

## EMPIRICAL PAPER

# Which rescue workers benefit from preventive training in self-management to improve mental health?

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## Abstract

The purpose of this study was to shed light on the question which rescue workers benefit from training in mental health self-management skills. The effectiveness of this training was examined in 79 respondents. The sample contained 38 policemen and 41 ambulance personnel. The effectiveness of the current training was evaluated by measuring the functioning in five private life tasks, metacognitive awareness and coping self-efficacy prior to and after the training. The influence of critical incident exposure, age and personality on intervention effectiveness was also evaluated. The results showed non-significant increases at T2 in perceived effectiveness for the life tasks: Social life and Maintaining mental health. In the scores on two other life tasks (Household and finance and Maintaining Positivity) no significant differences were found. The fifth life task, Giving meaning, was marginally lower at T2. The scales metacognitive awareness and coping self-efficacy showed no significant change. Analyses on differential training effects showed that respondents who experienced more critical incidents showed a smaller T2-T1 difference score on Giving meaning. Due to the small research group we can say with caution that this can indicate that individuals who have a lower exposure of critical incidents at T1, benefit more from these kinds of training schemes. Older respondents showed a smaller gain on Household and finance and Maintaining positivity between measurements, which might indicate that individuals at a younger age might benefit more from the training.

**Keywords:** Preventive training – rescue workers – self-management – mental health – differential training effects

## Abstrait

Le but de cette étude était de mettre en lumière la question de savoir quels sauveteurs bénéficient d'une formation aux compétences d'autogestion de la santé mentale. L'efficacité de cette formation a été examinée chez 79 répondants. L'échantillon comprenait 38 policiers et 41 ambulanciers. L'efficacité de la formation actuelle a été évaluée en mesurant le fonctionnement dans cinq tâches de la vie privée, la conscience métacognitive et l'auto-efficacité face avant et après la formation. L'influence de l'exposition aux incidents critiques, de l'âge et de la personnalité sur l'efficacité des interventions a également été évaluée. Les résultats ont montré des augmentations non significatives à T2 de l'efficacité perçue pour les tâches de la vie: vie sociale et maintien de la santé mentale. Dans les scores de deux autres tâches de la vie (ménage et finances et maintien de la positivité), aucune différence significative n'a été trouvée. La cinquième tâche de la vie, Donner du sens, était légèrement inférieure à T2. Les échelles de conscience métacognitive et d'auto-efficacité d'adaptation n'ont montré aucun changement significatif. Les analyses des effets d'entraînement différentiels ont montré que

**Mots clés:** Formation préventive – secouristes – autogestion – santé mentale – effets d'entraînement différentiels

## INTRODUCTION

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This study examined the effectiveness of a preventive mental health training in self-management skills for rescue workers (e.g., military, police, fire brigade, ambulance personnel). We also investigated whether critical incident exposure, age, and personality play an influential role in the effectiveness of this training. Rescue workers are known to have very demanding and high-risk jobs. Providing them with skills for maintaining a healthy mental condition is thus a necessity to give protection against the impact of a high demanding job. Research shows that an accumulation of involvement in critical incidents makes the rescuer susceptible to developing psychological symptoms like, exhaustion, feelings of depression, anxiety, hostility, sleeping problems, post-traumatic stress symptoms (Alexander & Klein, 2009; de Boer et al., 2011; Castro, 2009; Halpern & Maunder, 2011; Kleber & van der Ploeg, 2003; Monnier, Cameron, Hobfoll & Gribble, 2002). It also puts pressure on their private lives and takes a toll on their family life (Heshmati, 2007; Maddi, 2007), which reduces vitality (Bakker, Veldhoven, Gaillard & Hertogs, 2015; Cicognani, Pietrantonio, Palestini & Prati, 2009; Slotje, 2007, work and financial status (Adler-Baeder, 2007).

The present study evaluated whether preventive mental health training was effective in protecting rescue workers from developing mental health problems. The question of who benefits from a prevention program has been receiving much attention in other research areas (e.g. clinical psychology and health care). The training consists of two meetings of four hours. The focus was on learning to know ones' personal way of self-management, learning to recognize stress signals, finding resources of relaxation and energy, personal confidence and giving meaning. There was attention specifically for mental self-protection against negative energy and harsh events. The combination of psycho-education and exercises was pragmatic and was performed in a group as well as in couples.

Although the effects of preventive training in rescue workers have been studied before, research on who benefits from such training is still unexplored. To our knowledge, we are the first researchers to provide new insights on the subject. This may help practitioners to decide which self-management skills help to maintain mental health in a highly demanding job and who may benefit from receiving this training.

Before we go into the details of the current preventive training, we present a brief review of studies to date on the effectiveness of preventive mental health training in the two groups examined in this study: policemen and ambulance personnel.

## PREVENTIVE MENTAL HEALTH TRAINING

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Until now the effects of preventive training for rescue workers have largely focused on policemen and ambulance workers. The outcomes of a preventive training program given to 65 police officers by McCraty & Atkinson (2012) showed a decrease in psychological stress signals such as anger, sadness and anxiety and improved communication skills at work and at home. The trainees listened more during the training, which resulted in low competitiveness, greater cooperation and team cohesiveness. In a preventive training program for police officers, Shochet et al. (2015) gave "refresh" sessions 18 months after the initial sessions. The data showed a high level of engagement and acceptability to the program. The seven sessions enhanced posttraumatic growth, motivational interviewing and promoted positive relations within the organization. The program was based on cognitive behavioral therapy strategies of stress management and cognitive restructuring.

Comparable studies have asserted that relaxation techniques and imagery-based techniques improved health and problem-focused coping (Arnetz et al., 2013 ; Arble, Lumley, Pole & Blessman, 2016; Anderson et al., 2015). The police officers demonstrated positive reframing, humor and a reduction in anxiety and alcohol use. Furthermore, preventive training based on mindfulness showed improvements in self-reported mindfulness, resilience, emotion regulation, physical health and sleep disturbance (Bergman, Christoffer & Bowen, 2016; Christopher et al., 2016). Moreover, organizational stress, operational stress, and anger were reduced. Only few studies have been focused on preventive training among rescue workers. Weltman, Lamon, Freedy & Chartrand (2014) demonstrated that preventive training with self-regulation skills, utilizing an app and four one-hour telephone training sessions, improved wellness. When policemen are confronted with distressing and negative emotions, they have difficulties accepting and tolerating them.

Respondents were better able to successfully accept and tolerate their emotion, when trained in emotion regulation (Berking, Meier & Wupperman, 2010). Resiliency building for emergency service personnel was focused on the personal strengths of the trainees, highlighting the positive aspects of the emergency role and repeating the training periodically within the organization (Shakespeare-Finch & Copping, 2006; Shakespeare-Finch, 2007; Van der Meulen, & Bosman, 2018). Rewards were given for individual and group performances. The emergency workers self-monitored by periodically revisiting their own sense of meaning, shared it with

their colleagues and maintained professional supervision. Police recruits, who followed a resilience training program, showed more posttraumatic growth than those not in the program. Lastly, Siu, Cooper & Philips (2014), investigating stress management training, adopted a positive psychology approach with health care workers and teachers.

The results demonstrated an improvement in work-related well-being and a reduction in burnout. The large differences between the theoretical concepts and the contents of these studies make it difficult to compare these results. In addition, these studies collected their data during different time intervals after the training. The studies that contained more follow-up sessions over a longer period of time seemed to yield better and longer lasting mental health results (e.g. Shochet et al., 2015). Preventive programs that were integrated in regular job training appeared to be the most effective (Shakespeare-Finch & Copping, 2006).

The present report described the results of a training that focused on learning to maintain mental health through the application of self-management skills. Self-management consists of having control over one's thinking, behavior, and emotions and of being able to regulate and to adapt to internal and external demands (Bakker, 2007). The term self-management was originally developed in programs of health care for patients with chronic diseases. The definition in such programs is, that the patient is responsible for his or her day to day care, self-management is a life task for such patients (Lorig, Halsted & Holman, 2003).

Mental health status improves, when self-management supports an internal stable core in a demanding environment. The opposite occurs when an individual is driven by external triggers and impulses, which results in an inconsistent and stressed behavioral pattern (Bakker et al., 2015).

How policemen behave on the job becomes their way of life. Since critical incidents may occur at any time, they have to be continuously alert and available. This context of the daily job makes it difficult to have time to recover. Their behavior is thus continuously being stimulated and driven by external factors, even when it is no longer appropriate. In the long run, this has an eroding effect on rescue workers' personal health (Bakker et al., 2015, Bakker et al., 2019).

In addition, self-regulation and the processing of negative emotions after surviving a traumatic event facilitates staying healthy. Internalizing, inhibiting, the lack of emotion processing and keeping their problems to themselves, increase the risk of health problems. The lack of proper emotion regulation inhibits the possibility to integrate the trauma in their life narrative

(Tedeschi & Calhoun, 2006). Having low self-awareness has also been linked to more health problems (Pennebaker, 1989). Delahajj, Gaillard & van Dam (2009) show in their research that the relationship between hardiness and responses to a stressful situation are mediated by contextual person characteristics like coping style and coping self-efficacy.

The term hardiness is further developed in the military psychology by Bartone (2006). Hardy people experience harsh and difficult events as "overall interesting and worthwhile". Such experiences are experienced as challenging and present opportunities to learn and grow. Hardy people had a more effective coping style characterized by a more task-focused coping style in stressful circumstances rather than emotions focused coping style (Bartone, Picano & Williams, 2008). Furthermore hardy people tend to be more confident about their ability to cope with a stressful situation and they appraise the situation as more challenging and less threatening.

The goal of the current preventive training is to improve skills and abilities in rescue workers that maintain mental health and function as a buffer against the impact of job demands. These skills are perceived effectiveness in life tasks, meta cognitive awareness and coping self-efficacy. We describe the following hypotheses: Preventive mental health training improves functioning in life tasks (hypothesis 1), improves metacognitive awareness (hypothesis 2), improves coping self-efficacy (hypothesis 3). The fourth hypothesis is: Which rescue-workers benefit from this training? In this last hypothesis we want to investigate if there are any specific aspects measured at T1, that may correlate with outcomes measured at T2.

### **Hypothesis 1:**

#### **Preventive mental health training improves functioning in life tasks**

##### **Life tasks**

The effects of work on the functioning of rescue workers in their private life is a neglected area of research. Most studies focus on mental health problems, like PTSD and depression. In this study we focus on the effectiveness in life tasks. Life tasks are about the striving to build up your life; life tasks are about mastering oneself and the world, starting with our birth and building up mastery over one's functioning within one's environment (Adler, 1956). Adler (1956) and Maslow (1970) developed the pillars for health and happiness such as there are spirituality, self-regulation, work, love and friendship. Pesechian and Tritt (1998), the initiators of positive psychology, distinguished similarly four pillars of happiness and of the experience of success in life: work/finance, family and social contacts, health condition, consciousness and culture. Witmer

and Sweeney (1992) developed a holistic model for wellness and prevention over the life span, based on the theories of Adler (1956) and Maslow (1970).

In the present study we focused on practical daily life tasks, which were developed with a peer group of psychologist and rescue workers. On the basis of this preliminary research the following domains were regarded as the most important life tasks: Social life, Household and finance, Maintaining mental health, Giving meaning, and Maintaining positivity.

If these life tasks are properly maintained, they act as pillars for mental health and well-being, and support people to flourish in their life. However, to maintain the life tasks under pressure of high work demands, requires discipline and proactive behaviour.

The perceived effectiveness in life tasks is comparable to the concept of self-efficacy (Bandura, 2003). The difference is that perceived effectiveness focuses on the experience of functioning in private life. Self-efficacy appeared to play a critical role in the recovery of posttraumatic stress (Bandura, 2003; Benight & Harper, 2002) and in the impact of the loss of resources (Benight, Swift, Sanger, Smith, & Zeppelin, 1999). Having a sense of community was positively related to efficacy beliefs and to active coping strategies (Cicognani et al., 2009). Low self-efficacy has been linked to experiencing feelings of hostility, developing PTSD and being affected more by stressful situations (Heinrichs et al., 2005). We view self-efficacy as an element of managing mental health. Self-efficacy means trusting oneself and feeling confident that one can handle the problems that one is confronted with.

Effectiveness in life tasks is an important buffer against the hard side of life (Hobfoll, 2002).

#### **Hypothesis 2:**

##### **Preventive mental health training improves metacognitive awareness**

###### **Metacognitive awareness**

Schraw and Dennison (1994) developed the notion of metacognition for use in the educational domain. They developed a measurement which focused on the ability to reflect upon, understand and control one's learning. Learners who are more "metacognitively aware" are more strategic and perform better, because they have insight in their own learning strategies and effectiveness (Delahaij, 2009). The importance of awareness of one's stress reactions and coping strategies in order to effectively regulate coping behavior has been developed in the theoretical frameworks of rational emotive therapy (Ellis, 1991) and cognitive appraisal (Lazarus & Folkman, 1984).

#### **Hypothesis 3:**

##### **Preventive mental health training improves coping self-efficacy**

###### **Coping self-efficacy**

Coping buffers against the detrimental effects of stressors (Bandura, 2001). The distinction between adaptive and maladaptive coping styles, or active and passive styles, has received much attention, particularly in studies with rescue workers. Passive coping styles means avoidance of the problem through; seeking distraction like watching television, drink alcohol, or worrying.

Shepherd and Wild (2014) found that enhanced active coping among ambulance workers was associated with making more positive appraisals and greater levels of objectivity during call-outs. Adaptive coping styles (i.e., self-help, approach, and accommodation) led to better post-trauma outcomes among ambulance workers than a maladaptive coping style (i.e., avoidance or self-punishment) (Robyn, Shakespeare-Finch, & Palk, 2011). Sonnentag and Grant (2012) examined prosocial behavior, which is defined as the perception that one's actions on the job are beneficial to others. Positive work reflection was associated with higher perceived competence and predicted a positive effect at home. In another study (Sonnentag, Mojza, Binnewies, & Scholl, 2008), mentally detaching from work was associated with improved affective states at home. Engaging in positive activities buffers against negative feelings and beliefs about self-efficacy and functions as a determinant of prosocial behavior (Caprara & Steca, 2005).

To answer the question which person can benefit of a preventive training we found some interesting existing research. In an overview of the effectiveness of resilience training, Leppin and colleagues (2014) found that low confidence had a small to moderate effect on improving resilience. Positive changes were found in short interventions that did not include structured exercise sessions (Conn et al., 2011). Interventions with inactive participants produce larger effects on physical activity, compared with such interventions with previously active adults before the intervention. Self-efficacy is a better predictor of current ability (Jansen, Scherer & Schroeders, 2015). In mental health-promoting school programs especially, self-esteem seems to be a crucial factor for benefitting from these programs (Flay & Ordway, 2001).

We formulated three hypotheses for assessing the effect of our preventive training: mental health training in self-management was expected to result in 1) an increase in perceived effectiveness in life tasks, 2) an increase in metacognitive awareness, and 3) an increase in coping self-efficacy among rescue workers.

### Hypothesis 4:

#### Which rescue-workers benefit from this training?

The second goal of this study is to shed more light on the question of which rescue-worker benefits from this training. Resilience-oriented training programs have seldom been found to be effective in rescue-workers (e.g., van der Meulen, Bosmans, Lens, & van der Velden, 2018). Most studies in this area yielded negligible or no results and occasionally even reported a diminishing attitude towards the training and a declining resilience over time. The lack of strong overall training effects does not preclude, however, that preventive intervention may be helpful for some (rather than all) of the participants. If this is indeed the case it would be highly imperative to determine which participants benefited from the training. The research on preventive training in rescue workers is scarce, and differential training effects have hitherto not been reported in the literature. It is very important to gain insight into how to improve preventive programs for the subgroups of rescue workers. Therefore, we will contribute to the literature by exploring whether there are differential effects of the current preventive training program in relation to the following variables: the number of incidents, functional age and personality.

One key characteristic of the work of rescue workers is that they experience several critical incidents, the accumulation of which can overwhelm an individual when it reaches a critical point, and this may drain resources. One would expect accumulation to depend on functional age, e.g., how long one has been working in a rescue job (Monnier et al., 2002; Declercq et al., 2011; Prati, 2010). The accumulation of critical incidents increases over time for rescue workers.

When we pay attention to age Ramey et al. (2016) found increased stress in elder policemen after a preventive training and less stress experienced in younger policemen after the training. They explain this effect with greater awareness of stress after the training and more mental and physical health problems than before the training in the elder group.

The other variable to be examined was personality, because Carr and colleagues (2013) have argued that resilience training was more effective if participants were more optimistic and reported less use of disengagement coping styles. Active coping creates resilience, whereas passive coping does not. Vulnerable people often use passive coping styles, which reduces their resilience and their capability to build resilience. This may be problematic because people who tend to have passive coping strategies, low social support and lower levels of optimism are more prone to stressors (McGarry et al., 2015).

This is unfavorable, because they are also less responsive to resilience training programs and do not benefit from them. Thus, the training of this group should concentrate on learning to apply the skills to acquire healthier coping styles.

Beehr et al. (2014) studied the effect of initial resources on the development of strain during a stressful training situation. They examined four resources: emotional stability, previous experience, low drain on pre-existing resources, and group work quality. The primarily emotional stability and lack of pre-existing resources drain, tended negatively related to strains, consistent with the idea that it reduces strain. But contrary to the expectations the three resources that predicted trends over time (emotional stability, previous experience, and low pre-existing resource drain) were associated with worsening rather than improving strains. Britt, Adler and Bartone (2001), investigated in a study of US soldiers the relationship between the meaningfulness of work, personality hardiness, and deriving long term benefits from a stressful event. They completed measures during a year deployment and 4-5 months after it. Personal hardiness was associated with being engaged in meaningful work during the deployment, which was strongly associated with deriving benefits from the deployment months after it was over.

Several studies show an avoidance coping style in policeman, while an active coping style is more protective for mental health (Fortes-Ferreira et al, 2008; Shakespeare-Finch et al, 2005). They suggest that because law enforcement professionals are socialized to believe they are “invincible” and “superhuman” (Violanti, 2006) they are likely to disregard information that conflicts with their police role and identity. Shepherd & Wild (2014) found in ambulance workers that enhanced coping was associated with making more positive appraisals during the call-out. Better coping was also related to greater levels of objectivity during these call-outs. Coping less well was associated with the use of more negative appraisals during the call-out.

In international studies on the wellbeing of rescue workers, little research was conducted on the psychodynamic aspects of the personality. Psychodynamic personality assessment was developed by Eurelings & Snellen (2003).

The underlying personality structure helps to determine the style of self-management, interaction with the environment and expression of psychological symptoms. The personality structure was determined using a comprehensive clinical interview and test diagnostics. With determining the personality structure, it is important to look at the relationship between introversion / extraversion, levels of stress, and anxiety sensitivity in relation to skills

in self-control, stress signaling and whether or not a person takes responsibility for their own suffering. The personality assessment is also important to determine to what extent the self-image and self-presentation match or differ from the inner structure. Research shows that a high self-esteem is associated with a low degree of identification of psychological problems or issues on self-assessment questionnaires (Eurelings-Bontekoe, Luyten & Snellen, 2009).

**METHOD**

**Procedure**

The research was executed in the context of training to increase resilience in a highly demanding job by learning self-management skills. The preventive training consisted of two parts, each lasting four hours, with an interval of four to six weeks between the two sessions. Participants completed online questionnaires on two occasions: before the start of the first training (T1) and one month after the second training (T2). Participants received information about the study and about self-management training in advance by email and via intranet. They volunteered to participate in this study and gave permission by informed consent to use their data for this research. The training sessions were provided by an experienced psychologist in rescue work and an experienced expert trainer that was educated as a social worker.

The theoretical framework is described in Bakker (2007). The following theoretical elements are present in the training:

knowledge about personal character and using your personal manual (Eurelings-Bontekoe, Luyten & Snellen, 2009; Kernberg, 1984; Kernberg, 2005; Bakker, 2007, maintaining and using personal resources (Hobfoll, 1989; Hobfoll, 2002), hardiness (Bartone, 2006), sensemaking/hope (Tedeschi & Calhoun, 2006), personal effectivity (Bandura, 2001). The training was given in a group setting, with education and exercises related to work and private life. At T1, the following topics were discussed: learning to handle your personal manual; recognizing your needs and stress signals and taking the right action to find relaxation again; learning to reset negative emotions and memory; and identifying your personal sources of energy in the job and your private life and learning to use them actively. In particular, attention was paid to the sources of energy before training as a rescue worker.

The second meeting was about identifying aspects of the job that made them feel proud, fostering their professional growth. There is also attention to support of colleagues and supervisors. In the training, they developed a “personal first aid kit to maintain a good mental condition”.

**Sample**

The demographic data are presented in Table 1. Our initial sample consisted of 79 respondents (49 men (62%) and 30 women), containing 38 policemen and 41 ambulance personnel (before starting training), all of whom grew up in The Netherlands. The mean age was 40.76 years (SD: 9.87). The average numbers of

*Table 1. Comparison of respondents and non-respondents*

	<b>Overall (n = 79)</b>	<b>Respondents (n = 49)</b>	<b>Non-respondents (n = 30)</b>
<i>Gender</i>			
Man (%)	49 (62%)	25 (52.1%)	24 (77.4%)
Women (%)	30 (38%)	23 (47.9%)	7 (22.6%)
Age in years (M, SD)	40.76 (9.87)	42.08 (10.13)	39.16 (9.17)
Critical incidents (M, SD)	26.51 (12.88)	25.71 (13.73)	27.74 (11.55)
<i>Personality (median)</i>			
Extraversion	16	17.00	15.00
Somatization	3.00	3.00	3.00
Negativism	12.00	11.50	14.00

hours worked was 36.73 hours (SD: 4.63), with a range of 24 to 50 hours per week. Forty-nine respondents (59.8%) completed the T2 assessment after the training period: 28 were police officers, and 21 were ambulance personnel. This group consisted of 25 men and 24 women, with an average age of 42.33 years (SD: 10.17) and an average of 36.57 (SD: 4.66) working hours per week.

### Measurements

In the present study we collected three sorts of measures before and after training: effectiveness in life tasks, metacognitive awareness, and coping self-efficacy. We also studied potential differential training effects, depending on personality characteristics, age and exposure to critical incidents.

**Life Tasks.** We conceptualized the quality of functioning in private life as the perceived effectiveness in the following private life tasks outside work: Social life, Household and finance, Maintaining mental health, giving meaning and maintaining positivity. This test was especially developed for rescue workers (Bakker, Veldhoven, Gaillard & Hertogs, 2015). The scales used a five-point Likert scale, ranging from 'very bad' through 'very good'. The higher the score was, the more tasks were reported. Respondents were asked to indicate tasks in the domain of Social life through four questions. Items typical for this scale were 'I can maintain friendships' and 'I can receive support and sympathy in my friendships'. The Cronbach's alpha value (0.78) of the Social life scale in the current study was considered to be good.

The second scale was Maintaining Mental Health, which was measured through five questions. Typical items from this scale are 'I can deal with my emotions effectively' or 'I can deal with adversity effectively'. Cronbach's alpha for this scale was .72, which is considered to be good. The third scale was Household and Finance which included four questions. Examples of items from this scale were 'I can manage money effectively' and 'I can build a stable romantic relationship'. Cronbach's alpha for this scale was .67. The fourth scale was Giving meaning, which includes five questions. Items included in this scale were 'I try to learn from the things that I experience in life' and 'I feel relevant in my life'. Cronbach alpha for this scale was .65. The last scale was Maintaining positivity. It was measured by the following two questions: 'The disturbing incidents I experience at work make it hard to stay positive' and 'The disturbing incidents I experience at work make it hard to stay vibrant and hopeful in life'. Cronbach's alpha for this scale was .90

**Metacognitive awareness.** Delahaj & van Dam (2010) developed a metacognitive awareness instrument about stress and coping (MASC) based on the work of Schraw and Dennison (1994). It was developed for military exercises. The scale was constructed for the educational domain. The MASC consisted of 26 items and measured insight into one's coping behavior during a stressful situation and an evaluation of reactions and subsequent performance during and after a stressful situation. Examples of items were 'I know how my body reacts in stressful situations' and 'I know which methods to cope with stress work for me'. The response format was on a 5-point Likert scale ranging from 1 (not at all) to 5 (very much).

**Coping self-efficacy.** Delahaj & van Dam (2010) constructed a coping self-efficacy list, based on Bandura's definition of self-efficacy (Bandura, 1997). It measured the perceived capability to perform well during stressful situations. The list was developed for military exercises and consisted of 11 items. Examples of items are 'I am confident that I will be able to focus on my task, even when I feel anxious' and 'I am confident I will be able to control my fear during threatening circumstances.'

**Personality characteristics.** The NVM (Luteijn & Kok, 1985) is a Dutch personality questionnaire, based on the short version of the Minnesota Multiphasic Personality Inventory (MMPI). We used the subscales of Negativism, Somatization, and Extraversion. Several studies have been conducted researching the NVM (Eurelings-Bontekoe, Onnink, Williams & Snellen, 2008; Eurelings-Bontekoe et al., 2009; Eurelings-Bontekoe, Luyten, Remijnsen, & Koelen, 2010). Negativism had items about passive avoidance behavior, feelings of dissatisfaction, and resentment with daily life. A typical example was 'The life I lived was not the life that I imagined to live.' Somatization contained items related to vague physical complaints. Respondents with high scores tended to respond to psychological tension with physical complaints. Here, a typical example was "My stomach upsets me a lot."

In the research work of Eurelings-Bontekoe, Luyten and Snellen they developed a theory-driven profile interpretation of the Dutch short form of the MMPI (2009) DSFM (Luteijn & Kok, 1985). The interpretation method aimed at assessing structural features of personality based on Kernberg and Caligor's (2005). Research shows the DSFM profiles predicted structural features of personality functioning. In short Kernberg (1984) described three levels of personality organization; the neurotic, the borderline and the psychotic personality organization (PPO). The importance of

combining traits in personality assessments into profiles is more available in research work. Morey et al. (2002) and Miller (2003) show that it give more depth information to combine dimensions in personality tests. It is about the whole picture, not a single dimension.

In the DSFM are five subscales: Negativism, Somatization, Shyness, Severe Psychopathology and Extraversion. The explanation of these scales is in the theory driven way; Negativism is considered to measure the level negative affectivity. The subscale Somatization is considered to measure awareness of somatic (stress) signals, handling personal affect and social capacity. The subscale Shyness reflects the persons capacity of impulse control and inhibitory capacity. The subscale severe psychopathology assumed to reflect anxiety tolerance. The subscale extraversion is the way the person's openness or more closed to the environment. The subscale Shyness and Somatization must give self-regulation and self-protection to compare with the amount the person is open to the environment.

**Critical incidents inventory.** Critical incidents were measured with the critical incidents inventory (CII) developed by Monnier et al. (2002). The test consisted of 24 items indicating the type of incident using a four-point Likert scale, ranging from 0 to 3 points for 'never experienced this event', 'experienced one time', 'experienced two times', and 'experienced three or more times'. Examples of items were 'Line of duty death of a fellow emergency worker' and 'Incident requiring police protection while on duty'. Monnier et al. (2002) reported a median of 8.5 incidents and a range of 0-53.

**STATISTICAL ANALYSES**

The analyses and the descriptive statistics were performed using IBM SPSS Statistics version 23.

Training effects were assessed by performing paired T-tests on the pre- and post-training scores for each of the outcome variables in the study, e.g. life tasks, meta-cognitive awareness, and coping self-efficacy. To find differential effects of the intervention, we examined how critical incidents, age and personality were related to the difference values (T2 minus T1), using Pearson's correlations.

**RESULTS**

In Table 2 means, standard deviations and correlations at T1 are reported for the variables in this study. Some of the correlations are worthy to note here. Metacognitive awareness and self-efficacy were both highly correlated with Giving meaning and Maintaining positivity. Officers might view themselves as highly effective that enhances and reinforces their sense of duty from which they derive meaning. Other notable correlations are the low correlations of Critical incidents with all scales of the Life task test.

**Training effects**

In Table 3, the outcome measures are shown, comparing pre- and post-training scores. We expected that the training would result in a higher perception of their effectiveness in the life tasks. Although participants increased in the perceived effectiveness in their life tasks for Social life, which went from 4.00 (SD: .47, 95% CI [3.87;

Table 2. Correlations between measures at T1 (n = 49)

	Social Life	Maintaining mental health	Household and finance	Giving meaning	Maintaining positivity	Metacognitive awareness	Coping self-efficacy
Maintaining mental health	.187						
Household and finance	.326**	.046					
Giving meaning	.155	.402**	0.55				
Maintaining positivity	.415**	.149	.130	.209			
Metacognitive awareness	-.073	-.562**	.010	-.504**	-.156		
Coping self-efficacy	.028	-.494**	-.073	.353**	.170	-.480**	
Critical Incidents	-.150	-.045	.100	0.092	-.116	.093	.132

\* p < .05, \*\*p < .01



Table 3. Mean and SD of the outcome measures at T1 and T2

	T1	T2	t	p
Life tasks				
Social life	4.00 (.47)	4.10 (.36)	-.844	.403
Maintaining mental health	3.90 (.32)	3.92 (.40)	-.487	.629
Household and finance	4.13 (.39)	4.08 (.40)	.822	.415
Giving meaning	3.96 (.53)	3.77 (.47)	2.286	.027*
Maintaining positivity	4.21 (.72)	4.13 (.71)	.649	.519
Metacognitive awareness	2.23 (.36)	2.17 (.25)	1.409	.165
Coping self-efficacy	7.66 (1.02)	7.64 (1.00)	.242	.81

Table 4. Correlations of the differential effects. Life tasks Social Life, Mental Health, Household and finance, Giving Meaning, and Maintaining Positivity are differential scores for T2 – T1.

	1. Social Life	2. Mental Health	3. Household and Finance	4. Giving Meaning	5. Maintaining Positivity
1. Critical Incidents	.072	-.208	.022	-.330*	-.002
2. Age	-.190	-.124	-.447**	-.089	-.436**
3. Negativism	.120	-.063	-.233	.109	-.022
4. Somatization	.009	-.156	.068	.069	.091
5. Extraversion	-.121	-.038	.131	.106	.166

\* p < .05, \*\*p < .001

4.14] at T1 to 4.1 (SD: .36, 95% CI [3.95; 4.17]) at T2, and Maintaining mental health, which went from 3.9 (SD: .32, 95% CI [3.81; 3.98]) at T1 to 3.92 (SD: .4, 95% CI [3.82; 4.03]) at T2, these changes were not significant in a paired T-test. The scores on Household and finance, and Maintaining positivity were slightly reduced but also not significantly different. Participants had a decreased sense of Giving meaning at T2; the decrease from 3.96 (SD: .53, 95% CI [3.8; 4.12]) to 3.77 (SD: .47, 95% CI [3.64; 3.9]) at T2 was significantly different ( $t(47) = 2.286, p = .03$ ). In contrast to police officers, ambulance personnel reported decreases in their perceived effectiveness in the following life tasks: Giving

meaning decreased from an average of 4.04 (SD: .45, 95% CI [3.85; 4.24]) at T1 to 3.67 (SD: .49, 95% CI [3.44; 3.88]) at T2, and Maintaining positivity decreased from an average of 4.31 (SD: .64, 95% CI [4.06; 4.56]) to 3.98 (SD: .62, 95% CI [3.73; 4.25]).

**Metacognitive awareness.** No significant differences were found between the two groups at T1 and T2. Metacognition decreased between the two measurements, but not significantly, from 2.23 (SD: .36, 95% CI [2.13; 2.33]) at T1 to 2.17 (SD: .25, 95% CI [2.10; 2.24]).

**Coping self-efficacy.** We expected that the training would have provided respondents with a positive development in terms of coping self-efficacy. For the complete sample, we did not find any support for our claim that the training increases the coping self-efficacy of the respondents: The observed difference of .02 (95% CI [-.16; .20]) was not significant ( $t(47) = .064, p = .949$ ).

### DIFFERENTIAL TRAINING EFFECTS

Before we proceeded with the differential effects analyses, we examined whether there were differences between the group that responded to both T1 and T2 (referred to as the responsive group) versus the group that only responded to T1. The following demographic variables showed differences: gender, age, critical incidents; see Table 1 for an overview. Significant differences were found for the scores on the Life tasks test. The responsive group had a higher perceived effectiveness in Social life ( $t(77) = 2.58, p = .012$ ). The respective means were 4.03 (sd: .49, 95% CI [3.89; 4.16]) for the responsive group versus 3.76 (SD: .40, 95% CI [3.61; 3.89]) for the unresponsive group. The responsive group also had a higher perceived effectiveness of their Household and finance tasks ( $t(77) = 2.24, p = .028$ ). The responsive group had a mean score of 4.14 (SD: .39, 95% CI [4.03; 4.25]) while the unresponsive group had a mean score of 3.93 (SD: .46, 95% CI [3.77; 4.08]). For metacognitive awareness and coping efficacy, we found no differences in scores between the two groups. These initial results can be viewed in Table 1.

#### Critical incidents

Critical Incidents at T1 are a significant predictor for the difference score for Giving meaning ( $r = -.330, p = .022$ ), which indicates that a higher difference (more progress on this scale between T1 and T2) is associated with a lower score of Critical incidents at T1.

#### Age

The same is true for Household and finance, with age as a predictor ( $r = -.447, p = .001$ ). Also, the difference score of Maintaining positivity seemed to be negatively associated with age at T1 ( $r = -.436, p = .002$ ).

#### Personality Characteristics

For personality characteristics Negativism, Somatization and Extraversion we found that none of the personality characteristics

turned out to be significantly related with the difference scores for Life tasks.

### DISCUSSION

The first goal of this study was to examine whether preventive training in self-management improved functioning among rescue workers. We hypothesized that the training would result in a positive development on (1) perceived effectiveness in life tasks, (2) metacognitive awareness, and (3) coping self-efficacy. Concerning the first hypothesis, participants' scores increased in perceived effectiveness in their life tasks for Social life and Maintaining mental health, however these changes were not significant, whereas the score for Giving meaning was significantly reduced. The scores on Household and finance, and Maintaining positivity were slightly reduced but not significant. Therefore, we cannot say that any improvement occurred in these life tasks of the respondents one month after training, as measured with the Life task test. For the ambulance personnel, effectiveness in two life tasks (Giving meaning and Maintaining positivity) even decreased over the course of the training.

An explanation for the small effects may be that rescue workers tend to underreport mental health complaints (Bakker et al., 2015). In this preventive training, they have learned to recognize stress signals and to use skills in self-management. This means that a possible training effect could be that they are now capable of listening to and accepting stress signals in their awareness, rather than ignoring them. Another explanation for small or even opposite training effects has been suggested by Cigrang, Todd & Carbone (2000). In a study of cadets, they found no improvement because of a pessimistic attitude and disengagement coping. They expected that participants who were more optimistic and preferred problem-focused coping would benefit more from a preventive training. Robertson, Cooper, Sarkar, & Curran (2015) found in a review of 14 studies of resilience training in the workplace that the expectations of benefit from the preventive training influenced the results. They quoted a study by Carr et al. (2013), who found that when commanders have the impression that a particular program will not provide benefit, there is less of a training effect. In their study, resilience declined over time. This seems to be in line with the conclusions of Van Hove et al. (2015) that some people benefit more from intensive individual training with attention to their personal needs.

We also found that none of the groups (overall group, police group and the ambulance group) showed improvements in metacognitive

awareness. The training did not seem to improve their awareness of how they think and reflect under stress. Likewise, coping self-efficacy was not enhanced after the training. It should be noted that the scores on coping self-efficacy and meta-cognitive awareness of our group were quite high at T1. Due to this ceiling effect, the chance of finding further improvements was rather low. The high scores also show that rescue workers exhibit great trust in their own skills as a rescue worker, which in itself may act as a buffer against the detrimental effects of their work.

A possible explanation of lower scores on Giving meaning and maintaining positivity was that the training strengthens the awareness of stress signals. The experience that life is hard can grow larger when people pay more attention to it. Ramey et al. (2016) advises to give older people individualized training and to perform a pre-training test to select people with high scores on mental health problems to profit from preventive training. It is also possible that the period to expect change was too short, although measurements after 3 or 6 months can show more positive effects.

### Differential effects

The second part of our study was to provide some insight into the question who might and who might not be receptive of an intervention. Critical incidents and age at T1 predicted the difference scores on three Life task scales. Respondents who experienced more critical incidents showed a smaller difference score on Giving meaning. This indicates that individuals who have a lower exposure of critical incidents at T1, benefit more from these kinds of training schemes. Older respondents showed a smaller gain on Household and finance and Maintaining positivity between measurements, which might indicate that individuals at a younger age might benefit more from the training.

This has practical implications with respect who to include in a training like this. This concurs with earlier findings by Ramey et al. (2016), who found increased stress in elder policemen after a preventive training, whereas younger policemen experienced less stress after the training. Ramey and colleagues explained this effect by assuming that older trainees were more aware of stress after the training and had more mental and physical health problems after the training. Considering the relatively high average age, which was approximately 40 years old, this might be an explanation for why there were no differences before and after the training in the current study; our group might have suffered from the same effects as Ramey et al. (2016) found. It is also possible that the training had a larger effect with the younger rescue workers, who were also less exposed

to critical incidents. We think that these findings have practical implications and can be used to improve training programs.

Research on posttraumatic growth (PTG) also showed that results can be mixed. People might experience life as more meaningful, but that richer life may come at the price of the discomfort that tragedy and loss almost always produce (Calhoun & Tedeschi, 2009). In their research the relations and dependencies between critical incident exposure, personality and coping style are complicated because they are not linear making it difficult to untangle. On the one hand, incidents that are potentially traumatic can also foster growth in people, but on the other hand, people might acknowledge that experiences were difficult or hard; furthermore, in the latter case, they may realize the impact but were able to learn from it or to overcome, recover and become stronger because of it.

This is also supported on the basis of more qualitative and process oriented evaluation that we did for the current training. In these evaluations, the rescue workers who felt supported by their colleagues and their friends, were more capable of applying the learned skills to handle the impact of their job and maintain their mental condition. For others, it was the first time they could talk about their experiences and learn practical skills in maintaining mental condition.

In this study no differential effect was found for the personality factors. It means that in this study personality factors don't give an explanation for the benefits of the training. It is difficult to give an explanation for this result. Probably it is because of the small research group or in this group there are less differences between personality characteristics.

### LIMITATIONS AND FUTURE RESEARCH

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The major limitation of this research was the relatively small number of respondents in the two groups of rescue workers and the limited research design (no control group, only one follow-up period). This may be a partial explanation for the lack of an overall significant training effect. The differential results were promising, although they would need to be replicated in more (diverse) samples, using more sophisticated research designs. The inclusion of a control group (for example, colleagues with a less stressful or non-rescue job) is also imperative to be able to compare results and specific job characteristics.

In our design, we have chosen to run t-tests instead of a multivariate analysis, such as Manova. First, our sample was insufficient for the latter type of analysis, and second, that Manova analysis is vulnerable

for underestimating the levels of chance, especially in small samples, or in samples with large outliers. However, we do not dismiss these multivariate analyses, and recommend future research that incorporates such a design. Possible interaction effects can then also be distinguished, as well as revealing the individual variance of each contributing variable. This might provide more insight in the workings of the effects of interventions like the current one.

Comparison of characteristics of dropouts from the study at T2 with the final sample indicates selective responses. It appears that respondents who score worse at T1 in terms of Social life and Household and finance are less likely to participate in subsequent measurements, such as T2. This might have biased our sample, therefore the conclusions drawn for this study should be interpreted with caution.

#### PRACTICAL IMPLICATIONS

On the basis of the present study, the results indicate that one should be careful to administer a training to rescue workers, especially without any thoughts about who to include. None of our initial hypotheses were confirmed. There was slight improvement in Social life and Maintaining mental health, but not significant. On the other hand, the slight increase of difficulties in Household and finance, Giving meaning and Maintaining positivity can also show that the training support reflection and awareness of difficulties which needs to be solved. Rescue workers tend to underreport complaints (Ménard & Arter, 2013) and this training can give them support to be aware of it and take responsibility for improvement.

Our (small) study showed that most likely younger, less exposed rescue workers benefit more in their perceived efficiency in life tasks, compared to older colleagues who are more exposed to critical incidents. This would suggest that training for the target audience of rescue workers should preferably be offered to individuals at the beginning of their career, or even still in training. For rescue workers, who have years of professional experience and who have reported relatively more critical incidents, earlier studies showed that a training program that ran for a longer time, focused on cognitive behavioral skills and using a combination of group and individual approaches gave some improvement (Shochet et al., 2015). Another point is that this study showed that there is a need for more diverse research on this topic, to uncover differential effects in these training programs.

We urgently advise HR managers, education policymakers in rescue organizations and other people involved in the training of rescue

workers to integrate these types of training in and after basic training. Continuous training in mental health should be integrated into daily work rituals and ongoing education activities (Shakespeare-Finch, 2007). In addition to the training program itself, preventive actions should be integrated into the job. Like recovery time, limitations to years on the front line and support of leaders, create moments for colleague support and an effective work organization.

For future research it is advised to develop more incentives, for example a study reward, to stimulate study participation. The inclusion of a control group (for example, colleagues with a less stressful or non-rescue job) is also imperative in order to be able to compare results and specific job characteristics. ■

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References

- Adler, A.** (1956). *The Individual Psychology of Alfred Adler* (H.L. Ansbacher, & R.R. Ansbacher, Eds.). New York: Basic Books.
- Adler-Baeder, F.** (2007). *Smart Steps: Embrace the Journey*. National Stepfamily Resource Center.
- Andersen, J. P., Papazoglou, K., Koskelainen, M., Nyman, M., Gustafsberg, H., & Arnetz, B. B.** (2015). Applying resilience promotion training among special forces police officers. *SAGE open*, 5(2), Doi: 10.1177/2158244015590446
- Arnetz, B., Arble, E., Backman, L., Lynch, A., & Lublin, A.** (2013). Assessment of a prevention program for work-related stress among urban police officers. *International Archives of Occupational and Environmental Health*, 86(1): 79-88.
- Alexander, D., & Klein, S.** (2009). First Responders after Disasters: A Review of Stress Reactions, At-Risk, Vulnerability, and Resilience Factors. *Prehospital and Disaster Medicine*, 24(2): 87-94. Doi: 10.1017/S1049023X00006610
- Andersen, J. P., Papazoglou, K., Koskelainen, M., Nyman, M., Gustafsberg, H., & Arnetz, B. B.** (2015). Applying resilience promotion training among special forces police officers. *SAGE open*, 5(2), Doi: 10.1177/2158244015590446
- Arble, E., Lumley, M. A., Pole N., Blessman J., & Arnetz, B. B.** (2016). Refinement and preliminary testing of an imagery-based program to improve coping and performance and prevent trauma among urban police officers. *Journal of Police and Crime Psychology*
- Arnetz, B. B., Bliese, P. B., Mc Gurk, D., Hoge C. W., & Castro, C. A.** (2009). Battle mind debriefing and battlemind training as early interventions with soldiers returning from Iraq: Randomization by platoon. *Journal of Consulting and Clinical Psychology*, 77: 928-940. Doi:10.1037/a0016877
- Bakker, A. B., & Heuven, E.** (2006). Emotional dissonance, burnout and in-role performance among nurses and police officers. *Journal of Stress Management*, 13(4): 423-440.
- Bakker, A. B., & Brummelhuis, L. L., ten** (2012). A resources perspective on the work-home interface. The work-home resources model. *American Psychologist*, 67(7): 545-556.
- Bakker, A. H. M., Veldhoven, M. J. P. M., van, Gaillard, A. W. K., & Hertogs, R.** (2015). *The Impact of Critical Incidents on Mental Health: An Exploratory Pilot Study into the Moderating Effects of Social Support on the Impact of Adverse Events in Dutch Rescue Workers*. *Policing*, Doi: 10.1093/police/pav038
- Bakker, A.H.M., van Veldhoven, M., Gaillard, T., Hertogs, R. and Feenstra, M.** (2019). The functioning of rescue workers in life tasks: development of a test. *International Journal of Emergency Services*, Vol. ahead-of-print No. ahead-of-print.
- Bakker, A. H. M.** (2007). *Jezelf Besturen*. Weesp, The Netherlands: Tatra Media BV.
- Bandura, A.** (1997). Editorial. *American Journal of Health Promotion*, 12(1): 8-10.
- Bandura, A.** (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology*, 52(1): 1-26. Doi: 10.1146/annurev.psych.52.1.1
- Bandura, A.** (2003). On the psychosocial impact and mechanisms of spiritual modeling. *International Journal for the Psychology of Religion*, 13: 167-173.
- Bartone P. T.** (2006). Resilience nder military operational stress: can leaders influence hardiness. *Military Psychology*, 18 (suppl), S131-S148
- Bergman, A. L., Christopher, M. S., & Bowen, S.** (2016). Changes in facets of mindfulness predict stress and anger outcomes for police officers. *Mindfulness*, 7(4): 851-858. Doi: 10.1007/s12671-016-0522-z
- Benight, C. C., & Harper, M. L.** (2002). Coping self-efficacy perceptions as a mediator between acute stress response and long-term distress following natural disasters. *Journal of Traumatic Stress*, 15(3): 177-186. Doi: 10.1023/A:1015295025950.
- Benight, C. C., Swift, E., Sanger, J., Smith, A., & Zeppelin, D.** (1999). Coping self-efficacy as a mediator of distress following a natural disaster. *Journal of Applied Social Psychology*, 29(12): 2443-2464. Doi: 10.1111/j.1559-1816.1999.tb00120.x
- Bartone, P. T., Picano, J. J., Williams, T. J.** (2008). Psychological

hardiness predicts success in US army special forces candidates. *International of Selection and Assessment*, 16: 78-81

**Beehr, T., Ragsdale, J., & Kochert, J.** (2015). Effects of initial resources on the development of strains during a stressful training situation: Some counterintuitive results. *Journal of Organizational Behavior*, 36(4): 467-490.

**Berking, M., Meier, C., & Wupperman, P.** (2010). Enhancing emotion-regulation skills in police officers: results of a pilot controlled study. *Behavior Therapy*, 41(3): 329-339. Doi: 10.1016/j.beth.2009.08.001

**Boer, J. de, Lok, A., Verlaat, E. van 't, Duivenvoorden, H. J., Bakker, A. B., & Smit B. J.** (2011). Work-related critical incidents in hospital-based health care providers and the risk of post-traumatic stress symptoms, anxiety, and depression: A meta-analysis. *Social Science & Medicine*, 73: 316-326.

**Britt, T., Adler, A., & Bartone, P.** (2001). Deriving benefits from stressful events: The role of engagement in meaningful work and hardiness. *Journal of Occupational Health Psychology*, 6(1): 53-63.

**Brummelhuis ten, L. L., ter Hoeven, C. L., Bakker, A. B., & Peper, B.** (2011). Breaking through the loss cycle of burnout: The role of motivation. *Journal of Occupational and Organizational Psychology*, 84(2): 268-287. Doi: 10.1111/j.2044-8325.2011.02019.x

**Calhoun, L.G., & Tedeschi, R.G.** (2009). The foundations of posttraumatic growth: an expanded framework. **Handbook of Posttraumatic Growth**. Hove, UK: Lawrence Erlbaum Associates.

**Carr, W., Bradley, D., Ogle, A. D., Eonta, S. E., Pyle, B. L., & Santiago, P.** (2013). Resilience training in a population of deployed personnel. *Military Psychology*, 25(2): 148. Doi: 10.1037/h0094956

**Caprara, G. V., & Steca, P.** (2005). Affective and social self-regulatory efficacy beliefs as determinants of positive thinking and happiness. *European Psychologist*, 10(4): 275-286. Doi: 10.1027/1016-9040.10.4.275.

**Castro, C. C.** (2009). Impact of combat on the mental health and well-being of soldiers and marines. *Smith College Studies in Social Work*, 79(3-4), 247-262.

**Cigrang, J. A., Todd, S. L., & Carbone, E. G.** (2000). Stress management training for military trainees returned to duty after a mental health evaluation: effect on graduation rates. *Journal of Occupational Health Psychology*, 5(1): 48. Doi: 10.1037/1076-8998.5.1.48

**Christopher, M. S., Goerling, R. J., Rogers, B. S., Hunsinger, M., Baron, G., Bergman, A. L., & Zava, D. T.** (2016). A pilot study evaluating the effectiveness of a mindfulness-based intervention on cortisol awakening response and health outcomes among law enforcement officers. *Journal of Police and Criminal Psychology*, 31(1), 15-28. Doi: 10.1007/s11896-015-9161-x

**Cicognani, E., Pietrantonio, L., Palestini, L., & Prati, G.** (2009). Emergency workers' quality of life: The protective role of sense of community, efficacy beliefs and coping strategies. *Social Indicators Research*, 94(3): 449. Doi: 10.1007/s11205-009-9441-x

**Conn, V., Hafdahl, A., & Mehr, D.** (2011). Interventions to increase physical activity among healthy adults: Meta-analysis of outcomes. *American Journal of Public Health*, 101(4): 751-758.

**Ellis, A.** (1991). The revised ABC's of rational-emotive therapy (RET). *Journal of Rational-Emotive and Cognitive-Behavior Therapy*, 9: 139-172. Doi:10.1007/BF01061227

**Declercq, F., Meganck, R., Deheegher, J., & Van Hoorde, H.** (2011). Frequency of and subjective response to critical incidents in the prediction of PTSD in emergency personnel. *Journal of Traumatic Stress*, 24(1): 133-136.

**Delahaij, R., Gaillard, A. W. K., & Dam, van K.** (2009). Hardiness and the response to stressful situations: Investigation mediation processes. *Personality and Individual Differences*, 59(5): 386-390.

**Delahaij, R.** (2009). *Coping under acute stress: the role of person characteristics*. Breda: Kon. Broese & Peereboom.

**Delahaij, R., & van Dam, K.** (2010). Coping style development: The role of learning goal orientation and metacognitive awareness. *Personality and Individual Differences*, 92: 57-62. Doi: 10.1016/j.paid.2015.12.012

**Eurelings-Bontekoe, E. H. M., & Snellen, W. M.** (2003). *Dynamische Persoonlijheidsdiagnostiek*. Lisse: Swets & Zeitlinger.

**Eurelings-Bontekoe, E. H. M., Onnink, A., Williams, M. M., & Snellen, W. M.** (2008). A new approach to the assessment of structural personality pathology: Theory-driven profile interpretation of the Dutch Short Form of the MMPI. *New Ideas in Psychology*, 26(1): 23-40. Doi: 10.1016/j.newideapsych.2007.03.002.

**Eurelings-Bontekoe, E. H. M., Luyten, P., & Snellen, W.** (2009). Validation of a theory-driven profile interpretation of the Dutch short form of the MMPI using the TAT Social Cognitions and Object Relations Scale (SCORS). *Journal of Personality Assessment*, 91(2): 155-165. Doi:10.1080/00223890802634274.

**Eurelings-Bontekoe, E. H., Luyten, P., Remijsen, M., & Koelen, J.** (2010). The relationship between personality organization as assessed by theory-driven profiles of the Dutch Short Form of the MMPI and self-reported features of personality organization. *Journal of Personality Assessment*, 92(6): 599-609. Doi: 10.1080/00223891.2010.513311.

**Flay, B., Allred, R., & Ordway, C.** (2001). Effects of the Positive Action Program on achievement and discipline: Two matched-control comparisons. *Prevention Science*, 2(2): 71-89.

- Fortes-Ferreira, L., Peiró, J., González-Morales, M., & Martín, I.** (2006). Work-related stress and well-being: The roles of direct action coping and palliative coping. *Scandinavian Journal of Psychology*, 47(4): 293-302.
- Green, B.** (2004). Post-traumatic stress disorder in UK police officers. *Current Medical Research and Opinion*, 20(1): 101-105.
- Halpern, J. & Maunder, R.G.** (2011). Acute and Chronic Workplace Stress in Emergency Medical Technicians and Paramedics: Chapter from *Handbook of Stress in the Occupations*. Ed. Langan-Fox, J. & Cooper, C. L. pp.135-160. C.L. Edward Elgar: Cheltenham, UK.
- Heinrichs, M., Wagner, D., Schoch, W., Soravia, L. M., Hellhammer, D. H., & Ehlert, U.** (2005). Predicting posttraumatic stress symptoms from pretraumatic risk factors: a 2-year prospective follow-up study in firefighters. *American Journal of Psychiatry*, 162(12): 2276-2286. Doi: 10.1176/appi.ajp.162.12.2276
- Heshmati, A.** (2007). The relationship between income inequality, poverty and globalization. In *The Impact of Globalization on the World's Poor*, pp.59-93. Palgrave Macmillan UK.
- Hobfoll, S.E.** (1989). Conservation of resources. A new attempt at conceptualizing stress. *American Psychologist*, 44(3): 513-524.
- Hobfoll, S. E.** (2002). Social and psychological resources and adaptation. *Review of General Psychology*, 6: 307-324.
- Jansen, M., Scherer, R., & Schroeders, U.** (2015). Students' self-concept and self-efficacy in the sciences: Differential relations to antecedents and educational outcomes. *Contemporary Educational Psychology*, 41: 13-24.
- Kernberg, O. F.** (1984) *Severe Personality Disorders. Psychotherapeutic strategies*. New Haven, London: Yale University Press.
- Kernberg, O. F., & Caligor, E.** (2005). A psychoanalytic theory of personality disorders. *Major Theories of Personality Disorder*, 2: 114-156.
- Kleber R. J., & Ploeg E., van der.** (2003). Acute and chronic job stressors among ambulance personnel: Predictors of health symptoms. *Occupational & Environmental Medicine*, 60: 40-46.
- Lazarus, R. S., & Folkman, S.** (1984). Coping and adaptation. *The Handbook of Behavioral Medicine*, 282-325.
- Leppin A. L., Bora, R. P., Tilburt, J. C., Gionfriddo, M. R., Zeballos-Palacios, C., Dulohery, M. M., . . . Montori, V. M.** (2014). The efficacy of resiliency training programs: A systematic review and meta-analysis of randomized trials. *PLoS ONE*, 9(10): E111420.
- Luteijn, F., & Kok, A. P.** (1985). Revised Manual of the Dutch NVM. Lorig K. R., Halsted P. H., Holman H. R. (2003) Self-management education, history, definition, outcomes and mechanisms. *Annals of Behaviour Medicine*. 26(1): 1-7.
- Maddi, S. R.** (2007). Relevance of hardiness assessment and training to the military context. *Military Psychology*, 19(1): 61. Doi: 10.1080/08995600701323301.
- Maslow, A. H.** (1970). *Motivation and Personality*. New York: Harper & Row.
- McGarry, S., Girdler, S., McDonald, A., Valentine, J., Lee, S., Blair, E., . . . Elliott, C.** (2013). Paediatric health-care professionals: Relationships between psychological distress, resilience and coping skills. *Journal of Paediatrics and Child Health*, 49(9): 725-732.
- McCarty, R., & Atkinson, M.** (2012). Resilience training program reduces physiological and psychological stress in police officers. *Global Advances in Health and Medicine*, 1(5): 44-66. Doi: 10.7453/gahmj.2012.1.5.013
- Meloth, M. S.** (1990). Changes in poor readers' knowledge of cognition and the association of knowledge of cognition with regulation of cognition and reading comprehension. *Journal of Educational Psychology*, 82(4): 792. Doi: 10.1037/0022-0663.82.4.792.
- Ménard, K.S., & Arter, M. L.** (2013). Police Officers Alcohol Use and Trauma Symptoms; Associations with Critical Incidents, Coping and Social Stressors. *International Journal of Stress Management*. 20(1): 37-56.
- Meulen van der, E., Bosmans, M. W., Lens, K. M., Lahlah, E., & van der Velden, P. G.** (2018). Effects of mental strength training for police officers: A three-wave quasi-experimental study. *Journal of Police and Criminal Psychology*, 33(4), 385-397
- Miller, M. W. (2003).** Personality and the etiology and expression of PTSD. A three factor model perspective. *Clinical Psychology, Science and Practice*, 10 (4): 373-393.
- Monnier, J., Cameron, R. P., Hobfoll, S. E., & Gribble, J. R.** (2002). The impact of resource loss and critical incidents on psychological functioning in fire-emergency workers: A pilot study. *International Journal of Stress Management*, 9(1): 11-29. Doi: 10.1023/A:1013062900308.
- Morey, L., Gunderson, J., Quigley, B., Shea, M., Skodol, A., McGlashan, T., . . . Zanarini, M.** (2002). The representation of borderline, avoidant, obsessive-compulsive, and schizotypal personality disorders by the five-factor model. *Journal of Personality Disorders*, 16(3): 215-234.
- Peseschkian, N. & Tritt, K.** (1998). Positive psychotherapy effectiveness study and quality assurance. *European Journal of Psychotherapy & Counseling*, 1(1). Doi:10.1080/13642539808400508
- Pennebaker J.W.** (1989). Confession, inhibition and disease. *Advances in experimental Social Psychology*, 22: 211-244.

- Prati, G., & Pietrantonio, L.** (2010). Risk and Resilience Factors among Italian Municipal Police Officers Exposed to Critical Incidents. *Journal of Police and Criminal Psychology*, 25(1): 27-33.
- Ramey, S. L., Perkhounkova, Y., Hein, M., Chung, S., Franke, W. D., & Anderson, A. A.** (2016). Building resilience in an urban police department. *Journal of Occupational and Environmental Medicine*, 58(8): 796-804. Doi: 10.1097/JOM.0000000000000791
- Robertson, I. T., Cooper, C. L., Sarkar, M., & Curran, T.** (2015). Resilience training in the workplace from 2003 to 2014: A systematic review. *Journal of Occupational and Organizational Psychology*, 88(3): 533-562. Doi: 10.1111/joop.12120
- Robyn, K., Shakespeare-Finch, J., & Palk, G.** (2011). Adaptive and maladaptive coping strategies predict post trauma outcomes in ambulance personal. *Journal of Traumatology*, 17(4).
- Schaufeli, W. B., Bakker, A. B., & Van Rhenen, W.** (2009). How changes in job demands and resources predict burnout, work engagement, and sickness absenteeism. *Journal of Organizational Behavior*, 30(7): 893-917. Doi: 10.1002/job.595.
- Schraw, G., & Dennison, R. S.** (1994). Assessing metacognitive awareness. *Contemporary Educational Psychology*, 19(4): 460-475. Doi: 10.1006/ceps.1994.1033.
- Shakespeare-Finch, J., Gow, K., & Smith, S.** (2005). Personality, Coping and Posttraumatic Growth in Emergency Ambulance Personnel. *Traumatology*, 11(4): 325-334.
- Shakespeare-Finch, J., & Copping, A.** (2006). A grounded theory approach to understanding cultural differences in posttraumatic growth. *Journal of Loss and Trauma*, 11(5): 355-371.
- Shakespeare-Finch, J.** (2007). Building resilience in emergency service personnel through organisational structures. *The 42nd Annual Australian Psychological Society Conference: Making an Impact*, 25-29, Brisbane.
- Shepherd, L., & Wild, J.** (2014). Emotion regulation, physiological arousal and PTSD symptoms in trauma-exposed individuals. *Journal of Behavior Therapy and Experimental Psychiatry*, 45(3): 360-367. Doi: 10.1016/j.jbtep.2014.03.002.
- Shochet, I. M., Smith, C. L., Roos, C. R., Wurfl, A., Mackay, B., Robinson, T., ... & Ashby, B.** (2015). Rationale and description of an innovative resilience-building to promote mental health for indigenous job seekers. *Journal of Australian Indigenous Issues*, 18(4): 53-70.
- Siu, O. L., Cooper, C. L., & Phillips, D. R.** (2014). Intervention studies on enhancing work well-being, reducing burnout, and improving recovery experiences among Hong Kong health care workers and teachers. *International Journal of Stress Management*, 21(1): 69. Doi: 0.1037/a0033291.
- Slottje, P., Twisk, J. W. R., Smidt, N., Huizink, A. C., Witteveen, A. B., Mechelen W. van & Smid, T.** (2007). Health-related quality of life of firefighters and police officers 8,5 years after the air disaster in Amsterdam. *Quality of Life Research*, 16: 239-252.
- Sonnentag, S., Mojza, E. J., Binnewies, C., & Scholl, A.** (2008). Being engaged at work and detached at home: A week-level study on work engagement, psychological detachment, and affect. *Work & Stress*, 22(3): 257-276. Doi: 10.1080/02678370802379440.
- Sonnentag, S., & Grant, A. M.** (2012). Doing good at work feels good at home, but not right away: When and why perceived prosocial impact predicts positive affect. *Personnel Psychology*, 65(3): 495-530. Doi: 10.1111/j.1744-6570.2012.01251.x.
- Tedeschi, R. G., & Calhoun, L. G.** (2006). Expert companions: Posttraumatic growth in clinical practice. *Handbook of Posttraumatic Growth: Research and Practice*, 291-310.
- Theodosiou, A., & Papaioannou, A.** (2006). Motivational climate, achievement goals and metacognitive activity in physical education and exercise involvement in out-of-school settings. *Psychology of Sport and Exercise*, 7(4): 361-379. Doi: 0.1016/j.psychsport.2005.10.002
- Vanhove, A. J., Herian, M. N., Perez, A. L., Harms, P. D., & Lester, P. B.** (2016). Can resilience be developed at work? A meta-analytic review of resilience-building programme effectiveness. *Journal of Occupational and Organizational Psychology*, 89(2): 278-307.
- Violanti, J. M., Andrew, M. E., Burchfiel, C. M., Dorn, J., Hartley, T., & Miller, D. B.** (2006). Posttraumatic stress symptoms and subclinical cardiovascular disease in police officers. *International Journal of Stress Management*, 13(4): 541.
- Watson, D., & Pennebaker J.W.** (1989). Health complaints, stress and distress: Exploring the central role of negative affectivity. *American Psychological Association*, 96(2): 234-254.
- Weltman, G., Lamon, J., Freedy, E., & Chartrand, D.** (2014). Police department personnel stress resilience training: an institutional case study. *Global Advances in Health and Medicine*, 3(2): 72-79. Doi: 10.7453/gahmj.2014.015
- Witmer, J. M., & Sweeney, T. J.** (1992). A holistic model for wellness and prevention over the life span. *Journal of Counseling & Development*, 71(2): 140-148.
- Yap, A. J., & Tong, E. M.** (2009). The appraisal rebound effect: Cognitive appraisals on the rebound. *Personality and Social Psychology Bulletin*, 35(9): 1208-1219. Doi: 10.1177/0146167209338073.