



# Psychiatry

## Interpersonal and Biological Processes

ISSN: (Print) (Online) Journal homepage: <https://www.tandfonline.com/loi/upsy20>

## Pre-incident Training to Build Resilience in First Responders: Recommendations on What to and What Not to Do

Jennifer Wild , Neil Greenberg , Michelle L. Moulds , Marie-Louise Sharp , Nicola Fear , Samuel Harvey , Simon Wessely & Richard A. Bryant

To cite this article: Jennifer Wild , Neil Greenberg , Michelle L. Moulds , Marie-Louise Sharp , Nicola Fear , Samuel Harvey , Simon Wessely & Richard A. Bryant (2020) Pre-incident Training to Build Resilience in First Responders: Recommendations on What to and What Not to Do, Psychiatry, 83:2, 128-142, DOI: [10.1080/00332747.2020.1750215](https://doi.org/10.1080/00332747.2020.1750215)

To link to this article: <https://doi.org/10.1080/00332747.2020.1750215>



© 2020 The Author(s). Published with license by Taylor & Francis Group, LLC.



Published online: 27 Apr 2020.



[Submit your article to this journal](#)



Article views: 2050



[View related articles](#)



[View Crossmark data](#)



Citing articles: 1 [View citing articles](#)



# Pre-incident Training to Build Resilience in First Responders: Recommendations on What to and What Not to Do

Jennifer Wild, Neil Greenberg, Michelle L. Moulds, Marie-Louise Sharp, Nicola Fear, Samuel Harvey, Simon Wessely, and Richard A. Bryant

Emergency services are under enormous pressure to offer programmes that could protect their staff from the psychological impact of stressors encountered in their roles. There has been a surge in the number of pre-incident training programmes aimed at first responders to maintain their psychological wellbeing after critical incidents. These include pre-employment screening programmes, psychoeducation, operational training, line manager training and interventions aimed at improving resilience, wellbeing or stress management. Whilst developed with the best intentions, these programmes vary in efficacy. Therefore, knowing what training to offer first responders prior to exposure to critical incidents is far from clear. In this review, we critique the available evidence and make recommendations about what to offer and what to avoid offering first responders prior to exposure to critical incidents. We found no evidence of the effectiveness of pre-employment screening or psychoeducation offered as a standalone package, and little evidence for interventions aimed to improve wellbeing and

---

*Dr Jennifer Wild* is a consultant clinical psychologist, associate professor and NIHR Oxford BRC Senior Research Fellow at the University of Oxford. Her area of expertise is in developing and evaluating evidence-based interventions to prevent stress-related psychopathology in emergency responders. *Professor Neil Greenberg* is an academic psychiatrist, who is a specialist in the understanding and management of psychological trauma, occupational mental ill-health and post traumatic stress disorder. Dr Greenberg is based at King's College London and served as the President of the UK Psychological Trauma Society from 2014-2017. *Professor Michelle Moulds* is a PLuS Alliance Fellow in the School of Psychology at The University of New South Wales, Sydney. She was awarded her PhD at UNSW in 2003 and completed a Postdoctoral Fellowship at the Institute of Psychiatry, King's College London. The broad goal of her research is to understand how repetitive thinking, such as rumination, maintains depression. *Dr Marie-Louise Sharp* is a senior research associate at the King's Centre for Military Health Research (KCMHR). Dr Sharp is a mixed methods researcher and has research expertise in psychological medicine, epidemiology, and has responsibility for KSMHR research strategy. *Professor Nicola Fear* is a professor of epidemiology, the director of the King's Centre for Military Health Research and the Chair of the Psychological Medicine PhD sub-committee. Her area of expertise is the mental health and wellbeing of service personnel, veterans and their families. *Associate Professor Samuel Harvey* leads the Workplace Mental Health Research Program at the Black Dog Institute. He is a psychiatrist and epidemiologist with a particular interest in the overlap between mental health, physical health and work. *Sir Simon Charles Wessely* is a psychiatrist and professor of psychological medicine at the Institute of Psychiatry, King's College London and head of its department of psychological medicine, vice dean for academic psychiatry, teaching and training at the Institute of Psychiatry, as well as Director of the King's Centre for Military Health Research. *Professor Richard A Bryant* is an Australian medical scientist. He is Scientia Professor of Psychology at the University of New South Wales (UNSW) and Director of the UNSW Traumatic Stress Clinic, based at UNSW and Westmead Institute for Medical Research.

Address correspondence to Jennifer Wild, Department of Experimental Psychology, Oxford Centre for Anxiety Disorders & Trauma, University of Oxford, Paradise Square, Oxford OX1 1TW, UK. E-mail: [jennifer.wild@psy.ox.ac.uk](mailto:jennifer.wild@psy.ox.ac.uk) This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives License (<http://creativecommons.org/licenses/by-nc-nd/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited, and is not altered, transformed, or built upon in any way.

resilience to stress - although current trials of empirically-driven interventions for first responders are underway and show promise in preventing stress-related psychopathology. Operational and line manager training showed the most promise but need to be evaluated in high quality trials with sufficient follow-up to draw conclusions about their preventative benefits.

Organizations have an obligation to take reasonable steps to optimize their workers' mental and physical health particularly when their work places them at risk. First responders are routinely exposed to traumatic critical incidents as part of their job. Coupled with other occupational pressures, such as irregular shift patterns and reduced access to informal support (Stanley et al., 2016), the cumulative effects of such stress places them at elevated risk of developing trauma-related psychological disorders (Berger and Coutinho et al., 2012). Two broad approaches are currently in practice which aim to protect the psychological wellbeing of emergency responders: (a) pre-incident screening and training, and (b) post-incident support. Such approaches offer programmes varied in length, content, delivery and efficacy.

Recently there has been a gradual shift within many emergency service organizations toward taking a more proactive approach to the mental health and wellbeing of their workers. This has resulted in increasing interest in various pre-incident interventions, including pre-employment screening and training programmes, operational training, interventions aimed at improving resilience, wellbeing or stress management, psychoeducation resources, and line manager training. Knowing what works and when is essential to avoid offering training to staff which could be ineffective at best, and harmful at worst. The purpose of this paper is to evaluate the existing evidence on pre-incident screening and training, and make recommendations for what emergency service organizations should do - and just as importantly, should not do - before first responders are exposed

to the stressful and potentially traumatic aspects of their jobs.

## SCREENING

The finding from meta-analyses that approximately 10% of first responders have PTSD (Berger and Coutinho et al., 2012) or other forms of psychopathology leads to two conclusions. First, most personnel are resilient. Second, it seems reasonable to attempt to identify the significant minority who are at increased risk of developing psychological problems. These factors have led many agencies to implement pre-recruitment or pre-deployment screening of personnel to determine their likely capacity to psychologically cope with the demands of the job. Training emergency service personnel can be expensive and demanding on resources, and so agencies need to allocate training resources to personnel who are likely to succeed in both their training and subsequent careers. By identifying people who are at higher risk for psychological problems, agencies can achieve greater operational efficiencies and also avoid the personal costs to individual workers who are prone to stressor-related psychopathology.

Similar to the military, some first responder agencies have implemented screening procedures partly based on research indicating general risk factors for psychopathology, including PTSD, depression, and anxiety. These factors include childhood trauma, female gender, prior psychological problems, introversion, neuroticism, and maladaptive coping strategies. Much of this evidence comes from cross-sectional studies in which risk factors are inferred from factors associated with post-

trauma psychopathology. Since the recent wars in Iraq and Afghanistan, there have been numerous prospective studies that have indexed risk factors for psychopathology by assessing personnel prior to deployment (Polusny et al., 2017). In terms of first responder agencies, some prospective studies have been reported that have highlighted the risk for psychopathology conferred by the tendency to ruminate (Wild et al., 2016), engage in self-blame (Bryant & Guthrie, 2005, 2007), have a greater psychophysiological arousal to startle stimuli (Guthrie & Bryant, 2005), or impaired ability to learn that a previously conditioned fearful stimulus is no longer threatening (Guthrie & Bryant, 2006).

Although each of these factors are statistically linked to subsequent psychopathology, applying these associations to screening protocols has proven challenging. Attempts to conduct pre-deployment screening in the military has yielded mixed findings. Whereas there is evidence that screening performs poorly in identifying those who develop psychological problems (Rona et al., 2006), there is some evidence that preventing individuals with significant current mental health difficulties from deploying can lead to better mental health outcomes (C. H. Warner, Appenzeller, Parker et al., 2011). Importantly, it should be noted that this approach has been shown to be successful in the case of individuals with current mental health problems, who would not normally be recruited for operational service. A recent systematic review of studies of emergency service agencies that have evaluated pre-deployment recruitment screening included 21 prospective studies of police and fire-fighter organizations. It concluded that screening performed poorly in identifying those personnel who would develop psychological problems after commencing frontline duties (Marshall et al., 2017). Interestingly, this review found that more dynamic measures such as HPA activity or skin conductance responses to provocative stimuli or maladaptive cognitive styles were more predictive than the more commonly used “static” measures of trauma

history or prior psychiatric problems; however, even these measures were relatively poorly predictive. Also of interest was the finding that other more commonly used screening indicators such as trait anger and dissociation were not especially predictive of later psychopathology.

Despite such findings, many of the pre-employment screening protocols being used amongst emergency service workers continue to rely on personality measures. Of the four studies which have used the NEO Personality Inventory, which is based on the five-factor model of personality (neuroticism, extraversion, openness, agreeableness, and conscientiousness), only one that was conducted in the real-world setting of a first responder organization showed that neuroticism predicted later psychopathology (Pineles et al., 2013). The other commonly used personality measure used in screening protocols is the Multiphasic Minnesota Personality Inventory (MMPI), however to date only one study has evaluated its ability to predict psychological injury amongst first responders in a real world setting (Marshall et al., 2020). This study followed up 300 police recruits for seven years and found that elevated scores of various MMPI subscales were not associated with subsequent psychological injury. As demonstrated by these studies a major issue for any type of pre-employment mental health screening is that even the most well-established risk factors do not seem able to predict future psychological problems when they are used in real world settings. This is almost certainly due to the bias that most workers display in reporting both personality traits and early problems. Personnel will often under-report symptoms and impairment owing to (often well-founded) concerns that their employers will use this information in ways that may adversely affect their careers, prospects for promotion, or capacity to undertake certain duties (e.g., serve in elite units). Supporting this concern is evidence that workers answer surveys differently when they perceive that

employers have access to the information (Warner, Appenzeller, Grieger, et al. 2011).

The ultimate test for pre-recruitment screening is its ability to predict subsequent psychopathology and functioning at a reasonable level of accuracy at an individual level. Even when studies have been able to show statistical associations between pre-recruitment measures and subsequent psychopathology outcomes, there is a need to demonstrate that a particular cutoff score on any metric (either a scale or physiological marker) possesses sufficient predictive power. That is, a cutoff score needs to have sufficient positive predictive power (i.e., greater probability of later psychopathology developing if the first responder exceeds the cutoff) and negative predictive power (i.e., lower probability of later psychopathology if the screener score is below the cutoff). The current evidence suggests that there are no screening measures available with adequate predictive power to make it both useful and nondiscriminatory. Accordingly, extant measures lack the ability to function ably as a pre-recruitment screening tool. Despite this, hundreds of emergency services agencies continue to use a variety of screening instruments with variable cutoffs to predict prospective employees who will manage the demands of first responder duties. We postulate the use of such measures is in fact discriminatory, in that it excludes people from roles which they could carry out effectively, and dangerous because managers who lead teams of screened personnel may, incorrectly, infer that employees who screen as being psychologically resilient will not go on to develop mental health difficulties. This belief may reduce both a manager's vigilance for early indicators of mental health problems in their staff and their willingness to put in place other psychological health mitigation measures.

It is also worth noting that most emergency service organizations have recruitment procedures that do not rely on psychological screening but focus strongly on an applicant's academic history, occupational track

record, physical health, and other indices of general functioning (e.g., criminal checks). These factors are often strong proxies for psychological functioning, and can serve to predict how a person may function in the occupational arena. As such, they may be a more appropriate tool to use. There is a strong need to consider the potential merits of psychological screening relative to adverse consequences. Ongoing mental health screening does occur in some agencies, and evidence is emerging that practices, such as Mandatory Impact Monitoring, used by UK intelligent services is effective at signposting staff who wish and need access to treatment. However, the evidence is "classified" and not publicly available so again, caution must be used when regarding claims about the utility of ongoing mental health screening in the workplace, which also suffers from the same limitations as pre-employment screening.

## TRAINING

Operational training programs represent another key organizational approach to bolstering resilience in first responder groups. For example, in the UK student paramedics typically receive three years of training prior to commencing in their role as a newly qualified paramedic, and full-time firefighters complete 16 weeks of training with a two-year probationary period, which includes modular training during this time. A number of studies demonstrate that operational training, as distinct from stress management, contributes to better psychological wellbeing after critical incidents (Brooks et al, 2018). Such findings are consistent with studies of military personnel, which provide good evidence that personnel who felt properly prepared to carry out their role whilst on operational deployments were less likely to develop mental health problems including PTSD (Iversen et al., 2008). These findings have implications for some services which use mainly volunteer or part-time

staff who are often not able to get the same level of training and preparation. There is also evidence that access to supportive personnel within military units and access to good supervisory level leadership is protective of mental health (Jones et al., 2012). For example, regarding leadership, troops who report experiencing good leadership have around 1/10 of the rate of probable PTSD relative to troops who do not. However, it is notable that these data originate from cross-sectional studies and it is possible that troops reported having poor leaders because those views were influenced by negative thoughts as a result of poor mental health. Nonetheless, we highlight that these cross-sectional data were at least collected during deployment in Afghanistan itself, and not afterward, as is more common. Similar cross sectional associations between leadership behavior and mental health outcomes are now starting to emerge for first responders (Petrie et al., 2018). Good leadership is not just protective of troops' mental health – there is evidence that military personnel who perceive their leader to be supportive and effective increases the chance of personnel seeking help in the event that they go on to develop a mental health disorder (Jones et al., 2012).

## **INTERVENTIONS AIMED AT IMPROVING WELLBEING, RESILIENCE AND STRESS MANAGEMENT**

### **Resilience Training**

Whilst interventions aimed at improving resilience to general stress in first responders can be effective in improving psychological resilience (e.g., Joyce et al., 2017), it remains to be seen whether such improvements translate to better mental health outcomes for emergency workers after exposure to critical incidents. A recent systematic review demonstrated less promising findings linked to resilience interventions and determined that about a half of the

available interventions had no significant effects on mental or physical health outcomes (Wild et al., 2020). Those linked to beneficial effects that would be considered to be intervention-specific were more likely to lead to improvements in psychological wellbeing and stress, and to target modifiable risk factors of poor mental health, such as behavioral disengagement, physical inactivity and suppression. Interventions with a higher number and frequency of sessions tended to fare best with a mean number of 18 sessions for interventions that could be linked to intervention-related improvements (Wild et al., 2020). Interventions that led to little or no improvements were briefer, typically delivered with an average of between 3 to 4 sessions. The most effective interventions took place once a week, whereas the least effective interventions took place in a block of a three or four days, or every two weeks.

However, what is unclear is whether improvements in wellbeing, stress and resilience lead to a reduced likelihood of developing mental health problems after exposure to critical incidents. Most resilience, wellbeing and stress management interventions would not be considered pre-incident training since they are delivered well into a worker's career. One resilience intervention has been administered to newly recruited firefighters and would thus be considered to be pre-incident training at the start of service (Skeffington et al., 2016). The intervention was 4 hours in length and focused on teaching participants to stop to think before responding to a given situation and to assess what support they may need. The intervention had no effect on the primary prevention of mental health problems, including PTSD, and no effect on the use of social support or coping strategies.

The main limitation of existing studies which have attempted to evaluate the benefits of these interventions is that they have failed to assess emergency workers following (i.e., in the months or years after) their



exposure to critical incidents. Such studies leave untested the question of whether training programmes indeed confer preventive benefits – i.e., are effective in protecting against the development of mental health problems in the aftermath of critical incidents. A second shortcoming of existing studies is that evaluations of resilience training tend to exclude emergency workers with symptoms of PTSD or depression. Thus, the benefit of the programmes for reducing such symptoms and preventing their persistence cannot be determined from the current evidence.

A third limitation is that many interventions to improve resilience to stress and trauma do not systematically target psychological factors that predict the onset of psychological problems following a critical incident. In order to maximize the likelihood of effectiveness, preventive approaches need to target modifiable vulnerability factors that have been shown to precede and predict the emergence of post-trauma psychological problems, a conclusion supported by the empirical evidence (Wild, El-Salahi, & Hoge, 2020). An example of this approach is work being conducted with newly recruited paramedics in the UK (Wild et al., 2016); i.e., a prospective study which identified predictors of post-incident psychopathology in this group. Informed by this prospective work, the researchers are currently trialing an internet-delivered resilience training program that directly targets the cognitive processes identified as key risk factors for the development of PTSD and depression following exposure to critical incidents (Wild et al., 2018). This program of research offers an excellent model of the development of an evidence-based intervention aimed to reduce post-incident psychopathology.

What we can conclude from the available evidence is that resilience interventions which target modifiable risk factors (i.e., behavioral disengagement, cognitive bias, rumination, suppression) for mental health problems

improve self-reported resilience measures, wellbeing and reduce stress in emergency workers. Whether these improvements protect emergency workers from developing mental health problems or improve their coping (or indeed both) after exposure to critical incidents remains to be determined.

### Digital Interventions

Over recent decades, there has been increasing interest in the use of digital tools, including online programs and smartphone apps, to target a range of aspects of health and wellbeing, including mental health. There has been a proliferation in the number of apps developed to address mental health problems (over 10,000 currently commercially available; Torous et al., 2019), many of which have no evidence base supporting them. Moreover, recent commentaries (e.g., Anthes, 2016) have highlighted the absence of rigorous evaluation of many of the apps available to treat mental health problems, and called for a consensus on standards for developing and evaluating digital mental health tools, including apps (Torous et al., 2019). A further complication in evaluating apps which target specific behaviors is difficulty separating reinforcement of the target behavior *once it has commenced* versus reinforcement of the behavior *which is provided (i.e., initiated) by the app*. Moreover, commentators in this field have highlighted the need to elucidate the role of a potential “digital placebo effect” (Torous & Firth, 2016) in clouding the picture of the effectiveness of mental health apps. Finally, trials evaluating apps are often characterized by low rates of overall usage and particularly longer term retention (Torous et al., 2019).

Whilst there is evidence that apps are effective in promoting behavioral change in specific domains (e.g., increasing physical activity; Schoeppe et al., 2016), in the context of mental health the evidence is less promising. Recent systematic reviews and meta-analyses have shown that digital interventions are able to prevent some depression

and anxiety symptoms and can be used effectively in the workplace, although the longer-term benefits remain unclear (Deady et al., 2017). These digital platforms are often regarded as attractive to emergency service personnel because resilience programs can be completed anonymously, independently of the employer, and can be self-paced. A survey of Australian fire fighters found that over half stated they would be interested in trying a mental health focused smartphone app if it was developed for emergency workers (Deady et al., 2017).

Nonetheless, digital interventions, including online training and smartphone apps, represent important potential tools with which to deliver preparatory interventions to promote resilience and facilitate healthy adjustment in first responders in the aftermath of critical incidents. What, then, currently exists for first responders? A recently published RCT of an online training program conducted with Australian fire fighters and rescue workers demonstrated that mindfulness-based resilience training delivered via the internet led to improvements in adaptive resilience and coping over a six month follow up period (Joyce et al., 2019). Whilst there exist apps that specifically target wellbeing in first responders following critical incidents (e.g., Cordico Firefighter Wellness App, <https://www.cordico.com/firefighter-mobile-aap/>; Crew-Care, [www.CrewCareLife.com](http://www.CrewCareLife.com)) – the status of the field is that there are currently no apps that target behavior in first responders *prior* to a critical incident in order to confer protective benefits in its aftermath. Furthermore, even if such apps were to be developed, we would urge that they be rigorously evaluated before they could be recommended.

### Exercise

Turning to exercise, a substantial body of research supports the irrefutable benefits of exercise for the prevention of

many diseases, including cardiovascular disease, diabetes, cancer, hypertension, obesity, depression and osteoporosis (Warburton et al., 2006). Two studies have evaluated physical exercise interventions for first responders. Norris et al. (1990) assigned police officers to aerobic or anaerobic exercise three times a week for 8 weeks. Both groups demonstrated greater wellbeing and quality of life with large effect when compared to treatment-as-usual (Norris et al., 1990). Aerobic exercise was also associated with greater improvements in self-reported job stress. There were no significant differences between police officers who engaged in aerobic and anaerobic exercise, suggesting that type of exercise did not affect efficacy. In the second study (Norvell & Belles, 1993), circuit weight training three times a week for 4 months improved psychological functioning and physical symptoms in police officers (with large effect) compared to a waitlist control group, which failed to improve any outcome over time. It is unclear to what extent police officers retained their exercise routine and associated benefits over time and to what extent improvements in these domains protected against psychological ill health after critical incidents. Given that exercise is associated with improvements in psychological wellbeing, reductions in self-reported job stress (and in the general population, symptoms of low mood and depression), it seems reasonable to hypothesize that regular exercise could potentially improve coping after critical incidents, possibly through reducing self-reported stress and low mood and thereby improving problem-solving and use of resources.

### Psychoeducation

Psychoeducation as a tool to deliver information about health and how to stay well in times of stress is commonly employed amongst the emergency services. As part of their training, police, firefighters and paramedics receive psychoeducation



about the consequences of stress although the level of detail and the length of the psychoeducation programmes varies.

Mental health first aid has emerged as a popular psychoeducation programme, designed to help people understand mental health symptoms better and be more able to help those around them who experience mental health problems. Offered as a one or two-day workshop, this programme can lead to the qualification as a “Mental Health First Aider”, who is considered trained to prevent and/or help in a mental health crisis. The psychoeducation programme gives strategies for supporting people with depression, distress, psychosis, anxiety, self-harm and suicidal behavior. The training supports a detailed plan called the ALGEE action plan (ALGEE: Approach, Listen, Give support, Encourage to seek professional support, Encourage support of others). Mental health first aid is used in some police services for their officers. Although mental health first aid has been associated with improved attitudes to mental illness, increased knowledge and self-efficacy compared to leaflet-information only (Moffitt et al., 2014), there is currently no evidence that this approach has protective benefits for mental health.

Two recent trials have evaluated the impact of psychoeducation amongst emergency workers. The first compared psychoeducation to a group-based resilience intervention for emergency workers (Wild et al., 2020). The psychoeducation modules covered sleep, stress, depression, anger, mindfulness, and PTSD. Participants in both conditions self-reported improvements in confidence in managing their mental health. However, neither condition led to improvements in psychological outcomes at post-intervention (6 weeks) or at three month follow-up, and there were no differences between participants who received the group-based intervention and those who received psychoeducation on any measure. Second, Tan et al. (in prep) conducted a cluster RCT of psychoeducation amongst

new fire fighter recruits. Similarly, there were no long-term benefits of psychoeducation, either in terms of likely help-seeking or symptom levels.

Such findings are in keeping with the wider literature, which suggests that psychoeducation is generally ineffective in terms of building resilience to stress. Sharp-ley et al. (2008) compared Naval and Marine personnel who had and had not received psychoeducation about stress and stress reactions in a briefing session prior to being deployed to the 2003 Iraq war. There was no evidence that pre-deployment psychoeducation reduced subsequent psychological distress after deployment. What is emerging is evidence that it is the type of education that matters: training about the job appears to be more effective than training in stress management (i.e., Wessely et al., 2008)

Taken together, these results underscore the need to evaluate the efficacy of psychoeducation delivered prior to critical incidents to prevent or reduce subsequent mental ill health. Like critical incident stress debriefing (CISD), it may emerge that such broad approaches to mental health are unhelpful in the short and long-term.

## LEADERSHIP

Organizations have the potential to play a key role in fostering first responders' mental health by supporting good organizational processes, communication and leadership. Leadership practices at the management and group levels have scope to shape the psychological adjustment of personnel after critical incidents (see Petrie et al., 2018). There is a need for managers of first responders to be aware of the nature of mental health problems that may emerge after critical incidents, and to receive workplace training about how to respond appropriately. Observational data suggest that training focused on skill development is likely to be more effective at changing managers' behavior than other forms of

mental health education (Bryan et al., 2018). However, few such training programs exist. In a recent randomized evaluation of a 4 hour mental health training package for managers in the fire and rescue service in Australia (Milligan-Saville et al., 2017), the employees of managers who had received training on how to have conversations about mental health reported a significant decrease in work-related sick leave at 6-month follow-up. Although these findings cannot speak directly to the impact of training on employees' mental health outcomes, the authors note that for firefighter populations mental health problems are one of the most common reasons for sick leave. More recently, similar skills-based manager training programs, such as the Managing Mental Health in the Emergency Services training, which has been delivered by the UK's mental health charity, Mind, as part of their Blue Light Programme and *HeadCoach*, an online skills training delivered to senior ambulance staff have been shown to be effective in improving managers' confidence as well as their self-reported behaviors (i.e., Gayed et al., 2019). As such, the outcomes are promising, and raise the possibility that mental health training programs of this kind for managers may influence psychological outcomes in first responders.

At the group level, a supportive organizational environment and team support have a positive impact on first responder personnel. For example, there is evidence that perceived organizational support increases wellbeing and morale and retention in studies with UK police officers (Boag-Munroe et al., 2017). There is also evidence in first responder samples that as supervisor support increases, job satisfaction increases and organizational and operational stress decrease (Kula, 2017). Organizational factors also importantly influence personnel's psychological adjustment to critical incidents. For example, social support has been repeatedly found to act as a protective factor in managing reactions to traumatic incidents in Canadian firefighters (Regehr et al., 2003). Moreover, lack of such support predicted

depression (Regehr & Millar, 2007), and by diminishing job satisfaction also indirectly increased intentions to leave (Brough & Frame, 2004). In a recent US study comparing PTSD symptoms in first responders versus members of the community following exposure to Hurricane Sandy, first responders had fewer PTSD symptoms compared to community participants. The authors proposed that this difference may have been attributable to psychosocial factors involved in first responder professions, such as camaraderie and informal coworker support, which potentially functioned as protective factors against developing PTSD (Gonzalez & Rasul et al., 2019). It may be the case that social support functions as a protective factor against mental health problems by providing informal support that allows a positive environment in which problems can be disclosed and individuals supported (emotionally and practically) to address their difficulties.

Good leadership and management have the potential to create an environment in which mental health stigma is reduced, and first responders feel able to seek psychological help should they need it. Indeed, there is evidence of stigma in first responder populations (e.g., Menard, Arter, & Khan, 2016), and a recent systematic review highlighted fears of confidentiality and negative career impact as barriers to psychological help-seeking (Haugen et al., 2017). Such evidence has prompted the development of specific campaigns to reduce stigma (e.g., the 'blue light programme' run by the Charity Mind, UK, aimed to train first responder managers in mental health literacy, reduce stigma and improve help-seeking).

## CONCLUSION

In this paper, we have attempted to assemble and critically evaluate the evidence for screening and pre-incident training programmes for first responders. Table 1 shows the recommendations for pre-incident screening and training programmes borne

TABLE 1. Recommendations and Research Directions for First Responder Pre-incident Training Programmes

	SCREENING	OPERATIONAL TRAINING	WELLBEING/RESILIENCE/STRESS INTERVENTIONS	PSYCHOEDUCATION	LINE MANAGER TRAINING
BENEFITS	No evidence that screening prior to recruitment can accurately identify individuals who will manage stressors on duty	Realistic operational training may help prepare people for the challenges of their role and achieve mastery of skills during critical incidents.	Some interventions show improvements in wellbeing, stress management and psychological resilience. Exercise interventions are the most effective interventions for improving wellbeing.	Improvements in confidence to manage mental health.	Line manager training promotes an organizational environment that encourages help-seeking when mental ill health arises. The evidence suggests this training is associated with reduced sickness absence.
RECOMMENDATION AS A PRE- INCIDENT PROGRAMME	No	Yes	Not yet	No	Yes. It must be skills based leadership training
REASON	Evidence is inconclusive	Supportive evidence although not tested in high quality comparative trials.	Evidence is inconclusive	Evidence is lacking	Preliminary evidence
RESEARCH DIRECTION	Evaluate the positive and negative predictive value, and negative consequences, of screening prospective personnel (including cost analyses).	To assess the impact of pre-deployment/role training in high quality trials and to identify helpful components	Evaluate the protective benefits of pre-incident psychological programmes on post-incident functioning.	Evaluate the effects of pre-incident psychoeducation on post-incident functioning.	Evaluate the long-term relationship of line management training and mental health outcomes

out of the empirical research. The current status of the literature is such that there is little or no evidence for most of the pre-incident programmes reviewed, including pre-employment screening. There is evidence for operational training, which we would see as obligatory – whilst we regard psychological interventions aimed at improving wellbeing or resilience to stress as being optional until there is an evidence base to support their implementation. Whilst digital interventions, such as apps, appear to be acceptable to first responders and feasible to incorporate into their daily use, there is currently not enough evidence to recommend their implementation. The evidence reviewed suggests that psychoeducation alone is ineffective and should not be offered as a programme to improve wellbeing or to reduce the likelihood of developing mental health problems after critical incidents. Line manager training programmes, especially those focused on teaching managers practical mental health skills, do show preliminary promise and the field needs further research with longer follow-up to determine the preventative benefits of such programmes. Finally, it goes without saying that an organizational culture that supports mental health is crucial for ensuring staff ask for help if needed without fear of retribution or job insecurity. Programmes aimed to reduce stigma are likely to benefit organisations. However, their role in preventing mental health problems or reducing the incidence of stress-related psychopathology after critical incidents remains to be seen.

The current uptake and application of the approaches reviewed in this paper are time-intensive and costly to deliver, a concerning observation in the absence of evidence for their efficacy. Future research must evaluate the longterm benefits of such approaches for first responders with a view to disseminating interventions that work to reduce stress-related psychopathology. Current high quality trials of empirically driven

pre-incident interventions are underway, which will also evaluate trajectories of outcome following exposure to stressors and trauma. Such an approach is needed to develop evidence-based guidelines for emergency service organizations for advising on what to and what not to offer their staff before they are exposed to the stressful and potentially traumatic aspects of their jobs.

## ACKNOWLEDGMENTS

This work was supported by MQ, PLuS Alliance and the NIHR Oxford Health Biomedical Research Centre.

## FUNDING

This work was supported by MQ [CQRO1260]; PLuS Alliance [PS41270]; PLuS Alliance [PS41277].

## DISCLOSURE STATEMENT


No potential conflict of interest was reported by the authors.

## ORCID


Jennifer Wild  <http://orcid.org/0000-0001-5463-1711>


Neil Greenberg  <http://orcid.org/0000-0003-4550-2971>

Michelle L. Moulds  <http://orcid.org/0000-0001-7064-4248>

Marie-Louise Sharp  <http://orcid.org/0000-0001-8516-0166>

Nicola Fear  <http://orcid.org/0000-0002-5792-2925>

Samuel Harvey  <http://orcid.org/0000-0001-9580-3743>

Simon Wessely  <http://orcid.org/0000-0002-6743-9929>

Richard A. Bryant  <http://orcid.org/0000-0002-9607-819X>

## REFERENCES

- Anthes, E. (2016). Mental health: There's an app for that. *Nature*, 532(7597), 20–23. <https://doi.org/10.1038/532020a>
- Berger, W., Coutinho, E. S., Figueira, I., Marques-Portella, C., Luz, M. P., & Neylan, T. C., et al. (2012). Rescuers at risk: a systematic review and meta-regression analysis of the worldwide current prevalence and correlates of PTSD in rescue workers. *Soc Psychiatry Psychiatr Epidemiol*, 47(6), 1001–1011.
- Boag-Munroe, F., Donnelly, J., Van Mechelen, D., & Elliot-Davies, M. (2017). Police officers' promotion prospects and intention to leave the police. *Policing: A Journal of Policy and Practice*, 11, 132–145.
- Brooks, S. K., Dunn, R., Amlôt, R., Greenberg, N., & Rubin, G. J. (2018, February). Training and post-disaster interventions for the psychological impacts on disaster-exposed employees: A systematic review. *Journal of Mental Health*, 15, 1–25. <https://doi.org/10.1080/09638237.2018.1437610>
- Brough, P., & Frame, R. (2004). Predicting police job satisfaction and turnover intentions: The role of social support and police organisational variables. *New Zealand Journal of Psychology*, 33, 8–18.
- Bryan, B. T., Gayed, A., Milligan-Saville, J. S., Madan, I., Calvo, R. A., Glozier, N., & Harvey, S. B. (2018). Managers' response to mental health issues among their staff. *Occupational Medicine*, 68(7), 464–468. <https://doi.org/10.1093/occmed/kqy103>
- Bryant, R. A., & Guthrie, R. M. (2005). Maladaptive appraisals as a risk factor for posttraumatic stress: A study of trainee firefighters. *Psychological Science*, 16 (10), 749–752. PSCI1608 [pii]. <https://doi.org/10.1111/j.1467-9280.2005.01608.x>
- Bryant, R. A., & Guthrie, R. M. (2007). Maladaptive self-appraisals before trauma exposure predict posttraumatic stress disorder. *Journal of Consulting and Clinical Psychology*, 75 (5), 812–815. 2007-13640-014 [pii]. <https://doi.org/10.1037/0022-006X.75.5.812>
- Deady, M., Peters, D., Lang, H., Calvo, R., Glozier, N., Christensen, H., & Harvey, S. B. (2017). Designing smartphone mental health applications for emergency service workers. *Occupational Medicine*, 67(6), 425–428. <https://doi.org/10.1093/occmed/kqx056>
- Gayed, A., Bryan, B. T., LaMontagne, A. D., Milner, A., Deady, M., Calvo, R. A., Mackinnon, A., Christensen, H., Mykletun, A., Glozier, N., & Harvey, S. B. (2019). A cluster randomized controlled trial to evaluate headcoach: An online mental health training program for workplace managers. *Journal of Occupational and Environmental Medicine*, 61(7), 545–551. <https://doi.org/10.1097/jom.0000000000001597>
- Gonzalez, A., Rasul, R., Molina, L., Schneider, S., Bevilacqua, K., Bromet, E. J., Luft, B. J., Taioli, E., & Schwartz, R. (2019). Differential effect of Hurricane Sandy exposure on PTSD symptom severity: comparison of community members and responders. *Occupational and Environmental Medicine*, 76(12), 881–887. doi:10.1136/oemed-2019-105957
- Guthrie, R. M., & Bryant, R. A. (2005). Auditory startle response in firefighters before and after trauma exposure. *American Journal of Psychiatry*, 162 (2), 283–290. 162/2/283 [pii]. <https://doi.org/10.1176/appi.ajp.162.2.283>
- Guthrie, R. M., & Bryant, R. A. (2006). Extinction learning before trauma and subsequent post-traumatic stress. *Psychosomatic Medicine*, 68 (2), 307–311. 68/2/307 [pii]. <https://doi.org/10.1097/01.psy.0000208629.67653.cc>
- Haugen, P. T., McCrillis, A. M., Smid, G. E., & Nijdam, M. J. (2017). Mental health stigma and barriers to mental health care for first responders: A systematic review and meta-analysis. *Journal of Psychiatric Research*, 94, 218–229. <https://doi.org/10.1016/j.jpsychires.2017.08.001>

- Iversen, A. C., Fear, N. T., Ehlers, A., Hacker Hughes, J., Hull, L., Earnshaw, M., Greenberg, N., Rona, R., Wessely, S., & Hotopf, M. (2008, January). Risk factors for post-traumatic stress disorder among UK armed forces personnel. *Psychological Medicine*, 38, 511–522.
- Jones, N., Seddon, R., Fear, N. T., McAllister, P., Wessely, S., & Greenberg, N. (2012). Leadership, cohesion, morale, and the mental health of UK armed forces in Afghanistan. *Psychiatry: Interpersonal and Biological Processes*, 75(1), 49–59. <https://doi.org/10.1521/psyc.2012.75.1.49>
- Joyce, S., Shand, F., Lal, T. J., Mott, B., Bryant, R. A., & Harvey, S. B. (2019). Resilience @work mindfulness program: Results from a cluster randomized controlled trial with first responders. *Journal of Medical Internet Research*, 21(2), e12894. <https://doi.org/10.2196/12894>
- Joyce, S., Shand, F., Tighe, J., Laurent, S. J., Bryant, R. A., & Harvey, S. B. (2017). The road to resilience: A systematic review. *BMJ Open*, 8(6), e017858. <https://doi.org/10.1136/bmjopen-2017-017858>
- Kula, S. (2017). Occupational stress, supervisor support, job satisfaction, and work-related burnout: Perceptions of Turkish National Police (TNP) members. *Police Practice and Research*, 18, 146–159.
- Marshall, R. E., Milligan-Saville, J. S., Mitchell, P. B., Bryant, R. A., & Harvey, S. B. (2017). A systematic review of the usefulness of pre-employment and pre-duty screening in predicting mental health outcomes amongst emergency workers. *Psychiatry Research*, 253, 129–137. <https://doi.org/10.1016/j.psychres.2017.03.047>
- Marshall, R. E., Milligan-Saville, J. S., Steel, Z., Bryant, R. A., Placanica, J., Mitchell, P. B., & Harvey, S. B. (2020). A prospective study of MMPI-2 pre-duty screening to predict psychological injury amongst police officers. *Manuscript under review*.
- Ménard, K. S., Arter, M. L., & Khan, C. (2016). Critical incidents, alcohol and trauma problems, and service utilization among police officers from five countries. *International Journal of Comparative and Applied Criminal Justice*, 40(1), 25–42. <https://doi.org/10.1080/01924036.2015.1028950>
- Milligan-Saville, J. S., Tan, L., Gayed, A., Barnes, C., Madan, I., Dobson, M., Bryant, R. A., Christensen, H., Mykletun, A., & Harvey, S. B. (2017). Workplace mental health training for managers and its effect on sick leave in employees: A cluster randomised controlled trial. *The Lancet Psychiatry*, 4(11), 850–858. [https://doi.org/10.1016/S2215-0366\(17\)30372-3](https://doi.org/10.1016/S2215-0366(17)30372-3)
- Moffitt, J., Bostock, J., & Cave, A. (2014). Promoting well-being and reducing stigma about mental health in the fire service. *Journal of Public Mental Health*, 13(2), 103–113. <https://doi.org/10.1108/JPMH-02-2013-0004>
- Norris, R., Carroll, D., & Cochrane, R. (1990). The effects of aerobic and anaerobic training on fitness, blood pressure and psychological stress and well-being. *Journal of Psychosomatic Research*, 34(4), 367–375. [https://doi.org/10.1016/0022-3999\(90\)90060-H](https://doi.org/10.1016/0022-3999(90)90060-H)
- Norvell, N., & Belles, D. (1993). Psychological and physical benefits of circuit weight training in law enforcement personnel. *Journal of Consulting and Clinical Psychology*, 61(3), 520–527. <https://doi.org/10.1037/0022-006X.61.3.520>
- Petrie, K., Gayed, A., Bryan, B. T., Deady, M., Madan, I., Savic, A., Wooldridge, Z., Counson, I., Calvo, R. A., Glozier, N., & Harvey, S. B. (2018). The importance of manager support for the mental health and well-being of ambulance personnel. *PloS One*, 13(5), e0197802. <https://doi.org/10.1371/journal.pone.0197802>
- Pineles, S. L., Rasmusson, A. M., Yehuda, R., Lasko, N. B., Macklin, M. L., Pitman, R. K., & Orr, S. P. (2013). Predicting emotional responses to potentially traumatic events from pre-exposure waking cortisol levels: A longitudinal study of police and firefighters. *Anxiety, Stress, and Coping*, 26(3), 241–253. <https://doi.org/10.1080/10615806.2012.672976>
- Polusny, M. A., Erbes, C. R., Kramer, M. D., Thuras, P., DeGarmo, D., Koffel, E., ... Arbisi, P. A. (2017). Resilience and posttraumatic stress disorder symptoms in national guard soldiers deployed to Iraq: A prospective study of latent class trajectories and their predictors. *Journal of Traumatic Stress*, 30(4), 351–361. <https://doi.org/10.1002/jts.22199>



- Regehr, C., Hill, J., Knott, T., & Sault, B. (2003). Social support, self-efficacy and trauma in new recruits and experienced firefighters. *Stress and Health*, 19(4), 189–193. <https://doi.org/10.1002/smi.974>
- Regehr, C., & Millar, D. (2007). Situation critical: High demand, low control, and low support in paramedic organizations. *Traumatology*, 13(1), 49–58. <https://doi.org/10.1177/1534765607299912>
- Rona, R. J., Hooper, R., Jones, M., Hull, L., Browne, T., Horn, O., Murphy, D., Hotopf, M., & Wessely, S. (2006). Mental health screening in armed forces before the Iraq war and prevention of subsequent psychological morbidity: Follow-up study. *British Medical Journal*, 333(7576), 991–994A. <https://doi.org/10.1136/bmj.38985.610949.55>
- Schoeppe, S., Alley, S., van Lippevelde, W., Bray, N. A., Williams, S. L., Duncan, M. J., & Vandelandotte, C. (2016). Efficacy of interventions that use apps to improve diet, physical activity and sedentary behaviour: A systematic review. *International Journal of Behavioral Nutrition and Physical Activity*, 13(1), 127. <https://doi.org/10.1186/s12966-016-0454-y>
- Sharpley, J., Fear, N. T., Greenberg, N., Hacker Hughes, J., Jones, M., & Wessely, S. (2008). Pre-operational stress briefing: Does it have any effect? A comparison of Royal Naval and Royal Marine personnel receiving a pre-operational stress briefing before the invasion of Iraq with a group of personnel who did not. *Occupational Medicine*, 58(1), 30–34. <https://doi.org/10.1093/occmed/kqm118>
- Skeffington, P. M., Rees, C. S., Mazzucchelli, T. G., Kane, R. T., & Coyne, J. (2016). The primary prevention of PTSD in firefighters: Preliminary results of an RCT with 12-month follow-up. *PLoS One*, 11(7), e0155873. <https://doi.org/10.1371/journal.pone.0155873>
- Stanley, I. H., Hom, M. A., & Joiner, T. E. (2016). A systematic review of suicidal thoughts and behaviors among police officers, firefighters, EMTs, and paramedics. *Clinical Psychology Review*, 44, 25–44. <https://doi.org/10.1016/j.cpr.2015.12.002>
- Tan, L., Deady, M., Paterson, H., Bryant, R., & Harvey, S. B. (in prep). *The efficacy of a workplace mental health awareness and resilience training program on mental health and help-seeking outcomes*.
- Torous, J., Andersson, G., Bertagnoli, A., Christensen, H., Cuijpers, P., Haim, A., Hsin, H., Hollis, C., Lewis, S., Mohr, D. C., Pratap, A., Roux, S., Sherrill, J., & Arian, P. A. (2019). Towards a consensus around standards for smartphone apps and digital mental health. *World Psychiatry: Official Journal of the World Psychiatric Association (WPA)*, 18(1), 97–98. <https://doi.org/10.1002/wps.20592>
- Torous, J., & Firth, J. (2016). The digital placebo effect: Mobile mental health meets clinical psychiatry. *The Lancet Psychiatry*, 3(2), 100–102. [https://doi.org/10.1016/S2215-0366\(15\)00565-9](https://doi.org/10.1016/S2215-0366(15)00565-9)
- Warburton, D. E., Nicol, C. W., & Bredin, S. S. (2006). Health benefits of physical activity: The evidence. *Canadian Medical Association Journal*, 174(6), 801–809. <https://doi.org/10.1503/cmaj.051351>
- Warner, C. H., Appenzeller, G. N., Grieger, T., Belenkiy, S., Breitbach, J., Parker, J., & Hoge, C. (2011). Importance of anonymity to encourage honest reporting in mental health screening after combat deployment. *Archives of General Psychiatry*, 68(10), 1065–1071. <https://doi.org/10.1001/archgenpsychiatry.2011.112>
- Warner, C. H., Appenzeller, G. N., Parker, J. R., Warner, C. M., & Hoge, C. W. (2011). Effectiveness of mental health screening and coordination of in-theater care prior to deployment to Iraq: A cohort study. *American Journal of Psychiatry*, 168(4), 378–385. <https://doi.org/10.1176/appi.ajp.2010.10091303>
- Wessely, S., Bryant, R. A., Greenberg, N., Earnshaw, M., Sharpley, J., & Hughes, J. H. (2008). Does psychoeducation help prevent post traumatic psychological distress? *Psychiatry: Interpersonal and Biological Processes*, 71(4), 287–302. <https://doi.org/10.1521/psyc.2008.71.4.287>
- Wild, J., El-Salahi, S., & Degli Esposti, M. (2020). *The effectiveness of a group-based resilience intervention versus psychoeducation for*

*emergency responders in England: A randomised controlled trial.*

Wild, J., El-Salahi, S., & Degli Esposti, M. (2020). The effectiveness of interventions aimed at improving wellbeing and resilience to stress in first responders: A systematic review. In special issue: Toward a better understanding and evidence-based intervention strategies for early responses to trauma. *European Psychologist*. <https://doi.org/10.1027/1016-9040/a000402>

Wild, J., El-Salahi, S., Tyson, G., Lorenz, H., Pariante, C. M., Danese, A., Tsiachristas, A., Watkins, E., Middleton, B., Blaber, A., & Ehlers, A. (2018). Preventing PTSD, depression

and associated health problems in student paramedics: Protocol for PREVENT-PTSD, a randomised controlled trial of supported online cognitive training for resilience versus alternative online training and standard practice. *BMJ Open*, 8(12), e022292. <https://doi.org/10.1136/bmjopen-2018-022292>

Wild, J., Smith, K. V., Thompson, E., Bear, F., Lommen, M. J., & Ehlers, A. (2016). A prospective study of pre-trauma risk factors for post-traumatic stress disorder and depression. *Psychological Medicine*, 46(12), 2571–2582. <https://doi.org/10.1017/S0033291716000532>