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Objectives: To predict symptomatology (post-traumatic 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 standardised 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 post-traumatic 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 not being informed about important decisions within the organisation.

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 post-traumatic 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.

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 of this topic see Tennant¹). However, the role of acute and intense stressors are often neglected.

Employees working in so called medium or high risk professions, such as fire fighters, and emergency workers, are often confronted with acute stressors or critical incidents. Fire fighters 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 potentially traumatic events. However, the fact that they might experience symptoms similar to those they assist may be unrecognised.²

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.³ Research concerning these events has shown that acute stressors may lead to serious mental disturbances, in particular post-traumatic stress disorder (PTSD).⁴ In the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV)* this disorder is characterised 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.⁵

In a study among fire fighters 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—occurring in 10% of the subjects—being the second most frequent diagnosis.⁶

Ursano *et al* examined post-traumatic symptoms and depression in disaster workers exposed to traumatic death after the USS Iowa gun turret explosion.⁷ The body handlers were assessed at one, four, and 13 months after the disaster. Intrusive and avoidance 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,⁸ 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 *et al* suggested that frequent occurring critical incidents which are part of the job can be just as stressful for emergency workers as disaster work.⁹ Emergency workers involved in an unsuccessful cardiopulmonary resuscitation were found to suffer from post-traumatic stress reactions. They experienced vivid, involuntary, and uncontrollable thoughts, feelings and/or mental images concerning their attempts.¹⁰ Clohessy and Ehlers showed that a substantial

Abbreviations: CIS, Checklist Individual Strength; IES, Impact of Event Scale; QEAW, Questionnaire on the Experience and Assessment of Work; MBI, Maslach Burnout Inventory; PTSD, post-traumatic stress disorder

proportion of emergency workers (21%) who were not exposed to major disasters nevertheless experienced distinct symptoms of PTSD.¹¹ 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.¹²

Because the persistence of post-traumatic symptoms may lead to chronic fatigue, decreased job satisfaction, work absenteeism, or early retirement,¹³ 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, as Day and Livingstone stated,¹⁴ research concerning both types of stressors is sparse. They examined the impact of acute and chronic stressors on the health of military personnel. Psychological, behavioural, and physical symptoms were associated with acute work related events, lack of job stimulation, ambiguity, and overload. Alexander and Klein 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.¹⁵ A third of the ambulance workers suffered from post-traumatic stress reactions. It can be concluded from these studies that focussing on acute as well as chronic stressors is relevant in research.

In this article 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.¹⁶ Research has indicated that ambulance workers suffer from symptoms related to traumatic events.^{11 15 17} Moreover, they experience more chronic stressors in their work than workers in other health service settings.¹⁷ The purpose of this study is to investigate the predictive effect of both acute and chronic stressors on health symptoms, such as post-traumatic reactions, burnout, and fatigue. The central research question is: Do acute and chronic work related stressors predict poor mental health, in particular post-traumatic stress reactions, burnout, and fatigue?

METHOD

Subjects

Participants were paramedics and drivers from 10 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 an honest response individual survey forms would not be made available 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 at time 1 was 56%, with 221 ambulance workers participating. In the questionnaire the respondents were asked to fill in their name and address if they were willing to participate in 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%).

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. Standardised measures were used to get insight into chronic stressors and health symptoms (post-traumatic stress reactions, burnout, and fatigue).

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 (QEAW)¹⁸ was used to get insight in the presence of emotionally demanding situations compared to employees also working in a health service. This subscale labelled high emotional demands, consisted of seven items. An example of an item is: "Is your job emotionally demanding?". Cronbach's alpha (α) at time 1 was 0.60.

Chronic stressors

The QEAW was used to get insight in the presence of common work related stressors at time 1 and time 2.¹⁸ This questionnaire was validated in a sample of more than 80 000 people in various working settings in the Netherlands—for example, industrial, education, and transport sectors. 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 3409 to 4355. 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 $\alpha=0.88$, 11 items, for example, "Do you have influence on the planning of your work?"); lack of support from colleagues ($\alpha=0.81$, 9 items, for example, "Are your colleagues friendly to you?"); lack of support from the supervisor ($\alpha=0.89$, 9 items, for example, "May you count on your supervisor when you have difficulties in your work?"); poor communication ($\alpha=0.88$, 4 items, for example, "Are you informed about important issues in your organisation?"); lack of information ($\alpha=0.83$, 7 items, for example, "Do you receive enough information about the results of your job?"); insufficient financial reward ($\alpha=0.77$, 5 items, for example, "Do you think your company gives good rewards?"); and physical strains ($\alpha=0.81$, 7 items, for example, "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

standardised ranging from 0 to 100. The higher a score, the more the situation was perceived as a stressor.

Health symptoms

At time 1 and time 2 the questionnaire consisted of standardised scales to assess and predict the following mental health symptoms: post-traumatic stress symptoms, burnout, and fatigue.

The Dutch version of the Impact of Event Scale (IES) was used to determine and predict self reported symptoms of post-traumatic symptoms of intrusion and avoidance in relation with the last experienced critical incident.^{19, 20} 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 post-traumatic stress reactions,^{7, 15, 21} and is widely recommended as a screening instrument for victims after disasters and other extreme situations.²² The Dutch version was found to have reliable subscales and the structure was similar to the original version. At time 1 the internal consistency was 0.87 for intrusion, 0.88 for avoidance, and 0.92 for the total score. A score of 26 or higher is an indication of a clinical level of post-traumatic symptoms (indicative for PTSD).²¹ This cut off score is used in the present study to assess the intensity of post-traumatic stress symptoms.

Fatigue was measured at time 1 and time 2 with the Checklist Individual Strength (CIS),²³ a 20-item self report instrument. The CIS covers several aspects of fatigue, such as subjective fatigue (eight items, for example, "I get tired very quickly"); concentration (five items, for example, "Thinking requires effort"); motivation (four items, for example, "I feel no desire to do anything"); physical activity (three items, for example, "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 0.91, 0.82, 0.83, and 0.75 respectively. Cronbach's alpha for the total score of the CIS was 0.94. 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).²⁴ A cut off point (a CIS total score higher than 76) indicating that an individual is at risk for sick leave or disability was used.²⁵

The Dutch version of the Maslach Burnout Inventory (MBI) was used to predict the burnout symptoms at time 2.^{26, 27} This widely used instrument consists of 15 items assessing the three central dimensions of burnout: emotional exhaustion (five items, "I feel burned out from my job"); cynicism (four items "I am less enthusiastic about my job"); and personal accomplishment (six 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 0.86, 0.76, and 0.70 at time 1 for the three subscales respectively. Cut off scores were used to assess risk for burnout in ambulance workers. The reference group was a random sample of the Dutch working population (N = 1111).²⁷

Statistical analysis

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: post-traumatic 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.

RESULTS

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% were 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 (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%).

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 organisational problems (8%)—for example, lack of acknowledgement by a superior after a critical incident, or false or insufficient information about the site of the accident or the condition of the victims. 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 (16.8) months. The mean number of reported events was 3.7 (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 ($M=2.7$ (0.90)), confrontation with people in despair ($M=2.4$ (0.54)), and confrontation with children of sexual abuse (for example, assault or rape) ($M=2.3$ (0.96)).

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

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 (table 1).

Table 1 Means and standard deviations of ambulance personnel and a reference group on the Questionnaire on the Experience and Assessment of Work

Subscales of QEAW	Ambulance workers (n=221)		Reference groups			t	df	p Value
	M	SD	M	SD	n			
Poor communication	52.2	21.2	47.7	20.7	3656	3.3	220	<0.01
Insufficient financial reward	54.3	21.6	50.2	23.1	3409	2.8	218	<0.01
High emotional demands	39.5	9.7	34.4	14.9	4171	7.7	220	<0.001
Lack of information	48.6	16.6	49.3	18.6	3850	-0.61	220	NS
Lack of support from colleagues	25.6	11.4	22.0	13.9	3953	4.7	220	<0.001
Lack of support from supervisor	32.6	17.2	23.1	17.6	4316	7.4	220	<0.001
Physical strains	40.0	15.4	26.4	21.1	4172	13.2	220	<0.001
Lack of job autonomy	57.1	17.7	42.8	17.9	4355	11.9	219	<0.001

QEAW, Questionnaire on the Experience and Assessment of Work; SD, standard deviation.

Health symptoms

Post-traumatic 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 2. MANOVA repeated measures showed no significant differences between the scores at time 1 and at time 2.

According to Chemtob *et al.*,²¹ a score of 26 or higher is an indication of a clinical level of post-traumatic 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 post-traumatic distress.

Fatigue

Means and standard deviations on the CIS at both measurements are presented in table 2. 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 ($t(211)=3.5$; $p<0.01$), physical activity ($t(213)=4.2$; $p<0.001$), concentration ($t(211)=4.8$; $p<0.001$), and the total score ($t(210)=3.2$; $p<0.01$). The ambulance workers significantly scored higher, indicating that they reported more symptoms. According to Bültmann *et al.*,²⁵ 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 cut off point of the CIS at the time 1.

Burnout

Means and standard deviations at both measurements are presented in table 2. 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,²⁷ 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 2 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.

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 3. 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 post-traumatic stress reactions.

Prediction of symptomatology

Post-traumatic responses

Table 4 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.

Burnout symptoms

The results of the multiple hierarchical regression analyses of the MBI subscales are presented in table 4. MBI emotional exhaustion could be significantly predicted by poor communication and physical strains after controlling for symptoms at time 1 (MBI emotional exhaustion (44% of the variance) and IES total score (additional 2%) were significant). 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).

Fatigue

Table 4 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 2 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)

Subscale	T1 M (SD)	T2 M (SD)	F	p Value	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	0.56***	0.40***	0.52***	0.19	0.22*	0.38***	0.09	0.25*	0.27**	0.20*	-0.24*
2. IES avoidance	3.5 (5.6)	4.4 (6.4)	1.8	NS	0.72***	0.46***	0.51***	0.31**	0.26**	0.40***	0.16	0.31**	0.41***	0.22*	-0.18
3. IES total	10.1 (11.9)	11.8 (13.1)	2.2	NS	0.93***	0.92***	0.56***	0.27**	0.26**	0.42***	0.13	0.31**	0.37***	0.23*	-0.23*
4. CIS fatigue	18.8 (9.4)	19.9 (11.8)	1.1	NS	0.23**	0.37***	0.32***	0.47***	0.37***	0.43***	0.40***	0.49***	0.41***	0.30**	-0.32***
5. CIS activation	7.7 (3.8)	7.7 (4.6)	0.00	NS	0.13	0.23**	0.19**	0.50***	0.41***	0.18*	0.31**	0.27***	0.09	0.17	-0.38***
6. CIS concentration	11.9 (5.9)	12.9 (7.0)	2.9	NS	0.23**	0.27***	0.27***	0.67***	0.44**	0.50***	0.36***	0.45***	0.32***	0.22*	-0.34***
7. CIS motivation	9.2 (4.5)	9.7 (5.5)	1.2	NS	0.24**	0.36***	0.32***	0.72***	0.64***	0.60***	0.33***	0.33***	0.23*	0.22*	-0.43***
8. CIS total	47.8 (20.3)	50.7 (25.7)	1.7	NS	0.25**	0.37***	0.33***	0.92***	0.70***	0.82***	0.84***	0.48***	0.41***	0.28**	-0.42***
9. MBI emotional exhaustion	1.2 (0.89)	1.3 (1.0)	3.4	NS	0.29***	0.30***	0.32***	0.50***	0.16**	0.40**	0.38***	0.46***	0.65***	0.30**	-0.17
10. MBI cynicism	1.1 (0.88)	1.4 (1.1)	11.9	<0.01	0.20**	0.31***	0.27***	0.45***	0.27***	0.30***	0.38***	0.43***	0.62***	0.59***	-0.33***
11. MBI personal accomplishment	4.4 (0.87)	4.5 (0.85)	0.07	NS	-0.22**	-0.21**	-0.23**	-0.44***	-0.42***	-0.45***	-0.46***	-0.52***	-0.26**	-0.39***	0.59***

CIS, Checklist Individual Strength; IES, Impact of Event Scale; MBI, Maslach Burnout Inventory; SD, standard deviation.

*p<0.05, **p<0.01, ***p<0.001.

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%) were 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 post-traumatic symptoms after experiencing one or more critical incidents, in particular severe intrusions and avoidances. In line with earlier studies,^{9 11} 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 post-traumatic symptoms, this variable appeared to not 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 post-traumatic responses at time 2 were poor communication at time 1 and earlier reported symptoms of avoidances and intrusions. Various other studies have concluded that traumatic events may have long term and serious consequences for mental health.^{28 29} 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%).³⁰

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.³¹ Alexander and Klein reported indeed high levels of job satisfaction among ambulance workers.¹⁵ However, a distinction between satisfaction with regard to the job and satisfaction with regard to the organisation can be made. Expressed job satisfaction does not mean that the organisation does not have to concern about the well being of its employees. Dissatisfaction with organisational aspects has a price: a price to be measured in terms of the levels of general psychopathology, burnout, and post-traumatic 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 post-traumatic response, burnout symptoms, and fatigue.

Table 3 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-DEP	MBI-PA	IES-in	IES-av	IES-tot
Number of events	0.18	0.15	0.16	0.15	0.19*	0.30**	0.20*	-0.18	0.33***	0.26**	0.32**
Lack of social support from colleagues	0.28**	0.39***	0.34***	0.35***	0.38***	0.29**	0.27**	-0.42***	0.19*	0.15	0.19
Lack of social support from supervisor	0.39***	0.40***	0.40***	0.32***	0.43***	0.41***	0.40***	-0.34***	0.32**	0.24*	0.31**
Poor communication	0.18*	0.09	0.19*	0.05	0.15	0.26**	0.12	-0.09	0.15	0.31**	0.23*
Insufficient financial reward	0.03	0.12	-0.02	0.04	0.05	0.09	-0.05	0.11	0.15	0.09	0.13
Lack of job autonomy	0.18	0.25**	0.23*	0.17	0.22*	0.25**	0.18	-0.28**	0.22*	0.11	0.18
High emotional demands	0.16	0.17	0.11	0.12	0.17	0.27**	0.26**	-0.14	0.23*	0.32**	0.29**
Physical strains	0.24**	0.27**	0.15	0.09	0.23*	0.35***	0.16	-0.10	0.33***	0.23*	0.31**

IES-in = Impact of Event Scale-intrusion; IES-av = Impact of Event Scale-avoidance; IES-tot = Impact of Event Scale-total; MBI-EE = Maslach Burnout Inventory-Emotional Exhaustion; MBI-CY = Maslach Burnout Inventory-Cynicism; MBI-PA = Maslach Burnout Inventory-Personal Accomplishment; CIS-tot = Checklist Individual Strength-total. CIS-fat = Checklist Individual Strength-fatigue; CIS-act = Checklist Individual Strength-activation; CIS-con = Checklist Individual Strength-concentration; CIS-mot = Checklist Individual Strength-motivation.
*p<0.05, **p<0.01, ***p<0.001.

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 instead of management of organisational procedures and technical elements. Taking part in decision making, and being informed about important issues within the organisation should be adequately arranged in order to prevent health symptoms.

This study has some limitations. In research on the consequences of traumatic or critical incidences the response rate is often low.³² This is an important issue, because people who refused to participate in traumatic stress research have been found to have more health problems.³² 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,³³ such a selection bias would mean that the percentages of health symptoms are underestimated. Additionally, 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 realise 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 it 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

Table 4 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 Value
IES-in	1	IES-tot	0.31	0.56	0.06	<0.001
	2	Poor communication	0.30	0.27	0.03	<0.01
IES-av	1	IES-tot	0.21	0.41	0.05	<0.001
	2	Poor communication	0.30	0.27	0.03	<0.01
	3	High emotional demands	0.33	0.20	0.07	<0.05
IES-tot	1	IES-tot	0.30	0.55	0.10	<0.001
	2	Poor communication	0.35	0.22	0.05	<0.05
MBI-EE	1	MBI-EE	0.44	0.53	0.09	<0.001
	2	IES-tot	0.46	0.14	0.008	0.075
	3	Poor communication	0.49	0.16	0.003	<0.05
	4	Physical strains	0.52	0.17	0.005	<0.05
MBI-DEP	1	MBI-EE	0.08	0.16	0.12	0.13
	2	Lack of support from supervisor	0.16	0.31	0.01	<0.001
MBI-PA	1	CIS-tot	0.19	-0.19	0.004	0.060
	2	IES-tot	0.23	-0.17	0.007	<0.05
	3	Lack of support from colleagues	0.30	-0.23	0.008	<0.05
	4	Lack of support from supervisor	0.32	-0.20	0.005	<0.05
CIS-tot	1	CIS-tot	0.24	0.30	0.12	<0.01
	2	MBI-EE	0.30	0.22	2.81	<0.05
	3	Lack of support from supervisor	0.33	0.22	0.16	<0.05

IES-in = Impact of Event Scale-intrusion; IES-av = Impact of Event Scale-avoidance; IES-tot = Impact of Event Scale-total; MBI-EE = Maslach Burnout Inventory-Emotional Exhaustion; MBI-CY = Maslach Burnout Inventory-Cynicism; MBI-PA = Maslach Burnout Inventory-Personal Accomplishment; CIS-tot = Checklist Individual Strength-total.

management or on trauma counselling.³⁴ From our research is known that both acute as well as 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.³⁵ During training attention should be paid to the different kinds 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.^{34, 36} Talking with colleagues after a critical incident appears to be helpful in preventing harmful outcomes.^{15, 37} Alexander and Wells emphasised the psychoprophylactic role of a good organisation and sensitive staff management practices.³⁵ Jones *et al* demonstrated that the perception of a supportive organisation correlates strongly and negatively with the amount of work stress.³⁸ When implementing a workplace intervention following traumatic events support and acknowledgement from management are of vital importance.³⁹ This study demonstrated that organisational 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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