Support for healthcare professionals following surgical patient safety incidents: A qualitative descriptive study in five teaching hospitals.

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Abstract

Objectives:

Patient safety incidents can have a profound effect on health care professionals, with some experiencing emotional and psychological distress. This study explores the support medical and non-medical operating room staff received after being involved in a surgical patient safety incident(s) in five UK teaching hospitals.

Methods:

An invitation letter and information sheet was emailed to all medical and non-medical operating room staff (n=927) across the five sites. Semi-structured interviews were arranged with a range of different health care professionals working in operating rooms across a wide variety of surgical specialities. Interviews were audio-recorded, transcribed verbatim and analysed using an inductive thematic approach.

Results:

We conducted 45 interviews with medical and non-medical operating room staff, who emphasised the importance of receiving personalised support soon after the incident. Operating room staff described how the first 'go to' people were their peers and reported feeling comforted when their peers empathised with their own experience(s). Other participants found it very difficult to seek support, perceiving it as a sign of weakness. Although family members played an important role in supporting second victims, some participants felt unable to discuss the incident with them, fearing that they might not understand.

Conclusions:

There should be clear support structures in place for operating room staff who have been involved in surgical incidents. Health organisations need to offer timely support to front-line

staff following these incidents. Senior clinicians should be proactive in offering support to junior colleagues and empathise with their own experiences, thus shifting the competitive culture to one of openness and support.

Keywords: surgical incidents, second victims, support, operating room staff, patient safety

Introduction:

A human error in health care has the potential to cause serious patient harm. In situations where this happens, priority is rightly given to supporting the patient and their family. These incidents can also have a profound negative impact on the healthcare professionals involved.[1-4] The term 'second victims' has been used to describe *'a health care provider involved in an unanticipated adverse patient event, medical error and/or a patient related-injury who becomes victimised in the sense that the provider is traumatised by the event'*.[5] This term has recently come under scrutiny, with patient groups calling for it to be abandoned.[6] Even though patients acknowledge that health professionals need support and guidance following incidents, they have also felt that the usage of this term promotes the belief that patient harm is random, caused by bad luck and is simply not preventable. Healthcare professionals can experience emotional and psychological distress following a surgical incident, which in turn can lead to a loss of concentration, poor clinical performance and unsafe practice, compromising patient safety.[2, 3, 7-9] It has been reported that nearly half of health professionals worldwide have experienced being second victims.[9, 10, 6]

The United Kingdom (UK) Care Quality Commission, an independent regulator of health and adult social care, recommended that health care organizations offer support to the healthcare professionals following a surgical incident, including counselling, professional support interventions and well-being initiatives.[11] Despite these recommendations, not all healthcare professionals have received support.[7, 9, 12] Operating rooms are one of the highest risk environments in health care for errors,[3, 13] with the second highest number of serious incidents in the NHS reported to occur there.[14] A systematic review of the literature highlighted how very little had been published on the impact of surgical incidents on the wider operating team beyond surgeons and anaesthetists.[3] Operating room nurses, operating department practitioners (ODPs) and Operating room assistants can all experience emotional and psychological distress when involved in surgical incidents, with a significant impact on their professional work.[15, 16] We found a gap in the literature concerning

the nature of structured support systems currently in place to help second victims manage surgical incidents.[3] This qualitative study explores what support operating room staff actually received following surgical incidents and what other kinds of support would have helped them in moving forward.

Methods:

We used SRQR (standards for reporting qualitative research) criteria [17] to report our research and provided a checklist as supplementary material 1.

Study design, Setting and Sample

This qualitative study involved face-face semi structured interviews with medical operating room staff (e.g., surgeons and anaesthetists of all grades), and non-medical operating room staff (e.g., nurses, ODP's, operating room assistants of all grades) in one large English NHS Trust. The NHS trust comprising of five teaching hospitals providing multispecialty surgical procedures including emergency and major trauma. A recruitment pack including an invitation letter and information sheet was emailed to all medical and non-medical operating room staff (n=927) across the five sites. Promotional posters were displayed on Trust noticeboards and in rest rooms. One hundred and sixty-eight operating room staff responded to the initial email, with 129 of these have previously been involved in a surgical incident. We purposively selected participants from this group, covering a range of different roles across a wide variety of surgical specialities. All face-to-face interviews were conducted by the main researcher (NS), an experienced practitioner (ODP) in operating theatres, between February 2018 and December 2018.

A constructivist-interpretative paradigm was chosen to enable the realities to be constructed through interactions between the researcher and operating room staff about the surgical patient safety incidents and their subsequent impact. An interview topic guide was used (see table 1), included general questions on: the support operating room staff received following incidents; approaches to coping with the incident; whom they felt comfortable talking to; what kind of support would have helped them after the event; and views and

experiences of the culture and systems in place at the department and/or at an organizational level. Questions in the topic guide were informed by a literature review, and consultation with patient safety and qualitative research experts. The topic guide was tested for face validity in a pilot with four experienced operating room nurses.

Data Collection

The interviews took place at a time and location of the interviewee's choice, and without any other individual being present. Participants were given a detailed information sheet and had the opportunity to ask any questions prior to signing the consent form. All study documentation were treated as confidential documents and held securely in accordance with General Data Protection Regulations (GDPR). The interviews were recorded using a digital recorder, and these recordings deleted once they had been successfully transferred over to a password-protected computer. The study transcriber transcribed the recordings verbatim, and a unique participant identification number placed on each electronic file.

Data analysis and Trustworthiness

All interviews were conducted by the lead researcher audio-recorded, transcribed verbatim and analysed using an inductive thematic approach[18] aided by use of NVivo v12 to manage the codes and themes extracted during the data analysis .[19, 20] The researcher familiarised himself with the data by reading and re-reading the transcripts and allocating initial codes to segments/sections from the interview transcripts. The researcher also identified themes within each transcript, a concept known as `content analysis'.[20] A workable list of main and sub-themes was compiled and applied systematically to the whole dataset. Patterns were investigated and explanations built for the recurring patterns in the data. This process involved interrogating the dataset as a whole to identify linkages between sets of phenomena and exploring why such linkages occurred. These linkages were displayed on a series of maps to further improve understanding and clarity. Interviews were conducted until

~~theoretical~~ data saturation was reached, *i.e.* when themes began to repeat themselves and subsequent interviews yielded no new themes.

Throughout the analysis, other researchers (SPS, AH, SF) independently coded a selection of interview transcripts, and then compared these codes with NS to potentially reduce any researcher bias. Any sections of data, which did not support the generating themes, were also discussed with co-authors to uncover bias. Furthermore, the researcher was an experienced practitioner (ODP) in operating theatres, which is very likely to have influenced his thought processes while conducting this research study and interpreting the data collected. To address this, the researcher kept a research journal in which he recorded his own personal reflections when carrying out the data collection and discussed these with co-authors, which helped to acknowledge and set aside his own biases and preconceptions.

Full quotes have been provided as supplementary material (supplementary 2) to give context to the shorter quotes used below under each theme.

Ethical approval for the study was sought through University Ethics Committee (ID: 237980/1158905/37/907) and was registered as a service evaluation in the research site (Ref: 251).

Results:

Data saturation was achieved after 45 interviews, with each lasting between 30 to 75 minutes. ~~Forty-five face-to-face interviews were conducted between February 2018 and December 2018, with each interview lasting between 30 to 75 minutes.~~ Participants included 26 females and 19 males with a wide range of operating room roles and specialities (see Table 2), ranging in age (28-62 years) and experience of working in the operating room (7-32 years). Seven respondents who were senior managers in operating rooms and involved in clinical governance, patient safety incident investigations, and staff management were also selected. Three overarching themes emerged from the data, including (a) sources of support: peers, friends and family, (b) the timing of the support, and (c) the challenges of the

investigation process. These themes could be broken down into different sub-themes, which included individualized personal support, peer support, support from family, and support from friends; support soon after the incident, immediate support, continuous support, support during the investigation process; and apportioning blame following the incident, lack of transparency during investigation process, communication, reassurance, uncertainty and guidance during investigation process.

Sources of support: peers, friends and family

~~Medical and non-medical~~ Operating room staff pointed out that the first 'go to' person after a surgical incident was their peers. One senior ODP described the operating room staff like *"a close knit"* (Senior ODP, P45) community and how discussing the incident with colleagues really helped her. One Obstetric surgical trainee explained how she had "a good chat" with his senior consultant, who described *"being involved in a similar incident."* (Obstetric Surgical Trainee, P8). A junior Ear Nose and Throat (ENT) surgeon also recalled how his *"senior surgeon was so good (…). He signposted to his own experience and the lessons he learnt. It made me feel that I am not alone."* (ENT surgeon, P2).

Surgeons and anaesthetists felt that the Mortality and Morbidity (M&M) meetings were ideal places to discuss surgical incidents and provide support to those who were involved. However, one general surgeon highlighted how these meetings were *"more as team learning exercise, which is good, but not enough for individual emotional support*".(General Surgeon, Registrar, P14) One trauma consultant anaesthetist noted how several members of the multidisciplinary team e.g., ODP did not appear to be invited to her M&M meetings and *"wondered what a surgeon, theatre nurse[operating room nurse] or an ODP or even a HCA take [would be] on this particular incident. Because we work in theatres [operating room] as a team and when an incident happens it is good to learn as a team as well."* (Trauma and Emergency Consultant anaesthetist, P3). Most non-medical operating room staff, who attend the operating room team meetings, did not really feel that they discussed the surgical

incidents in any great detail, but rather focused on *"theatre [operating room] efficiency, utilisation and targets"* (ODP, P37). However, one operating room lead nurse felt that, as an organisation, the hospital had *"moved on and they are [were] now taking incidents seriously" (*Lead Operating room Nurse, P44). *He was aware of a group of people "called CONTACT who are [were] independent to your [her/his] department and they can offer you support in terms of listening to your concerns and show where you need to go [for support]." (*Lead operating room Nurse, P44).

Some surgeons and anaesthetists reflected on how it was sometimes very difficult for them to accept support following incidents as they felt that it may be perceived as a "*weakness in not being tough enough to handle things"* (General Surgery Consultant, P6). Similarly, a consultant anaesthetist explained how *"we got used to working in this tough competitive professional culture and I can understand why my fellow colleagues and juniors might not accept to receive support"* (Anaesthetist; Consultant, P43). He pointed out how *"this is when the seniors need to step up and talk to them individually and give them support […] again [hospital] trusts need to do their part in regulating practices to support these staff"* (Anaesthetist; Consultant, P43).

Although family members played an important role in supporting second victims, some participants felt unable to discuss the incident with them, as they felt that they would not understand. One senior ODP highlighted how his *"wife and university friends really helped [him] and reassured me [him], allowing me [him] to cope with what was a difficult period"* (Senior ODP, P5). The same senior ODP also reflected on how he was only three weeks into his job at the time of the incident and felt that he was not close enough to colleagues at that point to discuss the incident. A junior anaesthetist also recalled how she needed the *"emotional support"* from her *"loved ones"* (Anaesthetist; Junior Registrar, P18).

The timing of the support

Operating room staff emphasised the importance of receiving personalised support soon after their involvement in a surgical incident. We found variation in the support received by operating room staff, with most operating room nurses and ODP staff receiving little support and guidance when compared to surgeons and anaesthetists. One junior ODP described feeling completely isolated, not knowing *"… who to speak to"* (ODP, P41). A senior ODP also recalled how *"no one came to talk"* to her and asked *"… [where was] the emotional support I needed so desperately as soon as the incident had happened?" (*Senior ODP, P36). An operating room nurse explained how she would have appreciated a *"…one-to-one chat with my [her] manager and get some assurances that everything will be OK" (*Operating room Scrub Nurse, P30) but instead was told by her manager "*now go and speak to your union"*. (Operating room Scrub Nurse, P30) In contrast, one surgical registrar noted how her senior colleague, a consultant surgeon, had taken her *"…aside to her office and offered to support me [her] by all means and even suggested me [she] to take a day off and get relieved from the on-call and night duties in coming months. I [She] felt very supported and reassured".* (Obstetrics Registrar, P40)

Many participants described how having a debrief with team members following a surgical incident was helpful for them. One junior ODP recalled how her team *"discussed and reflected"* (ODP, P9) on the particular incident and felt better afterwards as she was "*not the only one who is [was] feeling this way"*. (ODP, P9) Similarly, an operating nurse described how "*an excellent anaesthetist, who is well respected by all and always looks after theatre [operating room] staff and advocates for safety in theatres [operating room]"* had facilitated the debriefing and she felt *"very supported"* (Operating room Scrub Nurse, P1). ~~A consultant anaesthetist felt that the support provided needs to be personalised and include emotional, professional or both.~~ One vascular surgeon emphasised how the welfare of those involved in the surgical incident needs to *"be followed up on consistent basis"* (Vascular Consultant Surgeon, P20). This was echoed by a senior orthopaedic operating room nurse who

described the need to *"constantly check"* whether colleagues involved in the incident were *"coping well"* (Senior Orthopaedic Nurse, P26).

The challenges of the investigation process

Some interviewees were instructed not to discuss the details of the surgical incident(s) with anyone while it was under investigation. This left one operating room nurse feeling very isolated:

> *"I was not allowed to share it [incident] with anyone […] it had an adverse emotional impact on me. My manager does not want to discuss the incident nor want me to talk to anyone about it as it is under investigation, and I didn't know who to approach to and talk to"* (Operating room Scrub Nurse, P15).

A senior anaesthetist also described feeling *"all alone in the whole process"* and recalled how she *"didn't know what to do or who I can [she could] speak to. […] It looked like at the time no one wants[ed] to talk to me or support me" (*Anaesthetist; Consultant, P35). One operating room support worker recounted how the investigative process was not explained to her and that *"a little bit more clarification in [about] what steps will be taken"* would have been helpful; in particular, she looked for reassurances that she would not lose her job (Operating room assistant, P28). One junior ODP recalled her frustration in completing the required investigation reports and how she was repeatedly asked for more details: *"irrespective [of] how many times I write it, it is going to be the same thing, that frustrated me a lot and [for] once I haven't seen this investigator apart from receiving this emails."* (ODP, P32). An operating room nurse received guidance from his operating room clinical educator, who advised him to stick to the facts when completing the necessary paperwork: *"it's not any wishy washy stuff because if you don't put out the truth or you don't put out the facts and it*

doesn't stand up to scrutiny you're going to be in a big mess" (Operating room Scrub Nurse, P30).

Discussion

This is the first qualitative study in the UK to explore the support that healthcare professionals receive following a surgical patient safety incident(s). Consistent with previous research in similar areas such as in pharmacy and medicine, most of the participants in this study highlighted a lack of adequate emotional and professional support following these incidents.[7-10, 12, 21-27] When provided, the support was not perceived to be personalised to the individual, with non-medical operating room staff such as operating room nurses, ODP's and operating room assistants appeared to receive little or no support when compared to that of medical staff. Due to the existence of a competitive professional culture in surgery, some surgeons and anaesthetists felt that seeking support after an incident could be viewed as a sign of weakness. Although some surgeons and anaesthetists found M&M meetings useful to openly discuss incidents, others believed that they should be multidisciplinary and questions why some non-medical colleagues were not included in these discussions.

Consistent with previous research, participants turned to their senior surgeons, anaesthetists and senior nurses for both emotional and professional support[9, 23, 27, 28] Previous studies have highlighted how senior clinicians should be proactive in offering support to junior colleagues and empathise with their own experience(s). [7, 9, 29, 30] These experiences appeared to resonate with participants who felt comforted by the fact that they were not alone.[31-39] The concept of "open discourse of incidents" especially by senior medical and surgical colleagues has been recommended in previous patient safety research as it highlights how mistakes can happen and promotes learning.[31-39] Our study also found variation in the support received by medical and non-medical staff, which may have been related to the different disciplinary culture of nursing and allied health professions when compared to medicine and surgery.

NHS England stressed the importance of communication and interpersonal skills amongst managers and senior clinicians, and the need to cultivate more of an empathetic approach.[40] Some participants in our study described the competitive professional culture in surgery, and their reluctance to seek support as it could be perceived as a sign of weakness.[41, 42] We believe this culture needs to change, and senior clinician staff should lead by example, thus shifting the competitive culture to one of openness and support. For this, top leaders in healthcare organisation need to also encourage openness, bearing in mind that most surgical incidents occur due to multiple contributing factors.[42]

The Serious Incident framework published by NHS England in 2015 described the importance of developing an investigation process within organisations for identifying serious incidents correctly, investigating them thoroughly and learning from them so as to prevent similar incidents happening again.[43] Our study found that, even though organisations may have developed these investigation processes, there was still challenges around how these processes were carried out. NHS Improvement in January 2019 published NHS long term plan and, under their NHS Health and Wellbeing Framework, recommended all NHS trusts to work with regional Clinical Commissioning Groups (CCGs) on protocols for the management and support processes for staff.[44]

Several leading institutions in the USA and Europe have developed standardized support programmes to support second victims. The RISE (Resilience in Stressful Events) program initiated by John Hopkins University, the Medically Induced Trauma Support Services (MITSS) run by a non-profit organisation, in Chestnut Hill, Boston, and the "*forYOU"* program at the University of Missouri Health Care are all supporting programmes that have been developed to support patients, their families and health professionals following patient safety incidents.[1, 45, 46] In addition, the second victim experience and support tool (SVEST) was developed to enable healthcare organizations around the world to assess the experiences of healthcare staff who have been involved in incidents and evaluate how useful these programmes are.[29] It can also provide healthcare organization leaders with evidence on

which support resources were most taken up and favoured by their staff. Based on the above established support programmes and tools, any health care organisations can adopt these programmes to help provide structured and meet their healthcare professionals' individual needs. Recent reports highlighted several wellbeing support programmes and systems been organised by the health organisations to support and prioritise the welfare of the front-line staff all over the world during this current COVID 19. [47-49] Reports describe the need for a "flatten work hierarchy" to support staff.[50] More work needs to be done to sustain these priorities and support the health and wellbeing of staff on the frontline during need.

Our study also observed how some members of the multidisciplinary team were absent from discussions about surgical incidents at M&M meetings. Medical and non-medical staff work together as a team in operating rooms and, as such, all surgical incidents should be discussed as a team in order to understand *where* errors might have occurred and *what* changes need to be put in place to prevent these occurring in the future.[51] The segregation of medical and non-medical staff at M&M meetings at this NHS Trust needs to be reviewed and a more collaborative approach taken to promote cross-disciplinary learning.[51-53]

Our study found that the timing of the support received was important. Consistent with previous research both medical and non-medical staff in this study described how they needed emotional and professional support in a timely manner after the event and felt isolated during the investigation process.[54-56] This finding has previously been highlighted in the Scott Three-Tiered Interventional Model of Support, where individuals required basic immediate emotional support following an incident, followed by peer-to-peer or one-to-one support, and then further access to professional counselling and guidance during the investigation and legal processes.[57, 58] The Scott Three-Tiered Interventional Model of Support described providing 24/7 support for those who needed it. The US based Medically Induced Trauma Support Services (MITSS) Toolkit contains a range of resources for organisations interested in providing emotional support to their staff following a patient safety incident[59].

~~Currently, health professionals around the world could be viewed as in a period of unease and insecurity due to COVID-19 pandemic. There are growing concerns on medical and non-medical staff health and wellbeing, and the negative impact the pandemic is having on health professionals.~~

We recognize there are limitations in our study. It was conducted in one large English NHS Trust and we acknowledge that the findings may not be generalisable to other hospital Trusts or settings. However, a range of multidisciplinary healthcare professionals of different grades and with varied experiences participated in this study.

Conclusions:

Surgical incidents are common and can have a profound impact on healthcare staff. Health organisations need to offer timely support to front-line staff following a surgical incident. Senior clinicians should be proactive in offering support to junior colleagues and empathise with their own experiences, thus shifting the competitive culture to one of openness and support. Organisations need to encourage collaborative approach to promote cross-disciplinary learning following surgical incidents.

References:

1. Edrees HH, Paine LA, Feroli ER, Wu AW. Health care workers as second victims of medical errors. *Polskie Archiwum Medycyny Wewnetrznej*. 2011;121(4):101-107.

2. Busch I MF, Purgato M, Barbui C, Wu A, Rimondini M. Dealing With Adverse Events: A Meta-analysis on Second Victims' Coping Strategies. *Journal of patient safety*. 2020;1

3. Serou N, Sahota LM, Husband AK, Forrest SP, Moorthy K, Vincent C, Slight RD, Slight SP. Systematic review of psychological, emotional and behavioural impacts of surgical incidents on operating theatre staff. *BJS Open*. 2017;1(3)doi:10.1002/bjs5.21

4. Serou N, Slight SP, Husband AK , Forrest SP ,Slight RD. Surgical incidents and their impact on operating theatre staff: qualitative study. *British Journal of Surgery Open*. 2020;6doi:10.1093/bjsopen/zraa007/6043604

5. Wu WA. Medical error: the second victim. *British Medical Journal*. 2000;320(726)

6. Clarkson MD, Haskell H, Hemmelgarn C, Skolnik PJ. Abandon the term "second victim". *BMJ*. Mar 27 2019;364:l1233. doi:10.1136/bmj.l1233

7. Coughlan B, Powell D, Higgins MF. The Second Victim: a Review. *Eur J Obstet Gynecol Reprod Biol*. Jun 2017;213:11-16. doi:10.1016/j.ejogrb.2017.04.002

8. Johnson J, Panagioti M, Bass J, Ramsey L, Harrison R. Resilience to emotional distress in response to failure, error or mistakes: A systematic review. *Clin Psychol Rev*. Mar 2017;52:19-42. doi:10.1016/j.cpr.2016.11.007

9. Nydoo P, Pillay BJ, Naicker T, Moodley J. The second victim phenomenon in health care: A literature review. *Scand J Public Health*. Aug 13 2019:1403494819855506. doi:10.1177/1403494819855506

10. Pellino G, Pellino IM. Deaths, errors and second victims in surgery: an underestimated problem. *Br J Surg*. Jan 2020;107(1):152. doi:10.1002/bjs.11432

11. Care Quality Commission;Learning from serious incidents in NHS acute hospitals; A review of the quality of investigation reports; June 2016. www.cqc.org.uk/content/briefing-learning-serious-incidents-nhs-acute-hospitals doi 25/02/2017

12. Sirriyeh R, Lawton R, Gardner P, Armitage G. Coping with medical error: a systematic review of papers to assess the effects of involvement in medical errors on healthcare professionals' psychological well-being. *Quality & safety in health care*. 2010;19(6):e43.

13. Flin R, Yule S, McKenzie L, Paterson-Brown S, Maran N. Attitudes to teamwork and safety in the operating theatre. *Surgeon*. 2006;4(3):145-151.

14. NHS England and NHS Improvement . *Provisional publication of Never Events reported as occurring between 1 April and 31 December 2019*. Improvement NEaN; 2020.

15. Chan STK, P.C.B.; Wang, W. Psychological responses, coping and supporting needs of healthcare professionals as second victims. *Internal Nursing Review*. 2016;

16. Chard R. How Perioperative Nurses Define, Attribute Causes of, and React to Intraoperative Nursing Errors. *AORN Journal*. 2010;91(1):132-145.

17. O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. Standards for reporting qualitative research: a synthesis of recommendations. *Acad Med*. Sep 2014;89(9):1245-51. doi:10.1097/ACM.0000000000000388

18. Braun V, Clarke V. Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health*. 2019;11(4):589-597. doi:10.1080/2159676x.2019.1628806

19. Creswell JW. *Qualitative Inquiry and Research Design; Choosing Among Five Approaches.* . 3 ed. SAGE Publications, Inc.; 2013.

20. Creswell JW. *Educational research : planning, conducting, and evaluating quantitative and qualitative research*. 5th Edition ed. Pearson Education, Inc; 2014.

21. Edrees HH, Morlock L, Wu AW. Do Hospitals Support Second Victims? Collective Insights From Patient Safety Leaders in Maryland. *Jt Comm J Qual Patient Saf*. Sep 2017;43(9):471-483. doi:10.1016/j.jcjq.2017.01.008

22. Gomez-Duran EL, Arimany-Manso J. Healthcare professional as second victim in healthcare injuries. *Med Clin (Barc)*. Feb 14 2020;154(3):98-100. El profesional sanitario como segunda victima del dano en la asistencia. doi:10.1016/j.medcli.2019.09.005

23. Harrison R, Lawton R, Perlo J, Gardner P, Armitage G, Shapiro J. Emotion and coping in the aftermath of medical error: a cross-country exploration. *Journal of patient safety*. 2015;11(1):28-35.

24. Harrison R, Lawton R, Stewart K. Doctors' experiences of adverse events in secondary care: the professional and personal impact. *Clinical medicine (London, England)*. 2014;14(6):585-90.

25. Lee W, Pyo J, Jang SG, Choi JE, Ock M. Experiences and responses of second victims of patient safety incidents in Korea: a qualitative study. *BMC Health Serv Res*. Feb 6 2019;19(1):100. doi:10.1186/s12913-019-3936-1

26. Leferink EHM, Bos A, Heringa MP, Rensen ELJv, Zwart DLM. The need and availability of support systems for physicians involved in a serious adverse event. *Journal of Hospital Administration*. 2018;7(2):23. doi:10.5430/jha.v7n2p23

27. Mohamadi-Bolbanabad A, Moradi G, Piroozi B, et al. The second victims' experience and related factors among medical staff. *International Journal of Workplace Health Management*. 2019;12(3):134-145. doi:10.1108/ijwhm-07-2018-0087

28. Donahue KR, Gossai T, Succar L, Bhakta SB, Varkey AC. Second victim syndrome and the pharmacy learner. *J Am Pharm Assoc (2003)*. Feb 26 2020;doi:10.1016/j.japh.2020.01.020

29. Burlison JD, Scott SD, Browne EK, Thompson SG, Hoffman JM. The Second Victim Experience and Support Tool: Validation of an Organizational Resource for Assessing Second Victim Effects and the Quality of Support Resources. *J Patient Saf*. Jun 2017;13(2):93-102. doi:10.1097/PTS.0000000000000129

30. Zhang X, Li Q, Guo Y, Lee SY. From organisational support to second victim-related distress: Role of patient safety culture. *J Nurs Manag*. Nov 2019;27(8):1818-1825. doi:10.1111/jonm.12881

31. Byrth J, Aromataris E. Health professionals' perceptions and experiences of open disclosure: A systematic review of qualitative evidence. *JBI Database of Systematic Reviews and Implementation Reports*. 2014;12(5):237-318.

32. Fein SP, Hilborne LH, Spiritus EM, et al. The many faces of error disclosure: a common set of elements and a definition. *Journal of general internal medicine*. 2007;22(6):755-61.

33. Ghalandarpoorattar SM, Kaviani A, Asghari F. Medical error disclosure: The gap between attitude and practice. *Postgraduate Medical Journal*. 2012;88(1037):130-133.

34. Hebert PC. Disclosure of adverse events and errors in healthcare: an ethical perspective. *Drug safety*. 2001;24(15):1095-104.

35. Helmchen LA, Richards MR, McDonald TB. How does routine disclosure of medical error affect patients' propensity to sue and their assessment of provider quality? Evidence from survey data. *Medical care*. 2010;48(11):955-61.

36. Iedema R, Allen S, Sorensen R, Gallagher H. What prevents incident disclosure, and what can be done to promote it? *Joint Commission Journal on Quality & Patient Safety*. 2011;37(9):409-418.

37. Martinez W, Hickson GB, Miller BM, et al. Role-modeling and medical error disclosure: a national survey of trainees. *Academic medicine : journal of the Association of American Medical Colleges*. 2014;89(3):482-9.

38. Martinez W, Lehmann LS. The "hidden curriculum" and residents' attitudes about medical error disclosure: comparison of surgical and nonsurgical residents. *Journal of the American College of Surgeons*. 2013;217(6):1145-50.

443 39. Wu AW, Boyle DJ, Wallace G, Mazor KM. Disclosure of adverse events in the United
444 States and Canada: An update, and a proposed framework for improvement. *Journal of*
445 *Public Health Research*. 2013;2(3):186-193.
446 40. NHS Improvement . *A just culture guide*. 2018.
447 https://improvement.nhs.uk/resources/just-culture-guide/
448 41. Boyle FM, Allen J, Rey-Conde T, North JB. Learning from regret. *Br J Surg*. Mar
449 2020;107(4):422-431. doi:10.1002/bjs.11452
450 42. Wilson A, Ronnekleiv-Kelly SM, Pawlik TM. Regret in Surgical Decision Making: A
451 Systematic Review of Patient and Physician Perspectives. *World J Surg*. Jun
452 2017;41(6):1454-1465. doi:10.1007/s00268-017-3895-9
453 43. NHS Improvement . Serious Incident Framework:Supporting learning to prevent
454 recurrence. 27 March 2015 2015;
455 44. NHS England . *NHS Long Term Plan* 2019.
456 45. Scott SD, Hirschinger LE, Cox KR, et al. Caring for our own: deploying a systemwide
457 second victim rapid response team. *Joint Commission journal on quality and patient safety /*
458 *Joint Commission Resources*. 2010;36(5):233-40.
459 46. Edrees H, Connors C, Paine L, Norvell M, Taylor H, Wu AW. Implementing the RISE
460 second victim support programme at the Johns Hopkins Hospital: a case study. *BMJ Open*.
461 Sep 30 2016;6(9):e011708. doi:10.1136/bmjopen-2016-011708
462 47. Adams JG, Walls RM. Supporting the Health Care Workforce During the COVID-19
463 Global Epidemic. *JAMA*. Mar 12 2020;doi:10.1001/jama.2020.3972
464 48. Greenberg N, Docherty M, Gnanapragasam S, Wessely S. Managing mental health
465 challenges faced by healthcare workers during covid-19 pandemic. *BMJ*. Mar 26
466 2020;368:m1211. doi:10.1136/bmj.m1211
467 49. Willan J, King AJ, Jeffery K, Bienz N. Challenges for NHS hospitals during covid-19
468 epidemic. *BMJ*. Mar 20 2020;368:m1117. doi:10.1136/bmj.m1117

50. Ellis R, Hay-David AGC, Brennan PA. Operating during the COVID-19 pandemic: How to reduce medical error. *Br J Oral Maxillofac Surg*. Apr 13 2020;doi:10.1016/j.bjoms.2020.04.002

51. Leistikow I, Mulder S, Vesseur J, Robben P. Learning from incidents in healthcare: the journey, not the arrival, matters. *BMJ Qual Saf*. Mar 2017;26(3):252-256. doi:10.1136/bmjqs-2015-004853

52. Drupsteen L, Groeneweg J, Zwetsloot GI. Critical steps in learning from incidents: using learning potential in the process from reporting an incident to accident prevention. *Int J Occup Saf Ergon*. 2013;19(1):63-77. doi:10.1080/10803548.2013.11076966

53. Macrae C. Learning from patient safety incidents: Creating participative risk regulation in healthcare. *Health, Risk & Society*. 2008;10(1):53-67. doi:10.1080/13698570701782452

54. Wu AW, Steckelberg RC. Medical error, incident investigation and the second victim: doing better but feeling worse? *BMJ quality & safety*. 2012;21(4):267-70.

55. Ullström S, Sachs MA, Hansson J, Øvretveit J, Brommels M. Suffering in silence: a qualitative study of second victims of adverse events. *BMJ Quality & Safety*. 2014;23(4):325-332.

56. Flint L. Acute traumatic stress among surgeons after major surgical complications by A. Pinto, O. Faiz, C. Bicknell, and C. Vincent. *American journal of surgery*. 2014;208(4):648-9.

57. Hirschinger LES, S.D.; Hahn-Cover, K. . Clinician Support: Five Years of Lessons Learned. 2015;

58. Merandi J, Liao N, Lewe D, et al. Deployment of a Second Victim Peer Support Program: A Replication Study. *Pediatr Qual Saf*. Jul-Aug 2017;2(4):e031. doi:10.1097/pq9.0000000000000031

59. Pratt S, Kenney L, Scott SD, Wu AW. How to develop a second victim support program: a toolkit for health care organizations. *Joint Commission journal on quality and patient safety / Joint Commission Resources*. 2012;38(5):235-193.