



## Understanding the psychological impacts of responding to a terrorist incident

Elena A. Skryabina<sup>a</sup>, Naomi Betts<sup>a</sup>, Richard Amlôt<sup>a</sup> and Gabriel Reedy<sup>b</sup>

<sup>a</sup>Behavioural Science Team, Emergency Response Department Science & Technology, Public Health England, Salisbury, UK; <sup>b</sup>Faculty of Life Sciences and Medicine, King's College London, London, UK

### ABSTRACT

**Background:** Responding to a mass casualty event can cause significant distress, even for highly trained medical and emergency services personnel.

**Objective:** The purpose of the study was to understand more about first responders' perspectives about their participation in major incident responses, specifically how and which individual and system factors contributed to their preparedness or may have enabled or hindered their response. The aim of the work was to improve preparedness and response for future incidents.

**Methods:** This study reports a detailed analysis of qualitative interview data from frontline staff who responded to a large mass casualty terrorist incident in the UK in 2017. Data highlighted the psychological distress caused by responding to terrorist events and thus became the focus of further, detailed analysis.

**Results:** Participants ( $n = 21$ ) articulated in their own words the psychological distress experienced by many of the first responders to the event. Participants reported that they were not prepared to deal with psychological impact associated with this mass casualty terrorist incident and their role in the response, and that follow-up support was inconsistent. Multiple factors were identified as potentially increasing psychological distress. Social support provided by peers and organizational debriefs were identified as two most common support mechanisms. Organizational support was identified as inconsistent.

**Conclusions:** This research contributes to the literature the voices of first responders to UK terrorist incidents, building on existing findings while further contributing unique contextual perspectives. This research reinforces the importance of psychosocial support for those who respond to these tragic incidents, and offers a number of recommendations for organizational preparedness for future events.

**Abbreviations:** A&E: Accident and Emergency; EPRR: Emergency Preparedness, Resilience and Response; ERD: Emergency Response Department; HEPE: Health Emergency Preparedness Exercise; PHE: Public Health England; PHE REGG: Public Health England Research Ethics and Governance Group; MCI: Mass Casualty Incident; NHS: National Health Service

### Comprendiendo el impacto psicológico de responder a un incidente terrorista

**Antecedentes:** Responder a un evento con presencia masiva de víctimas puede causar una angustia psicológica significativa, aún para el personal médico y de emergencias altamente entrenados.

**Objetivo:** El propósito del estudio fue tener una mayor comprensión acerca de la perspectiva de los primeros respondedores sobre su participación en la respuesta a incidentes mayores, específicamente cómo y qué factores individuales y del sistema contribuyeron a su preparación o que pudieron haber habilitado u obstaculizado su respuesta. El objetivo del trabajo fue de mejorar la preparación y respuesta para futuros incidentes.

**Métodos:** Este estudio reporta un análisis detallado de los datos de entrevistas cualitativas realizadas al personal de primera línea que respondieron a un gran incidente terrorista con víctimas masivas en el Reino Unido durante el 2017. Los datos destacaron la angustia psicológica causada por responder a eventos terroristas y, por lo tanto, se convirtieron en el foco de un análisis más detallado.

**Resultados:** Los participantes ( $n = 21$ ) articularon en sus propias palabras la angustia psicológica experimentada por muchos de los primeros en responder al evento. Los participantes reportaron que no se encontraban preparados para lidiar con el impacto psicológico asociado con este incidente terrorista con víctimas masivas y su rol en la respuesta, y que el soporte durante el seguimiento fue inconsistente. Se identificaron múltiples factores con pueden incrementar la angustia psicológica. El apoyo social proporcionado por los pares y el

### ARTICLE HISTORY

Received 2 December 2020

Revised 23 June 2021

Accepted 11 July 2021

### KEYWORDS

Major incident; psychological effect; healthcare responder; health response; terrorist attack; Manchester Arena bombing; responder wellbeing; mental health; mass casualty

### PALABRAS CLAVES

incidente mayor; efecto psicológico; primer respondedor de salud; respuesta de salud; ataque terrorista; atentado de Manchester Arena; bienestar del primer respondedor; salud mental; víctimas masivas

### 关键词

重大事件; 心理影响; 医疗救护员; 健康响应; 恐怖袭击; 曼彻斯特竞技场爆炸案; 救护人员福祉; 心理健康; 大规模伤亡

### HIGHLIGHTS

- First responders to the Manchester Arena terrorist attack experienced psychological distress and did not feel prepared to manage their own emotional reactions or provide emotional support to traumatized patients; they mentioned receiving informal support from friends, family, and colleagues.

‘debriefing’ organizacional fueron identificados como los dos mecanismos de apoyo más comunes. El apoyo organizacional se identificó como inconsistente.

**Conclusiones:** Esta investigación contribuye a la literatura las voces de los primeros respondedores a los incidentes terroristas del Reino Unido, basándose en los hallazgos existentes y, al mismo tiempo, aporta perspectivas contextuales únicas. Esta investigación refuerza la importancia del apoyo psicosocial para quienes responden a estos trágicos incidentes, y ofrece una serie de recomendaciones para la preparación organizacional para eventos futuros.

### 了解恐怖事件响应的心理影响

**背景:**即使是训练有素的医疗和紧急服务人员, 响应大规模伤亡事件也会造成严重的痛苦。

**目的:**本研究旨在更多了解急救人员对他们参与重大事件响应的看法, 特别是个人和系统因素如何以及哪些有助于他们的准备, 或者可能已经启用或阻碍其响应。这项工作旨在改进对未来事件的准备和响应。

**方法:**本研究报告了一项对2017年英国大规模伤亡恐怖事件急救人员的定性访谈数据的详细分析。数据强调了响应恐怖事件造成的心理困扰, 从而作为进一步详细分析的重点。

**结果:**参与者 ( $n = 21$ ) 用他们自己的话阐明了许多事件急救人员所经历的心理困扰。参与者报告说, 他们没有准备好处理与这次大规模伤亡恐怖事件相关的心理影响以及他们在响应中的作用, 并且后续支持也不稳定。识别出多种因素可能增加心理困扰。同伴提供的社会支持和向组织述职被确定为两种最常见的支持机制。组织支持被识别为不一致。

**结论:**本研究以现有研究结果为基础, 为反应英国恐怖事件急救人员声音的文献做出贡献, 同时进一步帮助了这一独特背景视角。本研究强调了社会心理支持对这些悲剧事件救援人员的重要性, 并为组织为未来事件做准备提供了许多建议。

## 1. Introduction

In a large-scale emergency, such as a disaster or a terrorist attack, there are four distinct groups who are most exposed to the trauma of the event: victims; victims’ relatives and friends, first responders, and hospital staff. Responding to a traumatic mass casualty event can cause significant distress, even for highly trained medical and emergency services personnel, and yet the impact of these events on responders remain relatively under-explored in the research literature and not sufficiently anticipated in organizational, regional, or national policy (Moran, Webb, Brohi, Smith, & Willett, 2017).

Exposure to extreme situations, such as major incidents, terrorism, and other mass casualty events (MCI), has the potential for significant negative psychological impacts for both the affected population and for responders (Richins et al., 2019; Williams & Kemp, 2018). Indeed, responders frequently experience some level of secondary traumatic stress as a result of supporting victims of an extremely traumatic event, or repeatedly caring for victims of less extreme traumatic events; this can produce a number of negative effects, ranging from mild distress (Misra, Greenberg, Hutchinson, Brain, & Glozier, 2009; Skogstad, Fjetland, & Ekeberg, 2015) to post-traumatic stress disorder (PTSD) (Perrin et al., 2007). In most cases, this secondary traumatic stress (Yaakubov, Hoffman, & Rosenbloom, 2020) is relatively short-lived but studies have shown differences between professions (with nurses, for example, showing higher incidences of adverse effects than doctors) and a dearth of a significant body of research focusing on less-severe but still troubling adverse psychological impacts from responding to natural and anthropogenic events (Naushad et al., 2019). Around 70% of people who

experience distress from the exposure to extreme adverse events do not develop long-term mental health conditions, if support is available in the immediate aftermath of the event (Williams & Kemp, 2018). However, exposure to such events is still a risk factor for the future development of other long-term mental health conditions for many who experience them: the remaining 30% of people may experience a significantly more intense stress reaction following an event. Of these, half are at risk of developing further short-term mental health conditions, and half may experience longer-term and chronic adverse mental health conditions (Williams & Kemp, 2018). The emotional response that any individual has to a traumatic event can be impacted by many factors, including: past experiences; the level or extent of trauma exposure; the level of emotional involvement in the incident; their overall physical and mental health; their perceived level of connectedness and support from colleagues and the organization; and the presence of effective leadership at an organizational level (Brooks et al., 2015). While some of these factors are not able to be mitigated, others may be within the control of the organizations that employ responders.

Indeed, existing research has shown that intervention and support can lower the potential for longer-term adverse mental health outcomes, and that effective support can consist of relatively low-intensity psychosocial interventions, which do not necessarily require trained mental health professionals (Bisson, 2014). Social support from relatives, friends, and colleagues can help first responders affected by the trauma of a mass casualty event to process the stress and return to normal life (Williams & Drury, 2010). In addition to the more generalized support provided by social contact, an ideal social support system would

help to normalize the experience, help to restore an individual's sense of agency, and enable them to seek further help (Hobfoll et al., 2007).

Ideally, this social support supplements a core of organizational support, in which first responders are well-trained, well-briefed, well-led, and offered opportunities for effective social and peer support (Williams & Kemp, 2018). Too frequently, however, very little support is actually provided to those clinical and front-line response staff, who can experience the worst of the immediate effects of mass casualty events (Moran et al., 2017) and can exhibit high levels of stress after events (Gouweloos-Trines et al., 2017).

This study reports a detailed analysis of a subset of data from a larger mixed-methods study of frontline staff who responded to three large mass casualty terrorist incidents in the UK in 2017 (Skryabina et al., 2020). The purpose of the study was to understand more about first responders' perspectives about their participation in major incident responses, specifically how and which individual and system factors contributed to their preparedness or may have enabled or hindered their response. The aim of the work was to improve preparedness and response for future incidents.

### 1.1. Background: the Manchester Arena bombing

The Manchester Arena bombing took place on the 22 May 2017 at 22.31 when a terrorist detonated a homemade suicide bomb, packed with nuts and bolts to act as shrapnel, in the foyer of the Manchester Arena, the largest indoor event venue in the UK (with a capacity of up to 21,000 people). The device was detonated at the end of a music concert which was attended by around 14,000 people, many of whom were teenagers and children accompanied by their parents. The attack killed 22 people, ten of whom were aged between eight and nineteen years old. A further 116 people required medical treatment, mostly for ballistic injuries, and many more were left with psychological and emotional trauma as a result of the attack (Kerslake, 2018; Torjesen & Gulland, 2017).

## 2. Methods

Responders to three mass casualty incidents in the UK in 2017 (the Westminster Bridge attack, the Manchester Arena bombing and the London Bridge attack) were invited to participate anonymously in an online survey exploring their experiences with the response, and how aspects of their training had supported and prepared them to respond to those incidents (Skryabina et al., 2020). Participants were then asked provide contact details if they were willing to participate in further semi-structured follow-up interviews, which were conducted by telephone. The overall aim of the study was to explore the perceptions and experiences of first responders and

clinical staff regarding both the individual and system response to a major incident, and specifically to identify factors helped to pre limit and enhanced their abilities to respond effectively to such an incident (Skryabina et al., 2020; Skryabina, Betts, Reedy, Riley, & Amlôt, 2020). The subset of data analysed here was generated from the interviews of first responders and clinical staff about their experiences and perceptions in responding to the Manchester Arena bombing (22 May 2017) (Craigie et al., 2018) and included a significant focus on the psychological impact of this mass casualty terrorist incident on responders. Ethical approval for this study was granted by the Public Health England Research Ethics and Governance Group (PHE REGG R&D298). Informed consent was sought and was provided by all participants prior to the follow-up interviews.

### 2.1. Participants, data collection, and analysis

Semi-structured interviews were completed with 21 participants who were involved in the response: clinicians ( $n = 12$ ), including seven medical consultants, a consultant clinical psychologist, three nurses and an ED advanced practitioner; emergency preparedness specialists (EPRR) ( $n = 5$ ); and NHS hospital managers and trust staff ( $n = 4$ ). All except two participants were from NHS Acute Trusts ( $n = 19$ ); the remainder were employed by other agencies responsible for various aspects of healthcare and emergency response. Participants identified as female ( $n = 11$ ) and male ( $n = 10$ ) and most gave their age as between 40–49 ( $n = 6$ ) or 50–59 ( $n = 7$ ) years old. All except two interviewees identified ethnically as White British ( $n = 19$ ); one identified as being of other White background and one of White and Black African origin. Participants reported a broad range of work experience, ranging between one and 42 years (median experience 4 years).

The semi-structured topical interview schedule (Supplementary material, File 1), which was developed in consultation with the project advisory group (comprised of clinicians, emergency preparedness experts, and members of public), was used to guide the conversational interviews. The interviews explored participants' experience with the response (to explore specifically aspects of the response that worked well and those that did not work well); experience with recent HEPES; exercises' impact on the response; and emergency preparedness training. Qualitative data from both interviews and surveys produced themes around these topics, and are reported separately (Skryabina et al., 2020). Interviews were conducted by telephone from October to December 2017 by members of the research team (ES and NB), both of whom have experience in conducting and reporting qualitative research (Skryabina et al., 2016). The average interview length was 48 minutes (range 27 to 69 minutes). All interviews were transcribed, and participants were given an opportunity to review and comment on their

contribution. Feedback received from eight participants indicated that their views had been appropriately reported.

Although the original research was envisaged as a convergent mixed-methods design (Creswell, 2009), the analytical approach for this interview data set was grounded firmly in the qualitative paradigm. Importantly, the analysis draws on the pragmatic inductive analytical approaches, which seek not solely to describe experiences, but to help build a more fulsome understanding of how various aspects of the lived world intersect and how meaning is made from experience. This approach to analysis takes the experiences of participants as primary data, analyses the data inductively, and seeks to generate theoretical insights relevant to the research aims that can then be implemented in practice.

In this vein, the recorded interview data was transcribed and then subjected to a thematic analysis using NVIVO11 software and following a five-step approach: 1) becoming familiar with the data; 2) generating initial codes; 3) searching for themes; 4) reviewing and refining themes; and 5) giving clear working definitions to themes to capture their content (Braun & Clarke, 2006). The initial coding of interview data was undertaken by ES inductively, using the explicit or surface meaning of the data, without attempts to interpret it; and openly, without using a pre-existing coding frame. This allowed generation of as many codes as were needed to characterize the data. The data was further analysed for key themes from among the open codes. These themes were then explored with other members of the research team, iteratively refined, and key themes were identified and agreed upon. Although often not considered a necessary task in approaches within the qualitative paradigm, coding reliability and validity was checked by asking another researcher (PR), who independently applied generated codes to two randomly selected transcripts. Through this process, coding agreement achieved for both transcripts was in the range of 88.3% – 99.6%, indicating good agreement and consistency.

Qualitative analytical approaches typically do not rely on quantitative measurements in order to establish thematic prevalence; indeed, the key themes which emerge from inductive analysis may not be the ones which are most prevalent within the data set (Creswell, 2009). However, following Miles and Huberman's (Miles et al., 2014) guidance, the prevalence of psychosocial themes among the data set was what led to this more focused analysis. The results of both the quantitative analysis and prevalence are presented below, followed by detailed quotes from each theme.

### 3. Results

Fourteen out of 21 interviewed responders to the Manchester Arena bombing discussed the psychological impact of the response on themselves and their colleagues

when sharing their experiences with the response, despite the fact that questions about the psychological impact of the incident on healthcare responders were not part of the topical interview guide (*Supplementary material*, File 1). The most prevalent themes around psychological impact of the response on the responders are reported (Table 1) and supported by appropriate quotes from the data. Numbered illustrative quotes from interview participants correspond to a unique participant number.

#### 3.1. Lack of preparedness

One of the clear themes in the data set was that staff felt unprepared for the stress and trauma they experienced in responding to the Manchester Arena bombing. Despite being experienced in trauma management, responders found dealing with ballistic injuries – an unfamiliar type of injury – distressing. Participants reported being especially distressed by the extensive shrapnel injuries in children, along with the knowledge that the injuries had been deliberately planned and inflicted. Participants also reported having their own strong emotional reactions and being unable to provide psychological support that patients needed.

We underestimate the post-trauma of it, and that's the one thing I definitely took away from this event, is we are not prepared for the stress and trauma it caused (Pfefferbaum, Nitiéma, & Newman, 2020).

I think I'm quite prepared, I'm quite resilient for it. What I didn't prepare for, I wasn't ready for was the fallout afterwards in terms of the psychological impact it had on me. Because I'm quite resilient but I found that very tough. The day that followed to deal with that afterwards (Gulland, 2017b).

I think I was not prepared or we were not prepared for how emotionally affected we would be. I think, yes, it's different from the day-to-day work that you normally do and I think you think it will be much the same but it isn't. [56]

#### 3.2. Impact on all staff

Participants reported that the psychological impacts of the incident were not restricted only to those who had direct contact with patients on the night of the incident, but also the impacts reverberated outward to colleagues more distal to the response. Participants reported that their colleagues who provided follow up care and other services for patients also had strong emotional responses

**Table 1.** Psychological impact of MCI on responders; the most prevalent themes.

Theme	No. Sources	No. References
Lack of preparedness	10	Kessler et al. (2010)
Impact on all staff	9	Miles et al. (2014)
Coping strategies	7	Braun and Clarke (2006)
Training and support	11	Dean (2017)

to the event. Most frequently reported were feelings of guilt or of being left by colleagues who were on the rota that night. Participants reported that these feelings may have been heightened by media coverage and a high level of incident-related public information, which continually reminded participants of the incident.

Yes, I think the horrible nature of the incident affected everybody, it was hard to get away from that: a terrorist incident that had targeted children. I think . . . It impacted on people obviously at work but also outside of work. [56]

Sometimes we forget fine, the team during that night it was very intense, it was very overwhelming but then there's so many others that are involved and we have that. [64]

Yes, so that you can't really step out. With some incidents that you deal with you can step away from work and be like, yes, I can forget about it. But I think Manchester was a very different one because it was a terrorist attack and it was quite hard to get it out of your system because you see it on the news, you see it on your phone, you see it on social media and you can't sort of get away from it (Perrin et al., 2007).

### 3.3. Coping strategies

Participants discussed various approaches they used to cope with their emotional reactions during and following the incident. Concentrating on delivering best possible clinical care on the night of the response was identified as a way of coping with immediate distress. While some participants reported working more in the aftermath of the incident, in order to stay busy and avoid ruminating on the event, they also reported subsequently experiencing stronger emotional distress and seeking further psychological support. Participants frequently discussed supporting their peers by regularly checking in with each other, and acknowledged that being able to openly share their experiences with their colleagues was an important coping strategy. Some participants mentioned participating in post-event debriefing conversations, which were mentioned as an effective support mechanism that provided a forum to talk about the event and share emotions. Participants also mentioned the importance of support from families and faith communities.

Just getting everyone else's perspective from that. so in the next few days we rang each other up and we'd just meet up at work and we'd talk about and kind of share our experiences and I think, yes, definitely talking about it was the most helpful. [63]

Having not been on a day shift for two months, a - weekday day shift for two months, following the incident, I felt completely lost. And I think that's the reason I ended up taking time off sick. Because I'd had no one to speak to, no one you could go and ask questions, or just take the time to debrief you. [65]

I guess, and we hadn't prepared for that. I was glad we ran those events [debrief] because we talked about it . . . They were amazingly well turned-out. The number of staff who were on who came in either especially or made the effort to come in just to talk about how it felt, what they felt and share that grief and that trauma element of it (Pfefferbaum et al., 2020).

### 3.4. Training and support needed

Participants acknowledged that it is extremely difficult to prepare for the awful reality of caring for severely injured children as a result of a terrorist incident. However, many also pointed out the lack of any preparation for staff before such an event, as well as a lack of support after the incident. Raising awareness of psychological reactions to traumatic events was identified as potentially being helpful, and yet participants characterized that it was their own responsibility to know how to access support and resources. Participants identified that access to professional mental health services was not always available, even when it was needed. Further, they identified issues associated with managers' responses to psychological needs after the incident, reporting that some managers appeared not to be sympathetic to the traumatic experiences of those responding to the event.

I think just to raise the awareness of how you may or may not react and that it's very individual . . . It's a very personal thing and not everybody is going to react in the same sort of way, but just to make people aware that it may happen and where to get help (Raz, Shadach, & Levy, 2018).

Surgeons are bad at getting help. Knowing what's normal is okay but actually understanding when you're just skipping out of the edges of normal and when to get help. And I think that's best self-monitored. I think we need to empower people to do that. But I think it's really important (Creswell, 2009).

I think we're going to develop some information for staff about the emotional impact on staff because I'm very aware they were reading our leaflets designed for patients but trying to explain their own emotional responses through that. So I think we'd like to develop some better information for staff around normalising their responses . . . [56]

Clinical responders identified a need for training on how to provide a psychosocial support to patients when providing them with medical care, and identified this as particularly relevant when caring for children. Readily available e-learning material, simulation exercises of various emergency situations, and training from psychosocial or psychotherapy teams were mentioned as ways of preparing medical staff for providing psychosocial support to patients affected by a mass casualty terrorist incident.

I remember one specific conversation that was particularly difficult with one of the patients. She was asking questions such as; why was it done? Could she go back and visit the place it happened? Would it happen again? And I was trying to, because I didn't personally know an answer. No one knew an answer. It was establishing an answer that was honest, but also to help her with her recovery. Because she was shocked . . . We weren't given any additional support in answering it regarding that individual patient. Because one of the main things is making sure that you explain to the patient and the families what you're doing whilst you do it. And we were never given any training on doing that, or doing it in a way to help ease their distress or worry. [65]

#### 4. Discussion

Participants in this study articulated significant psychological impacts associated with their response to the Manchester Arena bombing and were able to articulate their own perspectives on how the negative consequences of such incidents could be minimized with organizational support. Although the level of psychological distress experienced by the study participants was not directly measured using any readily available instruments (e.g. Brief Symptom Inventory or K6 – Kessler) (Jahangirian, Akbari, & Dadgostar, 2019; Kessler et al., 2010), the symptoms of emotional exhaustion, excessive worries (anxiety), intrusive memories, flashbacks, burnout, and avoidance behaviours were described by responders during interviews (Surya, Jaff, Stilwell, & Schubert, 2017). The evidence presented here is, we argue, particularly valuable, because in exploring participants' perspectives we are able to have some sense of the meaning they have made from the indirect trauma of responding to the event – and with it, an important insight into how we can support the psychological process of first responders in future events (Janoff-Bulman & McPherson Frantz, 1997).

Mass casualty incidents such as terrorist attacks are considered the least common form of trauma (Hesketh & Tehrani, 2018) among healthcare workers in many European countries, however the psychological impact of these types of events on responders has been explored in some detail (Misra et al., 2009; Naushad et al., 2019; Skogstad et al., 2015). Anthropogenic mass casualty events are occurring with increasing regularity, and are so common in some areas that an ongoing trauma response may be incited (Diamond, Lipsitz, & Hoffman, 2013). Indeed, facilitating psychological well-being following responder exposure to a traumatic event is an ongoing area of scholarship and research, and this evidence contributes to that conversation.

It is important to acknowledge that the psychological impact of different mass casualty incidents on the

responding health staff can differ markedly (Diamond et al., 2013; Raz et al., 2018). For many, the London 2017 terrorist attacks (the Westminster Bridge attack (Gulland, 2017a) and the London Bridge attack (Gulland, 2017b)) were not considered to be very different from a typical working day in a major trauma centre in a world capital: the number of casualties did not exceed the capacity of the receiving hospitals, and the type of injuries (road accidents and knife injuries) were familiar (Dean, 2017). However, the Manchester Arena attack (Craigie et al., 2018) was different in scope, type, and scale to those normally experienced by UK healthcare workers, even in a major trauma centre. As such, it challenged the level of psychosocial preparedness of responders, and highlighted the absence of necessary training and expertise to deal with severely injured patients from such an event.

Findings of this study further clarify that healthcare staff involved in the Manchester Arena response felt unprepared in two primary ways. Firstly, participants were unprepared to recognize and manage their own and their colleagues' emotional reactions when dealing with ballistic trauma patients from a terrorist incident, and particularly when those patients were children. Secondly, participants were unprepared to provide immediate emotional and psychological support needed by traumatized patients, in addition to clinical treatment of their injuries. Further participants reported wanting and needing psychosocial support, both during and after the response, a finding that is consistent with previous research (Brooks et al., 2015); however, they reported this support being inconsistent or unavailable.

Participants recognized the difficulty of preparing staff psychologically to deal with severely injured patients, particularly children. However, such training was considered as one of the protective factors for the psychological wellbeing of trauma-exposed staff and may lead to better psychological well-being post-incident (Brooks et al., 2015).

For pre-event training to provide meaningful and helpful support for mass casualty incident responders, it would need to cover a range of types of trauma, including those which are different from day-to-day work. Training should also include aspects which participants highlighted here, including: the range and extent of potential injuries from terrorist attacks; the inclusion and normalization of a range of reactions, including initial distress, which affected staff may experience; and the inclusion of some trauma management techniques. No training can fully prepare responders for all possible types of trauma that may result from a terrorist incident; indeed, an intention of terror attacks is to induce anxiety about the nature, place, and timing of future events (Hoffman, 2018). Including Mental Health services in a Trust Major Incident Plan could allow mental health specialists to

engage in emergency preparedness training and support of staff and as well as patients, as could programmes like the World Health Organization (WHO) Psychological First Aid (PFA) (Psychological first aid: Guide for field workers, 2011) which has shown potential for increasing the capacity for psychosocial support in response to crisis (Sijbrandij et al., 2020). Addressing these aspects may all positively influence staff adaptation after exposure to such an event (Brooks, Dunn, Amlôt, Greenberg, & Rubin, 2018).

Participants identified that additional training on providing emotional support to patients – particularly children – may have helped them during the response. Some practical support in dealing with the immediate needs of children in crisis is a part of, for instance, the WHO's PFA programme (Psychological first aid: Guide for field workers, 2011). More detailed or longer-term interventions would however need further research and, if supported by evidence, likely require highly detailed guidance before being implemented. Some evidence suggests that providing support to children in peritraumatic period immediately post-injury can prevent the development of paediatric medical traumatic stress (Marsac, Kassam-Adams, Delahanty, F. Widaman, & Barakat, 2014). Incorporating psychosocial care into trauma-medical care, also known as trauma-informed care, is a preventative measure that could reduce paediatric medical traumatic stress post incident (Hoysted et al., 2018) but was identified by participants as not being a part of this event response.

Post-event support is another protective factor for staff psychological wellbeing (Brooks et al., 2015), and yet this data set showed such support was informal and inconsistent. Although research is not yet clear on the most effective post-trauma support or interventions for reducing the distress experienced during and after a disaster (Brooks et al., 2018), effective social support (i.e. informal support from friends, family, and colleagues), as well as more formal structured organizational peer-support (Creamer et al., 2012) are important (Williams & Drury, 2010) and have been shown to be effective (Brooks, Dunn, Amlôt, Greenberg, & Rubin, 2016; Gouweloos-Trines et al., 2017). Indeed, even in the absence of formal organizational support, this data set showed practices that participants and their colleagues adopted immediately post-incident to help themselves cope with their traumatic experiences. Social support from colleagues was most commonly mentioned and appeared to mitigate the effect of traumatic exposure on symptoms of stress (Biggs, Brough, & Barbour, 2014).

Post-event debriefing, which offers an opportunity not only to discuss organizational performance in the response, but also an opportunity for staff to discuss their experiences and 'make sense' of emotions after the event, was identified as another common support

mechanism and was reported to be useful by participants in this study. For a generation or more, health professionals have had extensive exposure to an educational intervention consisting of simulated clinical practice, followed by a debriefing conversation that has an explicit goal of analysing the event to improve future practice (Eppich, Mullan, Brett-Fleegler, & Cheng, 2016; Fanning & Gaba, 2007; Tannenbaum & Cerasoli, 2012). This practice has further developed into the common practice of post-event debriefing after clinical events (Eppich et al., 2016). This practice of debriefing is distinct from psychological debriefing used as an intervention for post-traumatic stress. We cannot be certain from responders the exact nature of debriefing they have reported experiencing as useful in this study.

The evidence supporting post-event debriefing is mixed (Biggs et al., 2014), not least because of multiple conceptions of debriefing represented in the literature. Some studies seem to show that organizational debriefing can be a useful early intervention after a traumatic experience (Brooks et al., 2015, 2018) while studies on psychological debriefing revealed mixed findings (Brooks et al., 2018) and the potential for negative emotional and cognitive effects (Gittins & Paterson, 2015; Paterson, Whittle, & Kemp, 2015; Snowdon, 2021). Recent ISTSS guidelines (Forbes, Bisson, Monson, & Berliner, 2020) conclude that there is insufficient evidence to recommend individual psychological debriefing and group debriefing.

Effective teamwork is recognized as a significant contributing factor to successful provision of patients' care (Weaver, Dy, & Rosen, 2014), and it appears that good team building is a protective factor for staff wellbeing too. Team training may benefit from including the development of psychosocial skills and effective ways of supporting each other. Supportive managers and leaders are recognized as protective factors (Gouweloos-Trines et al., 2017), and managers would benefit from additional training to ensure that themselves and their staff know what the range of normal reactions after a traumatic event may be and where to seek help (Brooks et al., 2016), as this data set showed that not all managers were supportive of responders' psychological needs. Encouraging and supporting staff to take responsibility for their own wellbeing (Richins et al., 2019), and being aware of readily available tools to self-monitor their psychological state symptoms, were all identified by participants as potentially valuable.

Staff of trauma-exposed organizations may be exposed to stress either directly or indirectly (Richins et al., 2019; Williams & Kemp, 2018) and dealing with serious injuries is a recognized risk factor for psychological distress and post-traumatic responses (Brooks et al., 2015). This study provides further evidence of the impact of mass casualty terrorist incident response

on staff throughout the response system. This included not only medical staff directly involved in treating casualties on the night of the response, and staff who provided further clinical follow-up support, but also indirectly involved staff who may have had contact about the incident with colleagues, family, or media. These findings support the importance of preparing all staff within trauma-exposed organizations for the potential psychological impact associated with their jobs (UKPTS, 2014); in an extreme mass casualty event such as the one reflected in this data set, it is difficult to determine who may be impacted.

The study identified a few risk factors that can affect staff adaptation post-event, and that may increase the risk of psychological distress and post-traumatic recovery. These included emotional involvement of staff (Brooks et al., 2015) when providing treatment to severely injured patients, particularly children; making themselves very busy with work and not allowing time to recover post-incident (Gouweloos-Trines et al., 2017); and a general inability to distance themselves from the incident (Brooks et al., 2015), due to the excessive and prolonged media coverage.

Exposure to excessive media coverage following a large-scale violent event (Monfort & Afzali, 2017) was perceived by emergency responders in this study as being stressful. This observation supports the mounting evidence pointing to an association between intensive media exposure around disaster events, and negative psychological and mental health outcomes for responders and the general community, as well as overall concerns about the potentially harmful nature of mass trauma media coverage (Hopwood & Schutte, 2017; Pfefferbaum et al., 2020; Thompson, Jones, Holman, & Silver, 2019). Event exposure is a key predictor of post-traumatic mental health outcomes, and intensive media coverage over an extended period of time has contributed to prolonging the effect of trauma exposure (and thus the potential for increased psychological risk) for responders (Brooks et al., 2015). Preparedness training could benefit from including the associations between media consumption and posttraumatic stress for both directly and distantly involved staff (Pfefferbaum et al., 2020); additional training in dealing with various types of media, particularly with the ubiquitous nature of social media, could be supportive for staff in trauma-exposed organizations.

The severity of injuries, particularly in children, and the lack of experience of UK civil medical staff with ballistic injuries (Craigie et al., 2018) are additional risk factors, which should be recognized; appropriate immediate support should be available to staff who are exposed (UKPTS, 2014). Young employees with no previous experience of dealing with traumatic events are particularly vulnerable (Brooks et al., 2015). Feelings of self-doubt and guilt for being unable to provide patients with psychological support (from

direct exposure) or being excluded from the response (indirect exposure) were reported by participants in this study, which is consistent with direct and indirect trauma response and can be attributed to a sense of helplessness or lack of perceived control over the situation. Reinforcing that a terror incident and its impacts are, by definition, outside the locus of control of first responders may help to decrease a subsequent experience of guilt (Raz et al., 2018).

Broadly, interview participants who responded to the terrorist event in the Manchester arena identified support needs that are congruent with approaches that the trauma response literature identifies as potentially helpful in early support interventions. What was notable was that, although these features have been identified in previous work, they did not, in the main, feature as an aspect of the response. For instance, of Hobfoll et al.'s (Hobfoll et al., 2007) five principles of trauma intervention (promotion of a sense of safety, calming, self- and collective efficacy, connectedness, and hope), responders in this study identified needs aligned with all five categories and yet were not able to articulate formal or system-level responses that addressed any of these areas in a satisfactory way. Nor did they articulate that they were prepared to support their colleagues or patients in any of these principles, apart from drawing on their own personal experience. Similarly, the WHO-developed guide for psychological first aid (PFA) for fieldworkers (Psychological first aid: Guide for fieldworkers, 2011) articulates practical skills that could support clinicians and first responders in addressing many of the needs and concerns that they voiced in this study, including providing basic emotional support for children and young people and being present and supportive for colleagues in distress. Implementing a training and support programme based on these guidelines, and refreshing it on a regular basis, could be integrated into existing disaster preparedness and response regimes.

#### 4.1. Strengths of the study

The paper reports on a focused analysis of a qualitative data set derived from a larger mixed-methods study that aimed to understand healthcare staff experiences in the response to large mass casualty incidents in the UK. The data set consists of interviews with 21 responders who took part in the Manchester Arena response, a number which provides some confidence that the codes and themes generated in the analysis phase are trustworthy. Similarly, the depth and richness of the data set, as reflected in the samples provided here, allow for confidence in the reported results. While the psychological impacts of the incident were not the main aim of the research, this emerged as one of the main areas of focus from the interview data, and were within the scope of the aim of the larger study.



## 4.2. Limitations of the study

Although this study did collect demographic and professional role data, the analysis did not identify a distinction between the experiences of different professionals; other studies have shown variance between professions and a larger sample may have allowed this distinction to emerge in the qualitative analysis. Selection bias may have been a factor in this study, as those most motivated to share their experiences and opinions may have been more likely to participate. One participant, for example, said that this interview was the first opportunity they had to talk about their experience in the response. As such, the perspectives of first responders who were particularly affected by the response may be over-represented in this sample. The sample was also primarily comprised of participants who identified their ethnicity as White British; and those from other ethnic backgrounds may have responded differently. Finally, none of the responses were from trainee-grade doctors, who make up a large proportion of hospital staff, and so the views of junior doctors are not adequately represented in this sample.

## 4.3. Further research

Research is in progress to determine how best to facilitate trauma exposed staff psychological preparedness and recovery following emergencies. Further research should help explore the potential cognitive, emotional, and organizational impacts of organizational debriefing, particularly in light of the recent ISTSS guidelines (Forbes et al., 2020). Inability to support patients emotionally at the crucial early stage of their treatment may pose some detrimental effect on patients' emotional state, but may also negatively impact clinicians; this is an area where further research could provide valuable insight and shape the training of clinicians. Practices may benefit from including an experienced mental health professional as a part of a multidisciplinary trauma team and further evidence is needed to support this.

## 5. Conclusion

Data collected in this study provides further evidence to contribute to our understanding of the challenges of responding to a mass casualty event involving both adults and children, and the need for training for staff to manage the psychological impact of the incident, and appropriate psychosocial support for healthcare staff (Moran et al., 2017). In a recent major terrorist attack in a large UK city, training to support the psychosocial needs of staff prior to the incident was largely absent, and post-event support was limited. The incident negatively impacted the psychological wellbeing of staff throughout the healthcare system,

including those who treated patients on the night of the attack, those who provided follow-up patient care, and even those who did not have any direct contact with patients. Preventative support throughout the healthcare and emergency response system could help to prepare staff for the potential psychological impact of major events, perhaps especially because both the events and the impacts that emerge from them tend to be rare and unexpected.

Indeed, while exposure to traumatic events in major trauma centres is impossible to prevent, training, preparedness and support can be improved. Healthcare staff would benefit from appropriate and specialized training to address the psychosocial impact of a mass casualty incident. This could include such aspects as understanding of the psychological impact of traumatic incidents; recognizing psychological reactions to trauma; and becoming aware of coping strategies and available resources for support after an incident. Healthcare staff may also benefit from training to learn how to support patients emotionally to provide trauma-informed care. The most significant benefits from early intervention happen when it is delivered as a part of wider programme of support offered by an organization. Managers also play an important role in facilitating post-traumatic recovery in emergency responders, and managers would benefit from training on how to emotionally support their staff. Reinforced team building skills and social support should be promoted. In addition, staff may benefit from training to deal with broadcast media and social media.

Those who take care of patients on the front line of healthcare services must be adequately prepared and supported to do their jobs – and this is especially true for those rare and exceptionally traumatic events such as mass casualty terrorist events [Surya et al., 2017]. This research reinforces that some of the lingering psychological impacts from traumatic events, and the many potential ways to mitigate these impacts, need to be more fully appreciated, understood, and implemented.

## Data availability statement

Due to the nature of this research, participants of this study did not agree for their data to be shared publicly, so supporting data is not available.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

## Funding

The research was funded by the National Institute for Health Research Health Protection Research Unit (NIHR HPRU) in Emergency Preparedness and Response at King's College

London, in partnership with Public Health England (PHE). The views expressed are those of the author(s) and not necessarily those of the NHS, the NIHR, the Department of Health or Public Health England.

## Unique contribution of this study

The study reports the experiences of responders to the Manchester Arena bombing regarding the psychological impact of this incident on themselves and their colleagues, and describes their coping strategies, identified support and training needs. These insights can be used to inform strategies to enhance the emotional resilience of healthcare responders to cope with similar incidents in the future.

## References

- Biggs, A., Brough, P., & Barbour, J. P. (2014). Exposure to extraorganizational stressors: Impact on mental health and organizational perceptions for police officers. *International Journal of Stress Management*, 21(3), 255–282. doi:10.1037/a0037297
- Bisson, J. L. (2014). Early responding to traumatic events. *British Journal of Psychiatry*, 204(5), 329–330. doi:10.1192/bjp.bp.113.136077
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. doi:10.1191/1478088706qp063oa
- Brooks, S. K., Dunn, R., Sage, C. A. M., Amlôt, R., Greenberg, N., & Rubin, G. J. (2015). Risk and resilience factors affecting the psychological wellbeing of individuals deployed in humanitarian relief roles after a disaster. *Journal of Mental Health*, 24(6), 1–29. **early online**. doi:10.3109/09638237.2015.1057334
- Brooks, S. K., Dunn, R., Amlôt, R., Greenberg, N., & Rubin, G. J. (2016). Social and occupational factors associated with psychological distress responders: A systematic literature review. *BMC Psychology*, 4(1), 1–13. doi:10.1186/s40359-016-0120-9
- Brooks, S. K., Dunn, R., Amlôt, R., Greenberg, N., & Rubin, G. J. (2018). Training and post-disaster interventions for the psychological impacts on disaster-exposed employees: A systematic review. *Journal of Mental Health*, 1–25. doi:10.1080/09638237.2018.1437610
- Craigie, R. J., Farrelly, P. J., Santos, R., Smith, S. R., Pollard, J. S., & Jones, D. J. (2018). Manchester Arena bombing: Lessons learnt from a mass casualty incident. *BMJ Military Health*, 166(2), 72–75. doi:10.1136/jramc-2018-000930
- Creamer, M. C., Varker, T., Bisson, J., Darte, K., Greenberg, N., Lau, W., . . . Forbes, D. (2012). Guidelines for peer support in high-risk organizations: An international consensus study using the Delphi method. *Journal of Traumatic Stress*, 25(2), 134–141. doi:10.1002/jts.21685
- Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches*. London: SAGE Publications, Inc.
- Dean, E. (2017). When disaster strikes: How emergency services provide a rapid response. *Emergency Nurse*, 25(4), news/analysis.
- Diamond, G. M., Lipsitz, J. D., & Hoffman, Y. (2013). Nonpathological response to ongoing traumatic stress. *Peace and Conflict: Journal of Peace Psychology*, 19(2), 100–111. doi:10.1037/a0032486
- Eppich, W. J., Mullan, P. C., Brett-Fleegler, M., & Cheng, A. (2016). “Let’s talk about it”: Translating lessons from health care simulation to clinical event debriefings and coaching conversations. *Clinical Pediatric Emergency Medicine*, 17(3), 200–211. doi:10.1016/j.cpem.2016.07.001
- Fanning, R. M., & Gaba, D. M. (2007). The role of debriefing in simulation-based learning. *Simulation in Healthcare*, 2(2), 115–125. doi:10.1097/SIH.0b013e3180315539
- Forbes, D., Bisson, J. I., Monson, C. M., & Berliner, L. (2020). *Effective treatments for PTSD: Practice guidelines from the international society for traumatic stress studies* (3rd ed.). New York: Guilford Press.
- Gittins, H. M., & Paterson, L. S. (2015). How does immediate recall of a stressful event affect psychological response to it? *Journal of Behavior Therapy and Experimental Psychiatry*, 46, 19–26. doi:10.1016/j.jbtep.2014.07.006
- Gouweloos-Trines, J., Tyler, M. P., Giummarra, M. J., Kassam-Adams, N., Landolt, M. A., Kleber, R. J., & Alisic, E. (2017). Perceived support at work after critical incidents and its relation to psychological distress: A survey among prehospital providers. *Emergency Medicine Journal*, 34(12), 816–822. doi:10.1136/emered-2017-206584
- Gulland, A. (2017a). Leading anaesthetist praises NHS response to Westminster attacks. *BMJ*, 356, j1515. doi:10.1136/bmj.j1515
- Gulland, A. (2017b). “It wasn’t a medical miracle—we made our own luck”: Lessons from London and Manchester terror attacks. *BMJ*, 358, j4309. doi:10.1136/bmj.j4309
- Hesketh, I., & Tehrani, N. (2018). *Responding to trauma in policing: A practical guide*. College of Policing Limited. Available from [https://oscarkilo.org.uk/app/uploads/2020/12/Hesketh\\_Tehrani\\_Responding-to-trauma-in-policing-a-practical-guide.pdf](https://oscarkilo.org.uk/app/uploads/2020/12/Hesketh_Tehrani_Responding-to-trauma-in-policing-a-practical-guide.pdf)
- Hobfoll, S. E., Watson, P., Bell, C. C., Bryant, R. A., Brymer, M. J., Friedman, M. J., & Ursano, R. J. (2007). Five essential elements of immediate and mid-term mass trauma intervention: Empirical evidence. *Psychiatry*, 70, 283–315. doi:10.1521/psyc.2007.70.4.283
- Hoffman, Y. (2018). Who is afraid of ISIS? ISIS anxiety and its correlates. *Stress and Health*, 34(1), 84–92. doi:10.1002/smi.2764
- Hopwood, T. L., & Schutte, N. S. (2017). Psychological outcomes in reaction to media exposure to disasters and large-scale violence: A meta-analysis. *Psychology of Violence*, 7(2), 316–327. doi:10.1037/vio0000056
- Hoysted, C., Babl, F. E., Kassam-Adams, N., Landolt, M. A., Jobson, L., Van Der Westhuizen, C., . . . Alisic, E. (2018). Knowledge and training in paediatric medical traumatic stress and trauma-informed care among emergency medical professionals in low- and middle-income countries. *European Journal of Psychotraumatology*, 9(1), 1468703. doi:10.1080/20008198.2018.1468703
- Jahangirian, J., Akbari, H., & Dadgostar, E. (2019). Comparison of psychiatric screening instruments: GHQ-28, BSI and MMPI. *Journal of Family Medicine and Primary Care*, 8(4), 1337–1341. doi:10.4103/jfmnpc.jfmnpc\_135\_18
- Janoff-Bulman, R., & McPherson Frantz, C. (1997). *The impact of trauma on meaning: From meaningless world to meaningful life, in The transformation of meaning in psychological therapies: Integrating theory and practice* (pp. 91–106). Hoboken, NJ: John Wiley & Sons Inc.
- Kerslake, R. (2018). *The Kerslake report: An independent review into the preparedness for and emergency response to, the Manchester Arena attack on 22nd May 2017*. Retrieved from [https://www.jesip.org.uk/uploads/media/Documents%20Products/Kerslake\\_Report\\_Manchester\\_Are.pdf](https://www.jesip.org.uk/uploads/media/Documents%20Products/Kerslake_Report_Manchester_Are.pdf)
- Kessler, R. C., Green, J. G., Gruber, M. J., Sampson, N. A., Bromet, E., Cuitan, M., & Zaslavsky, A. M. (2010). Screening for serious mental illness in the general population

- with the K6 screening scale: Results from the WHO World Mental Health (WMH) survey initiative. *International Journal of Methods in Psychiatric Research*, 19(S1), 4–22. doi:10.1002/mpr.310
- Marsac, M. L., Kassam-Adams, N., Delahanty, D. L., Widaman, K., & Barakat, L. P. (2014). Posttraumatic stress following acute medical trauma in children: A proposed model of bio-psycho-social processes during the peri-trauma period. *Clinical Child and Family Psychology Review*, 17(4), 399–411. doi:10.1007/s10567-014-0174-2
- Miles, M. B., Huberman, A. M., & Saldana, J. (2014). *Qualitative data analysis: A methods sourcebook* (3rd ed.). London: SAGE Publications: Inc.
- Misra, M., Greenberg, N., Hutchinson, C., Brain, A., & Glozier, N. (2009). Psychological impact upon London ambulance service of the 2005 bombings. *Occupational Medicine*, 59(6), 428–433. doi:10.1093/occmed/kqp100
- Monfort, E., & Afzali, M. H. (2017). Traumatic stress symptoms after the November 13th 2015 terrorist attacks among young adults: The relation to media and emotion regulation. *Comprehensive Psychiatry*, 75, 68–74. doi:10.1016/j.comppsy.2017.02.015
- Moran, C. G., Webb, C., Brohi, K., Smith, M., & Willett, K. (2017). Lessons in planning from mass casualty events in UK. *BMJ*, 359, j4765. doi:10.1136/bmj.j4765
- Naushad, V. A., Bierens, J. J., Nishan, K. P., Firjeeth, C. P., Mohammad, O. H., Maliyakkal, A. M., & Schreiber, M. D. (2019). A systematic review of the impact of disaster on the mental health of medical responders. *Prehospital and Disaster Medicine*, 34(6), 632–643. doi:10.1017/S1049023X19004874
- Paterson, H. M., Whittle, K., & Kemp, R. I. (2015). Detrimental effects of post-incident debriefing on memory and psychological responses. *Journal of Police and Criminal Psychology*, 30(1), 27–37. doi:10.1007/s11896-014-9141-6
- Perrin, M. A., DiGrande, L., Wheeler, K., Thorpe, L., Farfel, M., & Brackbill, R. (2007). Differences in PTSD prevalence and associated risk factors among World Trade Center disaster rescue and recovery workers. *American Journal of Psychiatry*, 164(9), 1385–1394. doi:10.1176/appi.ajp.2007.06101645
- Pfefferbaum, B., Nitiéma, P., & Newman, E. (2020). The association of Mass Trauma media contact with depression and anxiety: A meta-analytic review. *Journal of Affective Disorders Reports*, 3, 100063. doi:10.1016/j.jadr.2020.100063
- Psychological first aid: Guide for field workers. (2011). *World Health Organization, war trauma foundation and World vision international*. Geneva: WHO.
- Raz, A., Shadach, E., & Levy, S. (2018). Gaining control over traumatic experiences: The role of guilt in posttraumatic stress disorder. *Journal of Aggression, Maltreatment & Trauma*, 27(5), 461–474. doi:10.1080/10926771.2017.1389792
- Richins, M. T., Gauntlett, L., Tehrani, N., Hesketh, I., Weston, D., Carter, H., & Amlôt, R. (2019). *1Scoping review: Early post-trauma interventions in organisations*. Final Report for Internal Use Only.
- Sijbrandij, M., Horn, R., Esliker, R., O'May, F., Reiffers, R., Ruttenberg, L., ... Ager, A. (2020). The effect of psychological first aid training on knowledge and understanding about psychosocial support principles: A cluster-randomized controlled trial. *International Journal of Environmental Research and Public Health*, 17(2), 484. doi:10.3390/ijerph17020484
- Skogstad, L., Fjetland, A. M., & Ekeberg, Ø. (2015). Exposure and posttraumatic stress symptoms among first responders working in proximity to the terror sites in Norway on July 22, 2011 - a cross-sectional study. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine*, 23(1), 23. doi:10.1186/s13049-015-0104-4
- Skryabina, E., Morris, J., Byrne, D., Harkin, N., Rook, S., & Stallard, P. (2016). Child, teacher and parent perceptions of the FRIENDS classroom-based universal anxiety prevention programme: A qualitative study. *School Mental Health*, 8, 486–498. doi:10.1007/s12310-016-9187-y
- Skryabina, E., Betts, M., Reedy, G., Riley, P., Amlôt, R. (2020). UK healthcare staff experiences and perceptions of a mass casualty terrorist incident response: A mixed-methods study. *BMJ Emergency Medicine Journal*, 23, 1–9. doi:10.10162/j.ijdr.2020.101503
- Skryabina, E., Betts, N., Reedy, G., Riley, P., & Amlôt, R. (2020). The role of emergency preparedness exercises in the response to a mass casualty terrorist incident: A mixed methods study. *International Journal of Disaster Risk Reduction*, 46, 1–10. doi:10.1016/j.ijdr.2020.101503
- Snowdon, K. (2021). Exploring the clinical debrief: Benefits and barriers. *Journal of Paramedic Practice*, 13(1), 1–7. doi:10.12968/jpar.2021.13.CPD1
- Surya, M., Jaff, D., Stilwell, B., & Schubert, J. (2017). The importance of mental well-being for health professionals during complex emergencies: It is time we take it seriously. *Global Health: Science and Practice*, 5(2), 188–196. doi:10.9745/GHSP-D-17-00017
- Tannenbaum, S. I., & Cerasoli, C. P. (2012). Do team and individual debriefs enhance performance? A meta-analysis. *Human Factors*, 55(1), 231–245. doi:10.1177/0018720812448394
- Thompson, R. R., Jones, N. M., Holman, E. A., & Silver, R. C. (2019). Media exposure to mass violence events can fuel a cycle of distress. *Science Advances*, 5(4), eaav3502. doi:10.1126/sciadv.aav3502
- Torjesen, I., & Gulland, A. (2017). Manchester doctors describe aftermath of bomb blast as NHS continues to treat casualties. *BMJ*, 357, j2628. doi:10.1136/bmj.j2628
- UKPTS. (2014). *Traumatic stress management guidance: For organisations whose staff work in high risk environments*. Retrieved from <http://docplayer.net/24619991-Traumatic-stress-management-guidance.html>
- Weaver, S. J., Dy, S. M., & Rosen, M. A. (2014). Team-training in healthcare: A narrative synthesis of the literature. *BMJ Quality & Safety*, 23(5), 359–372. doi:10.1136/bmjqs-2013-001848
- Williams, R. J. W., & Drury, J. (2010). The nature of psychosocial resilience and its significance for managing mass emergencies, disasters and terrorism. In A. Awotona (Ed.), *Rebuilding sustainable communities for children and their families after disasters: A global survey* (pp. 121–148). Newcastle-upon-Tyne, UK: Cambridge Scholars Publishing
- Williams, R., & Kemp, V. (2018). Principles for designing and delivering psychosocial and mental healthcare. *Journal of the Royal Army Medical Corps*, 166, jramc-2017-000880. doi:10.1136/jramc-2017-000880
- Yaakubov, L., Hoffman, Y., & Rosenbloom, T. (2020). Secondary traumatic stress, vicarious posttraumatic growth and their association in emergency room physicians and nurses. *European Journal of Psychotraumatology*, 11(1), 1830462. doi:10.1080/20008198.2020.1830462