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Clinical paper

The presence of psychological trauma symptoms in resuscitation providers and an exploration of debriefing practices

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Abstract

Introduction: Witnessing traumatic experiences can cause post-traumatic stress disorder (PTSD). The true impact on healthcare staff of attending in-hospital cardiac arrests (IHCAs) has not been studied. This cross-sectional study examined cardiac arrest debriefing practices and the burden of attending IHCAs on nursing and medical staff.

Methods: A 33-item questionnaire-survey was sent to 517 doctors (of all grades), nurses and health-care assistants (HCAs) working in the emergency department, the acute medical unit and the intensive care unit of a district general hospital between April and August 2018. There were three sections: demographics; cardiac arrest and debriefing practices; trauma-screening questionnaire (TSQ).

Results: The response rate was 414/517 (80.1%); 312/414 (75.4%) were involved with IHCAs. Out of 1463 arrests, 258 (17.6%) were debriefed. Twenty-nine of 302 (9.6%) staff screened positively for PTSD. Healthcare assistants and Foundation Year 1 doctors had higher TSQ scores than nurses or more senior doctors ($p = 0.02$, $p = 0.02$, respectively). Debriefing was not associated with PTSD risk ($p = 0.98$). Only 8/67 (11.9%) of resuscitation leaders had prior debriefing training.

Conclusions: Nearly 10% of acute care staff screened positively for PTSD as a result of attending an IHCA, with junior staff being most at risk of developing trauma symptoms. Very few debriefs occurred, possibly because of a lack of debrief training amongst cardiac arrest team leaders. More support is required for acute care nursing and medical staff following an IHCA.

Keywords: Resuscitation, Health personnel, Psychological stress, Cardiopulmonary arrest, Anxiety

Introduction

Healthcare staff wellbeing and burnout is a significant concern with implications for staff attrition rates and, in turn, patient care, satisfaction and safety.[1–3] The United Kingdom National Health Service Health (NHS) and Well-being Review has published recommendations for NHS hospitals to research the causes of burnout, well-being and absenteeism and to provide support for staff.[4]

One such cause for burnout and poor psychological well-being may be exposure to stressful experiences, such as in hospital cardiac arrest (IHCA). Healthcare staff working in intensive care units (ICUs), acute medical units (AMUs) and emergency departments (EDs) may have a greater exposure to IHCA (estimated at 1.5 per 1000 hospital admissions in the UK)[5] as a routine part of their work, but the psychological impact of such experiences on staff is not known. Exposure to potentially traumatic events can result in acute stress responses causing anxiety, hyper-arousal, avoidance and flash-backs.[6] Accumulation of symptoms may lead to post-traumatic stress

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disorder (PTSD) and in turn, depression and anxiety, which can have economic effects secondary to absenteeism.

Studies reporting the psychological effect of witnessing cardiopulmonary resuscitation (CPR) have focused primarily on bystanders and have reported rates of PTSD of up to 27%.[7,8] Data on the effect on healthcare staff of attending a CPR attempt are limited to two small studies and are inconclusive. The first, completed by 41 junior doctors, showed that 73% found cardiac arrests to be a stressful experience,[9] and the second captured only 0.5% of incentivised nurses via social media.[10] The true impact of IHCA on nurses and doctors in terms of PTSD therefore remains unknown.

Debriefing after IHCA is advocated by the American Heart Association, the International Liaison Committee on Resuscitation (ILCOR) and the Resuscitation Council UK (RC (UK)) to facilitate open discussions for learning and improvement,[11] and to improve clinical performance.[12–15] A recent survey completed by 73 NHS hospitals reported a consensus that psychological support should be considered a key focus of the debrief.[16] Despite this there is no formal training within advanced life support (ALS) or advanced cardiac life support (ACLS) courses on how to debrief following cardiac arrests, nor is there training in 'psychological first aid' for such events as suggested by the UK Psychological Trauma Society (UKPTS).[17] Rates of debriefing after IHCA are unknown as are their impact on the risk of developing PTSD in healthcare providers.

This study therefore sought to examine cardiac arrest debriefing practices and the psychological burden of attending IHCA on both nursing and medical staff who work in acute areas of the hospital.

Methods

This was a single centre study set in an acute, 732-bed district general hospital in the UK, between April and August 2018. An anonymous 33-item questionnaire hosted by SurveyMonkey™ was emailed to staff (see Supplementary file); paper copies were delivered to ward areas to further increase uptake. Email reminders for survey completion were sent to maximise the study cohort. The survey was sent to 517 staff: to 358 doctors (of all grades), nurses and healthcare assistants (HCAs) who worked in the ED, AMU or ICU; it was also sent to all foundation doctors (FY), core trainee doctors (CT) and medical registrars (159 staff), who would have rotated through these departments or would have formed a part of the resuscitation team in the previous 12 months. The survey had three sections: demographics; cardiac arrest and debriefing practices experienced over the preceding 12 months; and the trauma-screening questionnaire (TSQ). The TSQ is a validated screening tool for PTSD with a sensitivity and specificity of 0.85 and 0.89 respectively.[18] A cumulative score of six or more is a positive predictor of PTSD. The TSQ asked specifically to link trauma symptoms with and following IHCA experiences only. If answering the questionnaire brought about any unsettling thoughts or feelings, staff were directed to seek additional and confidential support from the Employee Assistance Programme.

Answers taken from the questionnaire were the only source of data in this study. Statistical analyses were performed using StataCorp. 2017 (Stata Statistical Software: Release 15. College Station, TX: StataCorp. LLC). Categorical data are presented as percentages. Exact Fisher's test and χ^2 were used to compare associations between categorical frequency data; the Mann–Whitney U test was used to compare medians; general linear model and Spearman's rank correlations were used to compare associations between numerical data.

The details of this project were entered in the NHS Health Research Authority online decision tool and NHS REC approval was not required.[19] Consent was assumed through completion of the questionnaire.

The study was unfunded.

Results

Four hundred and fourteen staff responded to the questionnaire (80.1% response rate), of whom 312/414 (75.4%) had been involved with an IHCA in the preceding 12 months (Fig. 1). The remaining staff were excluded from the survey. Participants in the study reported a total of 1463 attendances at cardiac arrests. Because each arrest had

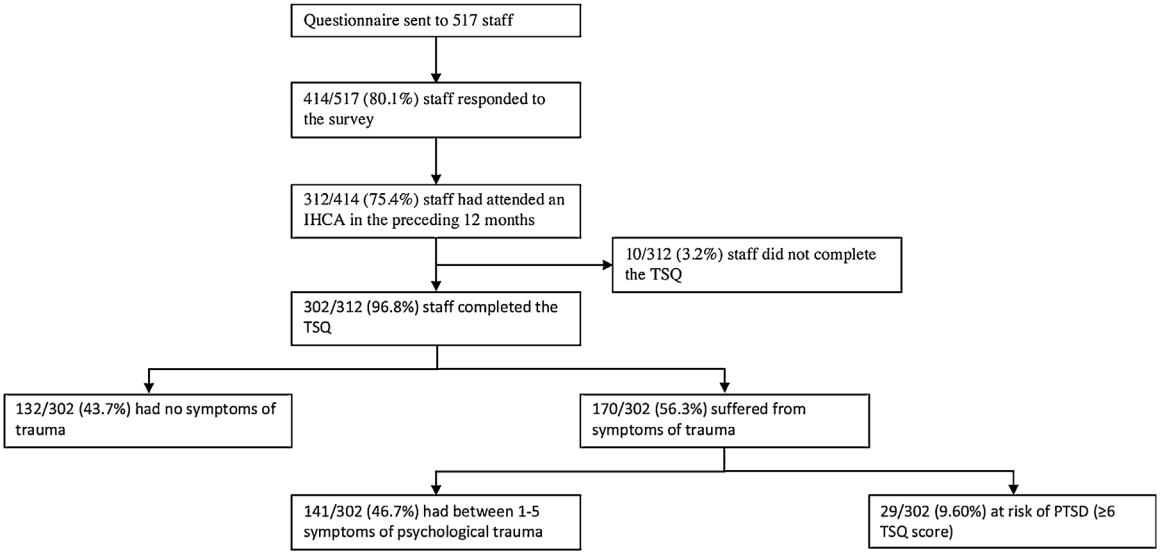

Fig. 1 – Overview of results.

multiple attendees, it is inevitable that many of these reported attendances were for overlapping arrests, meaning events were counted more than once. However, as the subject of this study is the individual experience of the attendee, this multiple counting is unlikely to adversely bias the results. The median number of arrests attended was three. The questionnaire was completed by 75–97% of all staff in each professional category and captured 71–96% of all staff in ED, ICU and AMU (Table 1).

Cardiac arrest and debriefing results

Out of 1463 cardiac arrest attendances, 258 were followed by a debrief (17.6%). There were 116/312 (37.2%) people who had attended at least one resuscitation attempt followed by a debrief, which reflects the multiple reporting described above. Of the cardiac arrest attendances 59 (4.0%) were followed by formal debriefs (Table 2). Formal debriefs were organised and non-fortuitous.

There were 1079/1463 (73.8%) attendances to fatal IHCAs; 202/1079 (18.7%) were followed by a debrief. Out of 384 attendances to non-fatal IHCAs, 56 (14.6%) were followed by a debrief. There was no statistical difference between the chances of a debrief attendance occurring after a fatal (18.7%) compared with a non-fatal (14.6%) resuscitation attempt ($p = 0.07$, $\chi^2 = 3.34$, OR = 1.35, 95% CI: 0.97–1.90).

The majority of staff found a debrief to be a positive experience; the most frequently stated reasons were feeling more supported (72.4%), having time to ask or answer questions to the team (69.0%) and feeling generally better as a result of the debrief (66.4%; Table 2). In contrast, negative impacts of a debrief were uncommon. The most frequent reason for finding the debrief a negative experience was the debrief being poorly organised (12.9%). Following IHCAs, 54% of staff never took a rest.

Trauma screening questionnaire (TSQ)

The TSQ was answered by 302/312 (96.7%) staff who had been involved with a cardiac arrest and 29/302 (9.60%) screened positively for PTSD (TSQ score ≥6; Fig. 1). There were 132 (43.7%) people who had no symptoms of psychological trauma and 141 (46.7%) reported between 1–5 symptoms of psychological trauma (Fig. 2). Patient outcome following the arrest was not associated with TSQ score ($p = 0.92$, Spearman's rho = −0.01) or risk of PTSD ($p = 0.28$, Spearman's rho = 0.06). We found no association between PTSD risk and debriefing ($p = 0.98$), or between PTSD risk and debriefing following either non-fatal or fatal IHCAs ($p = 0.77$, $p = 0.98$, respectively). Whilst there was no correlation between TSQ score and debriefing following all IHCAs ($p = 0.92$, Spearman's rho 0.01,), there was a significant negative correlation between debriefing and TSQ score following non-fatal IHCA ($p = 0.02$, Spearman's rho = −0.15; Table 3).

Effect of role on TSQ and PTSD risk

We found that FY1 doctors and HCAs were at higher risk of PTSD than nurses ($p = 0.01$ $\chi^2 = 6.02$, $p = 0.01$ $\chi^2 = 6.28$, respectively; Table 1). There were no differences in the prevalence of those at risk of PTSD between doctor roles ($p = 0.50$). In addition, FY1 doctors had higher TSQ scores than more experienced doctors ($p = 0.02$) and HCAs had higher TSQ scores than nurses ($p = 0.02$).

Effect of post-IHCA rests on TSQ and PTSD

A total of 259/312 (83%) staff answered both the TSQ and questions relating to break behaviour post-IHCA. Staff who never took a break

Table 1 – Response rates and prevalence of TSQ score ≥6. Significant p values ($p < 0.05$) are shown in bold.

	Number of participants (and response rate, %)		TSQ score ≥6		Analysis		Likelihood of TSQ score ≥ 6	
Variable	n	%	n*	%	χ^2	p	Odds ratio	95% CI
Role					9.56	0.14		.
Nurse	149/198	75.3	6/113	5.3	ref	ref	.	.
HCA	55/66	83.3	6/31	19.4	6.28	**0.01**	4.28	1.03–17.29
FY1	33/36	91.7	5/25	20.0	6.02	**0.01**	4.46	0.96–19.21
FY2	34/35	97.1	2/29	9.0	0.11	0.74	1.32	0.12–7.91
CT grade	83/108	76.9	6/46	13.0	2.05	0.15	2.33	0.58–9.16
ST grade	36/43	83.7	2/29	6.90	0.11	0.74	1.32	0.12–7.91
Consultant	24/31	77.4	2/21	9.52	0.56	0.45	1.88	0.17–11.52
Department **					1.10	0.58	.	.
ICU	125/176	71.0	4/58	6.9	ref	ref	.	.
ED	89/93	95.7	7/89	7.9	0.05	0.83	1.15	0.28–5.63
AMU	75/89	84.3	8/70	11.4	0.77	0.38	1.74	0.44–8.32
Post-IHCA rest behaviour ***								
Rested post-IHCA			8/125	6.4	ref	ref	.	.
Never rested post-IHCA			19/134	14.2	4.19	**0.04**	2.42	0.96–6.62

HCA = health-care assistant; FY1 = foundation year 1 doctor; FY2 = foundation year 2 doctors; CT = core trainee; ST = specialist trainee (registrar).

* There were 302/312 people who went to an IHCA answered the TSQ. The denominator in this column is the number of people who completed the TSQ in each staff group.

** The survey was sent to 517 staff: 358 were working in ED, AMU or ICU; 159 were FY, CT or medical ST grade doctors who by the time of the questionnaire were working in other departments/would have formed part of the resuscitation team.

*** A total of 259/312 staff answered both the TSQ and questions relating to rest behaviour post-IHCA.

Table 2 – Debriefing format and perceptions.

Debriefing format	n/1463	%
Group	211	14.4
Informal	199	13.6
Formal*	59	4.0
One-to-one	27	1.9
TRiM**	11	0.8
Responses to debriefing* **	**n/116**	**%**
Positive responses		
Feel more supported/cared for	84	72.4
Allowed me to ask or answer questions to others in the team	80	69.0
Made me generally better	77	66.4
Made me understand the clinical reasons that led to the arrest/outcome	74	63.8
Developing learning	72	62.1
Made me realise that others felt the same way	66	56.9
Gave me options to discuss the matter at a later time	58	50.0
Made me feel like I hadn't done anything wrong	53	45.7
If I had made an error, it supported me to learn from it	17	14.7
Negative responses		
Poorly organised	15	12.9
Performed too soon after the event	6	5.2
Did not allow me to express the things I wanted to say	3	2.6
Intimidated by debriefing in front of others (needed 1:1 session)	3	2.6
Did not help me process my thoughts	3	2.6
Made me feel worse about the event	2	1.7
Did not provide avenues to discuss the matter at a later time should I wish	2	1.7
Could not process the situation	1	0.9

Debrief formats displayed are not mutually exclusive from one another.

* Formal debriefs were organised and non-fortuitous.

** TRiM = Trauma Risk Management. TRiM professionals are those trained in psychological support.

*** Data taken from 'Yes/No' questions (see supplementary file).

after an IHCA had a higher frequency of PTSD than staff who did take a break after an IHCA ($p = 0.04$; Table 1). Staff who rested after IHCAs also had lower TSQ scores than those who did not ($p = 0.05$).

Resuscitation leaders

A total of 67 resuscitation team leaders participated in the study. Of this cohort, 8/67 (11.9%) were trained in debriefing techniques, and 53/62 (85.5%) said training would increase the frequency with which they would instigate a debrief (55/63 (87.3%)). An individual's role (in the order of HCA, nurse, FY1, FY2, CT1-2, ST3+, consultant) correlated with the number of debriefs attended ($p = 0.008$, Spearman's rho = 0.17).

Not having time to run a debrief was the most common reason for not instigating a debrief (Table 4). No training, perceived discomfort dealing with responses/emotions and being unsure how to lead a

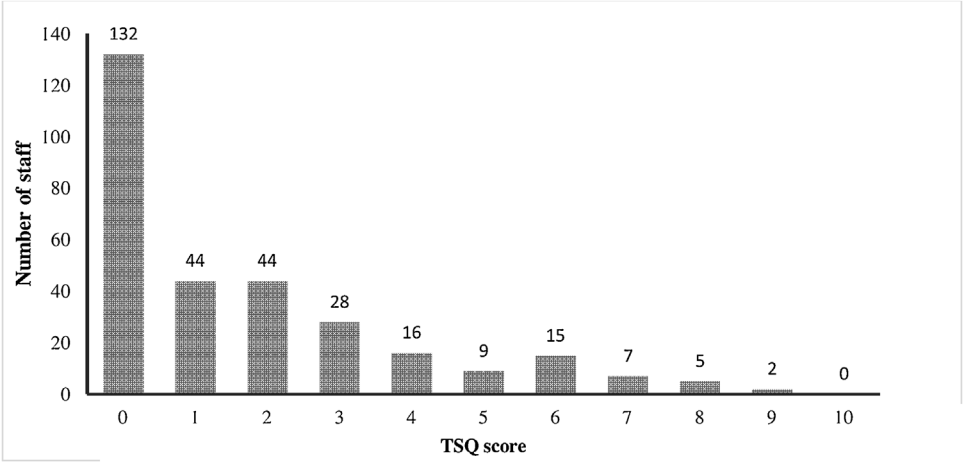

Fig. 2 – Number of resuscitation providers with each TSQ score.

Table 3 – P values of the association between debriefing and both TSQ score (Spearman's correlation) and being screened positively for PTSD (TSQ ≥ 6; Fisher's exact test), when stratified by patient outcome. Significant p values (p < 0.05) are shown in bold.

	TSQ		Screened positively for PTSD
	Spearman's rho	p	p
Debriefing following IHCA	0.01	0.92	0.98
Debriefing following fatal IHCA	0.06	0.34	0.77
Debriefing following non-fatal IHCA	**−0.15**	**0.02**	0.98

Table 4 – Cardiac arrest team leader data.

Reasons for not instigating a debrief*	n/67	%
Lack of time	29	43.3
No experience/training in how to lead a debrief	17	25.4
Don't know how to approach a debrief	12	17.9
Not felt it necessary	11	16.4
Never occurred to me	8	11.9
Would find it uncomfortable dealing with the responses/emotions of other professionals	6	9.0
Do not believe that they help	0	0.0
Negative experience of debriefs in the past	0	0.0
Debrief training data	n	%
No. leaders who had previous debrief training	8 / 67	11.9
No. leaders who would find it beneficial to receive debrief training	53 / 62	85.5
No. leaders in whom training would increase the frequency of debriefing	55 / 63	87.3

* Data taken from direct 'Yes/No' questions (see Supplementary file).

debrief, all of which link to a lack of training/experience/knowledge, together accounted for 35/67 (52.2%) of the reasons given for not instigating a debrief.

Work related impacts

Of the staff who participated in the survey, 60/312 (19.2%) said they resented having to return to work immediately after an IHCA. Fifty-one of 312 (16.3%) staff stated they had considered leaving NHS work altogether because of the traumatic effect of the IHCA, and 81/312 (26.0%) stated they experienced significant loss in their confidence in their professional abilities following the IHCA.

Discussion

This is the first study to assess the impact of attending a cardiac arrest on the mental well-being of acute healthcare staff, and the use of debriefing practice in this setting. With a response rate of over 80%, this survey reliably captures a representative sample of healthcare staff working in acute care departments.

Nearly 10% of staff suffered, or were at risk of suffering PTSD as a result of attending an IHCA. This is higher than the 1–6% prevalence of PTSD in the general population, but is in keeping with previous studies amongst emergency medical staff.[20,21] A survey of 63 ED residents carried out in 2001 found seven (11.1%) had PTSD.[22] A more recent longitudinal study of 386 London Ambulance Paramedics found an 8.6% prevalence of PTSD episodes over two years and a meta-analysis estimated a rate of 11% in paramedics.[23,24] The prevalence of those at risk of PTSD varied significantly between staff groups in our study, with junior members of the team being the most affected. FY1 doctors experienced more symptoms of trauma than more experienced doctors, and both FY1 doctors and HCAs had over four times the odds of being at risk of PTSD than nurses. This highlights FY1 doctors and HCAs as vulnerable groups of staff requiring more attention and support. Possible explanations may be experience, understanding, education or sense of control/preparedness over the event.[25,26] In support of this hypothesis, De Stefano and colleagues found that those with BLS training had higher TSQ scores than those with ILS or ALS training.[27] We identified that taking a break after an IHCA seemed to be protective; staff who never took a break after an IHCA had 2.4 times the odds of developing PTSD than staff who did rest after a cardiac arrest. One explanation may be that avoidant styles of coping with stress is a recognised predictor of PTSD.[24]

We chose the TSQ to assess PTSD as it is well validated, easy to answer and has a sensitivity and specificity of 0.85 and 0.89 respectively.[18,28] Our questionnaire asked specifically to link the TSQ symptoms with the IHCA experience. However, individuals already suffering from PTSD, possibly as a consequence of their day-to-day work, may find it impossible to identify those symptoms which derive purely from the IHCA. A TSQ performed too soon after an event has reduced specificity, and after six months has reduced sensitivity.[18,28] Participants in our study were asked to recall symptoms retrospectively within the three months following an IHCA to minimise the variability in the scores. PTSD has been estimated to affect 13% of ICU staff; the same study also found that just over a third of ICU staff reported having no symptoms in their TSQ, which approximates to the 44% of staff who experienced no symptoms of trauma in our study.[29]

A debrief occurred in only 17.6% of arrests. We found that more senior clinicians were more likely to initiate or attend a debrief. The reasons given by cardiac arrest team leaders for not implementing a debrief was broadly a lack of time (43.3%) or a lack of training/experience/knowledge (52.2%), in line with the literature.[30,31] Lack of training may have been associated with poorly organised debriefs and might explain the negative experience reported by many respondents.

A recent survey that analysed debriefing practice across 70 NHS hospitals found that 40 (54.7%) of the hospitals offered debriefing after cardiac arrests, although 36 out of the 40 hospitals said they offered debriefs only for 'some of the arrests'; it is possible that these figures are an over-estimate because the data capture systems lack reliability and are prone to recall and information bias.[32] In another study, only 7.7% of arrests were formally debriefed, slightly higher than the 4% of IHCA which were followed by formal, non-fortuitous debriefs in our study.[33]

Although a Cochrane review did not recommend the single session, one-to-one critical incident stress debriefing model because of potential risk of harm,[34] debriefing in groups has since been shown to improve quality of life scores without risk.[21] Psychoeducational debriefing is another model proven to be of benefit in a military setting, and involves a discussion around psychological trauma, recovery strategies and how to access support if required.[35,36] It remains unknown whether one debriefing model is superior to another or whether debrief timing has a role.

In addition to supporting emotional welfare, debriefing can be a valuable tool for helping people to learn and develop in difficult circumstances which can be cognitively disruptive. Data-driven debriefs focused on technical aspects of resuscitation performance are associated with reduced time to first compression, shorter hands off compression periods and better patient outcomes.[11,12,37] This is reflected in the ILCOR guidelines, yet guidance and training on debriefing or supporting the psychological aspects of resuscitation is currently lacking. The UK Psychological Trauma Society (UKPTS), which issues guidance for organisations with employees exposed to potentially traumatic events, advises that team leaders exposed to trauma should be trained to identify and support staff exposed to traumatic incidents. Organisations should also use evidence-based peer support programs to prevent the development of PTSD. Trauma Risk Management (TRiM), is a peer support program, which aims to ensure that personnel exposed to trauma seek help if they develop psychological symptoms which fail to resolve spontaneously. TRiM has been shown to reduce rates of absenteeism, positively influence organisational functioning, and does not exacerbate symptoms.[38] In our study, less than 1% of staff had TRiM support and 10% had probable PTSD. This mismatch suggests that health care staff in this study lack exposure to TRiM-trained personnel. Psychological first aid (PFA) is an alternative early intervention model designed to support basic psychological functioning immediately post incident.[34,39] The UKPTS suggests that front-line staff should be trained in PFA in order to actively support staff exposed to traumatic situations and staff should remain up to date with these skills as they do with their life support/physical first aid skills. None of the advanced life support courses (ALS/ACLS) currently provide debriefing or PFA training; this is something which should be evaluated, particularly in light of the findings in our study.

This study was not designed to identify a causal relationship between debriefing and protection from PTSD, but no such association was noted, in line with the literature on this topic.[21,34] The heterogeneity in incidents and debriefing practices currently makes the assessment of such a link difficult. Importantly, debriefing was not associated with trauma symptom accumulation in our study.

There were several limitations of our study. Firstly, our study was not exhaustive amongst the target cohort and there may be some bias in respondents, which may skew the results. This was also a single-centre study, which may limit the generalisability of the results. Secondly, there were a few people who screened positively for PTSD, making our results relatively fragile. Thirdly, all results were obtained from subjective questionnaire responses and the data are therefore subject to information or recall bias. Fourthly, this study was carried out over four months, until a minimum of an 80% response rate was achieved. This may have altered cardiac arrest leader behaviour with regards to debriefing practices later in the study period. Fifthly, the TSQ score, whilst being a widely used screening test for PTSD, has a sensitivity and specificity of 0.85 and 0.89 respectively and so may have misdiagnosed some staff. Sixthly, the scope of the questionnaire was limited in order to keep the questionnaire completion time to under five minutes to maximise the response rate. Finally, although respondents were asked to link their TSQ responses to IHCA, the TSQ responses cannot guarantee causation, given the stressful work that many in the acute healthcare sector experience, and this is one limitation of this study.

Conclusions

Trauma-stress reactions are a normal but intense and potentially disabling reaction to an abnormal threat and one of many occupational hazards in an acute care environment. Approximately 10% of acute care staff screened positively for PTSD following an IHCA and a further 47% of staff declared symptoms of trauma. Systems should be implemented to identify staff at risk of PTSD and to provide appropriate support. Guidance and training in effective debriefing and supporting the psychological aspects of resuscitation may be the first step. Further study is warranted to determine the best support model and to establish how to prevent the development of PTSD following potentially traumatic events in a clinical setting.

Conflicts of interest

JPN is the Editor-in-Chief of Resuscitation.

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Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.resuscitation.2019.06.280.

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