in shooting incidents 5 to 12 years ago in which physical injury or death had taken place. Of the respondents, 27% met the Diagnostic and Statistical Manual of Mental Disorders (3rd ed., DSM–III; American Psychiatric Association, 1980) criteria for PTSD retrospectively prior to the study. At the time of the study the criteria were still applicable for 19% of the group (Gersons, 1989).

These studies refer to events in which employees were directly confronted with an aggressor. However, employees who are indirectly exposed to similar incidents also have a risk of developing trauma-related symptoms. Examples are psychologists, social workers, and forensic doctors. They are not victims themselves, but they have to help the victims. These workers become eyewitnesses to the consequences of such critical incidents. The confrontation with indirect aspects of stressful situations can affect them too (Hodgkinson & Stewart, 1991; Raphael, 1986). In a study of reactions relating to the confrontation with violent death, Ursano and McCarroll (1990) reported significant stressors in the work of rescue workers. The shock of the unexpected event gave rise to many tensions. Moreover, insufficient information impeded proper

job performance. Also, the emotional involvement with regard to handling dead bodies was found to be a stressor (Ursano, Fullerton, Vance, & Kao, 1999).

Posttraumatic stress associated with a critical incident is a multifaceted phenomenon and cannot easily be captured by one or two predictor variables (Weiss et al., 1995). McFarlane (1988) found in his study among firefighters exposed to a bush fire disaster that predisaster variables were as important in the onset and course of the disorder as were the bush-fire losses or the extent of exposure to the disaster. Exposure to an extreme trauma is a necessary factor but is not sufficient by itself to explain the onset and pattern of posttraumatic morbidity.

Besides acute stressors (critical incidents), work characteristics may also play a significant role in coping with the experience. The interplay between these two types of stressors has hardly been investigated. In this contribution we combine the two approaches of acute and chronic stress. The sample of this study consists of Dutch forensic doctors. The central research questions are the following: 1) What are the consequences of critical incidents for the health of forensic doctors? 2) Which chronic stressors do forensic doctors experience in their work, and how are these stressors related to health symptoms? and 3) Can acute stressors, chronic stressors, and health symptoms be combined in a path model?

Forensic doctors are confronted with many critical incidents in their jobs. They conduct medical attendances to detainees, who may be aggressive. They have to examine dead bodies to identify the victims and determine the precise cause of death. They also give support to psychiatric patients with acute disturbances. Forensic doctors perform their tasks in shifts in combination with either a part-time or full-time job at a public health service. Shift work, even of short duration, has been shown to affect job performance, sleep patterns, and social as well as family life adversely (Monk, 1990).

We expect that these doctors experience posttraumatic stress symptoms, such as intrusive thoughts about the event or avoiding talking or thinking about the event. Besides these symptoms we expect they experience fatigue, or even burnout, because of exposure to chronic stressors. Workers in helping professions often experience high emotional arousal associated with intense involvement with clients or

patients. They are particularly vulnerable to develop burnout, as burnout is considered to be a long-term stress reaction that occurs among professionals who work with people, such as teachers and nurses (Schaufeli & Enzmann, 1998).

3.2. Method

3.2.1. Participants

In the Netherlands forensic experts work at public health institutes. There are about 50 of those regional agencies. We approached a representative sample of small and large public health services to get a good insight into the situation of forensic doctors in the Netherlands. For confidential reasons it was not possible to send the questionnaires by postal mail. The questionnaires were distributed by the managers to all 132 forensic doctors of 11 public health services in the Netherlands. The response rate was 64%; 84 questionnaires were returned. Information about the nonresponders was not available.

3.2.2. Measures

The questionnaire included questions concerning demographic items, such as sex, age, and marital status. Questions about job characteristics were formulated, as well as questions concerning kind and number of critical incidents in the last 5 years, visits to mental health professionals, and social support received from important others in relation to the critical event. The following standardized scales were added to the questionnaire.

The Impact of Event Scale (IES; Horowitz, Wilner, & Alvarez, 1979; Dutch version, Brom & Kleber, 1985) was used to determine the frequency of self-reported posttraumatic symptoms of avoidances and intrusions in relation to a specific critical incident. The IES has seven items designed to measure intrusion (e.g., “I had waves of strong feelings about it”) and eight items to measure avoidance (e.g., “I tried not to talk about it”). Respondents were asked to rate the items on a 4-point scale according to how often each had occurred in the past 7 days (0 = not at all, 1 = rarely, 3 = sometimes, 5 = often). This questionnaire has been used in numerous investigations concerning posttraumatic stress reactions and is recommended as a screening instrument for victims after disasters (Raphael, Lundin, & Weisaeth, 1989). The internal consistency of the subscales was good. Cronbach’s

alpha was .90 for intrusion, .82 for avoidance, and .92 for the total scale.

Fatigue was measured with the Checklist Individual Strength (CIS; Vercoulen et al., 1994), a 20-item self-report instrument. This questionnaire was originally formulated in Dutch but has been used in English-language publications (Bültmann et al., 2000; Vercoulen et al., 1996). The CIS covers several aspects of fatigue, such as subjective fatigue (8 items, e.g., "I get tired very quickly"), concentration (5 items; e.g., "Thinking requires effort"), motivation (4 items, e.g., "I feel no desire to do anything"), physical activity (3 items, e.g., "I don't do much during the day"), and a total score. Items are scored on a 7-point Likert scale (1 = yes, that is true to 7 = no, that is not true). Higher scores indicate a higher degree of fatigue. Reliability scores of the four subscales (subjective fatigue, reduced motivation, impaired concentration, and physical activity) were .95, .79, .87, and .81, respectively. The Cronbach's alpha for the total score of the CIS was .94. The mean scores on the subscales and the total score of the CIS of the forensic doctors were compared with those of a representative group of healthy participants (Vercoulen et al., 1996). This comparison group consisted of 53 persons (76% female; mean age = 37.1 years, range = 19–63). In addition, a cutoff point indicating that an individual is at risk for sick leave or disability was used (Bültmann et al., 2000).

The Dutch version of the Maslach Burnout Inventory (MBI; Maslach & Jackson, 1986; Dutch version Schaufeli & van Dierendock, 2000) was used to get an indication of how many employees of this sample reported symptoms of burnout. The most commonly used definition of burnout is a psychological syndrome of emotional exhaustion, depersonalisation, and reduced personal accomplishment (Maslach, 1993). This instrument consists of 15 items assessing the three characteristic dimensions of burnout: emotional exhaustion, cynicism and personal accomplishment. The five items of the emotional exhaustion subscale describe feelings of being emotionally overextended and exhausted by one's work. The cynicism subscale contains four items assessing an unfeeling and impersonal response towards one's work. The six items of the personal accomplishment subscale describe feelings of competence and successful achievement in one's work. A high score on emotional exhaustion and cynicism or a low score on personal accomplishment is an indication of burnout (Schaufeli & van

Dierendonck, 2000). The reliability coefficients were .86, .79, and .80 for the three subscales, respectively. The scores of forensic doctors were compared with these of a reference group. This group (N = 1,129) consisted of 56% women. Mean age was 39.5 years (SD = 9.5), and mean working experience was 8.5 years (SD = 8.2). This reference group is representative for the Dutch working population (Schaufeli & van Dierendonck, 2000).

The Questionnaire on the Experience and Assessment of Work (QEAW; Van Veldhoven, Meijman, Broersen, & Fortuin, 1997) was used to examine the presence of work-related chronic stressors in the work setting of forensic doctors. This instrument was validated in a sample of more than 80,000 people in various working settings (e.g., industrial, transport, education) in the Netherlands. The questionnaire has been translated in English and used in several studies (Bekker, Nijssen, & Hens, 2001; De Croon, Blonk, van der Beek, & Frings-Dresen, 2001; Houkes, Janssen, de Jonge, & Nijhuis, 2001). The scores of the forensic doctors were compared with those of other employees working in different kinds of health services (68.9% women; 35.2% had an age in the range of 35–44 years). In line with the purpose of this study, relevant subscales of this questionnaire were included: lack of job autonomy (α = .89; 11 items, e.g., “Do you have influence on the planning of your work?”), poor social support from colleagues (α = .79; 9 items, e.g., “Are your colleagues friendly to you?”) and poor social support from the superior (α = .88; 9 items, e.g., “Can you count on your supervisor when you have difficulties in your work?”), poor communication (α = .81; 4 items, e.g., “Are you informed about important issues in your organization?”), lack of information (α = .80; 7 items, e.g., “Do you receive enough information about the results of your job?”), insufficient financial reward (α = .73; 5 items, e.g., “Do you think your company gives good rewards?”), and high emotional demands (α = .67; 7 items, e.g., “Is your job emotionally demanding?”). The items were scored on a 4-point scale (1 = always to 4 = never). The scores on the subscales were standardized and ranged from 0 (low) to 100 (high). The higher a score is, the more a stressor is perceived.

3.2.3. Procedure

The supervisors of 11 public health services distributed the questionnaire among the forensic doctors. The questionnaire was

accompanied with a letter in which confidentiality and anonymity were guaranteed. The questionnaires were returned to the authors. A general reminder letter was distributed to all doctors within 2 weeks and 4 weeks after the initial mailing. Reminders were sent to all doctors because names and addresses were not in our possession.

3.3. Results

3.3.1. Demographic characteristics

Most of the participating doctors were male (n = 57, 67.9%), and 89.3% had a partner. Mean age of the doctors was 42.2 years (SD = 7.08). Most of them were married (69.9%), 19.3% cohabited, 8.4% lived alone, and 2.4% was divorced. Most of them had one or more children living with their parents (n = 57, 67.9%). Mean working experience at the public health service was 8.8 (SD = 6.3) years. More than half of the respondents (56.8%) worked part time.

3.3.2. Acute stressors

The forensic doctors indicated that the most disturbing incidents were the experiences in which young children were involved as victims of violence, sexual assault, “victims” of suicide, and situations that involved the death of a child. Of all respondents, 75.0% had experienced one or more critical incidents in the last 5 years. Examples of such situations were confrontation with the sudden death or the murder of a young child, aggressive detainees, and confrontation with decomposed bodies. Most of them (76.3%) had experienced the most recent disturbing incident within the past year.

3.3.3. Posttraumatic responses

Doctors who had experienced a critical incident in the last 5 years were asked to fill in the IES (n = 64). Mean scores on the subscales and the total score of the IES are reported in Table 7. A total score of 26 or higher on the IES is an indication of a clinical level of PTSD (Chemtob, Tomas, Law, & Cremniter, 1997). Of the forensic doctors who experienced a critical incident, 14.0% (n = 9) suffered from a clinical level of distress after the incident.

Table 7 Means and standard deviations concerning forensic doctors and the various reference groups

	Forensic doctors			Reference groups		
	M	SD	N	M	SD	N
1 IES intrusion	6.8	7.94	64[1]			
2 IES avoidance	3.7	5.71	64			
3 IES total	10.5	12.53	64			
4 MBI emotional exhaustion	1.6	.97	84	1.78	1.21	1129
5 MBI cynicism	1.6	1.08	84	1.34	1.13	1129
6 MBI personal accomplishment	4.2	.89	84	4.29	.97	1129
7 CIS fatigue***	22.4	12.17	84	17.3	10.1	53
8 CIS concentration***	12.8	6.52	84	9.5	5.0	53
9 CIS motivation***	9.7	4.30	84	7.9	4.1	53
10 CIS activity*	7.6	3.77	84	6.6	4.5	53
11 CIS total***	52.6	21.74	84	41.5	19.8	53
12 QEAW High emotional load ***	44.3	11.8	84	34.4	14.9	4171
13 QEAW Lack of autonomy	43.7	18.6	84	42.8	17.9	4355
14 QEAW Insufficient financial reward**	43.4	21.1	84	50.2	23.1	3409
15 QEAW Poor relationship with colleagues	20.0	11.8	84	22.0	13.9	3953
16 QEAW Poor relationship with management	21.8	17.8	84	23.1	17.6	4316
17 QEAW Lack of information***	56.6	15.6	84	49.3	18.6	3850
18 QEAW Poor communication	48.5	19.1	84	47.7	20.7	3656
19 Acute stressors	3.31	1.67	84			

1) The Impact of Event Scale was only filled in when the forensic doctor had experienced at least one critical incident

* $p < .05$, ** $p < .01$, *** $p < .001$

Pearson correlations were calculated for the subscales of the IES and the number of experienced critical incidents (see Table 8). The significant correlations showed a positive correlation between the number of incidents on the one hand and intrusion, avoidance, and the total score of the IES on the other hand. This means that the more the forensic doctors were confronted with critical incidents, the more they suffered from characteristic posttraumatic responses.

Table 8 Interscale correlations of study variables (IES, MBI, CIS, and QEAW)

subscales	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1 IES intrusion																		
2 IES avoidance	.68***																	
3 IES total	.94***	.89***																
4 MBI emotional exhaustion	.28*	.38**	.35**															
5 MBI cynicism	.11	.17	.15	.56***														
6 MBI personal accomplishment	-.09	-.25*	-.17	-.47***	-.47***													
7 CIS fatigue	.16	.36**	.26*	.54***	.28**	-.55***												
8 CIS concentration	.35**	.34**	.38**	.50***	.26*	-.45***	.44***											
9 CIS motivation	.26*	.33**	.32*	.49***	.38***	-59***	.62***	.60***										
10 CIS activity	.14	.22	.19	.45***	.51***	-.39***	.38***	.56***	.60***									
11 CIS total	.27*	.41**	.36**	.62***	.40***	-.55***	.88***	.76***	.81***	.66***								
12 QEAW High emotional loads	.23	.07	.18	.26*	.20	.17	.06	.17	.09	.11	.12							
13 QEAW Lack of autonomy	.17	.30*	.24	.22*	.18	-.25*	.27*	.25*	.32**	.14	.32**	.11						
14 QEAW Insufficient financial reward	.18	.28*	.25	.13	.12	-.28*	.26*	.08	.20	.06	.21	.10	.25*					
15 QEAW Poor relationship with colleagues	.19	.09	.16	.28*	.34**	-.15	-.03	.23*	.11	.26*	.12	.22*	-.05	-.03				
16 QEAW Poor relationship with management	.16	.12	.16	.36**	.25*	-.26*	.20	.18	.34**	.17	.27*	.31**	.12	.02	.45***			
17 QEAW Lack of information	-.03	.15	.05	.18	.27*	-.35	.19	.21	.28*	.33**	.28*	-.14	.18	.11	.27*	.27*		
18 QEAW Poor communication	.07	.30*	.18	.41***	.30**	-.40***	.40***	.33**	.47***	.29**	.46***	.31**	.13	.19	.15	.50***	.19	
19 Acute stressors	.41**	.28*	.39**	.3.9***	.34**	-.15	.17	.33**	.21	.29**	.28*	.31**	.10	.24*	.28**	.12	.17	.21

* p < .05, ** p< .01, *** p < .001

3.3.4. Health, fatigue, and burnout

The number of visits to mental health professionals was used as an indication of poor mental health. To investigate fatigue, we examined the scores on the CIS. The MBI was used to assess burnout levels.

Almost a quarter of the forensic doctors (n = 20) reported consults with a professional (social worker, psychologists, or psychiatrist) because of mental problems. Of those who met with a counselor, 34.8% reported that they sought this professional because of their experiences with critical incidents in their jobs.

The scores of the forensic doctors on the scales of the CIS are presented in Table 7. Their scores are compared with those of the comparison group of healthy adults (Vercoulen, Alberts, & Bleijenberg, 1999). The two groups differed on subjective fatigue ($t(82) = 3.8$, $p < .001$), motivation ($t(83) = 3.9$, $p < .001$), physical activity ($t(83) = 2.4$, $p < .05$), concentration ($t(82) = 4.7$, $p < .001$), and the total score ($t(81) = 4.6$, $p < .001$). The doctors significantly scored higher on all subscales and total score, which means that they reported more symptoms.

Bültmann et al. (2000) found that a cutoff point of >76 on the total score of the CIS should be regarded as an indication of a fatigue level that puts the individual “at high risk” for subsequent sick leave or work disability. In this sample 14.6% (n = 12) scored above this cutoff point.

The MBI was used to determine how many doctors are at risk for clinical burnout. Compared with the Dutch reference group, 25.0% of forensic doctors (n = 21) scored high on emotional exhaustion, 40.5% (n = 34) scored high on cynicism, and 20.2% (n = 17) had a low score on personal accomplishment. Mean scores and standard deviations are presented in Table 7. According to Schaufeli and van Dierendonck (2000), a high score on emotional exhaustion and cynicism or a low score on personal accomplishment is an indication for being at risk for clinical burnout. In this sample 21.4% (n = 18) met these criteria. Of the doctors who scored “at high risk” on the fatigue scale (CIS), 58% met the criteria of being at risk for clinical burnout. Of the doctors who scored on a clinical level with regard to posttraumatic responses (IES), 33% scored “at high risk” on fatigue and 44% met the criteria of being at risk for clinical burnout.

3.3.5. Chronic stressors

In Table 7means and standard deviations on the subscales of the QEAW are presented. The forensic doctors differed from the reference group (health services professionals) on the following subscales: high emotional demands, insufficient financial reward, and lack of information. This means that the forensic experts experienced significantly more emotional stressors ($t(83) = 7.7$, $p < .001$), they were more satisfied with their financial reward than workers in comparable organizations ($t(80) = -2.9$, $p < .01$), and they received significant less information about their job than the reference group ($t(81) = 4.3$, $p < .001$).

3.3.6. Relationship between chronic and acute stress

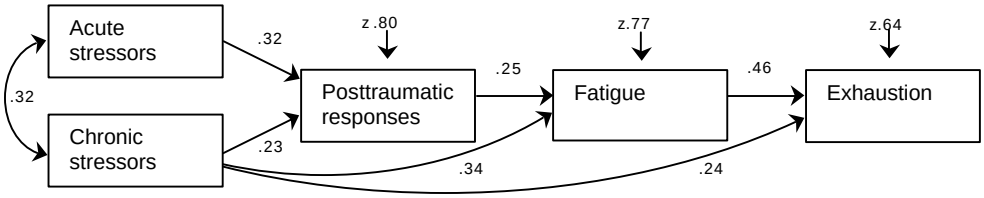
One of the research questions of this study concerned the interaction between acute and chronic stressors in relation to symptoms. This question can be answered by Pearson correlations between acute stressors (number of critical incidents), chronic stressors (the subscales of the QEAW), and the symptoms (IES, CIS and MBI). These correlations are reported in Table 8.

The IES scale was significantly correlated with the number of critical incidents. The IES scores were not significantly correlated with chronic work-related stressors. The three dimensions of burnout and the total score of CIS showed a considerable association with both acute and chronic stressors.

3.3.7. Interaction between acute and chronic stressors in relation to symptoms

To test the hypothesis whether there is an interaction between acute and chronic stressors in relation to posttraumatic responses, fatigue, and exhaustion, we tested a LISREL model. Path analysis is a technique to assess the direct effect of one variable on another. The independent variables in our model are the acute and chronic stressors, and the dependent variables are the various symptoms. The subscales of QEAW were summated to create the variable chronic stressors. The variable acute stressors is represented by the number of experienced critical incidents. Symptoms are operationalized as follows: characteristic posttraumatic responses (total score on IES), fatigue (total score on CIS), and exhaustion (core subscale of the MBI).

In the initial hypothesized model, a relation between acute and chronic stressors was assumed. Paths were drawn from these two variables to posttraumatic responses. From posttraumatic responses, a path was drawn to fatigue and from fatigue to exhaustion. This model did not fit the data, because the chi-square appeared to be significant ($\chi^2(5, N = 64) = 1.41, p < .05$), root-mean-square error of approximation (RMSEA) = .145, comparative fit index (CFI) = .89, goodness-of-fit index (GFI) = .93. To find a model that fitted the data better, additional paths were drawn. A connection between chronic stressors and fatigue was added. This model fitted better than the previous model ($\chi^2(4, N = 64) = 7.61, p = .10$), RMSEA = .145, CFI = .89, GFI = .93. Although the chi-square was not significant, on the basis of the fit indices (RMSEA, CFI, and GFI), it may be concluded that this model has no satisfactory fit. In the next fitted model, an additional connection from chronic stressors to exhaustion was drawn. This model fitted the data satisfactorily and was significantly better than the previous model, ($\chi^2(3, N = 64) = 3.44, p = .33$), RMSEA = .049, CFI = .99, GFI = .98, ($\chi^2_{diff}(1) = 4.17, p < .05$). The model is represented in Figure 2. This model shows an interaction between acute and chronic stressors in relation to symptoms related to the traumatic event. Besides the direct relation of trauma-related symptoms fatigue and exhaustion, there is a direct relation between the chronic stressors fatigue and exhaustion. Critical incidents have no direct effect on fatigue and exhaustion.



χ^2 (3, n = 64) = 3.44, p = 0.33, RMSEA = 0.049, CFI = 0.99, GFI = 0.98

Figure 2 Path model of acute and chronic job stressors, and health symptoms in a sample of forensic doctors.

3.4. Discussion

This study focused on medical professionals who had been confronted in their work with the negative consequences of traumatic events. Three quarters of the forensic doctors reported one or more critical incidents in the last 5 years. Examples were confrontation with the death of (young) children, suicide, decomposed dead bodies, and aggressive prisoners. These confrontations were found to be related to the characteristic posttraumatic responses of intrusions and avoidances. A significant minority (almost 15%) was found to suffer from a clinical level of event-related distress (e.g., PTSD). This percentage is reasonably high. In most Dutch studies on work-related trauma, 5% to 25% (Van der Ploeg, Kleber, & van der Velden, 2000) of the workers suffered from severe symptoms after confrontation with traumatic events at work.

Although almost all victims of critical incidents suffer from different symptoms for some time, most of them are capable of recovering from the consequences by themselves or with support from closely related others (Kleber, 1995). Andersen, Christenen, and Petersen (1991) found in their study among rescue workers after a major rail accident that almost half of the sample felt that participating in the rescue work in some way had a positive impact on their lives afterward. This means that facing severe life events not only gives rise to psychological morbidity but may also lead to personal growth. Thinking of the positive aspects of the rescue work can serve as a helpful coping strategy. This is consistent with Lazarus and Folkman's (1984) claim for the value of "cognitive reconstructing," that is, translating what is an unpleasant and arduous task into a valuable and meaningful one (Alexander & Wells, 1991).

In this study a cumulative effect of acute stress was found: The more events someone was exposed to, the more symptoms like intrusions and avoidances were reported. This finding seems self-evident, but another hypothesis states the opposite. This hypothesis suggests that the more incidents, the more resiliency and consequently the fewer problems. People who had already experienced traumatic events may be better able to cope with new stressors. This last hypothesis was not confirmed in this study. Our finding is in line with other research (Bryant & Harvey, 1996; McFarlane, 1988). Moreover,

the number of experienced incidents correlated not only with trauma-related symptoms but also with more general health symptoms like fatigue. However, when we analyze the relations between acute stressors and chronic stressors and health symptoms in a path model, there is no direct relation between the number of critical incidents on the one hand and fatigue and burnout at the other hand. There is only an indirect relation via the characteristic posttraumatic responses. However, acute and chronic stressors are interrelated. Furthermore, fatigue and burnout are directly related with chronic job stressors. Our results imply that the consequences of traumatic or acute stressors and the consequences of chronic stressors are two interdependent processes with differential effects on dependent variables. This is also manifested by our finding that people with clinical levels of posttraumatic distress are not necessarily those with burnout or prolonged fatigue. There is an overlap, but this overlap is not complete (Dorresteijn, 2000).

Our conclusions have to be interpreted with some caution. The data were collected at a single time point. A longitudinal design is needed to draw conclusions about the interaction between acute and chronic stressors in relation to symptoms. In addition, the model should be refined in future research, because chronic stressors were lumped together in this analysis. A path model with specific stressors may give more in-depth insights. Additionally, data were collected on the basis of self-report measures, and the study was retrospective.

A positive point is the response rate (64%). In research on the consequences of traumatic or critical incidents, a low response rate is often common. This is an important issue, because people who refuse to participate in traumatic stress research appear to have more health problems (Weisaeth, 1989). On the one hand, one could argue that there is an overestimation of symptoms because the forensic doctors probably would like to receive attention for their working situation. On the other hand, there could be an underestimation of symptoms because 36% refused to participate. Although we attempted to select a representative sample, the relatively high response rate does not rule out the possibility of sampling bias.

The role of negative affectivity (NA) was not investigated in this study. This phenomenon is supposed to enhance the relationship between perceptions of environmental stressors and the reporting of

psychological strains (Payne, 2000). However, Spector, Zapf, Chen, and Frese (2000) assumed that correlations among work variables were not inflated by an NA bias. They argued strongly against partialing as it can lead to removing the effects of the very variables one wishes to study. Further research should focus on the role of NA in the job stress process.

It is remarkable that in our study a fifth of the doctors were diagnosed as at risk for clinical burnout. This rate exceeds the prevalence rates of police officers (7.0%), psychologists (10.2%), and physiotherapists (12.8%) but is lower than the rate of general practitioners (41.4%). (These rates are from a large Dutch overview study by Bakker, Schaufeli, and van Dierendonck, 2000.) The forensic doctors also reported more fatigue than the reference group (Vercoulen et al., 1999); almost 15% is “at risk” for prolonged fatigue (Bültmann et al., 2000).

It is clear that these professionals need systematic attention in health care and health care policy. In the Netherlands employers are obliged by law to take care of employees who have been affected by critical incidents. How can trauma-related disturbances and adjustment problems be prevented? A crucial factor in coping with traumatic stress is the awareness of perceived control (see Kleber & Brom, 1992; Rothbaum, Weisz, & Snyder, 1982). People can adapt better to the implications of violence and disaster when they have the idea that they are in some control of the situation. Especially in the case of traumatic incidents, this sense of control has to do with forms of cognitive control (Thompson, Sobolew-Shubin, Gailbraith, Schwankovsky, & Cruzen, 1993) or interpretative control. It is important to provide people feedback about their work situation. Examples are paying attention to the experienced critical incidents during structured meetings of trauma counseling (Brom & Kleber, 1989) or talking with colleagues after a traumatic incident (Stephens & Long, 2000). Good team relationships, thorough preparation, and high morale, backed up by professional support, appear to be powerful antidotes to the more serious and enduring adverse reactions after traumatic experiences. A linking theme running through these examples is the sense of control and mastery that they create for the individuals involved (Alexander & Wells, 1991).

Lack of information about work, insufficient communication, and less autonomy were strongly related to fatigue and burnout in our study. In prevention of fatigue and burnout, it is important that people can influence the implementation of their jobs, for example, arranging their own working schedule or allowing them to determine their working plan. This all suggests that management support is of vital importance in the implementation of a workplace intervention (Stephens, 1997).

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4. Traumatic and chronic job stressors: A study among ambulance personnel

Submitted for publication

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Abstract

This chapter reports on the relation between both traumatic and chronic work-related stressors among ambulance workers in relation to mental health problems. Critical incidents are common: 85% experienced at least one incident in the last five years and 66% in the last year. The most disturbing events for ambulance workers involved the exposure to dead children. Confrontations with critical incidents during daily work were related to posttraumatic reactions, like avoidances and intrusions. A substantial minority (10%) reported a clinical level of distress (indicative of PTSD) due to acute stressors. The more acute stressors ambulance workers experienced, the more trouble they got with coping with the traumatic event. Besides acute stressors, the majority of ambulance workers also experienced chronic job stressors, such as lack of job autonomy, physical strain and poor communication on the job. Severe fatigue and risk for burnout were found to be present among a part of the workers (10% and 7% respectively). In a path model the interaction was tested between acute and chronic job stressors in relation to posttraumatic responses, fatigue and burnout.

4.1. Introduction

In some professions employees are frequently confronted with critical incidents. Examples of these medium or high-risk professions are health care professionals, bank employees, firefighters and police officers. They are exposed to various kinds of critical incidents, for example hold-ups, disasters, assaults, aggression, and confrontations with dying or dead people. A critical incident may be defined as an event that is sufficiently disturbing to overwhelm or threaten to overwhelm the individual's usual ways of coping (Alexander & Klein, 2001; Brom & Kleber, 1989). Such critical incident can have exceeding consequences for the health of the worker. Distress symptoms can continue over significant periods of time (Robinson & Mitchell, 1993), and may include depression, anxiety, fatigue, absenteeism and posttraumatic stress disorder (PTSD).

Several studies have indicated that emergency workers are at risk to develop PTSD or other mental disturbances and social dysfunctions. Wagner, Heinrich, and Ehlert (1998) found that 18% of the professional firefighters in their study showed symptoms characteristic for PTSD, such as intrusive thoughts about the critical incident, avoiding to talk or think about the event, and hyperarousal. Of these firefighters diagnosed with PTSD, 40% also suffered from a depressive disorder, 60% suffered from social dysfunction, and 19% suffered from substance abuse. McFarlane (1988) showed that firefighters with chronic PTSD reported an increased frequency of negative life events. Bryant and Harvey (1996) reported the same result in their sample of firefighters.

Ambulance service workers form a specific group of emergency workers. They are trained professionals who are confronted with accidents, illness and loss on a daily basis. Clohessy and Ehlers (1999) revealed that 21% of a sample of ambulance service workers suffered from PTSD. These workers reported high levels of background stressors, such as a time pressure and shift work. Alexander and Klein (2001) conducted a study on the prevalence of psychopathology among ambulance personnel in relation to exposure to critical incidents. Their workers reported high levels of job satisfaction, and they were less satisfied with external features of their organization, like lack of support by management. Additionally, they reported high levels of illness symptoms: 32% suffered from general psychopathology (measured with

the General Health Questionnaire). Furthermore, burnout and psychopathology were related to the distressing events in the previous six months.

Ambulance service workers have to respond to more emergency calls than police and fire service combined (James & Wright, 1991). Compared to police officers and firefighters, ambulance workers have longer and more intimate contact with injured victims during recovery and transport. This makes it difficult to adopt a detached attitude towards work. They also have to conduct emergency medical interventions that frequently have life or death consequences. After transporting victims to emergency medical facilities, ambulance personnel have no further contact with the victims and are left to guess about the ultimate impact of their interventions. As a result, ambulance personnel, compared with police and fire personnel, may ruminate about the outcome of their efforts, and assume exaggerated responsibility for the fate of the victims. Hence, it will not come as a surprise that ambulance workers reported more stress-specific and general health symptoms than police and firefighters (Marmar, Weiss, Metzler, Ronfeldt, & Foreman, 1996).

In addition to confrontation with critical incidents, ambulance service workers may have to deal with the usual chronic work-related stressors, such as lack of control, poor social support, role ambiguity and work overload (James & Wright, 1991). Chronic stressors may affect the mental health well-being of the worker as well. For instance, work overload and lack of control have been found to lead to fatigue, burnout (emotional exhaustion) and job dissatisfaction (Schaufeli & Enzmann, 1998). Job-related strain appears to be pervasive throughout organizations and it has been associated with a number of negative individual and organizational outcomes (Jones, Flynn, & Kelloway, 1995; Kahn & Byosiere, 1992). Such job-related psychological problems may cause absenteeism and even workers disability (Taris, Schaufeli, de Boer, Schreurs, & Caljé, 2000). In a Dutch study, a causal relation was found between work stress and high levels of absenteeism due to sickness and permanent work disability because of psychologically dysfunction (Houtman & Kompier, 1995). Thus, when one investigates the work-related health problems in ambulance workers, it is important to take both acute and chronic stressors into account. When one understands how different aspects of the work situation are interrelated

and connected to impaired health and well-being, adequate interventions may be developed in order to prevent health problems due to work-related stressors.

The simultaneous role of both kinds of job stressors (i.e., acute and chronic) in relation to health and well-being has hardly been investigated in clinical and occupational psychology. Day and Livingstone (2001) recently examined acute and chronic job stressors in relation to health problems of military personnel. Officers and soldiers who had experienced more acute work-related events, lack of job stimulation, ambiguity, and overload reported more negative psychological, behavioral, and physical health symptoms. There appeared to be a relationship between the consequences of acute and chronic job stressors in relation to health.

In this study we will examine the role of acute (traumatic) and chronic job stressors in relation to symptoms of poor mental health, such as posttraumatic reactions, fatigue and burnout. The target population consists of ambulance service personnel who are confronted with critical incidents in their daily work. The aims of this study are: 1) to gain insight in the types of stressors during daily work identified by ambulance workers, 2) to study the prevalence of posttraumatic symptoms and other psychological health problems, in particular fatigue and burnout and 3) to study the interplay of critical incidents and chronic stressors in relation to the psychological health of the ambulance worker.

In line with other research (Alexander & Klein, 2001; Clohessy & Ehlers, 1999) we expect to find a range of critical incidents, like the confrontation with a child as victim and dealing with relatives of patients. Besides, we expect to find high levels of chronic stressors in ambulance personnel (Clohessy & Ehlers, 1999; James & Wright, 1991). Considering the importance of both acute and chronic stressors in mental health (e.g., Jones et al., 1995) we hypothesize a direct positive relationship between acute stressors (i.e., number of painful and critical events encountered at work) and chronic stressors (enduring negative circumstances, such as physical strain and lack of communication) on the one hand and reported mental health symptoms (i.e., posttraumatic symptoms, fatigue and burnout symptoms) at the other hand. In addition, we expect that the combination of stressors will lead to more

traumatic symptoms, which in turn will induce more fatigue and finally burnout.

4.2. Method

4.2.1. Participants

Participants were all paramedics and drivers of ten regional ambulance services in urban as well as rural areas of the Netherlands. Questionnaires were distributed by the supervisor of each ambulance service to all 393 ambulance workers who worked at the regional ambulance services. Questionnaires were accompanied by a letter ensuring confidentiality. The completed questionnaire could be sent to the authors by using the enclosed return envelope. After two and four weeks reminders were sent to all ambulance workers. For reasons of anonymity the addresses were not in the possession of the researchers. Therefore, reminders were sent to all ambulance workers. The return rate was 56%. Two hundred twenty-one ambulance workers participated in this study.

4.2.2. Measures

The questionnaire included questions concerning demographic items, such as gender, age and marital status, and several job characteristics. It also included questions concerning kind and number of critical incidents in the last five years. In order to evaluate these events the respondents were asked to describe their last experienced critical event. Furthermore, they were asked to rate a list of acute stressors compiled by the authors based on interviews. They scored how stressful each acute stressor was to them on a scale of 1 (not at all stressful) to 4 (extremely stressful). Examples of acute stressors are: dealing with psychiatric patients, confrontation with young victims of a sexual abuse and confrontation with suicide.

The questionnaire included of the following standardized scales. The Dutch version of the Impact of Event Scale (IES; Brom & Kleber, 1985; Horowitz, Wilner & Alvarez, 1979) was used to determine the frequency of self-reported posttraumatic symptoms of avoidances and intrusions in relation to the most recently experienced critical incident. The IES has seven items designed to measure intrusion (e.g., “I had waves of strong feelings about it”) and eight items to measure avoidance (e.g., “I tried not to talk about it”). The ambulance workers

were asked to rate the items on a four-point scale according to how often each had occurred in the past seven days (0 = not at all, 1 = rarely, 3 = sometimes, 5 = often). The IES has been used in numerous studies concerning posttraumatic stress reactions and is widely recommended as a screening instrument in victims after disasters and other extreme situations (Raphael, Lundin, & Weisaeth, 1989). The internal consistency (coefficient alpha) is .87 for intrusion, .88 for avoidance and .92 for the total score. A score of 26 or higher is an indication of a clinical level of posttraumatic symptoms (indicative for PTSD) (Chemtob, Tomas, Law, & Cremniter, 1997). This cutoff score is used in the present study to assess the intensity of posttraumatic stress symptoms.

Fatigue was measured with the Checklist Individual Strength (CIS; Vercoulen et al., 1994), a 20-item self-report instrument, that consists a total score and four subscales: 1) subjective fatigue (8 items, e.g., “I get tired very quickly”), 2) impaired concentration (5 items, e.g., “Thinking requires effort”), 3) reduced motivation (4 items, e.g., “I feel no desire to do anything”), and 4) lack of physical activity (3 items, e.g., “I don’t do much during the day“). Items are scored on a seven-point Likert scale (1 = Yes, that is true to 7 = No, that is not true). Higher scores indicate a higher degree of fatigue. Reliability coefficients (α) of the subscales (subjective fatigue, reduced motivation, impaired concentration and lack of physical activity) were .91, .82, .83 and .75 respectively. Cronbach’s alpha for the total score of the CIS was .94. The scores on the subscales of the CIS can be compared with various norm groups (e.g., patients with various kinds of diseases as well as healthy adults (Vercoulen, Alberts, & Bleijenberg, 1999)). The ambulance workers were compared with the healthy adults.

The Dutch version (Schaufeli & van Dierendonck, 2000) of the Maslach Burnout Inventory (MBI; Maslach & Jackson, 1986) was used to get an indication of how many employees of this sample are at risk for burnout. This widely used instrument consists of 15 items assessing the three characteristic dimensions of burnout: emotional exhaustion (5 items, e.g., “I feel burned out from my job”), cynicism (4 items, e.g., “I am less enthusiastic about my job“) and personal accomplishment (6 items, e.g., “I deal very effectively with problems in my job”). The items are scored on a seven point Likert scale (0 = never, 6 = always). A high score on emotional exhaustion and cynicism and/or a low score on

personal accomplishment is an indication of burnout (Schaufeli & van Dierendonck, 2000). Cronbach's alpha is .86, .76 and .70 for the three subscales respectively. The scores of the ambulance workers are compared with the scores of a representative sample of the Dutch working population (n = 1,129) (Schaufeli & van Dierendonck, 2000).

The Questionnaire on Experience and Assessment of Work (QEAW; Van Veldhoven, Meijman, Broersen, & Fortuin, 1997) was used to get insight in the presence of work related chronic stressors in the work setting of ambulance personnel. This questionnaire was validated in a sample of more than 80,000 people in various kinds of working settings in The Netherlands (e.g., industrial, transport, education sector) (Van Veldhoven, Meijman, Broersen, & Fortuin, 1997). The scores of the ambulance workers were compared to employees working in various kinds of health services. In line with the purpose of this study, the following relevant subscales of this questionnaire were selected: lack of job autonomy (α = .88, 11 items, e.g., "Do you have influence on the planning of your work?"), lack of social support from colleagues (α = .81, 9 items, e.g., "Are your colleagues friendly to you?"), lack of social support from your superior (α = .89, 9 items, e.g., "Can you count on your supervisor when you have difficulties in your work?"), poor communication (α = .88, 4 items, e.g., "Are you informed about important issues in your organization?"), insufficient information (α = .83, 7 items, e.g., "Do you receive enough information about the results of your job?"), insufficient financial reward (α = .77, 5 items, e.g., "Do you think your company gives good rewards?"), high emotional demands (α = .60, 7 items, e.g., "Is your job emotionally demanding?"), and physical strain (α = .81, 7 items, e.g., "Is your job physically demanding?"). The items are scored on a four-point scale (1 = always to 4 = never). The scores on the subscales were standardized and ranged from 0 (low) to 100 (high). The higher a score, the more a stressor is perceived as such.

4.2.3. Statistical analyses

A path model was tested with a hypothesized direct positive relationship between acute stressors (i.e., number of painful and critical events encountered at work) and chronic stressors (enduring negative circumstances, such as physical strain and lack of communication) on the one hand and reported mental health symptoms (i.e., posttraumatic

symptoms, fatigue and burnout symptoms) at the other hand. To evaluate the hypothesized relations between acute and chronic stressors and symptoms a path analysis was conducted in LISREL 8.30 (Jöreskog & Sörbom, 1993). Path analysis is a technique to assess the direct effect of one variable to another. The independent variables in our model were the acute and chronic stressors and the dependent variables were the various clusters of symptoms. The variable representing "chronic stressors" was created summing the subscales of the QEAW: i.e. poor communication, lack of information, lack of social support of the colleagues as well as the supervisor, high emotional demands and physical strain. The variable “acute stressors” was represented by the number of experienced critical incidents. Symptoms were operationalized as follows: characteristic posttraumatic responses (total score on IES), fatigue (total score on CIS) and exhaustion (core subscale of the MBI).

4.3. Results

4.3.1. Demographic characteristics

Most of ambulance workers were men (n = 189, 86%). Mean age was 39.8 years (SD = 7.1). Most of them were married 74.4%, 12.8% cohabited, 8.2% was single, and 4.6% was divorced. The majority had one or more children living with their parents (n = 145, 65.9 %). Mean working experience at the public health service was 9.3 (SD = 7.0) years. Most of the respondents (90.9%) worked full-time. The majority of the participants were paramedics (57.5%), although the questionnaire was sent to an equal number of paramedics and drivers.

4.3.2. Incidents

The ambulance workers rated a list of acute stressors. The acute stressor which was rated as the most stressful was “confrontation with dead children” (M = 2.7, SD = 0.90), followed by “confrontation with sad and helpless people” (M = 2.4, SD = 0.54) and “dealing with youthful victims of sexual offence” (M = 2.3, SD = 0.96), respectively.

Of all respondents, 85% had experienced one or more critical incidents in the previous five years. All these respondents gave a description of the last experienced critical incident. Incidents involving dead children were most common (25%), followed by medical emergencies (23%), severe accidents or injuries (21%), acts of violence or threats (13%), suicide(attempts) (10%), organizational problems (i.e.,

lack of acknowledgement of superior after a critical incident, or false or insufficient information about the site of the accident or the condition of the victims) (8%). The majority (66%) experienced the last disturbing incident one year or less ago. The mean number of reported events was 3.7 (SD = 1.5).

4.3.3. Posttraumatic responses

The workers who experienced a critical incident in the last five years filled in the IES (n = 187). Mean scores, presented in Table 9, on the subscales of the IES were: 6.2 (SD = 6.5) for intrusion, 3.7 (SD = 6.2) for avoidance and 9.8 (SD = 11.7) for the total score on the IES.

A total score of 26 or higher on the IES is an indication of a clinical level of distress (indicative of PTSD) (Chemtob, Tomas, Law, & Cremniter, 1997). 11.8% (n = 22) suffered from a clinical level of distress after experiencing a critical incident.

Positive correlations were found between the number of incidents and intrusion ($r = .28$, $p < .001$), avoidance ($r = .22$, $p < .01$) and the total score of the IES ($r = .27$, $p < .001$). This indicates that the more the ambulance workers were confronted with critical incidents, the more they suffered from posttraumatic reactions.

Table 9 Means and standard deviations of ambulance personnel and norm group on the Impact of Event Scale and the subscales of the Checklist Individual Strength

	Ambulance workers			Norm group (N = 53)	
	M	SD	N	M	SD
IES Intrusion	6.2	6.5	187		
IES Avoidance	3.7	6.2	187		
IES Total	9.8	11.7	187		
CIS Fatigue	17.9	9.4	213	17.3	10.1
CIS Motivation **	9.0	4.6	212	7.9	4.1
CIS Activity ***	7.7	3.9	214	6.6	4.5
CIS Concentration ***	11.4	5.7	212	9.5	5.0
CIS Total **	46.0	20.1	211	41.5	19.8

* $p < .05$; ** $p < .01$; *** $p < .001$

4.3.4. Fatigue and burnout

The scores of the ambulance workers on the subscales and the total score of the Checklist Individual Strength are also presented in Table 9. These scores were compared with those of a control group of

healthy adults (Vercoulen, Alberts, & Bleijenberg, 1999). The two groups differed on motivation ($t(211) = 3.5$; $p < .01$), physical activity ($t(213) = 4.2$; $p < .001$), concentration ($t(211) = 4.8$; $p < .001$), and the total score ($t(210) = 3.2$; $p < .01$). The ambulance workers scored significantly higher on three subscales and the total score, which means that they reported more fatigue symptoms.

Bültmann and colleagues (2000) found that a cutoff point of >76 on the total score of the CIS should be regarded as an indication of a fatigue level that puts the individual "at risk" for subsequent sick leave or work disability. In our sample, 10% ($n = 21$) scored above this cutoff point.

With regard to the level of burnout it was found that, in comparison with the norms provided by Schaufeli and van Dierendonck (2000) 12% of the ambulance personnel ($N = 26$) scored high on emotional exhaustion, 18% ($N = 39$) scored high on cynicism and 16% ($N = 36$) had a low score on personal accomplishment. According to Schaufeli and van Dierendonck (2000), a high score on emotional exhaustion and cynicism in combination with a low score on personal accomplishment is an indication of burnout. In our sample, 7% ($n = 16$) met the criteria of burnout.

4.3.5. Chronic stressors

In Table 10 the means and standard deviations on the subscales of the Questionnaire on the Experience and Assessment of Work (QEAW) are presented for the sample of ambulance personnel and the norm group. The ambulance workers significantly differed from the norm group on all subscales with exception of information. This means that ambulance workers experience more emotional stressors ($t(220) = 7.7$; $p < .001$), think that their payment is lower than in comparable companies ($t(218) = 2.8$, $p < .01$), are less satisfied with the relationship with their colleagues ($t(220) = 4.7$, $p < .001$) and with their supervisor ($t(220) = 7.4$, $p < .001$) than the norm group. They think that the communication in their organization is less clear than in other organizations ($t(220) = 3.2$, $p < .01$) and have to work under more physical strain ($t(220) = 13.2$, $p < .001$) than the norm group.

Table 10 Means and standard deviations of ambulance personnel and a norm group on the Questionnaire on the Experience and Assessment of Work

	Ambulance workers (N = 221)		Control group		
QEAW subscales	M	SD	M	SD	N
Poor communication **	52.2	21.2	47.7	20.7	3656
Insufficient financial reward **	54.3	21.6	50.2	23.1	3409
High emotional demands ***	39.5	9.7	34.4	14.9	4171
Lack of information	48.6	16.6	49.3	18.6	3850
Lack of social support from colleagues ***	25.6	11.4	22.0	13.9	3953
Lack of social support from supervisor ***	32.6	17.2	23.1	17.6	4316
Physical strain ***	40.0	15.4	26.4	21.1	4172
Lack of job autonomy ***	57.1	17.7	42.8	17.9	4355

* $p < .05$; ** $p < .01$; *** $p < .001$

4.3.6. Relationship between chronic and acute stress

One of the research questions of this study concerned the interaction between acute and chronic stressors in relation to symptoms. This question can be answered by Pearson correlations between acute stressors (number of critical incidents), chronic stressors (the subscales of the QEAW), and the symptoms (IES, CIS and MBI). These correlations are reported in Table 11.

Both acute and chronic job stressors (i.e., number of events, high emotional demands, physical strain, lack of autonomy, poor relationships with the management and lack of information) were significantly correlated with health symptoms (IES, MBI and CIS).

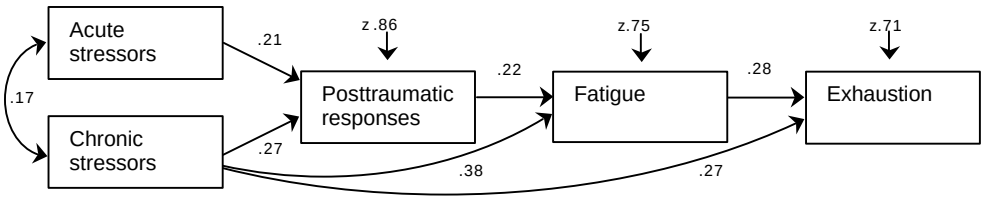
Table 11 Pearson correlations between all variables in the present study among ambulance workers (N = 221)

subscale	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1 IES Intrusion																			
2 ES Avoidance	.72***																		
3 IES Total	.93***	.92***																	
4 MBI Emotional exhaustion	.29***	.30***	.32***																
5 MBI Cynicism	.20**	.31***	.27***	.62***															
6 MBI Personal accomplishment	-.22**	-.21**	-.23**	-.26***	-.39***														
7 CIS Fatigue	.23**	.37***	.32***	.50***	.45***	-.44***													
8 CIS Concentration	.23**	.27***	.27***	.40***	.30***	-.45***	.68***												
9 CIS Motivation	.24**	.36***	.32***	.38***	.38***	-.46***	.72***	.60***											
10 CIS Activity	.13	.23**	.19**	.16*	.27***	-.42***	.50***	.44***	.64***										
11 CIS Total	.25**	.37***	.33***	.46***	.43***	-.52***	.92***	.82***	.86***	.70***									
12 QEAW High emotional loads	.16*	.24**	.21**	.33***	.32***	-.10	.21**	.12	.11	-.02	.15*								
13 QEAW Physical strain	.24**	.22**	.25**	.30***	.28***	-.11	.22**	.17*	.13	.04	.19**	.45***							
14 QEAW Lack of autonomy	.23**	.21**	.24**	.18**	.21**	-.26***	.21**	.20**	.26***	.19*	.25***	.07	.16*						
15 QEAW Insufficient financial reward	.05	.16	.04	.08	.00	-.01	.05	.14*	-.05	.02	.06	.14*	.19**	.22**					
16 QEAW Poor relationship with colleagues	.14	.14	.15*	.27***	.35***	-.38***	.37***	.38***	.31***	.27***	.39***	.19**	.12	.12	.14*				
17 QEAW Poor relationship with management	.25***	.29***	.29***	.35***	.43***	-.38***	.40***	.32***	.36***	.22**	.40***	.18**	.20**	.12	.13	.41***			
18 QEAW Lack of information	.18*	.18*	.20**	.25***	.28***	-.35***	.31***	.24**	.25***	.21**	.31***	.14*	.17*	.27***	.19**	.31***	.49***		
19 QEAW Poor communication	.10	.15*	.14	.16*	.24***	-.24***	.18**	.13	.23**	.17*	.21**	.05	.09	.22**	.15*	.18**	.55***	.49***	
20 Acute stressors	.28***	.22**	.27***	.26***	.24***	-.04	.13	.12	.13	.08	.14*	.30***	.21**	-.01	-.01	.09	.15*	.11	.08

* p < .05; ** p < .01; *** p < .001

4.3.7. Interaction between acute and chronic stressors in relation to symptoms

To test the hypothesis that there is an interplay of acute and chronic stressors in relation to posttraumatic responses, fatigue and exhaustion, a hypothesized path-model was tested. The hypothesized path-model does not adequately fit the data (χ^2 (5, n = 187) = 45.71, p< .001, RMSEA = .210, GFI = .91). In order to find a satisfactory model paths were submitted. The path model represented in Figure 3 is the best fitting model. This model fits the data satisfactorily (χ^2 (3, n = 187) =6.17, p = .10, RMSEA = .076, GFI = 0.99). This model shows an interaction between acute and chronic stressors. These acute and chronic stressors are related to posttraumatic symptoms. The trauma related symptoms are related to fatigue. Fatigue is in turn related to exhaustion. There is a direct relation between the chronic stressors and fatigue and exhaustion. Critical incidents have only an indirect effect on fatigue and exhaustion.



χ^2(3, n = 187) = 6.17, p = 0.10, RMSEA = 0.076, GFI = 0.99

Figure 3 Path model representing the interaction of acute and chronic stressors in relation to health symptoms in a sample of ambulance personnel

4.4. Discussion

This study focused on acute and chronic job stressors in relation to mental health problems in a representative sample of ambulance service personnel. A substantial proportion of the ambulance workers (85%) was confronted with a critical accident in the last five years. Incidents involving children and dealing with sad and hopeless patients were rated as most stressful. A substantial minority of the emergency

workers (12%) suffered from severe posttraumatic symptoms after experiencing one or more critical incidents, in particular severe intrusions and avoidances. In line with earlier studies (e.g., Clohessy & Ehlers, 1999; Marmar et al., 1996) the findings indicate that emergency workers may be at risk of developing PTSD, even if they are not exposed to major disasters.

Our results indicated that the majority showed posttraumatic responses to some extent, but not at a clinically significant level. The responses can be considered as a normal part of the process of recovery from an upsetting event (e.g., Creamer, 1995; Kleber & Brom, 1992). Nevertheless, some interpret these intrusions in a negative way. Negative interpretations are important in explaining the maintenance of intrusive memories and PTSD in general (Ehlers & Steil, 1995).

Our findings are partially consistent with those of earlier studies (e.g., Alexander & Klein, 2001; Clohessy & Ehlers, 1999). According to Alexander and Klein (2001) 30% had severe posttraumatic symptoms. This percentage is based on a different cutoff score on the IES (> 19). In our study a higher cutoff point (> 25) was used, resulting in 12% suffering from a high level of posttraumatic distress. When we used the same cutoff point as Alexander and Klein, a percentage of 16% was suffering from severe posttraumatic distress. The still existing difference between the two studies may have to do with the fact that the ambulance workers in the study of Alexander and Klein (2001) filled in the IES only when they had reported a personally disturbing incident in the previous 6 months. In the present study the time between the critical incident and the measurement was at most 5 years. In the Scottish study the response rate was somewhat higher than in our study (69% versus 56%). In research concerning posttraumatic responses low rates are quite common. People who refused to participate in a study concerning responses to a disaster were found to have more health problems (Weisaeth, 1989). A high response rate may guarantee an adequate estimation of posttraumatic symptoms. Therefore, posttraumatic reactions may be more serious than our study indicated.

Clohessy and Ehlers (1999) found that 21% of the ambulance workers met DSM-III-R symptom criteria for PTSD. This percentage was also higher than the percentage found in our study. Although both studies have almost the same response rate (57% and 56%), there was

some selection-bias in recruiting the respondents in the study conducted by Clohessy and Ehlers. Potential participants were made aware of the study. Only ambulance workers who had shown interest in the project received a questionnaire. In the present study the questionnaire was sent to all ambulance workers, and not only to the ones who showed interest in the research. In the sample of Clohessy and Ehlers there may be an overestimation of symptoms. Maybe especially those who would like to receive attention for their problems at the workplace participated in the project. Nevertheless, as mentioned above, the opposite may also be true.

This study revealed a cumulative effect of acute stress: the more events someone is exposed to, the more symptoms like intrusions and avoidances are reported. This finding is in line with other research (e.g., Bryant & Harvey, 1996; McFarlane, 1988). However, Hytten, and Hasle (1989) found in their study among firefighters, participating in a hotel fire rescue operation, that the more experienced men had fewer posttraumatic responses while subjectively experiencing the same intensity during the disaster. This indicates that experience helps to "digest" very stressful impressions, while our finding suggests that the likelihood of a negative response to a stressful event is increased by previous events. Cognitive theories of PTSD interpret this pattern in terms of fear structures that were developed in the working memory following a trauma and are reinforced by successive traumas (Foa, Steketee, & Rothbaum, 1989). Confrontation with a traumatic event will lead to the development of a representation of the event in the memory (fear structure). This representation includes information about the feared stimulus situation, the responses and the meaning of the stimuli and responses. Exposure to new, similar stressful situations will evoke fear, since these new stressful events activate fear structures related to earlier traumatic events.

A remarkable proportion of ambulance workers reported fatigue. They were significantly more fatigued than a control group and a tenth of our sample showed a fatigue level that puts an individual "at risk" for subsequent sick leave or work disability. The percentage of burnout (7%) was reasonably high as well. The percentage of burnout cases in the working population of the Netherlands is 5.25% (Houtman, Schaufeli, & Taris, 2000).

Alexander and Klein (2001) reported high levels of job satisfaction among ambulance workers. Earlier research on ambulance personnel has also indicated that providing care for others is personally gratifying (e.g., James & Wright, 1991). However, a distinction between job and organizational satisfaction should be made. The first one is associated with the personal well-being of the worker while the last one is associated with symptoms of burnout (Alexander & Klein, 2001). High levels of chronic stressors are quite common in ambulance workers. Their consequences are manifested in fatigue and burnout as well as in an increase in posttraumatic responses, as was shown in the present study.

This study showed an interaction between acute and chronic stressors in relation to health problems. This is in line with research by James and Wright (1991). They found that a high level of background stressors such as shift work and time pressure contributed to the overall distress, and possibly to some PTSD symptoms. In future research our model should be tested in a longitudinal design in order to draw conclusions about causal relations. In addition, a refinement of the model will be necessary for a better understanding of the interaction between acute and chronic stressors in relation to health problems. In the presented model all chronic stressors were added. It should be relevant to focus on specific chronic stressors separately.

Since in various European countries the employer is obliged by law to take care of employees who have been affected by critical incidents, it is important to have insight in the association between acute and chronic stressors in relation to the well-being of the employee. This insight is necessary for developing appropriate interventions to prevent work-related stress symptoms. From this research is known that both acute as well as chronic stressors have their impact on the well-being of the worker.

For a number of reasons, our conclusions should be interpreted with some caution. The data were collected at a single time-point. In order to draw causal conclusions and to identify risk factors for developing PTSD a longitudinal design is of vital importance. Moreover, the data were collected on the basis of self-report measures and the study was retrospective. However, this last limitation is almost inherent to research on critical incidents. It is hardly possible to predict the

occurrence of a critical incident, and to study pre-disaster characteristics.

In spite of these limitations, the results of this research have practical implications. From research it is known that preparing the helpers in what they are going to face is useful in preventing health symptoms (Alexander & Wells, 1991). During training attention should be paid to different kind of stressful aspects of the work and during structured meetings in the work setting it is of importance to pay attention to critical incidents and their aftermath (Brom & Kleber, 1989; Van der Velden, Hazen, & Kleber, 1999). Talking with colleagues after a critical incident appears to be helpful in preventing harmful outcomes (Alexander & Klein, 2001; Stephens & Long, 2000). Jones et al. (1995) demonstrated that the perception of a supportive organization correlates strongly and negatively with the amount of work stress. When implementing a work-place intervention following traumatic events support and acknowledgement from management are of vital importance (Stephens, 1997).

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5. Predicting health symptoms in forensic doctors: The role of acute and chronic job stressors

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Abstract

Workers in medium or high-risk professions are often confronted with critical incidents at the workplace, such as robberies or acts of violence. The impact of these acute stressors may be serious and enduring. Many workers also experience chronic job stressors, such as work overload or role conflicts. The purpose of this article is to study the relationship between acute and chronic stressors and self-reported health symptoms (i.e., posttraumatic responses, fatigue and burnout) using a longitudinal design among Dutch forensic doctors (N = 64). Most doctors were confronted with a least one work-related critical incident on time 1. In addition, they reported high levels of chronic stressors, such as lack of information within the organization and high emotional demands. A substantial minority suffered from posttraumatic responses. A remarkable finding is that more than a tenth of the forensic doctors showed a fatigue level that puts them at risk for subsequent sick leave or work disability. The percentage of burnout is high as well, especially compared to the general Dutch working population. Although bad communication within the organization at time 1 appeared to be a predictor of health symptoms at time 2, health symptoms measured at time 1 were the best predictors of symptoms at time 2. This study demonstrated that the health symptoms of the forensic doctors were quite stable in time.

5.1. Introduction

Workers such as policemen, firefighters and bank employees are frequently confronted with critical incidents or acute stressors in their jobs. Examples of such events are acts of violence, confrontations with dead bodies, sudden death of colleagues and (armed) robberies. These stressful events may have a serious and enduring impact on the mental health of the workers, as they may lead to various psychosocial disturbances, including absenteeism and serious mental disorders, in particular posttraumatic stress disorder (PTSD; Mitchell & Dyregrov, 1993).

Due to their profession forensic doctors are frequently exposed to acute stressors. The purpose of our study is to explore the kind of stressful events and to analyse the course of health symptoms evoked by these events, especially trauma-specific symptoms, such as avoidance and intrusion, in a sample of Dutch forensic doctors. Additionally, forensic doctors also have to deal with "usual" chronic stressors in their jobs, such as shift work, work overload, and lack of social support of colleagues. These stressors may also influence mental health. For instance, these sources of work-related stress may lead to worker dissatisfaction, decreased productivity, poor mental as well as physical health, and absenteeism (see for a review Tennant, 2001).

5.1.1. Theoretical background

Intrusions and avoidances are two characteristic responses to a traumatic event (e.g., Creamer, 1995). Intrusion refers to re-experiencing the traumatic event. It takes a number of forms, the most common being the involuntary recollection of the stressor: the individual continuously deals with what has happened; memories pop up again and again. Repetitive dreams and nightmares about the event are also a common way in which thoughts, feelings and images related to the event are re-experienced. The psychological process of avoidance has to do with a general numbing of psychic responsiveness. It is expressed by not wanting to talk about it, by avoiding the location of the event, and by other avoidance behaviors, such as diminished interest in significant activities and emotional numbness (Horowitz, 1976). Intrusion and avoidance are theoretically considered as manifestations of the process of coping with the overwhelming nature of the traumatic experience (e.g., Kleber & Brom, 1992). In the long run they can become

dysfunctional: intense and prolonged forms of intrusion and avoidance are central characteristics of the diagnosis of PTSD (American Psychiatric Association, 1994). Prevalence rates of PTSD vary between 5 and 30 percent (Breslau, 1998; Kleber, 1997).

Within traumatic stress studies one of the most important questions is who will (not) develop persisting difficulties after experiencing a critical event (Marmar, Weiss, Metzler, Ronfeldt, & Foreman, 1996). To provide an answer to this question longitudinal research is needed. Unfortunately, longitudinal research concerning the development of posttraumatic stress symptoms and other health symptoms induced by work related critical incidents is sparse. Only few studies using data collected over a certain time span have been conducted so far (e.g., Alexander & Wells, 1991; Andersen, Christensen, & Petersen, 1991; McFarlane & Papay, 1992).

It has been found that workers exposed to disasters reported a decreased level of symptoms in course of time after the event. A study among rescue workers after a major railway accident indicated that these workers showed health symptoms directly after the accident, followed by a significant decline in posttraumatic responses three to seven months after the rescue operation (Andersen et al., 1991). In a study of firefighters exposed to a major fire disaster it was found that in the majority of workers with a chronic course of posttraumatic responses, the symptoms fluctuated significantly with the passage of time. The intensity of intrusive symptoms decreased significantly over time, especially in the first two years after the disaster (McFarlane & Papay, 1992). Alexander and Wells (1991) conducted a longitudinal study among police officers involved in retrieving bodies after the Piper Alpha oilrig disaster. Pre-disaster data were available on these policemen. Most of the officers were remarkably free from psychiatric morbidity after the event. The police officers were compared with a matched control group of officers who were not involved in such work. Comparison between these two groups three months after the disaster failed to demonstrate high levels of posttraumatic distress in the group involved in the disaster.

It may be concluded from these described studies that exposure to disasters evoke health symptoms, especially posttraumatic stress symptoms directly after exposure, and that there is a significant decline

in the level of health symptoms in time. Most studies of occupational trauma in emergency workers have been event-specific, in the sense that they focus on the consequences of a major disaster such as a plane accident or an earthquake (Marmar et al., 1996). These events are relatively rare. In our study we focus on recurrent exposure to various stressful events in the work situation. There are some cross sectional studies (Alexander & Klein, 2001, Clohessy & Ehlers, 1999) that have focused on the prevalence of posttraumatic stress symptoms and other disturbances in high-risk professionals after exposure to recurrent or frequent critical incidents, such as confrontation with acts of violence and dying or dead people. Examples of those professions are policemen, firefighters and ambulance personnel.

From these studies focusing on recurrent stressful events it appeared that approximately one third of ambulance personnel reported high levels of general psychopathology, burnout and posttraumatic symptoms after exposure to critical incidents (Alexander & Klein, 2001). Burnout was associated with less job satisfaction, longer time in service, less recovery time between incidents and more frequent exposure to incidents. For some ambulance workers the effects of some events lasted weeks or even months (Alexander & Klein, 2001). Clohessy and Ehlers (1999) also found that emergency workers were at risk of developing PTSD and other psychiatric symptoms even if they were not exposed to major disasters. A substantial proportion of their sample (21%) suffered from posttraumatic stress symptoms.

These above-described studies indicated that often-occurring acute stressors negatively affect mental health. However, these studies did not take chronic job stressors, such as work overload, lack of social support or information, into account. Nevertheless, chronic stressors are also likely to affect the worker's quality of life adversely if the exposure is appraised as threatening (Brown, Fielding, & Grover, 1999). Until now most research have examined either the consequences of acute stressors or those of chronic stressors. Studies focusing on both acute and chronic stressors are sparse. Day and Livingstone (2001) examined the impact of acute and chronic stressors on health symptoms of military personnel. This cross sectional study showed that both stressors were associated with increased symptoms. Military personnel who had experienced more acute work-related events (i.e., lack of job stimulation,

role-ambiguity and role-overload) tended to report more negative psychological, behavioral and physical health complaints.

5.1.2. The present study

The aim of this study is to take both acute and chronic stressors into account in the prediction of health symptoms in a sample of forensic doctors in the Netherlands. Forensic doctors are exposed to various critical incidents in their jobs. They conduct medical attendances to detainees, who may be aggressive. They have to examine dead bodies to identify the victims and to determine the precise cause of death. They also take care of psychiatric patients with acute disturbances. Forensic doctors perform their tasks in shifts in combination with either a part-time or full-time job at a public health service. Shift work, even of short duration, has been shown to affect job performance, sleep patterns, and social as well as family life adversely (Monk, 1990).

We expect that these doctors experience characteristic posttraumatic stress symptoms (Van der Ploeg, Kleber, & van der Velden, 2000), in particular intrusive thoughts about the event and avoiding talking or thinking about the event (Creamer, 1995; Horowitz, 1976). Like previous cross sectional research indicated (e.g., Buchanan, Stephens, & Long, 2001) we expect a cumulative effect of acute stressors in time. A prolonged exposure to traumatic work-related events will make the forensic doctors more vulnerable for health symptoms. Besides posttraumatic stress symptoms, we expect that they suffer from fatigue, or even from burnout, due to exposure to chronic stressors. Workers in helping professions often experience high emotional arousal associated with an intense involvement with clients or patients. They are particularly vulnerable to develop burnout, as burnout is considered to be a long-term stress reaction that occurs among professionals whose work is focused on helping or assisting people, such as teachers and nurses (Schaufeli & Enzmann, 1998).

The research questions of the present study are: 1) Which kind of events are most stressful for forensic doctors and how frequently are they exposed to it? 2) To which chronic stressors are they exposed? and 3) Which stressors predict health symptoms, such as posttraumatic stress symptoms, fatigue and burnout?

5.2. Method

5.2.1. Subjects

Forensic doctors work at public health institutes. There are approximately 50 of these regional services in the Netherlands. In order to obtain a representative sample both rural and urban services were included in the study. At the first measurement (time 1) 132 questionnaires were distributed by the supervisor of each service to all the forensic doctors of that service. The completed questionnaires were sent to the authors using the enclosed return envelope. For reasons of anonymity the addresses were not in the possession of the researchers. Reminder letters were sent to all respondents two and four weeks after the initial mailing.

The return rate was 64%. Eighty-four forensic doctors participated at time 1. Respondents who were willing to participate at a follow-up (time 2) filled in their name and address. A year later 64 questionnaires were sent to these respondents. After two reminders (two and four weeks after the initial mailing) 51 questionnaires were returned (response rate 80%).

Most of the participating doctors were male ($n = 39$, 76.5%). The mean age of the doctors was 43.0 years ($SD = 6.9$). Most of them were married 70.6%, 15.7% cohabited, 9.8% was single, and 3.9% was divorced. The majority (68%) indicated that they had at least one child living with them. Mean working experience at time 1 was 9.5 years ($SD = 6.4$) and the majority (56%) worked in part-time.

Significantly more women decided not to participate at time 2 ($t(60.3) = 2.1$, $p < .05$). The doctors who did not participate at time 2 reported significant less characteristic posttraumatic symptoms, in particular intrusions at time 1 ($F(1,62) = 8.5$, $p < .01$) and scored significant lower on general posttraumatic symptoms of intrusion and avoidance ($F(1,62) = 4.6$, $p < .05$). In addition, those who did not participate at time 2 received significant less support from their partner ($F(1,51) = 5.5$, $p < .05$) and they received significant less recognition of their colleagues ($F(1,58) = 7.7$, $p < .01$).

5.2.2. Measures

5.2.2.1. Acute stressors.

The respondents were asked to how many stressful events they were exposed to in the last five years. The last experienced stressful event had to be described in detail. Furthermore, they were asked to rate how stressful 13 acute stressors were to them on a scale from 1 (not stressful at all) to 4 (extremely stressful). Examples of these stressors were: dealing with psychiatric patients, involvement with dying people, confrontations with young victims.

5.2.2.2. Chronic stressors.

The Questionnaire on the Experience and Assessment of Work (Van Veldhoven, Meijman, Broersen, & Fortuin, 1997) was used to assess work-related stressors at time 1. This comprehensive questionnaire was validated in a sample of more than 80,000 people in various working settings in the Netherlands (e.g., industrial, education, and transport sector). The scores of the forensic doctors were compared with those of employees working in various kinds of health services (Van Veldhoven et al., 1997). The following subscales were selected: lack of job autonomy (Cronbach's alpha at time 1 = .89, 11 items e.g., "Do you have influence on the planning of your work?"), lack of social support from colleagues (α = .79, 9 items, e.g., "Are your colleagues friendly to you?"), lack of social support from the supervisor (α = .88, 9 items, "May you account on your supervisor when you have difficulties in your work?"), poor communication (α = .81, 4 items, "Are you informed about important issues in your organization?"), lack of information (α = .80, 7 items, "Do you receive enough information about the results of your job?"), insufficient financial reward (α = .73, 5 items, "Do you think your company gives good rewards?"), and high emotional demands (α = .60, 7 items, "Is your job emotionally demanding?"). The items were scored on a four-point scale (1 = always, 4 = never). To interpret the subscales the sum scores were recoded and standardized ranging from 0 to 100. The higher a score, the more the situation is perceived as a stressor.

5.2.2.3. Psychological health

The Dutch version of the Impact of Event scale (IES; Brom & Kleber, 1985; Horowitz, Wilner, & Alvarez, 1979) was used to assess self-reported posttraumatic symptoms of intrusion and avoidance in

relation with the last experienced critical incident. The IES has seven items designed to assess intrusion, for example, “I had waves of strong feelings about it”, and eight items to assess avoidance, for example, “I stayed away from reminders of it”. The items were scored on a four-point scale (0 = never, 1 = sometimes, 3 = often, 5 = always). At time 1 the internal consistency was .90 for intrusion, .82 for avoidance and .92 for the total score. Only the forensic doctors who indicated that they were involved in a critical incident filled in the IES (time 1 n = 40, time 2 n = 42). According to Chemtob, Tomas, Law, and Cremniter (1997), a score of 26 or higher on the IES is an indication of a clinical level of posttraumatic symptoms (PTSD). This cutoff score is used in the present study to assess the intensity of posttraumatic stress symptoms. In line with other studies (e.g., Alexander & Klein, 2001) the total scores on the IES were divided into three categories: 0-8 (low), 9-19 (medium) and 20 + (high). These categories were used to get insight in the course of posttraumatic symptoms in time.

Fatigue was measured at time 1 and time 2 with the Checklist Individual Strength (CIS, Vercoulen et al., 1994), a 20-item self-report instrument. This CIS measures several aspects of fatigue, such as subjective fatigue (8 items, “I get tired very quickly”), concentration (5 items, “Thinking requires effort”), motivation (4 items, “I feel no desire to do anything”), physical activity (3 items, “I don’t do much during the day“) and a total score. Items are scored on a seven-point Likert scale (1 = Yes, that is true to 7 = No, that is not true). Higher scores indicate a higher degree of fatigue. Reliability coefficients of the subscales at time 1 (subjective fatigue, reduced motivation, impaired concentration and lack of physical activity) were .95, .79, .87 and .81 respectively. Cronbach’s alpha for the total score of the CIS was .94. The mean scores on the subscales and the total score of the CIS of the forensic doctors were compared with those of a representative group of healthy subjects (Vercoulen et al., 1996). This comparison group consisted of 53 persons (76% female; mean age was 37.1, range 19-63). In addition, a cutoff point indicating that an individual is at risk for sick leave or disability was used (Bültmann et al., 2000).

The Dutch version of the Maslach Burnout Inventory (MBI; Maslach & Jackson, 1986; Schaufeli & van Dierendonck, 2000) was used to assess the burnout symptoms at time 1 and time 2. This widely used instrument consists of 15 items assessing the three central

dimensions of burnout: emotional exhaustion (5 items, “I feel burned out from my job”), cynicism (4 items “I am less enthusiastic about my job“) and personal accomplishment (6 items “I deal very effectively with problems in my job ”). The items were scored on a seven-point scale (0 = never, 6 = always). Cronbach’s alpha was .86, .79 and .80 at time 1 for the three subscales respectively. Cutoff scores were used to assess burnout symptoms in this sample (Schaufeli & van Dierendonck, 2000).

5.3. Results

5.3.1. Acute stressors

Mean number of critical incidents at time 1 was 3.4 (SD = 1.7) and 3.6 (SD = 1.6) at time 2. Most of the forensic doctors (83.8%) experienced the most recently incident less than one year before the first measurement. Examples of these incidents were experiences involving confrontation with aggressive detainees, suicide and confrontations with victimized children. The forensic doctors rated how stressful a list of acute stressors was to them. The three most stressful events the doctors were exposed to were: exposure to dead children (M = 2.95, SD = 0.99), involvement with young victims of sexual abuse (e.g., assault or rape) (M = 2.68, SD = 1.00), and confrontation with young victims of violence (M = 2.43, SD = 0.83).

5.3.2. Chronic stressors

In Table 12 means and standard deviations on the subscales of the QEAW of the forensic doctors at time 1 and those of the reference group are presented. At baseline the forensic doctors significantly experienced higher emotional demands ($t(50) = 6.0$; $p < .001$) than the reference group, they were significantly more satisfied with the financial reward ($t(47) = -2.4$; $p < .05$), and they were significantly less satisfied with the provision of information within the organization ($t(49) = 4.2$; $p < .001$).

Table 12 Means and standard deviations of the forensic doctors and a reference group on the subscales of QEAW at time 1

	Forensic doctors			Reference group		
QEAW subscales	M	SD	N	M	SD	N
QEAW High emotional demands ***	43.7	11.1	51	34.4	14.9	4171
QEAW Lack of job autonomy	43.5	18.3	50	42.8	17.9	4355
QEAW Insufficient financial reward**	42.8	21.0	48	50.2	23.1	3409
QEAW Poor relationship with colleagues	21.7	12.1	51	22.0	13.9	3953
QEAW Poor relationship with management	21.8	17.8	49	23.1	17.6	4316
QEAW Lack of information***	59.1	16.6	50	49.3	18.6	3850
QEAW Poor communication	48.2	17.2	50	47.7	20.7	3656

* $p < .05$, ** $p < .01$, *** $p < .001$

5.3.3. Health symptoms

5.3.3.1. Posttraumatic responses.

Means and standard deviations at baseline and follow-up are presented in Table 13. MANOVA repeated measures showed a significant difference between time 1 and time 2 on the subscale Intrusion (IES). The forensic doctors reported less intrusions at the second measurement. On the subscale avoidance and the total score of the IES no significant differences were found.

At time 1 20% ($n = 8$) of the forensic doctors reported a clinical level of posttraumatic distress. At time 1 50% of the forensic doctors had a low score, 20% had a medium score and 30% had a high score. At time 2 more than half of the forensic doctors (62%) had a low score, 19% had a medium score and 19% a high score. More than half of the forensic doctors (53%) did not change in time, 36% showed a minor change and 11% showed a major change. A minor change indicated an increase or decrease of one category (e.g., from low to medium) and a major change was an increase or decrease of two categories (e.g., from low to high).

5.3.3.2. Fatigue

Means and standard deviations on the CIS at both measurements are presented in Table 13. MANOVA repeated measures showed no differences in time on the CIS. The forensic doctors differed from the reference group at time 1 on the following subscales: fatigue ($t(50) = 3.3$; $p < .01$), motivation ($t(50) = 3.5$; $p < .01$), physical activity ($t(50) = 2.5$; $p < .05$), concentration ($t(49) = 4.5$; $p < .001$), and the total score ($t(50) = 4.4$; $p < .001$). The forensic doctors significantly scored higher, indicating that they reported more symptoms. According to

Bültmann and colleagues (2000), a score > 76 on the total score of the CIS is an indication of a fatigue level that puts the individual "at high risk" for subsequent sick leave or work disability. In this sample 14.0% (n = 7) scored above the cutoff point of the CIS at time 1.

5.3.3.3. Burnout

Means and standard deviations at both measurements are presented in Table 13. MANOVA repeated measures indicated no significant differences on the subscales of the MBI in time.

According to the criteria for the Dutch MBI (Schaufeli & van Dierendonck, 2000), 25% scored (n = 13) high on exhaustion, 35 % (n = 18) scored high on cynicism and almost 24% (n = 12) scored low on competence at time 1. Of the forensic doctors almost 20% (n = 10) met the criteria of burnout. There is some overlap between the high scoring individuals on respectively posttraumatic stress symptoms, fatigue, and burnout. One doctor reported a high symptom level on posttraumatic stress symptoms, fatigue and burnout. Three doctors with a high level of fatigue also met the criteria of burnout.

In Table 13 the interrelations between the subscales of the IES, CIS and MBI are presented. In the upper half of the matrix the interrelations between time 1 and time 2 are presented and in the lower half of the matrix the interrelations between the subscales at time 1 are given.

5.3.4. Relation between acute stressors, chronic stressors and mental health

In order to get insight in the association between both kinds of stressors at time 1 and health symptoms at time 2, Pearson correlations are presented in Table 14. Poor communication was found to be a variable that is correlated with several health symptoms. There was hardly any association between social support and mental health.

Table 13 MANOVA repeated measures, means, standard deviations and Pearson intercorrelations of the forensic doctors on the subscales of the IES, MBI and CIS at time 1 (lower half) and between the subscales of time 1 and time 2 (bold, upper half)

		T1	T2												
	Subscale	M (SD)	M (SD)	F(df)	p	1	2	3	4	5	6	7	8	9	10	11
1	IES Intrusion	8.9 (8.8)	5.8 (7.1)	6.4 (1,35)	< .05	.61***	.72***	.93***	.15	.17	.27	.30	.24	.22	.12	-.08
2	IES Avoidance	4.1 (5.7)	4.0 (6.4)	.01 (1,35)	NS	.77***	.65***	.92***	.39*	.31*	.42**	.53***	.48**	.37*	.24	-.32*
3	IES Total	13.0 (13.8)	9.9 (12.5)	3.4 (1,35)	NS	.96***	.91***	.71***	.28	.25	.36*	.44**	.38*	.32*	.20	-.21
4	CIS Fatigue	23.0 (12.2)	23.3 (11.0)	.02 (1,48)	NS	.13	.31	.21	.68***	.20	.38**	.62***	.71***	.54***	.23	-.52***
5	CIS Activation	8.0 (3.8)	7.7 (4.1)	.35 (1,49)	NS	.11	.19	.15	.24	.46**	.38**	.49***	.53***	.38**	.51***	-.48***
6	CIS Concentration	13.9 (6.8)	13.8 (7.1)	.05 (1,48)	NS	.38*	.39*	.41*	.32*	.48***	.57***	.40**	.31*	.41**	.26	-.42**
7	CIS Motivation	10.1 (4.5)	10.7 (4.8)	.95 (1,49)	NS	.22	.37*	.30	.55***	.41**	.55***	.67***	.86***	.60***	.53***	-.47**
8	CIS Total	54.7 (21.0)	55.7 (22.6)	0 (1,47)	NS	.27	.43**	.36*	.85***	.57***	.71***	.79***	.73***	.75***	.62***	-.49***
9	MBI Emotional exhaustion	1.7 (1.0)	1.9 (1.1)	1.7 (1,49)	NS	.19	.35*	.27	.45**	.34*	.36*	.43**	.53***	.63***	.65***	-.19
10	MBI Cynicism	1.9 (1.1)	1.8 (1.0)	1.0 (1,49)	NS	.08	.12	.10	.14	.42**	.13	.28	.26	.56***	.63***	-.45**
11	MBI Personal accomplishment	4.2 (.09)	4.2 (.83)	.19 (1,49)	NS	-.03	-.26	-.13	-.52***	-.20	-.33*	-.56***	-.56***	-.40**	-.38**	.57***

* p < .05, ** p < .01, *** p < .001

Table 14 Correlations between acute and chronic stressors at time 1 and psychological distress at time 2

	IES Intrusion	IES Avoidance	IES Total	MBI EE1	MBI CY2	MBI PA3	CIS total	CIS fatigue	CIS motivation	CIS activity	CIS concentration
Number of acute events	.39*	.27	.36*	.48***	.35*	-.20	.45**	.33*	.33*	.44**	.44**
Lack of support of colleagues	-.03	.04	.01	-.10	-.05	-.15	.07	-.09	.12	.11	.22
Lack of support of management	.07	.18	.13	.14	.09	-.07	.18	.18	.23	.06	.11
Poor communication	.24	.39*	.34*	.57***	.43**	-.22	.54***	.54***	.44**	.34*	.39**
Lack of information	.00	.02	.01	.14	.20	-.04	.03	.01	.17	.02	-.05
Insufficient financial reward	.27	.38*	.35*	.33*	.41**	-.23	.38**	.25	.34*	.39**	.42**
Lack of job autonomy	.23	.17	.22	.41**	.43**	-.11	.23	.25	.10	.19	.16
High emotional demands	.35*	.12	.26	.29*	.16	.08	.09	.07	.00	.03	.20

1) MBI EE = Maslach Burnout Inventory Emotional Exhaustion
2) MBI CY = Maslach Burnout Inventory Cynicism
3) MBI PA = Maslach Burnout Inventory Personal Accomplishment

* $p < .05$, ** $p < .01$, *** $p < .001$

5.3.5. Prediction of symptomatology

To determine the predictive factors of the forensic doctors' development of health symptoms, the following hierarchical multiple regression analyses were conducted. In two blocks the predictors were stepwise entered into the equation. To control for symptoms at time 1 the variable measured at time 1 corresponding with the outcome variable was entered in the first block. In the second block the frequencies of acute stressors and chronic stressors (seven subscales of the QEAW) were entered. Separate analyses were conducted for the IES subscales and the total score, the MBI subscales and the CIS total score.

5.3.5.1. Posttraumatic responses.

Table 15 presents the results of the multiple regression analyses of the IES subscales. After controlling for intrusion at time 1, no variables entered in the second block were found to be significant predictors of intrusion. IES intrusion at time 1 explained 41.3% of the variance of intrusion at time 2. IES avoidance at time 2 could be predicted by IES avoidance at time 1 which accounted for 39.2% of the variance. IES total score at time 1 showed to be a significant predictor of IES total at time 2. IES total at time 1 explained 50.0% of the variance.

5.3.5.2. Fatigue.

Table 15 presents the results of the multiple regression analysis of the CIS total scores. Poor communication was found to be a significant predictor of CIS total score at time 2 after controlling for fatigue symptoms at time 1 (CIS-total (58.3% of the variance). Poor communication accounted for an additional 5.1% of the variance.

5.3.5.3. Burnout symptoms.

The results of the multiple hierarchical regression analyses of the MBI subscales are presented in Table 15. MBI emotional exhaustion could be significantly predicted by poor communication, lack of autonomy and lack of support of the supervisor after controlling for emotional exhaustion at time 1 (41.3% of the variance). The three chronic stressors accounted for 12.3%, 8.6% and 4.6% of the variance of emotional exhaustion respectively. After controlling for cynicism symptoms at time 1 lack of autonomy (9.0% of the variance) and poor communication (6.3% of the variance) were found to be a significant

predictor of MBI cynicism at time 2. MBI cynicism at time 1 accounted for 41.1% of the variance. MBI personal accomplishment at time 1 showed to be a significant predictor of MBI personal accomplishment accounting for 34.1% of the variance.

Table 15 Results of stepwise multiples regression analyses of health symptoms (IES, MBI and CIS total) at time 2 (only significant values are displayed)

Outcome	Predictor	Total R^2	Beta	p
IES-in[1]	IES-in	.41	.64	< .001
IES-av[2]	IES-av	.39	.63	< .001
IES-total	IES-total	.50	.71	< .001
CIS-total	CIS-total	.58	.61	< .001
	Poor communication	.63	.28	< .05
MBI-EE[3]	MBI-EE	.41	.46	< .001
	Poor communication	.54	.53	< .001
	Lack of job autonomy	.62	.27	< .01
	Lack of support from supervisor	.67	-.26	< 05
MBI-CY[4]	MBI-CY	.41	.53	< .001
	Lack of job autonomy	.50	.30	< .01
	Poor communication	.56	.26	< .05
MBI-PA[5]	MBI-PA	.34	.58	< .001

1) IES-in = Impact of Event Scale Intrusion
2) IES-av = Impact of Event Scale Avoidance
3) MBI-EE = Maslach Burnout Inventory Emotional Exhaustion
4) MBI-CY = Maslach Burnout Inventory Cynicism
5) MBI-PA = Maslach Burnout Inventory Personal Accomplishment

5.4. Discussion

5.4.1. Present study

This study focused on acute and chronic job stressors in relation to mental health problems in a representative sample of forensic doctors in the Netherlands. The majority of the forensic doctors (83.8%) was confronted with at least one critical incident in the last five years. Confrontations with dead children were rated as most stressful followed by confrontations with young assault victims and young victims of aggression. In this study it was found that forensic doctors may be at risk of developing posttraumatic disturbances (such as PTSD), although

they were not exposed to major disasters. It can be concluded that other acute work stressors evoke posttraumatic stress responses as well.

A substantial minority of the forensic doctors (20%) suffered from severe posttraumatic symptoms after experiencing one or more critical incidents, in particular severe intrusions and avoidances related to the experienced events. Although this finding is in line with results of previous research among other professions, such as ambulance workers (e.g., Clohessy & Ehlers, 1999), this percentage could be an underestimate of the extent of psychological responses. It has been hypothesized that individuals who choose helping roles may have an investment in denying their own vulnerability (Gibbs, Drummond, & Lachenmeyer, 1993). Besides, Horowitz (1976) has theorized that avoidance or denial is an integral part of coping process with severe stress. It may result in an underestimation of the psychological responses to the critical incident, and it may also affect the return rates for distributed questionnaires. Low rates of compliance may mask the extent of the response. Indeed, the resistance of participating in research was found to be highly related to severity of disaster response (Weisaeth, 1989).

Although the number of acute stressors was significantly associated with posttraumatic symptoms, this variable surprisingly appeared not to be a significant predictor of health symptoms one year after the first assessment. Significant predictors of posttraumatic responses at time 2 were trauma-related symptoms at time 1. A cumulative effect in time of acute stressors was not found in this study. The lack of this cumulative effect may be due to the small sample size. Probably the power is too low. In further research this should be analyzed in a larger sample. Another explanation for the fact that no cumulative effect of acute stressors was found could be that the forensic doctors got used to the exposure of acute stressors. Besides the theory of the cumulative effect of acute stressors, there is the opposite hypothesis that states that the more incidents, the more resiliency and consequently the fewer problems. Individuals may experience a significant positive change arising from the struggle with major life crises (Tedeschi & Calhoun, 1996). However, this hypothesis was not confirmed either, since the symptoms appeared to be very stable in time. Stability was the most prominent characteristic of the longitudinal data.

In this study high levels of chronic stressors were also find to be quite common for the work of forensic doctors. In particular, poor communication within the work environment was found to be associated with posttraumatic responses, burnout symptoms and fatigue. This is a relevant finding for the implication of the results. We may conclude that improving job circumstances is more a matter of improving the social climate and enhancing acknowledgement and attention, in short of management of people, than of management of organizational procedures and technical elements. It has been shown that preparing the employees in what they were going to face during critical incidents was useful in preventing health symptoms (Alexander & Wells, 1991).

Forensic doctors were significantly more tired than a reference group. A remarkable proportion (14%) of our sample showed a fatigue level that puts an individual "at risk" for subsequent sick leave or work disability. The percentage of burnout symptoms (20%) was high as well, especially in comparison with the percentage of burnout cases in the general working population of The Netherlands (5.25%, Houtman, Schaufeli, & Taris, 2000). Forensic doctors performed their job in shift work. Shift work in combination with the various acute and chronic stressors created the risk for prolonged fatigue. The frequent contacts with patients in combination with the acute and chronic stressors probably put them at risk for burnout too.

The results of the MANOVA repeated measures showed that the various health symptoms did not changed significantly in time. Only on the subscale intrusion of the IES a significant decrease of symptoms in time was found. This decrease may be due to selective dropout. The doctors who participated at both measurements had significant higher scores at time 1 than those who only participated at time 1. Also, the correlation coefficients and the regression analyses showed that the symptoms were quite stable in time. The best predictor of symptoms at time 2 was corresponding symptoms at time 1. This remarkable stability could be explained by the fact that the sample was a homogeneous group and their job conditions stayed rather equal. Although they have to deal with a variety of incidents, they were able to cope with it reasonably well. Unfortunately, they did not quite recover from earlier incidents, since those who already reported high symptomatology at time 1, still suffered from symptoms at time 2. While we expected a

cumulative effect of acute stressors in time, these new situations did not evoke more symptoms.

This study has some limitations. In research on the consequences of traumatic or critical incidences a low response rate is often common. This is an important issue, because people who refuse to participate in traumatic stress research appear to have more health problems as was mentioned before (Weisaeth, 1989). The response-rate in this study is 64%. Since it is suggested that psychological impact of their work on emergency workers is underreported (Gibbs et al., 1993), such a selection bias would mean that our percentages of health symptoms were underestimated. Another limitation of this study is that it was retrospective. However, a prospective study is hard to realize in the field of trauma research. By definition, traumatic stressors cannot be manipulated.

5.4.2. Practical implications

Alexander and Wells (1991) emphasized the psychoprophylactic role of a good organization and sensitive staff management practices. Jones, Flynn, and Kelloway (1995) demonstrated that the perception of a supportive organization correlated strongly and negatively with the amount of work stress. When implementing a work-place intervention following traumatic events support and acknowledgement from management were found to be of vital importance (Stephens, 1997).

Individual and organizational interventions could be developed to prevent absenteeism or turnover due to stressors at work. Individual interventions are mostly focused on improvement of individual coping styles. Organizational interventions mostly focus on the prevention of stressors caused by the organization (Eriksen, Olff, & Ursin, 2000). Examples are restructuring the working circumstances, flexible working hours, enlargement of control and improvement of communication within the organization (Cooper & Cartwright, 1997). During these organizational interventions attention should be paid to different kind of stressful aspects of the work setting. Also, during structured meetings it is of importance to pay attention to critical incidents and their aftermath (Brom & Kleber, 1989; Van der Velden, Hazen, & Kleber, 1999). Talking with colleagues after a critical incident has been found to be helpful in preventing harmful outcomes (Alexander & Klein, 2001; Stephens & Long, 2000). This study among forensic doctors demonstrated that

organizational aspects, in particular social support at work and communication, are important in handling work-related health symptoms resulting from acute and chronic stressors.

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6. Acute and chronic job stressors among ambulance personnel: Predictors of health symptoms

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Abstract

Objectives. To predict symptomatology (posttraumatic distress, fatigue and burnout) due to acute and chronic work-related stressors among ambulance personnel.

Methods. Data were gathered from 123 ambulance workers in the Netherlands in a longitudinal design. At two measurements they completed standardized questionnaires to assess health symptoms, such as the Impact of Event Scale, the Maslach Burnout Inventory and the Checklist Individual Strength. Acute stressors were assessed with specific questions and chronic work-related stressors were measured with the Questionnaire on the Experience and Assessment of Work.

Results. Most of the ambulance workers had been confronted with acute stressors in their work. They also reported more chronic work-related stressors than a reference group. Of the participants, more than a tenth suffered from a clinical level of posttraumatic distress, a tenth reported a fatigue level that put them at high risk for sick leave and work disability and nearly a tenth of the personnel suffered from burnout. Best predictors of symptomatology at time 2 were lack of social support at work and poor communication, such as being informed about important decisions within the organization.

Conclusions. Ambulance personnel are at risk to develop health symptoms due to work-related stressors. Although, acute stressors are related to health symptoms, such as fatigue burnout and posttraumatic symptoms, it was not found to predict health symptoms in the long term. Main risk factors have to do with social aspects of the work environment, in particular lack of support from the supervisor as well as colleagues and poor communication. When implementing workplace-interventions these social aspects need to be taken into account.

6.1. Introduction

In the field of occupational health psychology researchers have mostly focused their attention on negative effects of long-term work characteristics, in particular chronic work-related stressors, such as job overload, shift work, role conflict and lack of social support. Implications of these sources of work-related stress include the effects on worker satisfaction and productivity, mental as well as physical health, absenteeism, and the potential for employer liability (for a review see, Tennant, 2001). However, the role of acute and intense stressors is often neglected.

Employees working in so-called medium or high-risk professions, such as firefighters, and emergency workers, are often confronted with acute stressors or critical incidents. Firefighters may be exposed to the devastating impact of fire and emergency workers may be confronted with dead or dying people. These professionals may be involved in life threatening situations. Moreover, they are repeatedly exposed to the potentially traumatic events. However, the fact that they might experience symptoms similar to those they assist may be unrecognized (Paton & Smith, 1996).

The focus of most researchers examining types and consequences of traumatic work-place exposures has been on relatively rare events, such as airplane crashes, shipping disasters or earthquakes (Beaton, Murphy, Johnson, Pike, & Corneil, 1998). Research concerning these events has shown that acute stressors may lead to serious mental disturbances, in particular posttraumatic stress disorder (PTSD)(Mitchell & Dyregrov, 1993). In the Fourth Edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) this disorder is characterized by symptoms following exposure to a traumatic stressor. The symptoms are divided into three clusters: re-experiencing of the specific event, avoidance of trauma-related stimuli, and increased emotional arousal (American Psychiatric Association, 1994).

In a study among firefighters exposed to a bush-fire disaster it was found that the disaster was associated with a rise in the prevalence of mental disorders from 2.7% to 22.4%. PTSD was the most common disorder (18%), with major depression, which occurred in 10% of the subjects, being the second most frequent diagnosis (McFarlane & Papay, 1992).

Ursano, Fullerton, Kao, and Bhartiya (1995) examined posttraumatic symptoms and depression in disaster workers exposed to traumatic death after the USS Iowa gun turret explosion. The body-handlers were assessed at 1, 4, and 13 months after the disaster. Intrusive and avoidant symptoms were elevated at all three measurements compared to a control group, and the symptoms decreased in time. For most, recovery appeared to be the norm. However, intrusive and avoidant symptoms persisted in some workers. Approximately 15% of the respondents reported clinically significant levels of symptoms 13 months after the explosion.

From these studies it may be concluded that disasters negatively affect psychological well-being of rescue workers. Although most symptoms decreased in time, results indicated that symptoms could persist for months or even years. How do workers cope with these acute stressors when they are frequently exposed to them? According to Beaton and Murphy (1995), repetitive or frequent exposure to trauma is potentially cumulative and threatening to health and well-being. To examine this effect of repetitive exposure to acute stressors a longitudinal research design is needed. However, until now most research concerning these repetitive acute stressors has had a cross sectional design.

Marmar, Weiss, Metzler, Ronfeldt, and Foreman (1996) suggested that frequent occurring critical incidents which are part of the job can be just as stressful for emergency workers as disaster work. Emergency workers involved in an unsuccessful cardiopulmonary resuscitation were found to suffer from posttraumatic stress reactions. They experienced vivid, involuntary and uncontrollable thoughts, feelings and/or mental images concerning their attempts (Genest, Levine, Ramsden, & Swanson, 1990). Clohessy and Ehlers (1999) showed that a substantial proportion of emergency workers (21%) who were not exposed to major disasters experienced nevertheless distinct symptoms of PTSD. The most common symptoms were intrusive memories, feelings of irritability, sleep problems and a sense of detachment from others. The General Health Questionnaire identified more than half of the emergency workers with these PTSD symptoms as psychiatric cases. The results of this study also pointed to a high level of relatively permanent stressors that were chronically present in the work situation. Examples were time pressure and shift work. They contributed to overall distress and to the

PTSD symptoms. Emergency workers have often to deal with time pressure in their job, especially in life threatening situations. Working under such pressure of time may be stressful. Also working in shifts is found to affect job performance, sleep patterns, and social as well as family life adversely (Monk, 1990).

Because the persistence of posttraumatic symptoms may lead to chronic fatigue, decreased job satisfaction, work absenteeism or early retirement (Hall, Gardener, Perl, Stickney, & Pfefferbaum, 1979), it is important to pay attention to the consequences of acute stressors experienced on a regular basis. In order to get a better understanding of the influence of work-related stressors, researchers should include acute as well as chronic stressors in their study design. However, research concerning both types of stressors is sparse, as Day and Livingstone (2001) stated. They examined the impact of acute and chronic stressors on the health of military personnel. Psychological, behavioral and physical symptoms were associated with acute work-related events, lack of job stimulation, ambiguity and overload. Alexander and Klein (2001) found in a sample of ambulance personnel that emotional exhaustion was associated with less job satisfaction, longer time in service, less recovery time between incidents and more frequent exposure to incidents. A third of the ambulance workers suffered from posttraumatic stress reactions. It can be concluded from these studies that focusing on acute as well as chronic stressors is relevant in research.

In this manuscript we examine the role of acute and chronic stressors in the development of health symptoms in a sample of ambulance workers. These workers are often involved in critical incidents and the direct aftermath. They have to deal with people in panic and distress, and are thereby often confronted with a rather unflattering side of humanity (James, 1988). Research has indicated that ambulance workers suffer from symptoms related to traumatic events (Alexander & Klein, 2001; Clohessy & Ehlers, 1999; Van der Ploeg & Kleber, 2001). Moreover, they experience more chronic stressors in their work than other workers in health service settings (Van der Ploeg & Kleber, 2001). The purpose of this study is to investigate the predictive effect of both acute and chronic stressors on health symptoms, such as posttraumatic reactions, burnout and fatigue. The central research question is: Do acute and chronic work-related stressors predict poor

mental health, in particular posttraumatic stress reactions, burnout and fatigue?

6.2. Method

6.2.1. Subjects

Participants were paramedics and drivers of ten regional ambulance services in the Netherlands. In order to get a representative sample these ambulance services were randomly selected from the total group of 80 services in the Netherlands. Rural as well as urban services were included in the study. At the first measurement, called time 1, 393 questionnaires were distributed by the supervisor of each ambulance service to all personnel of that service. A letter ensuring confidentiality accompanied questionnaires. To encourage honest responding individual survey forms would not be made to the employers, or to the ambulance service companies. The completed questionnaires were sent to the authors using the enclosed return envelope. For anonymity reasons the addresses were not in the possession of the researchers, therefore reminder letters were sent to all respondents two and four weeks after the initial mailing.

The return rate was 56%. Two hundred twenty-one ambulance workers participated at time 1. In the questionnaire the respondents were asked to fill in their name and address if they were willing to participate at the follow-up (time 2). Of the ambulance workers 71% agreed to participate in future research. One year later 156 questionnaires were sent to these respondents. After three reminders (two, four and six weeks after the initial mailing) 123 questionnaires were returned (final response rate 31%).

6.2.2. Measures

The questionnaire at time 1 included questions concerning demographic items, such as sex, age, and marital status. Specific questions about the acute stressors in the work setting of ambulance workers were formulated. Standardized measures were used to get insight into chronic stressors and health symptoms (posttraumatic stress reactions, burnout and fatigue).

6.2.2.1. Acute stressors.

The exposure to acute stressors was examined with questions formulated by the researchers. The respondents were asked how many

incidents that were personally disturbing to them they experienced in the last five years. They were asked to indicate the time passed since their last experienced incident. In order to evaluate this last experienced event they had to describe this event. Furthermore, they were asked to rate how stressful a list of specified acute stressors (13 items) was to them on a scale from 1 (not stressful at all) to 4 (extremely stressful). Examples of stressors in this list were: dealing with psychiatric patients, involved with dying people, confrontation with young victims, etc. These questions about acute stressors were also asked at time 2. Finally, a subscale of the Questionnaire on the Experience and Assessment of Work (Van Veldhoven, Meijman, Broersen, & Fortuin, 1997) (see below) was used to get insight in the presence of emotional demanding situations compared to employees also working in a health service. This subscale labeled high emotional demands, consisted of seven items. An example of an item is: "Is your job emotionally demanding?". Cronbach's alpha at time 1 was .60. More details about this questionnaire will be described in the next paragraph.

6.2.2.2. Chronic stressors

The Questionnaire on the Experience and Assessment of Work (Van Veldhoven et al. 1997) was used to get insight in the presence of common work-related stressors at time 1 and the time 2. This questionnaire was validated in a sample of more than 80,000 people in various working settings in the Netherlands (e.g., industrial, education, and transport sector). The scores of the ambulance workers were compared with those of employees working in various kinds of health services. Depending on the subscale the size of the reference group ranged from 3,409 to 4,355. In line with the purpose of this study, the following subscales of this comprehensive instrument were selected: lack of job autonomy (Cronbach's alpha at time 1 = .88, 11 items e.g., "Do you have influence on the planning of your work?"), lack of support from colleagues (α = .81, 9 items, e.g., "Are your colleagues friendly to you?"), lack of support from the supervisor (α = .89, 9 items, e.g., "May you account on your supervisor when you have difficulties in your work?"), poor communication (α = .88, 4 items, e.g., "Are you informed about important issues in your organization?"), lack of information (α = .83, 7 items, e.g., "Do you receive enough information about the results of your job?"), insufficient financial reward (α = .77, 5

items, e.g., “Do you think your company gives good rewards?”), and physical strains (α = .81, 7 items, e.g., “Is your job physically demanding?”). The items were scored on a four-point scale (1 = always, 4 = never). To interpret the subscales the sum scores were recoded and standardized ranging from 0 to 100. The higher a score, the more the situation was perceived as a stressor.

6.2.2.3. Health symptoms

At time 1 and time 2 the questionnaire consisted of standardized scales to assess and predict the following mental health symptoms: posttraumatic stress symptoms, burnout and fatigue.

The Dutch version of the Impact of Event scale (IES; Horowitz, Wilner, & Alvarez, 1979; Dutch version Brom & Kleber, 1985) was used to determine and predict self-reported symptoms of posttraumatic symptoms of intrusion and avoidance in relation with the last experienced critical incident. The IES has seven items designed to assess intrusion, for example, “I had waves of strong feelings about it”, and eight items to assess avoidance, for example, “I stayed away from reminders of it”. The items are scored on a four-point scale (0 = never, 1 = sometimes, 3 = often, 5 = always). This questionnaire has been used in numerous studies concerning posttraumatic stress reactions (Alexander & Klein, 2001, Chemtob, Tomas, Law, & Cremniter, 1997; Ursano et al., 1995) and is widely recommended as a screening instrument for victims after disasters and other extreme situations (Rahpael, Lundin, & Weisaeth, 1989). The Dutch version was found to have reliable subscales and the structure was similar to the original version (Van der Ploeg, Mooren, Kleber, van der Velden, & Brom, in press). At time 1 the internal consistency was .87 for intrusion, .88 for avoidance and .92 for the total score. A score of 26 or higher is an indication of a clinical level of posttraumatic symptoms (indicative for PTSD, Chemtob et al., 1997). This cutoff score is used in the present study to assess the intensity of posttraumatic stress symptoms.

Fatigue was measured at time 1 and time 2 with the Checklist Individual Strength (CIS; Vercoulen et al., 1994), a 20-item self-report instrument. The CIS covers several aspects of fatigue, such as subjective fatigue (8 items, e.g., “I get tired very quickly”), concentration (5 items, e.g., “Thinking requires effort”), motivation (4 items, e.g., “I feel no desire to do anything”), physical activity (3 items,

e.g., “I don’t do much during the day“) and a total score. Items are scored on a seven-point Likert scale (1 = Yes, that is true to 7 = No, that is not true). Higher scores indicate a higher degree of fatigue. Reliability of the subscales (subjective fatigue, reduced motivation, impaired concentration and lack of physical activity) were .91, .82, .83 and .75 respectively. Cronbach’s alpha for the total score of the CIS was .94. The mean scores on the subscales and the total score of the ambulance workers were compared with those of a representative group of healthy subjects. This comparison group consisted of 53 adults (73% female; mean age was 37.1 years; range 19- 63; Vercoulen, et al., 1996). Besides, a cutoff point (a CIS total score higher than 76) indicating that an individual is at risk for sick leave or disability was used (Bültmann et al., 2000).

The Dutch version of the Maslach Burnout Inventory (MBI; Maslach & Jakson, 1986; Dutch version Schaufeli & van Dierendonck, 2000) was used to predict the burnout symptoms at time 2. This widely used instrument consists of 15 items assessing the three central dimensions of burnout: emotional exhaustion (5 items, “I feel burned out from my job”), cynicism (4 items “I am less enthusiastic about my job“) and personal accomplishment (6 items “I deal very effectively with problems my job ”). The items were scored on a seven-point scale (0 = never, 6 = always). Cronbach’s alpha was .86, .76 and .70 at time 1 for the three subscales respectively. Cutoff scores were used to assess risk for burnout in ambulance workers. The reference group was a random sample of the Dutch working population (N = 1,129; Schaufeli & van Dierendonck, 2000).

6.2.3. Statistical analyses

Several statistical analyses have been performed in order to answer the research questions. To test whether there is a difference in the presence of chronic stressors as well as a difference in fatigue symptoms between the ambulance workers and the reference group one-sample t-test have been conducted. Multivariate analyses of variance with repeated measures design have been conducted to investigate whether there is a difference in reported psychological health symptoms in time. To determine the predictive factors of ambulance workers’ development of health symptoms, hierarchical multiple regression analyses have been conducted. In two blocks the predictors

were stepwise entered into the equation. To control for symptoms at time 1 the following variables were entered in the first block: posttraumatic stress symptoms (IES total), emotional exhaustion (MBI EE) and fatigue (CIS total). Emotional exhaustion was the only subscale of the MBI entered in the equation, because this is considered the most important dimension of burnout. In the second block the acute (number of critical incidents and the subscale high emotional demands of the QEAW) and chronic stressors (subscales of the QEAW) were entered. Separate analyses were conducted for the IES subscales and the total score, the MBI subscales and the CIS total score.

6.3. Results

6.3.1. Demographic characteristics of the ambulance workers

Most of the ambulance workers were men (n = 189, 86%). Mean age was 39.8 years (SD = 7.1). Most of them were married 74.4%, 12.8% cohabited, 8.2% was single, and 4.6% was divorced. The majority had one or more children living with their parents (n = 145, 65.9%). Mean working experience at the public health service at time 1 was 9.3 (SD = 7.0) years. Most of the respondents (90.9%) worked full-time. Although the questionnaire was sent to an equal number of paramedics and drivers, the majority of the participants were paramedics (57.5%).

6.3.2. Acute stressors at time 1

At time 1 85% of all ambulance workers experienced one or more critical incidents in the last five years. The descriptions of the experiences could be divided in six categories: examples of those experiences were events involving dead children (25%), followed by medical emergencies (23%), severe accidents or injuries (21%), acts of violence or threats (13%), suicide (attempts) (10%) and organizational problems (i.e., lack of acknowledgement of a superior after a critical incident, or false or insufficient information about the site of the accident or the condition of the victims) (8%). The majority (66%) experienced the last disturbing incident less than one year ago. The mean time past since the last experienced incident was 14.3 months (SD = 16.8). The mean number of reported events was 3.7 (SD = 1.5). Almost half of the respondents (45%) experienced four or more critical incidents in the previous five years. Furthermore, the ambulance workers

rated how stressful a list of specified acute stressors was to them. The three most stressful events the ambulance workers were exposed to were: confrontation with deceased children (M = 2.7, SD = .90), confrontation with people in despair (M = 2.4, SD = .54), and confrontation with children of sexual abuse (e.g., assault or rape) (M = 2.3, SD = .96).

Compared to the reference group the ambulance workers scored significantly higher on the subscale high emotional demands of the Questionnaire on the Experience and Assessment of Work (QEAW) at time 1. This indicates that the ambulance perceived their job as more emotional demanding than employees of various health services. (For statistical details see Table 16).

6.3.3. Chronic stressors at time 1

With regard to chronic work-related stressors the ambulance workers differed from the reference group at time 1 on all included subscales with exception of the subscale lack of information of the QEAW. The ambulance workers scored higher than the reference group, which means that they reported more chronic work-related stressors (see Table 16).

Table 16 Means and standard deviations of ambulance personnel and a reference group on the Questionnaire on the Experience and Assessment of Work

	Ambulance workers (N = 221)		Reference groups					
Subscales of QEAW	M	SD	M	SD	N	t	df	p
Poor communication	52.2	21.2	47.7	20.7	3656	3.3	220	< .01
Insufficient financial reward	54.3	21.6	50.2	23.1	3409	2.8	218	< .01
High emotional demands	39.5	9.7	34.4	14.9	4171	7.7	220	< .001
Lack of information	48.6	16.6	49.3	18.6	3850	-.61	220	NS
Lack of support from colleagues	25.6	11.4	22.0	13.9	3953	4.7	220	< .001
Lack of support from supervisor	32.6	17.2	23.1	17.6	4316	7.4	220	< .001
Physical strains	40.0	15.4	26.4	21.1	4172	13.2	220	< .001
Lack of job autonomy	57.1	17.7	42.8	17.9	4355	11.9	219	< .001

6.3.4. Health symptoms

6.3.4.1. Posttraumatic responses

The ambulance workers who indicated that they experienced at least one critical incident filled in the IES (at time 1 n = 187 and at time 2 n = 112). Means and standard deviations of the IES of those who

participated at both time-points are presented in Table 17. MANOVA repeated measures showed no significant differences between the scores at time 1 and at time 2.

According to Chemtob et al. (1997), a score of 26 or higher is an indication of a clinical level of posttraumatic distress (indicative for PTSD). From those who indicated at time 1 that they were exposed to at least one critical incident in the last five years 12% (n = 22) suffered from a clinical level of distress. At time 2 13% (n = 15) suffered from this level of posttraumatic distress.

6.3.4.2. Fatigue

Means and standard deviations on the CIS at both measurements are presented in Table 17. MANOVA repeated measures showed no differences in time on the CIS.

The ambulance workers differed from the reference group at time 1 on the following subscales: motivation ($t(211) = 3.5$; $p < .01$), physical activity ($t(213) = 4.2$; $p < .001$), concentration ($t(211) = 4.8$; $p < .001$), and the total score ($t(210) = 3.2$; $p < .01$). The ambulance workers significantly scored higher, indicating that they reported more symptoms. According to Bültmann et al. (2000), a score > 76 on the total score of the CIS is an indication of a fatigue level that puts the individual at high risk for subsequent sick leave or work disability. In this sample 10% (n = 21) scored above the cutoff point of the CIS at the time 1.

6.3.4.3. Burnout

Means and standard deviations at both measurements are presented in Table 17. MANOVA repeated measures indicated a significant difference on the subscale cynicism in time. At time 2 the ambulance personnel reported more cynicism than at time 1.

According to the criterion of Schaufeli and van Dierendonck (2000), almost 12% scored (n = 26) high on exhaustion, almost 18% (n = 39) scored high on cynicism and 16% (n = 36) scored low on competence at time 1. Of the ambulance workers 8.6% (n = 19) met the criteria of risk for burnout. In Table 17 the interrelations between the subscales of the IES, CIS and MBI are presented. In the upper half of the matrix the interrelations between time 1 and time 2 are presented and in the lower half of the matrix the interrelations between the subscales at time 1 are given.

Table 17 MANOVA repeated measures, means, standard deviations and Pearson intercorrelations of the ambulance personnel on the subscales of the IES, MBI and CIS at time 1 (lower half) and between the subscales of time 1 and time 2 (bold, upper half)

	T1	T2													
Subscale	M (SD)	M (SD)	F	p	1	2	3	4	5	6	7	8	9	10	11
1 IES Intrusion	6.5 (7.0)	7.4 (7.7)	1.6	NS	.56***	.40***	.52***	.19	.22*	.38***	.09	.25*	.27**	.20*	-.24*
2 IES Avoidance	3.5 (5.6)	4.4 (6.4)	1.8	NS	.72***	.46***	.51***	.31**	.26**	.40***	.16	.31**	.41***	.22*	-.18
3 IES Total	10.1 (11.9)	11.8 (13.1)	2.2	NS	.93***	.92***	.56***	.27**	.26**	.42***	.13	.31**	.37***	.23*	-.23*
4 CIS Fatigue	18.8 (9.4)	19.9 (11.8)	1.1	NS	.23**	.37***	.32***	.47***	.37***	.43***	.40***	.49***	.41***	.30**	-.32***
5 CIS Activation	7.7 (3.8)	7.7 (4.6)	.00	NS	.13	.23**	.19**	.50***	..41***	.18*	.31**	.27**	.09	.17	-.38***
6 CIS Concentration	11.9 (5.9)	12.9 (7.0)	2.9	NS	.23**	.27***	.27***	.67***	.44***	.50***	.36***	.45***	.32***	.22*	-.34***
7 CIS Motivation	9.2 (4.5)	9.7 (5.5)	1.2	NS	.24**	.36***	.32***	.72***	.64***	.60***	.33***	.33***	.23*	.22*	-.43***
8 CIS Total	47.8 (20.3)	50.7 (25.7)	1.7	NS	.25**	.37***	.33***	.92***	.70***	.82***	.84***	.48***	.41***	.28**	-.42***
9 MBI Emotional exhaustion	1.2 (0.89)	1.3 (1.0)	3.4	NS	.29***	.30***	.32***	.50***	.16***	.40***	.38***	.46***	.65***	.30**	-.17
10 MBI Cynicism	1.1 (0.88)	1.4 (1.1)	11.9	< .01	.20**	.31***	.27***	.45***	.27***	.30***	.38***	.43***	.62***	.59***	-.33***
11 MBI Personal accomplishment	4.4 (0.87)	4.5 (0.85)	.07	NS	-.22**	-.21**	-.23**	-.44***	-.42***	-.45***	-.46***	-.52***	-.26***	-.39***	.59***

*p < .05, ** p < .01, *** p < .001

6.3.5. Relation between acute and chronic stressors and mental health

In order to get insight in the association between both kinds of stressors at time 1 and health symptoms at time 2, Pearson correlations are presented in Table 18. Lack of social support from colleagues as well as lack of social support from the supervisor were found to be associated with almost all health symptoms. Insufficient financial reward was not associated with any of the health symptoms. The frequency of acute stressors was related to fatigue, burnout symptoms and posttraumatic stress reactions.

6.3.6. Prediction of symptomatology

6.3.6.1. Posttraumatic responses

Table 19 presents the results of the multiple regression analyses of the IES subscales. After controlling for symptoms at time 1 no variables entered in the second block were found to be significant predictors of intrusion. IES total score at time 1 explained 30.7% of the variance of intrusion at time 2. After controlling for symptoms at time 1 (IES total explained 21% of the variance), IES avoidance at time 2 could be predicted by poor communication that accounted for 9% of the variance. A further 3% of the variance was explained by high emotional demands. In total 33% of the variance of IES avoidance was explained. Poor communication at time 1 showed to be a significant predictor of IES total after controlling for symptoms at time 1 (IES total accounted for 30% of the variance). Poor communication accounted for an additional 5% of the variance.

Table 18 Pearson correlations between acute and chronic stressors at time 1 and psychological distress at time 2

	CIS-fat	CIS-con	CIS-mot	CIS-act	CIS-tot	MBI-EE	MBI-CY	MBI-PA	IES-in	IES-av	IES-tot
Number of events	.18	.15	.16	.15	.19*	.30**	.20*	-.18	.33***	.26**	.32**
Lack of social support from colleagues	.28**	.39***	.34***	.35***	.38***	.29**	.27**	-.42***	.19*	.15	.19
Lack of social support from supervisor	.39***	.40***	.40***	.32***	.43***	.41***	.40***	-.34***	.32**	.24*	.31**
Poor communication	.18*	.09	.19*	.05	.15	.26**	.12	-.09	.15	.31**	.23*
Insufficient financial reward	.03	.12	-.02	.04	.05	.09	-.05	.11	.15	.09	.13
Lack of job autonomy	.18	.25**	.23*	.17	.22*	.25**	.18	-.28**	.22*	.11	.18
High emotional demands	.16	.17	.11	.12	.17	.27**	.26**	-.14	.23*	.32**	.29**
Physical strains	.24**	.27**	.15	.09	.23*	.35***	.16	-.10	.33***	.23*	.31**

*p < .05, ** p < .01, *** p < .001

6.3.6.2. Burnout symptoms

The results of the multiple hierarchical regression analyses of the MBI subscales are presented in Table 19. MBI emotional exhaustion could be significantly predicted by poor communication and physical strains after controlling for symptoms at time 1 (significant were MBI emotional exhaustion (44% of the variance) and IES total score (additional 2%)). These two chronic stressors accounted both for 3% of the variance of emotional exhaustion. After controlling for symptoms at time 1 lack of social support from the supervisor was found to be a significant predictor of MBI cynicism at time 2. Emotional exhaustion at time 1 and lack social support from the supervisor accounted both for 8% of the variance. Lack of social support from colleagues and lack of social support from the supervisor showed to be significant predictors of MBI personal accomplishment after controlling for symptoms at time 1 (CIS total score and IES total score). Lack of social support from colleagues accounted for an additional 7% of the variance and lack of social support from the supervisor for 2% after CIS total score (19% of the variance) and IES total (an additional 4% of the variance).

6.3.6.3. Fatigue

Table 19 presents the results of the multiple regression analysis of the CIS total scores. Lack of social support from the supervisor was found to be a significant predictor of CIS total score at time 2 after controlling for symptoms at time 1 (CIS-total (24% of the variance) and IES total score (an additional 6% of the variance). Lack of social support from the supervisor accounted for an additional 3% of the variance.

Table 19 Results of stepwise multiple regression analyses of health symptoms (IES, MBI and CIS total) at time 2

Outcome	Step	Predictor	Total R^2	Beta	SE	p
IES-in[1]	1	IES-tot	.31	.56	.06	< .001
IES-av[2]	1	IES-tot	.21	.41	.05	< .001
	2	Poor communication	.30	.27	.03	< .01
	3	High emotional demands	.33	.20	.07	< .05
IES-tot[3]	1	IES-tot	.30	.55	.10	< .001
	2	Poor communication	.35	.22	.05	< .05
MBI-EE[4]	1	MBI-EE	.44	.53	.09	< .001
	2	IES-tot	.46	.14	.008	.075
	3	Poor communication	.49	.16	.003	< .05
	4	Physical strains	.52	.17	.005	< .05
MBI-CY[5]	1	MBI-EE	.08	.16	.12	.13
	2	Lack of support from supervisor	.16	.31	.01	< .001
MBI-PA[6]	1	CIS-tot	.19	-.19	.004	.060
	2	IES-tot	.23	-.17	.007	< .05
	3	Lack of support from colleagues	.30	-.23	.008	< .05
	4	Lack of support from supervisor	.32	-.20	.005	< .05
CIS-tot[7]	1	CIS-tot	.24	.30	.12	< .01
	2	MBI-EE	.30	.22	2.81	< .05
	3	Lack of support from supervisor	.33	.22	.16	< .05

1) IES-in = Impact of Event Scale - Intrusion
2) IES-av = Impact of Event Scale - Avoidance
3) IES-tot = Impact of Event Scale - Total
4) MBI-EE = Maslach Burnout Inventory - Emotional Exhaustion
5) MBI-CY = Maslach Burnout Inventory -Cynicism
6) MBI-PA = Maslach Burnout Inventory - Personal Accomplishment
7) CIS-tot = Checklist Individual Strength - Total

6.4. Discussion

This study focused on acute and chronic job stressors in relation to various mental health problems in a representative sample of ambulance service personnel. A substantial proportion of the ambulance workers (85%) was confronted with at least one critical incident in the last five years. Incidents involving children and dealing with sad and

hopeless patients were rated as most stressful. A substantial minority of the emergency workers (12%) suffered from severe posttraumatic symptoms after experiencing one or more critical incidents, in particular severe intrusions and avoidances. In line with earlier studies (Clohessy & Ehlers, 1999; Marmar et al., 1996), the findings indicate that emergency workers may be at risk of developing PTSD, even if they are not exposed to major disasters.

Although the number of acute stressors was significantly associated with posttraumatic symptoms, this variable appeared not to be a significant predictor of health symptoms one-year after the first assessment. High emotional demands, for instance, experienced at time 1 significantly predicted avoidances at time 2. Other significant predictors of posttraumatic responses at time 2 were poor communication at time 1 and earlier reported symptoms of avoidances and intrusions. Various other studies (Kleber & Brom, 1992; Van der Kolk, McFarlane, & Weisaeth, 1996) have concluded that traumatic events may have long-term and serious consequences for mental health. Based on the correlations between health symptoms of time 1 and time 2, MANOVA (repeated measures) as well as the results of the multiple regression analyses, it may be concluded that reported health symptoms appear to be stable in time. This may confirm the conclusion that traumatic events, but also chronic stressors have enduring consequences for psychological health.

A remarkable proportion of ambulance workers also reported fatigue. They were significantly more tired than a reference group. A tenth of our sample showed a fatigue level that puts an individual “at risk” for subsequent sick leave or work disability. The percentage of risk for burnout (8.6%) was reasonably high as well, especially in comparison with the percentage of burnout cases in the general working population of the Netherlands (5.25%) (Houtman, Schaufeli, & Taris, 2000).

The results of the MANOVA repeated measures showed that the various health symptoms were stable in time. Only on the subscale cynicism of the MBI a significant increase of symptoms in time was found. The best predictors of symptoms at time 2 were symptoms at time 1. This stability could be explained by the fact that the sample is a rather homogeneous group and their job conditions stay rather equal.

Although they have to deal with a diversity of incidents, most ambulance workers are able to cope with these events reasonably well. They appreciate their profession, in particular. Taking care for patients may be rewarding and satisfying which makes it possible to cope with the negative aspects of the job. Earlier research on ambulance personnel has indicated that providing care for others is personally gratifying and rewarding (James & Wright, 1991). Alexander and Klein (2001) reported indeed high levels of job satisfaction among ambulance workers. However, a distinction between satisfaction with regard to the job and satisfaction with regard to the organization can be made. Expressed job satisfaction does not mean that the organization does not have to concern about the well-being of its employees. Dissatisfaction with organizational aspects has a price: a price to be measured in terms of the levels of general psychopathology, burnout and posttraumatic symptoms.

In this study high levels of chronic stressors were quite common in ambulance workers. These stressors showed to be significant predictors of health symptoms. Especially social aspects of the work environment were important predictors, in particular lack of social support from colleagues, lack of social support from the supervisor, and finally poor communication. These factors were found to be significant predictors of posttraumatic response, burnout symptoms and fatigue. Therefore, improving job circumstances is more a matter of improving the social climate, and enhancing acknowledgement as well as attention, in short management of people, in stead of management of organizational procedures and technical elements. Taking part in decision-making, and being informed about important issues within the organization should be adequately arranged in order to prevent health symptoms.

This study has some limitations. In research on the consequences of traumatic or critical incidents the response rate is often low (Weisaeth, 1989). This is an important issue, because people who refused to participate in traumatic stress research have been found to have more health problems (Weisaeth, 1989). The response rate at time 1 in this study is 56%. Since it is suggested that psychological impact of their work on emergency workers is underreported (Gibbs, Drummond, & Lachenmeyer, 1993), such a selection bias would mean that the percentages of health symptoms are underestimated. Besides, it was not possible to send a follow up questionnaire to all ambulance

workers. Consequently, there may be some selection bias, because only those who indicated at time 1 that they were willing to participate were included in the second measurement. Another limitation of this study is that it is retrospective. However, a prospective study is hard to realize in the field of trauma research. A time consuming solution would be to examine ambulance workers who have just started with their job and follow them during a period of some years to investigate which factors are predictive for health symptoms.

Several questionnaires measuring health symptoms were used in the present study. From the Pearson intercorrelations between the subscales of the IES, MBI and CIS may be concluded that these instruments have good psychometric properties in terms of convergent and discriminative validity. They also appeared quite stable in time (test-retest reliability).

Since in various European countries the employer is obliged by law to take care of employees who have been affected by critical incidents, it is important to have insight in the association between acute and chronic stressors in relation to the well-being of the employee. This insight is necessary for developing appropriate interventions to prevent work-related stress symptoms. Until now, these interventions have focused either on stress management or on trauma counseling (Van der Velden, Hazen, & Kleber, 1999). From our research is known that both acute and chronic stressors have their impact on the well-being of the worker. Therefore, occupational interventions and care after trauma should be integrated.

It has been shown that preparing the helpers in what they are going to face is useful in preventing health symptoms (Alexander & Wells, 1991). During training attention should be paid to different kind of stressful aspects of the work and during structured meetings in the work setting it is of importance to pay attention to critical incidents and their aftermath (Brom, Kleber, & Defares, 1989; Van der Velden et al., 1999). Talking with colleagues after a critical incident appears to be helpful in preventing harmful outcomes (Alexander & Klein, 1991; Stephens & Long, 2000). Alexander and Wells (1991) emphasized the psychoprophylactic role of a good organization and sensitive staff management practices. Jones, Flynn and Kelloway (1995) demonstrated that the perception of a supportive organization correlates strongly and

negatively with the amount of work stress. When implementing a work-place intervention following traumatic events support and acknowledgement from management are of vital importance (Stephens, 1997). This study demonstrated that organizational aspects, in particular lack of social support at work and poor communication, are of vital importance in the development of work-related health symptoms.

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7. General discussion and conclusions

7.1. Introduction

Central in this thesis were the work-related acute stressors and their interplay with chronic job stressors. Several occupational groups are at risk to experience critical incidents in their workplace. For example, bank employees are likely to become a victim of armed hold-ups, and those employed in mining, construction, and oil exploration may experience serious industrial accidents. All these workers are directly exposed to critical incidents, but even those indirectly involved with traumatic accidents, such as forensic physicians and ambulance workers, are at risk.

Research in the field of traumatic stress has shown that exposure to acute work-related stressors, such as disasters and acts of violence, has a negative impact on the psychological health of the professionals involved. Employees may suffer from posttraumatic symptoms, such as intrusions and avoidances, and from characteristic emotions, such as anxiety, anger and feelings of guilt. For some it may lead to long-term psychological difficulties, such as posttraumatic stress disorder (PTSD), depression or substance abuse. For instance, Taylor and Frazer (1982) reported that body handlers suffered from emotional distress for over 20 months after an airplane accident.

Studies in the field of occupational health psychology have shown that chronic job stressors such as work overload, poor communication, role ambiguity, and lack of support from colleagues and management, may lead to dissatisfaction, poor psychological health (e.g., burnout, fatigue) and eventually to absenteeism and employee turnover (Maslach, Schaufeli, & Leiter, 2001; Tennant, 2001).

The studies in this thesis focused on the consequences of both traumatic events and chronic job stressors for the psychological health of workers in medium or high-risk professions. This particular study is unique because we have combined knowledge on traumatic events and on chronic job stressors in one research project. Until now, most studies have concentrated either on acute stressors or on chronic stressors. The consequences of acute stressors are a highly neglected subject of study in the field of organizational and health psychology. Handbooks on organizational health psychology have paid little attention to the impact of acute stressors. For example, in the Handbook of Work and Health Psychology (Schabracq, Winnubst, & Cooper, 2003) only one chapter

(Kleber & van der Velden, 2003) deals with acute stressors at work in contrast to 21 chapters addressing chronic “common” work stressors (e.g., work overload, lack of autonomy, insufficient information), their impact on the psychological health of the worker, and workplace intervention strategies to reduce distress. According to Gibbs, Drummond, and Lachenmeyer (1993), this may be because organizational stressors seem easier to ameliorate than the nature of an extreme event or the stress dealing with these events. In the field of clinical psychology, the consequences of chronic work-related stressors have also been neglected. The focus in this discipline is mostly on psychological disorders (e.g., anxiety disorders, personality disorders, clinical depression), rather than on “common” work-related stressors. Work is a rather neglected dimension (Van der Kolk, McFarlane, & Weisaeth, 1996). In our opinion it is important to focus on both types of stressors, because exposure to both acute and chronic job stressors may have an impact on the psychological health of workers, resulting in, for example, burnout, fatigue and depression.

7.2. Research questions

The subjects studied in this research project were forensic physicians and ambulance workers. These workers are frequently confronted with acute stressors in their work setting and work in organizations in which chronic job stressors are often present. In this thesis the following research questions were central:

1. What is the impact of acute work stressors on the psychological health of workers in medium or high-risk professions?
2. What are the consequences of chronic stressors on psychological health?
3. How do acute and chronic job stressors interplay with regard to the psychological health of these workers?

Besides these three main research questions, we also explored: 1) which incidents are most disturbing for the two study groups; 2) the validity and reliability of the major instrument used to assess posttraumatic responses in all our studies; 3) the possible cumulative effect of acute stressors; 4) the level of chronic stressors in both groups of workers and 5) whether acute and chronic job stressors predict poor psychological health.

7.3. Content of this chapter

This last chapter is divided into four parts: Part I Acute stressors and consequences of exposure to them. Part II Chronic job stressors and consequences of exposure to them. Part III Integration of knowledge on acute and chronic job stressors. Part IV Methodological issues and Implications.

Part I focuses on acute stressors in the work of forensic physicians and ambulance workers and addresses the following research questions: 1a) Which kind of acute stressors are both samples exposed to? 1b) Is the Impact of Event Scale (one of the main instruments used in this research project) a valid and reliable instrument to measure posttraumatic stress symptoms? 1c) What is the prevalence of posttraumatic responses in both groups (this is the first main question mentioned above)? 1d) Is there a the cumulative effect of acute stressors.

In Part II the central theme is chronic job stressors in our two study groups. The following questions are addressed: 2a) Which chronic stressors are both forensic physicians and ambulance workers exposed to in their work, followed by the second main research question of this thesis; 2b) What are the consequences of chronic stressors for psychological health?

In Part III, findings on acute and chronic job stressors are integrated and the third main research question is discussed: 3a) How do acute and chronic job stressors interplay with regard to the psychological health of these workers? In addition, we explore: 3b) Which stressors (acute and chronic) are significant predictors of poor psychological health?

Part IV discusses methodological issues, future research and practical implications. Special attention is paid to prevention and intervention strategies to reduce emotional distress after exposure to critical incidents.

7.4. Part I: Acute stressors

7.4.1. Nature of acute stressors

One aim of this research project was to gain better insight in the nature of acute stressors both types of professionals were exposed to in their jobs, although it is known that dramatic and painful events are

quite common in their type of work. In chapters 3 and 4 we found that the vast majority of the forensic physicians and the ambulance workers were exposed to at least one critical incident in the previous five years.

Major incidents were situations involving children. For example, an ambulance worker described a car accident in which a child died, because his grandfather did not see the child playing on the access to the garage. The grandparents felt guilty and devastated about the accident. For the ambulance worker it was hard to cope with the situation with the dead boy laying on the ground surrounded by his severely distressed grandparents. Nothing could be done for the boy, which created feelings of powerlessness and sadness in the ambulance worker. In another example, a forensic physician was involved in the discovery of a dead child. This child looked like her own daughter, was wearing similar cloths, was of the same age and had the same hair color. The night after this experience the physician could not sleep because images of her daughter came into her mind. During that night she often went to the room of her daughter to check whether she was all right.

These two examples of situations involving children concur with other reports; especially situations with victimized children are very stressful (e.g., Alexander & Klein, 2001; Clohessy & Ehlers, 1999; James, 1988; Van der Ploeg, Dorresteijn, van der Velden, & Kleber, 2001). According to Janoff-Bulman (1989, 1992), these kinds of experiences shatter the basic assumptions an individual holds about the world. The world is originally considered as benevolent: children are not supposed to be the victim of something dreadful; they will live longer than us and we should to protect them from danger.

Identification with the victim also plays a role. It is known that identification with the victim is related to additional symptoms in health care workers (Ursano, Fullerton, Vance, & Kao, 1999). It raises awareness that one's own loved ones may become victimized. Assumptions about the benevolent word, and the illusion of invulnerability of oneself and others ("it does not happen to me") may be shattered, creating feelings of fear and uncertainty (Janoff-Bulman, 1989, 1992). These basic assumptions have to be rebuilt and revised: integrating the event into a view of the world will restore feelings of

security and invulnerability, as is stated in cognitive theories on coping with trauma (see chapter 1).

Our forensic physicians also reported that detainees sometimes threatened them when they made a medical examination. This is an example of a situation in which they are directly confronted with the stressor. The forensic physician is the target of violence and aggression, whereas in most situations they and ambulance workers are generally indirectly involved with confrontations. They mostly witness the implications of violence and aggression and have to provide professional help to victims directly confronted with the critical incident. Traditionally, it was thought by most authors on traumatic stress that only victims of direct confrontations were liable to develop characteristic posttraumatic symptoms (such as intrusions and avoidances), but professionals witnessing traumatic events may also develop such symptoms (Mitchell & Dyregrov, 1993).

7.4.2. Psychometric properties of the Impact of Event Scale

Horowitz, Wilner, and Alvarez (1979) developed the Impact of Event Scale (IES) to measure the two main characteristic responses (intrusions and avoidances) of victims after traumatic events. The Dutch version of the IES (Schokverwerkingslijst; Brom & Kleber, 1985) is one the main instruments used in the current research project.

We chose this questionnaire because it does not exclusively focus on a disturbed process of coping. Our view was not a pathological one, because our main focus was on relative levels of posttrauma adjustment. We investigated representative groups of employees (“healthy” and “unhealthy” professionals), and were not studying in posttraumatic stress disorder as such. Posttraumatic responses (such as intrusions and avoidances) are seen in the theoretical perspective underlying the IES as principally normal reactions after exposure to abnormal circumstances (Creamer, 1995; Kleber, 1997).

The IES is often used in research on the impact of traumatic events. Although some studies (using exploratory factor analysis) indicated a stable structure of two dimensions, few studies have employed confirmatory factor analysis (CFA). CFA is the most appropriate statistical technique to test the hypothesized structure or dimensions of a theoretically constructed instrument, such as the IES. We investigated the structure of the IES in 1,588 victims of different

kinds of traumatic events. Our samples consist of 1) participants who experienced a traumatic event at work; 2) participants who survived the Second World War; and 3) participants who were victims of a road accident or a shipping disaster. This secondary analysis enables to investigate whether the responses were the same across various kinds of events.

The original structure, such as postulated by Horowitz et al. (1979) was replicated using the Dutch version of the IES, which makes comparison with other (inter)national studies possible. Moreover, the IES had a robust structure across the three samples, indicating that the responses of the participants were similar and that the structure of the adaptation process of trauma victims is also similar.

In addition, conclusions about the discriminative validity of the IES may be drawn from cross sectional studies on forensic physicians (chapter 3) and ambulance personnel (chapter 4). These two studies present correlations between the IES, the Maslach Burnout Inventory (MBI) and the Checklist Individual Strength (CIS). The results show small to moderate relationships between all reported symptoms. There was some overlap between posttraumatic stress symptoms on the one hand and burnout and fatigue on the other. The IES clearly measured a different construct than the burnout and fatigue inventories. In general, it may be concluded that the IES is a sound and valuable instrument to measure posttraumatic responses after various types of traumatic events.

7.4.3. Prevalence of posttraumatic symptoms

The first research question in this thesis was: “What is the impact of acute work stressors on the psychological health of workers in medium or high-risk professions?” In chapters 3 and 4 we concluded that a substantial minority of forensic physicians and ambulance workers suffered from symptoms as a consequence of exposure to traumatic events. About 15% of the forensic physicians suffered from a clinical level of posttraumatic symptoms, in particular severe intrusions and avoidances. About 10% of the ambulance workers suffered from a clinical level of posttraumatic responses, indicative for posttraumatic stress disorder.

Are we to conclude that many workers suffered from severe symptoms, or that most workers of both samples are able to cope with

the critical incidents? Although 10-15% suffered from distress, the majority in both groups is free from serious symptoms. However, there are no strict criteria about what is a “lot”. In the light of the hypothesis that professional helpers are somehow immune from suffering the same sort of distress (i.e., posttraumatic reactions) as those they are helping (Bamber, 1994), we may conclude that 10- 15% suffering from clinical distress is a substantial proportion of the workers.

Unfortunately, it was not possible to compare the results of our study on forensic physicians with data from other studies, because, as far as we know, no comparable studies have been conducted in this group. However, we could compare our results in ambulance workers with two British studies, which revealed a lower prevalence rate of posttraumatic stress reactions in our ambulance workers. Clohessy and Ehlers (1999) reported that 21% of their British ambulance workers met the DSM-III-R criteria for posttraumatic stress disorder, and Alexander and Klein (2001) reported that about 30% of their ambulance personnel suffered from serious posttraumatic stress symptoms.

To examine the differences in the prevalence rates, we compare our study with both British studies in detail. Some important issues in research on traumatic stress, such as response rate, moment of measurement, questionnaires, can be addressed.

First, there are methodological differences between these three studies. For example, Clohessy and Ehlers (1999) used the Posttraumatic Stress Symptom Scales (PSS; Foa, Rigges, Dancu, & Rothbaum, 1993), a self-report questionnaire with good validity. But the use of a different questionnaire is not sufficient to explain why we had a lower percentage of posttraumatic stress reactions, because the PSS has good concurrent validity with other measures, including the Impact of Event Scale.

Alexander and Klein (2001) also determined the severity of the symptoms with the IES, but they used a cutoff score of 20 or higher to indicate a high level posttraumatic stress symptoms compared with a cutoff score of 26 or higher used in our study. Even using the same cutoff score, the prevalence of symptoms in our study is still lower (16%). Moreover, in the Alexander and Klein study the participants had experienced a personally disturbing incident in the previous 6 months compared with the previous five years in our study. Elapsed time passed

between the incident and time of questionnaire completion may be important in determining the prevalence of symptoms. However, analysis of the relationship between time passed and the total score on the IES did not confirm this hypothesis; the correlation was almost zero (r = .01, NS).

In the field of traumatic stress studies the timing of research is an important issue. Time will pass since the critical incidents and the specific moment of research may effect on the prevalence of symptoms found. The process of coping with critical incidents is characterized by oscillation between intrusions and avoidances (Horowitz, 1976). The victim may have either strong intrusive thoughts about the experience, or tries to avoid recalling the experience because the emotions become too intense. If a respondent is (too) occupied with avoidance, this could affect research results.

Although the response rate might explain the difference between our study and the British studies, analysis of the response rates of both British studies gave an ambiguous picture. The response rate in our study was 56%. Clohessy and Ehlers claimed that they achieved a response rate 57%, but in this British study questionnaires were only sent to a selective sample. The researchers did not send a questionnaire to all personnel of the service selected for the research, but only to those who showed specific interest in the project, which resulted in an actual response rate of 45%. It can be speculated that the two main influences on self-selection are: 1) emergency workers with posttraumatic stress disorder are more willing to participate than those without, because they regard the study as important (overestimation), and 2) some emergency workers with the disorder may not return the questionnaire fearing that their job may be at risk if their problems are discovered. The response rate in the Alexander and Klein study was 69%. Thus, the fairly similar response rates are not likely to explain the difference between the results of the three studies.

Another explanation for the differences between the studies may be the characteristics of the studied sample. In the study of Alexander and Klein (2001) 64% of the respondents were technicians compared with 32% in the study by Clohessy and Ehlers and 42% in our study. Technicians have less occupational skills to deal with the patients, which could result in more difficulties in coping with acute stressors. If this

explanation is true, our sample should consist of fewer technicians than both British studies; thus, this does not provide a satisfying explanation.

The differences between British and Dutch ambulance workers are probably more complex. Societal and cultural environment or differences in education programs may play a role in reporting symptoms. For example, Dutch ambulance workers undergo an extensive training and education program, which could provide them with skills to handle stressful situations; this may protect them from symptoms due to exposure to critical incidents. Also, because the Netherlands is traditionally a country with a more a no-nonsense attitude, one complains less and tends to more readily suppress posttrauma symptoms.

Despite the discussion as whether the prevalence rate in our two samples are relatively high or low, we may conclude that exposure to acute stressors is a serious problem in these professional groups. More than 1 in 10 persons suffered from serious psychological disturbances as a result of exposure to critical incidents.

7.4.4. Cumulative effect of acute stressors

There are two main competitive viewpoints on the impact of critical incidents on psychological health. The “inoculation perspective” proposes that the experience of a critical incident makes it easier for the victim to cope with later exposure. It suggests that the greater the number of experiences, the more resilience and consequently the fewer the problems. The earlier experiences make the victim “immune” to the effects of later exposure. This idea can be found in the method of stress inoculation, an approach to therapy developed by Meichenbaum (1985) and is the psychological equivalent of biological immunization. The general principle of this therapy is that individuals learn to deal with stress by successfully dealing with moderate proportions of stress.

The alternative theory, which we labeled as “vulnerability perspective”, proposes that a critical incident will make a victim more vulnerable for the consequences of later experiences with critical incidents. This viewpoint assumes a cumulative effect of acute stress. These two viewpoints have important practical implications. If the first idea is confirmed, less attention has to be paid to prevention and intervention, while evidence of the second perspective implies that prevention and intervention are important issues.

We found evidence for the hypothesis that there is a cumulative effect of acute stress, i.e. the more critical events that were experienced, the more posttraumatic symptoms were reported in both samples. Moreover, the number of critical incidents was not only associated with posttraumatic symptoms, but also with more general symptoms such as fatigue.

This finding is important, because both samples were at high risk for exposure to acute stressors and therefore were at heightened risk to suffer from (mental) health difficulties, such as posttraumatic stress responses. The fact that we found a cumulative effect of acute stressors emphasizes the need for adequate prevention strategies.

7.5. Part II: Chronic stressors

7.5.1. Level of chronic stressors

Besides acute stressors, levels and consequences of chronic work stressors were investigated in the same samples. It is known that enduring exposure to chronic stressors may lead to dissatifaction, poor psychological well-being (e.g., burnout, fatigue) and eventually absenteeism and turnover (for a review, see Maslach, Schaufeli, & Leiter, 2001; Tennant, 2001). We investigated which chronic stressors were present in our two groups and compared these with a healthy reference group of subjects also working in the health sector. Our two samples reported significantly more chronic job stressors than the reference group. Table 20 shows the chronic stressors reported in both samples.

Table 20 Significant chronic job stressors reported by forensic physicians and ambulance workers

Chronic job stressor	Forensic physicians	Ambulance workers
Poor communication	No	Yes
Insufficient financial reward	No	Yes
High emotional demands	Yes	Yes
Lack of information	Yes	No
Lack of social support from colleagues	No	Yes
Lack of social support from supervisor	No	Yes
Lack of job autonomy	No	Yes
Physical strain	Not available	Yes

The forensic physicians had to deal with more emotional demands in their jobs and received less information about their job than the reference groups, but they were more satisfied with their financial reward than the reference group. Compared to the reference group the ambulance workers reported more chronic work stressor, had to deal with more emotional demands, and considered their salary to be lower than workers in comparable organizations. Moreover, they were less satisfied with the communication in their organization, had to work under more physical strain and were less satisfied with their relationship with their colleagues and supervisor than the reference group.

It may be concluded that both samples are at risk to suffer from psychological symptoms, because they experience more chronic stressors than workers in the reference group, particularly the ambulance workers. The experienced chronic job stressors were mainly related to poor communication, lack of information and lack of support from colleagues and supervisors. This implies that in developing workplace interventions, attention should be paid to these social aspects of the work environment.

7.5.2. Health symptoms related to chronic stressors

Inability to cope with chronic stressors can lead to psychological and physical health symptoms. The professionals examined in this study project had to deal with demanding patients and are vulnerable to develop burnout. They also reported high levels of exposure to chronic stressors, such as lack of autonomy, poor information and lack of social support from management as well as from colleagues. All these stressors are well-known risk factors for the development of burnout (Maslach et al., 2001). Therefore, we focused on the following research question: What are the consequences of chronic job stressors on psychological health (such as burnout and fatigue) in forensic physicians and ambulance workers?

7.5.2.1. Burnout

Burnout has been conceptualized as a reaction to chronic stressors, which takes the form of emotional exhaustion, depersonalization or cynicism, and reduced personal accomplishment (Maslach, 1993). Studies on burnout research have their roots in the care-giving and service sectors, in which the work centers on the relationship between the provider and the recipient. The provision of

service or care can be extremely demanding, often leading to emotional exhaustion due to work. Both our study groups have to deal with demanding situations and often experience emotional arousal associated with intense or extended involvement with patients, which makes them vulnerable to develop burnout.

Both groups of workers were similar to the general Dutch working population with regard to burnout symptoms. This is not surprising finding because both our samples are part of the working population i.e. no sick workers were included in our study population.

However, about one fifth of the forensic physicians and about one tenth of the ambulance workers were found to be at risk to develop burnout (symptoms). Especially the forensic physicians were at risk. Compared to other countries, the situation of forensic physicians in the Netherlands is unique in that their work is not formally registered as a medical specialty. Our sample conducted their duties in combination with either a part-time or a full-time job in the public health service (with the exception of the city of Amsterdam). This unique situation may enlarge their workload, creates ambiguity and lack of acknowledgment, placing them at extra risk to develop burnout (symptoms).

The forensic physicians scored remarkably high on the subscale cynicism: i.e. 40% compared with 18% of the ambulance workers with high scores. The forensic physicians experienced also more emotional exhaustion and less personal accomplishment than the ambulance workers. Although emotional exhaustion reflects the stress dimension of burnout, it fails to capture the critical aspects of the relationship people have with their work. Emotional exhaustion is not something that is simply experienced, rather it prompts actions to distance oneself emotionally and cognitively from one's work, presumably as a coping strategy. The emotional demands of the work can exhaust a worker's capacity to be involved with and responsive to the needs of recipients. Cynicism is an attempt to distance oneself from recipients by actively ignoring the qualities that make them unique and engaging people. Their demands are more manageable when they are considered as rather impersonal objects of one's own work. Outside of the human services, people use cognitive distancing by developing an indifference or cynical attitude when they are exhausted and discouraged. Research on burnout has established the sequential link from exhaustion to cynicism (Maslach

et al., 2001). Thus, cynicism or distancing is a way of coping with the emotional demands of the task as forensic physician.

Although distancing is from this viewpoint seen as a functional coping strategy. For a short time avoiding may be effective because one is not concerned with the negative feelings associated with the emotional demands. In the long term this way of coping may be maladaptive, resulting in impaired coping process with traumatic events (Creamer, 1995). Effective recovery depends on the cognitive networks (schemata) being activated long enough to allow for modification, and this may not occur when distance or avoidance levels are high. High levels of avoidance are often associated with the continued presence of psychological symptoms (Creamer, 1995). Based on the high levels of cynicism or distancing it may be concluded that the forensic physicians are not only at risk to develop burnout, but are also at risk to develop maladaptive strategies to cope with acute stressors.

Although our two groups did not differ from the Dutch working population with regard to clinical burnout, they were at increased risk to develop burnout symptoms. It is important to investigate which work characteristics are related to burnout, in order to derive workplace interventions. The high levels of cynicism are an important issue to focus on, especially form the viewpoint that distancing or cynicism is a maladaptive strategy to cope with acute stressors on the long term.

7.5.2.2. Fatigue

Before discussing the results with regard to fatigue, it is important to note that there exists a conceptual distinction between burnout and fatigue. Burnout is clearly a work-related syndrome. Emotional exhaustion, the most central dimension of burnout, refers to a depletion of emotional resources and a feeling of being “empty”. Fatigue is defined more generally and is independent of a certain task (Meijman & Schaufeli, 1996).

Fatigue can result from exposure to both acute and chronic stressors. Compared with the reference groups, the forensic physicians scored higher on all subscales and the total score of the fatigue instrument and the ambulance workers scored higher on motivation, physical activity, concentration and the total score. Both groups reported more symptoms of prolonged fatigue than the reference group. A

remarkable minority of both groups of workers was at risk for subsequent sick leave or work disability.

Coping with critical incidents takes time and energy. As a result of exposure to critical incidents and high emotional demands in their work settings the forensic physicians and ambulance workers were fatigued. However, the heightened levels of fatigue in both samples might be the consequence of confrontation with critical incidents as well as experiencing of chronic stressors. It is known that shift work disturbs the sleep pattern of workers (Monk, 1990), which could explain why our study populations are fatigued. However, based on observations of the researchers, it could be concluded that the reported levels of fatigue were underestimated. Some workers have difficulties with shift work. Those who could not manage working in this situation even stopped working in this work setting.

7.6. Part III: Integrating acute and chronic job stressors

7.6.1. Prediction of posttraumatic symptoms

This research project used a longitudinal study design to predict mental health symptoms as a result of acute and chronic stressors in the samples of forensic physicians and ambulance workers. A longitudinal design is important in research on the aftermath of acute (traumatic) stressors, as is emphasized by many authors (e.g., Kleber & Brom, 1992; Paton & Smith, 1996). Acute stressors are followed by adaptation processes, in which changes in the nature, intensity and frequency of responses may occur over time. One needs at least two assessments over time to measure the (possible) development in these responses as well as the related symptoms. A longitudinal design was also needed, to examine the question which stressors were the important predictors of mental health symptoms. Below we discuss the results of the two groups separately because the results show some important differences.

In the study on forensic physicians no predictors of posttraumatic responses were found (described in chapter 5). This is contrary to our expectations because in the cross sectional design we found a significant association between exposure to acute stressors and posttraumatic responses. This association was not found in the long term.

One explanation for this may be the effects of habituation or toughening by the experience on the job, i.e. the forensic physicians may learn to cope with the acute stressors over time. An alternative explanation could be the underrepresentation in our sample of the most disturbed physicians. Studies on victims of traumatic experiences have shown that the non-responders are those with most health problems (Weisaeth, 1989). If Weisaeth had not been able to increase the response rate in his study from 83% to 100%, he estimated that 42% of the PTSD cases in his sample would have been missed. High response rates, although difficult to attain and therefore uncommon in traumatic stress research, are important. Although at the first measurement our response rate was 64%, it was more difficult to achieve a satisfactory response rate at the second measurement. We were aware of the risk of a possible selective drop-out, but no significant differences were found between the forensic physicians who participated and those who did not participate at the second measurement. One reason for not participating in the second measurement was that some had left that job, perhaps because they could no longer handle the traumatic incidents.

In our studies we do not have pretest data in the sense of data from before a critical incident. Almost all workers were exposed to at least one critical incident. Therefore, the first measurement is not comparable with a baseline measure. To elucidate which factors are predictive for posttraumatic responses it would be interesting to follow over time those who just started in the profession.

Another explanation for why we did not find a cumulative effect of acute stressors in the long term could be that our operationalization of the acute stressors was not good enough: i.e. acute stressors or traumatic events were operationalized as the number of events the worker was exposed to in the previous five years. A shorter time span may have made the sample more heterogeneous with regard to posttraumatic stress symptoms.

The relationship between acute stressors and posttraumatic stress responses is probably more complex than the hypothesized linear relationship. Factors other than acute stressors may play a role in the development of the stress reactions. The perception of the experienced symptoms of victims may be colored by the critical incident; unaffected groups will tend to forget or minimize the severity of traumatic stress

some time after the event (McFarlane, 1989). The process of remembering is likely to differ between those who suffer from posttraumatic reactions and those who do not; thus, retrospective recall of the traumatic event may naturally bias the data toward the finding of high levels of exposure in the group suffering from symptoms (McFarlane, 1995). This in turn will lead to skewed distributed data.

However, the study on ambulance workers showed a cumulative effect of high emotional demands in the work. As described in chapter 6, high emotional demands and poor communication were found to be predictive for posttraumatic responses (particularly avoidances). This implies that in developing workplace interventions to prevent posttraumatic reactions, attention should be paid to acute and chronic stressors.

7.6.2. Prediction of burnout and fatigue

Organizational stressors played an important role in the prediction of burnout symptoms and fatigue in both our groups. Poor communication, lack of job autonomy and lack of social support of the supervisor were found to be important factors in the development of emotional exhaustion among forensic physicians and poor communication and physical strains were significant predictors of emotional exhaustion in the ambulance workers. This finding concurs with results on job burnout by Maslach et al. (2001). Lack of job autonomy and poor communication were important in the development of cynicism among forensic physicians and lack of support from the supervisor among ambulance workers. Among the ambulance workers personal accomplishment was predicted by lack of social support from colleagues and the supervisor. Significant predictors of fatigue were poor communication in the forensic physicians and lack of social support from the supervisor in the ambulance workers.

Acute stressors did not play a role in the prediction of burnout symptoms or fatigue. Surprisingly, the organizational stressors produced distress. More attention should be paid to organizational stressors when developing prevention and intervention strategies. However, the impact of traumatic events should also not be neglected, even though our sample is relatively quite small and we must be cautious about drawing conclusions based on the current findings. Although we found no longitudinally evidence that acute stressors predict psychological

distress, in the cross sectional design that exposure to traumatic event was related to distress.

7.7. Part IV: Methodological issues and implications

7.7.1. Methodological issues

In the discussion sections of chapters 3, 4, 5 and 6 of this thesis considerable attention was paid to the limitations of the present studies. We focused particularly on the importance of high response rates in such studies, and the fact that studies in the field of traumatic stress are mainly retrospective. Since we have already described these limitations in detail, we focus here only on the following issues: generalization of the results, the operationalization of acute stressors, recommendations for future research, and practical implications of our results.

7.7.1.1. Generalization of results

Most of the populations who might be affected by critical incidents in their work situation (e.g., firefighters, police officers, emergency medical services) are far from homogeneous groups. Differences in, for example, the tasks and roles they perform, their operating contexts and background, work philosophy, as well as differences in the relative proportions of males and females in their work force, present a diversity of risk populations (Paton & Smith, 1996). In the present study there are both similarities and differences in the results from our two study groups. However, not all differences could be attributed to methodological differences (such as response rates and sample sizes). Most differences are related to sample characteristics, such as demographics, background and education. Even within the same profession differences exist, e.g. within the ambulance work there were differences in education level and between the roles of technicians and paramedics. The paramedics have more skills to help and assist the ones who need it and helping in a practical way is known to result in less posttraumatic stress symptoms among those involved professionally (Luce, Firth-Cozens, Midgley, & Burges, 2002).

In spite of the differences between the samples in the present research, our results were in line with other studies among high-risk professional (e.g., police (Gersons, 1989; Robinson, Sigman, & Wilson, 1996), body handlers (McCarroll, Ursano, Wright, & Fullerton, 1993), military personnel (Day & Livingston, 2001) and firefighters (Fullerton,

McCarroll, Ursano, & Wright, 1992; Bryant & Harvey, 1996; Beaton, Murphy, Johnson, Pike, & Corneil, 1998)). Generalizations to other high-risk professions are possible. The nature of acute stressors and related symptoms, such as intrusions and avoidances, as well as the levels of chronic stressors and related reactions to these stressors, i.e. burnout and fatigue, are not unique to the forensic physicians and ambulance workers. Our results might have practical implications for preventative interventions for emergency personnel, military personnel, police officers, and others for whom exposure to acute (and chronic) stressors is a consequence of their work.

7.7.1.2. The operationalization of acute stressor

As described above and in chapter 6, in our ambulance personnel, high emotional demands and poor communication were found to be predictive for posttraumatic responses (particularly avoidances). At the start of the project emotional demands were considered as a chronic job stressor (i.e., emotional demands is a subscale of our used questionnaire assessing chronic job stressors). Items of this subscale refer to the exposure to critical incidents (e.g., being threatened by clients or patients). During the study we found out that this stressor better can better be categorized as an acute stressor. In chapter 6, high emotional demands was operationalized as an acute stressor, whereas in the previous chapters this variable was operationalized as a chronic stressor. In the context of this project emotional demands are to be considered as an acute stressor. Even the term acute stressor is debatable, because “acute” implies that the onset of the stressor is suddenly and unexpected. This may be true for some of the incidents (such as aggression towards the helpers), but most experienced critical incidents do not happen suddenly or totally unexpected, because the workers often know beforehand what kind of emergencies they will be exposed to. Although the acute stressors may be chronic in the job situation of our studied samples, we continued to use the term “acute” to indicate traumatic events.

7.7.2. Recommendations for future research

In our opinion, three main issues deserve more study: 1) the possibility of posttraumatic growth; 2) a “golden standard” of posttraumatic stress disorder and 3) personality characteristics of the high-risk professionals.

7.7.2.1. Posttraumatic growth

In the current research project we focused only on the negative consequences of experiencing traumatic events, whereas some "positive" outcomes are known, e.g. posttraumatic growth (Tedeschi & Calhoun, 1995), and higher professional level (Paton, 1996). Posttraumatic growth is the individual's experience of significant positive change arising from struggling with a major life crisis such as acts of violence, aggression, being witness of dead or dying persons. A higher professional level can be seen as a positive outcome.

Cognitive processing is not only important in rebuilding the worldview and in adaptation to trauma, but is also an important component in the development of posttraumatic growth (Tedeschi & Calhoun, 1995). Traumatic events shatter basic assumptions about one's future and produce anxiety and psychological problems. Victims may have to rebuild these assumptions, and even rebuild their way of life, which may sometimes be superior to the old one. They establish new psychological constructs that incorporate the possibility of traumatic events, and better ways to cope with them. They appreciate their newly found strength and may value what they now have and the process of creating it, even though the process involved loss and distress. This process may be described as posttraumatic growth, because it implies that persons experiencing this phenomenon have developed beyond their previous level of adaptation, psychological functioning, or life awareness (Tedeschi, Park, & Calhoun, 1998).

Future studies should focus on further elucidating the underlying cognitive processes of maladjustment as well as posttraumatic growth. When these processes are better understood, professionals can be trained to use the processes to cope with critical incidents. The present study shows that 94% of the ambulance workers was satisfied with the content of their job (which might "protect" them against negative consequences of critical incidents) and 90% consider their job to be useful.

7.7.2.2. "Golden standard" for the Impact of Event Scale

In future studies a clinical interview should be used in order to draw conclusions about the prevalence of posttraumatic stress symptoms. The IES is one of the most widely used questionnaires to measure posttraumatic stress symptoms (Allen, 1994). It is a good

screening instrument to assess the impact of trauma (Sundin & Horowitz, 2002). In our study, no conclusions about the prevalence rates of posttraumatic stress disorder could be drawn, because the IES has not yet been validated using a gold standard, such as a clinical interview. Chemtob, Tomas, Law, and Cremniter (1997) introduced a cutoff score for clinical distress, which might be indicative for a posttraumatic stress disorder.

We argue that validation with a clinical interview will be necessary in order to overcome this shortcoming. However, the IES has been developed to assess intrusion and avoidance, which are the general psychological processes that alternately facilitate recovery (Horowitz et al., 1979), whereas PTSD (defined in DSM-IV; American Psychiatric Association, 1994) is characterized by three clusters (i.e., intrusive memories and re-experiencing, avoidance and numbing, hyperarousal). The third cluster, hyperarousal, is not assessed with the IES. To overcome the missing of this third dimension (i.e., hyperarousal), the IES-Revised was developed (IES-R; Weiss & Marmar, 1997). This instrument may enhance comparability with the DSM-IV criteria, but we decided not to use this rather recently introduced instrument to assess posttraumatic reactions. At the start of current research project rather few studies has been conducted on the psychometrics of this instrument (Weiss & Marmar, 1997). Besides, comparison with other (national and international) would not have been possible.

7.7.2.3. The personality of high-risk professionals

At the beginning of the current research project we had to make choices about important variables. Personality characteristics of the workers in high-risk professions were not included. Nevertheless, distinct personality characteristics may moderate the negative effects of work. The organizational climate in which employees are often confronted with acute stressors is a “macho-culture”, which is also called “John Wayne”-culture. Reactions such as “If you can’t cope it, you shouldn’t have taken the job” are rather common in this kind of culture (Kleber & van der Velden, 2003).

Hardiness has surfaced as one of the most popular concepts, and it has been studied in other work settings in relation to burnout (Schaufeli & Enzmann, 1998). Hardiness is a constellation of personality traits that enables individuals to resist stress. This construct is defined

as the tendency to struggle adaptively with life adversities by perceiving potentially stressful events in less threatening terms (Florian, Mikulincer, & Taubman, 1995). Three elements are central: a sense of commitment to personal life roles, a sense of control over some aspects of life's problems, and the assumptions of a challenge orientation when confronted with problems. Because emergency workers are assumed to be hardier than most workers in “low-risk” professions (James & Wright, 1991), it would be useful to examine the effect of personality on emotional distress.

7.7.3. Practical implications

Since the introduction of the Working Conditions Act (the “Arbo-wet”) in 1994, employers in the Netherlands have been obliged to take care of employees affected by critical incidents (Schaufeli & Kompier, 2001). Moreover, employers have to develop preventive procedures to protect employees from acute stressors in the work setting and their aftermath. If an employee is confronted with a critical incident and suffers from it, the employer has to arrange an intervention, such as counseling or other forms of psychological support. Since a substantial minority of the professionals in the current study suffers from psychological symptoms it may be concluded that the care after traumatic experiences is not yet sufficient.

Our main conclusion concerning practical implications is that social aspects of the work environment deserve considerable attention. Prevention and intervention programs should focus on the following aspects: improving communication within the organization, enhancing autonomy, and stimulating social support of management and colleagues. These elements (i.e., poor communication, lack of autonomy and lack of support) were predictors of poor mental health, in particular burnout and fatigue. Chronic stressors are probably easier to ameliorate than the acute stressors, because the acute stressors are an inherent part of their jobs.

Improving communication within the organization should focus on the following aspects: workers should know who is responsible for solutions within the organization, decision-making should be clear, and in case of conflicts it should be clear who serves as trusted representative. Organizations should offer support to the employees. Recognition is a highly important element in the support of victim. This should not be

underestimated. Support is often limited, especially in organization with a “macho- attitude”. Good relationships in the workplace are important, particularly in high-risk professions. Employees have to feel safe to talk with each other about the experienced critical incidents. Support from colleagues is especially useful and important, since employees, such as ambulance workers and forensic physicians, may avoid talking with their partners about their work related problems (Van der Velden, Hazen, & Kleber, 1999). To prevent professionals suffering from emotional stress reactions they could benefit by being informed about which stressors they will be exposed to. Clear information about the circumstances that they have to face is necessary, because it enables them to consider strategies about how to handle. Besides, several training programs could be developed paying attention to various aspects of the work situation, but also during structural meetings attention may be paid to these aspects.

Unfortunately, accidents will happen and the victims will need help. Above to attention for the social environment of the work, attention should also be paid to the various consequences of critical incidents as well as possible interventions. There is a variety of brief interventions after traumatic experiences (Kleber & Mittendorff, 2000). Psychological debriefing has been well studied, but there is reasonable doubt as to whether it does in fact prevent chronic posttraumatic stress symptoms (Van Emmerik, Kamphuis, Hulsbos, & Emmelkamp, 2002). We believe that instead of such single-session method, the victim may benefit from more than one session. Intervention programs such as trauma counseling (Brom & Kleber, 1989) have been developed for employees who experienced a critical incident. One of the merits of trauma counseling is that more sessions take place, which is necessary for the monitoring of adaptation processes since the coping process stretches over a long period of time. It is important to follow the employee in this process, because concern from the near environment soon tends to ebb away. Besides, it gives the counselor the opportunity to consider who is at risk to develop chronic posttraumatic symptoms. The intervention program is introduced formally as a program within the organization, because the management support is essential for these workplace interventions.

In addition to trauma counseling, structured regular meetings (structured work meetings) could be arranged to talk about experienced

traumatic events. Talking with colleagues about traumatic events and sharing emotions is supportive and helpful in coping with traumatic events. Both Alexander and Klein (2001) and Stephens (1997) concluded that talking about shared experienced critical incidents with colleagues is necessary. Social support and opportunities to talk about traumatic experiences and their emotional impact with others in the work place have shown to be related to better mental well-being, in particular PTSD symptoms (Alexander & Klein, 2001). Because ambulance workers and forensic physicians in the Netherlands indicated that they were not satisfied with the support of colleagues, it would be worthwhile to implement these regular meetings. These meetings also give the opportunity to notice who is suffering from the posttraumatic symptoms. Structured work meeting may enlarge professional skills and the team spirit (Van der Velden, Hazen, & Kleber, 1999).

Effective trauma-incident management requires that recovery resources will be integrated within wider organizational response and management systems (Paton, 1997; Stephens, 1997; Kleber, & van der Velden, 2003). Organizational commitment to crisis planning can be constrained by several factors, such as underestimating the risk of event occurrence and the consequences for employees and organizations, overestimating existing (response) capabilities, and ambiguity of responsibility (Paton, 1997). Jones Flynn, and Kelloway (1995) demonstrated that the perception of a supportive organization correlates strongly and negatively with the amount of work stress. The present research project demonstrated that when implementing a work-place intervention following traumatic events support and acknowledgement from management are of vital importance.

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Samenvatting

Het risico van risicovolle beroepen: Gevolgen voor de psychische gezondheid bij forensische artsen en ambulance medewerkers

Werknemers in de zogeheten risicovolle beroepen, zoals forensisch artsen en ambulancemedewerkers kunnen in hun werksituatie geconfronteerd worden met gebeurtenissen die acute machteloosheid en ontwrichting te weeg brengen zoals agressie op de werkvloer, ongevallen, confrontatie met slachtoffers. Deze ingrijpende ervaringen kunnen leiden tot gezondheidsproblemen, zoals posttraumatische stress klachten, maar ook tot spanningen op het werk en ziekteverzuim. Het optreden van deze gebeurtenissen en de nasleep ervan vormen een reëel risico voor het bedrijfsleven, zeker sinds de Arbo-wet werkgevers verplicht zorg te dragen voor de veiligheid en de gezondheid van hen die door geweld en incidenten zijn getroffen. Deze gebeurtenissen komen daarnaast vaker voor dan wordt aangenomen. Bovendien hebben werknemers vaak te maken met allerlei andere werkgerelateerde stresserende factoren, zoals rolonduidelijkheid, hoge werkdruk en slechte sociale relaties op het werk. Ook deze chronische stressoren kunnen leiden tot gezondheidsklachten. Zelden zijn deze stressoren gezamenlijk onderwerp van onderzoek geweest. Het doel van dit proefschrift is om de inzichten omtrent ingrijpende gebeurtenissen en chronische stressoren te combineren. Een drietal onderzoeksvragen staat centraal:

1. Wat zijn de gevolgen van het meemaken van ingrijpende gebeurtenissen in het werk op het psychisch welbevinden van forensisch artsen en ambulance personeel?
2. Wat zijn de gevolgen van chronische werkstressoren op het psychisch welbevinden van forensisch artsen en ambulance personeel?
3. Wat is de wisselwerking tussen het meemaken van ingrijpende gebeurtenissen op het werk en chronische werkstressoren in relatie met pscyhische gezondheidsklachten?

In Hoofdstuk 1 wordt een overzicht gegeven van theorieën die als basis hebben gediend in dit proefschrift. Er wordt een beschrijving geven van de conpten stressoren en stress, waarop vervolgens de interactionale benadering van Lazarus en Folkman (1984) besproken wordt. Om inzicht te krijgen welke stressoren mogelijk als stresserend ervaren worden zijn de karakteristieken van deze stressoren beschreven (Taylor, 1999). Daar er geen specifieke theorieën omtrent ingrijpende gebeurtenissen in de werksituatie bestaan (Paton, 1996) is de bespreking van ingrijpende gebeurtenissen gericht op de

schokverwerkingsbenadering (Kleber & Brom, 1992) waarin inzichten omtrent hantering en verwerking van acuut controleverlies zijn geïntegreerd. Tenslotte worden inzichten rondom chronische werkstressoren in relatie tot burnout en vermoeidheid besproken.

De Schokverwerkingslijst (Brom & Kleber, 1985; Nederlandse bewerking van de Impact of Event Scale, Horowitz, Wilner, & Alvarez, 1979) is een centraal meetinstrument in het onderzoeksproject. In hoofdstuk 2 wordt aandacht besteed aan de psychometrische eigenschappen van dit instrumentarium. Met behulp van confirmatieve factor analyses is de structuur van de vragenlijst onderzocht in een drietal grote steekproeven, te weten 1) een groep die met werkgerelateerde ingrijpende gebeurtenissen geconfronteerd is, 2) een groep mensen die de tweede Wereld Oorlog heeft meegemaakt en 3) een groep die het slachtoffer is geworden van een verkeersongeluk of slachtoffer waren bij de scheepsramp met de Achille Lauro. Daarnaast is gekeken naar de betrouwbaarheid van de Schokverwerkingslijst. Uit de confirmatieve factor analyses bleek dat de structuur van de vragenlijst (herbeleven en vermijden) zoals voorgesteld door de ontwerpers van de vragenlijst goed bij de data te passen. Bovendien bleek de structuur stabiel over de verschillende gebeurtenissen, dat wil zeggen dat de reacties bij slachtoffers van verschillende gebeurtenissen vergelijkbaar zijn. Tevens bleek de interne consistentie (betrouwbaarheid) van het meetinstrument goed te zijn. Geconcludeerd kan worden dat de Schokverwerkingslijst een goed en betrouwbaar meetinstrument is om verwerkingsreacties te meten.

In de hoofdstukken 3 en 4 worden de resultaten beschreven van twee cross-sectionele onderzoeken bij respectievelijk forensisch artsen en ambulance personeel. In deze onderzoeken wordt beschreven met welke ingrijpende gebeurtenissen de twee onderzoeksgroepen te maken hebben in hun werk. Daarnaast is aandacht besteed aan de relatie tussen deze gebeurtenissen en psychische gezondheid, zoals verwerkingsklachten die kenmerkend zijn voor mensen die getroffen worden door dergelijke gebeurtenissen (herbelven en vermijden). Tevens is onderzocht welke chronische stressoren in het werk van de onderzoeksgroepen voorkomen en is hun relatie met psychische gezondheidsklachten (burnout en vermoeidheid) onderzocht. Tenslotte richtte dit onderzoek zich op de vraag welke relatie er bestaat tussen enerzijds ingrijpende gebeurtenissen en chronisch werkgerelateerd

stressoren en anderzijds psychische gezondheid, zoals posttraumatische stress klachten, burnout en vermoeidheid. Beide onderzoeksgroepen bleken veelvuldig geconfronteerd te worden met ingrijpende gebeurtenissen. Gebeurtenissen waarbij kinderen betrokken waren werden vooral als stressvol ervaren. Een minderheid kampte met ernstige verwerkingsklachten gerelateerd aan de ingrijpende gebeurtenissen op het werk. De forensisch artsen en het ambulance personeel waren aan veel chronische stressoren op het werk blootgesteld, met name gebrek aan sociale steun en slechte communicatie binnen de organisatie werden genoemd. Een klein deel van de forensisch artsen en het ambulance personeel leed aan burnout symptomen en/of ernstige vermoeidheid. Zowel ingrijpende gebeurtenissen op het werk als chronisch stressoren bleken een verband te hebben met psychische gezondheidsklachen.

In de hoofdstukken 5 en 6 worden twee vervolgstudies bij respectievelijk forenische artsen en ambulance personeel besproken. Om het cumulatie effect van ingrijpende gebeurtenissen te onderzoeken is een longitudinaal onderzoeksdesign van belang. Tevens voor het doen van causale uitspraken over gevolgen van ingrijpende gebeurtenissen en chronische werkstressoren op de psychische gezondheid zijn tenminste twee metingen noodzakelijk. Centraal in deze twee hoofdstukken staat het voorspellen van gezondheidsklachten door ingrijpende gebeurtenissen op het werk en chronische werkstressoren. De belangrijkste voorspellers van slechte psychische gezondheid bleken verschillende chronische werkstressoren; met name slechte communicatie binnen de organisatie en slechte sociale relaties met collega's en het management. Bij het ambulance personeel bleken hoge emotionele eisen op het werk voorspellend te zijn voor schokverwerkingsklachten.

In het afsluitende hoofdstuk zijn de bevindingen geïntegreerd en volgen conclusies met betrekking tot de gevolgen van ingrijpende gebeurtenissen op het werk en chronisch werkstressoren. Aandacht is besteed aan praktische implicaties van de resultaten. Hier is ingegaan op het belang van een goed sociaal klimaat bij de verwerking van ingrijpende gebeurtenissen. In de beschrijving van diverse interventiestrategieën is de nadruk gelegd op opvang na ingrijpende gebeurtenissen, omdat de uitkomsten van dit onderzoek goed bij de uitgangspunten van deze interventie aansluiten.

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Appendix 1

Instructie. Hieronder vindt u een lijst van uitspraken die mensen doen na een zeer ingrijpende gebeurtenis. Neem de door u meegemaakte gebeurtenis in gedachten, bekijk elke uitspraak en geef aan hoe vaak ze op u van toepassing was tijdens de afgelopen ZEVEN dagen. Als ze niet voorkwam zet u een kruisje bij “helemaal niet”.

	Helemaal niet	Zelden	Soms	Vaak
1 Ik dacht eraan zonder dat ik dat wilde	0	0	0	0
2 Ik zorgde ervoor niet van streek te raken als ik eraan dacht of eraan herinnerd werd	0	0	0	0
3 Ik probeerde de gebeurtenis uit mijn geheugen te bannen	0	0	0	0
4 Ik kon moeilijk in slaap vallen of in slaap blijven omdat beelden en gedachten erover door mijn hoofd gingen	0	0	0	0
5 Bij vlagen had ik er sterke gevoelens over	0	0	0	0
6 Ik droomde erover	0	0	0	0
7 Ik bleef dingen die mij eraan herinneren uit de weg gaan	0	0	0	0
8 Ik had het gevoel alsof het niet echt gebeurd was, alsof het niet echt was	0	0	0	0
9 Ik heb geprobeerd er niet over te praten	0	0	0	0
10 Beelden ervan schoten me in gedachten	0	0	0	0
11 Andere dingen deden mij er steeds weer aan denken	0	0	0	0
12 Ik wist dat ik er nog heel wat gevoelens over had, maar hield er geen rekening mee	0	0	0	0
13 Ik heb geprobeerd er niet aan te denken	0	0	0	0
14 Iedere herinnering bracht de gevoelens weer terug	0	0	0	0
15 Mijn gevoel erover was als het ware verdoofd	0	0	0	0

Een woord van dank

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Eleonore van der Ploeg

Utrecht, april 2003

Curriculum Vitae

Eleonore van der Ploeg was born on June 19th, 1971 in Capelle aan den IJssel (the Netherlands). After finishing her schooling (VWO), she studied Architecture at the Delft University of Technology for one year. From 1992 till February 1998 she studied Psychology at Leiden University. Her major field was Methods and Techniques of Psychological Research.

She started as an "Onderzoeker in Opleiding" at the Department of Clinical Psychology at Utrecht University in April 1998. This thesis is the result of the research conducted in this period. During her time as OiO, she also worked on a special project (financed by the Ministery of Health, Welfare and Sports) at the Institute for Psychotrauma for four months, which resulted in a book about the firework disaster in Enschede ("Blijvende herinneringen aan de vuurwerkramp in Enschede op 13 mei 2000").

She represented the AiO's and OiO's of the Faculty of Social Sciences in the BAU (union for Ph.D. students of Utrecht University) from 1998 till 2000. She was also chair of the Ph.D. council of the Research Institute Psychology & Health from 2000 till 2002.

Since February 2003 she works as a post doc researcher in the field of traumatic stress studies at the Department Medical Psychology of VU University Medical Center in Amsterdam.