




BMJ Open Key factors for effective implementation of healthcare workers support interventions after patient safety incidents in health organisations: a scoping review

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ABSTRACT

Objectives This study aims to map and frame the main factors present in support interventions successfully implemented in health organisations in order to provide timely and adequate response to healthcare workers (HCWs) after patient safety incidents (PSIs).

Design Scoping review guided by the six-stage approach proposed by Arksey and O'Malley and by PRISMA-ScR.

Data sources CINAHL, Cochrane Library, Embase, Epistemonikos, PsycINFO, PubMed, SciELO Citation Index, Scopus, Web of Science Core Collection, reference lists of the eligible articles, websites and a consultation group.

Eligibility criteria for selecting studies Empirical studies (original articles) were prioritised. We used the Mixed Methods Appraisal Tool Version 2018 to conduct a quality assessment of the eligible studies.

Data extraction and synthesis A total of 9766 records were retrieved (last update in November 2022). We assessed 156 articles for eligibility in the full-text screening. Of these, 29 articles met the eligibility criteria. The articles were independently screened by two authors. In the case of disagreement, a third author was involved. The collected data were organised according to the Organisational factors, People, Environment, Recommendations from other Audies, Attributes of the support interventions. We used EndNote to import articles from the databases and Rayyan to support the screening of titles and abstracts.

Results The existence of an organisational culture based on principles of trust and non-judgement, multidisciplinary action, leadership engagement and strong dissemination of the support programmes' were crucial factors for their effective implementation. Training should be provided for peer supporters and leaders to facilitate the response to HCWs' needs. Regular communication among the implementation team, allocation of protected time, funding and continuous monitoring are useful elements to the sustainability of the programmes.

Conclusion HCWs' well-being depends on an adequate implementation of a complex group of interrelated factors to support them after PSIs.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ The inclusion and exclusion criteria were defined in accordance with a preliminary search strategy, guided by the population, concept and context, as recommended by the Joanna Briggs Institute for scoping reviews.
- ⇒ We did not restrict language and period of time to avoid having selection bias and compromise the validity and reliability of the findings.
- ⇒ The data collection was limited to five interrelated dimensions (Organisational factors, People, Environment, Recommendations from other studies, Attributes of the support interventions).
- ⇒ We used the Mixed Methods Appraisal Tool assessment tool to evaluate the quality of the included studies; however, some of the criteria could not be fully applied in some specific cases.
- ⇒ We included five experts from different countries to complement the literature search with additional sources of information.

INTRODUCTION

It is estimated that 10.4%–50% of the professionals working in healthcare sector will experience at least once in their career the second victim phenomenon (SVP)^{1 2} defined as 'any healthcare worker (HCW), directly or indirectly involved in an unanticipated adverse patient event, unintentional healthcare error or patient injury, and who becomes victimised in the sense that they are also negatively impacted'.³ These types of incidents, with an unintended or unexpected nature, can harm patients (first victims of an adverse event) or pose a risk to the system (near miss).^{4 5}

HCWs play a crucial role in patient care and they can be seriously affected when a patient safety incident (PSI) happens. PSIs can impact HCWs' quality of life,^{2 6 7} in

particular their physical and psychological well-being.^{8 9} A study published in 2020 shows that the most prevalent symptoms in HCWs after PSIs were troubling memories, anxiety/concern and anger toward themselves.⁹ Work satisfaction, confidence in their abilities² and work performance^{7 10} can also be seriously impacted by these types of incidents. It can result in turnover intentions and absenteeism¹¹ and in the most severe cases can lead to suicide.¹²

Institutional support systems are increasingly being implemented in order to provide an immediate and empathic response to HCWs after stressful situations such as PSIs. Health organisations are recognising the importance of this type of support, due to its important impact on the organisational culture,¹³ patient safety (PS) and quality of care^{14–16} and also on the economic perspective.¹⁷ It is well-established that poor HCWs' well-being has a strong influence on the reoccurrence of PSIs.¹⁴ Therefore, prioritising interventions that effectively support HCWs after stressful situations can prevent future health-care incidents and improve PS.

The first reported support programmes were implemented in the USA in 2006 and since then, they have been gradually multiplying all over the world.¹⁸ In recent years, there has been a growing number of publications describing the implementation of these types of programmes and practices with the overall aim of decreasing emotional and psychological distress in HCWs. A systematic review found that HCWs seek support not only after being involved in PSIs, but also when facing other distressing situations (eg, emotional distress, torpid evolution of a patient, personal crises, intraoperative mishaps).⁹ Based on the fact that there is still a lack of assistance to HCWs to cope in distressing situations, some support interventions are opening their scope of action.⁹

Although support interventions have demonstrated their benefits and utility, there is still limited research on finding what the common elements present in the development and implementation process of successful interventions are. A toolkit was introduced in 2010 to provide guidance on the implementation of programmes to support HCWs who have been negatively impacted by PSIs.¹⁹ The development of this toolkit was an important step in assisting with the implementation of support programmes and it can be adjusted to any type of health-care organisation.¹⁹ However, no study has been published focusing on reviewing the existing evidence to understand the main factors that contribute for an effective implementation of these types of support interventions.

Evidence shows that establishing a set of elements for implementing interventions does not ensure its effective introduction into daily usage.^{20 21} The success of interventions in health organisations highly depends on an adequate design, implementation and evaluation.²² One of the main aims of implementation science is to understand what are the factors that might affect the effectiveness and sustainability of the interventions and what is the necessary implementation process to produce the expected effects.²⁰ In this sense, learning from previous



Figure 1 OPERA—The five key domains to guide HCWs' support interventions after stressful events such as PSIs. HCW, healthcare worker; OPERA, Organisational factors, People, Environment, Recommendations from other studies, Attributes; PSI, patient safety incident.

experience can facilitate practical application and contribute to more effective interventions.²³

Study rationale

In this study, we set out to map and frame the main factors that underlie an effective implementation of support interventions in order to provide timely and adequate response to HCWs who are physically and/or emotionally affected by PSIs (known as second victims) or similar distressing situations. We have defined five interrelated dimensions guided by five main research questions, further described in this study, and we organised them in the Organisational factors, People, Environment, Recommendations from other studies, Attributes (OPERA) (figure 1). This framework helped to inform the planning and design of the scoping review, as well as the execution. The defined five domains were inspired on the health policy triangle (HPT) framework to guide effective implementation of health policies.²⁴ However, HPT is a theoretical model and in order to overcome the research-to-practice gap, we have incorporated the implementation science principles and Donabedian's structure–process–outcome quality of care model, more recently adapted by Yano.²⁵

Objectives

We aim to understand what existing organisational factors, relevant actors, contextual factors, operational attributes are present in interventions that were successfully implemented in health organisations to support HCWs after PSIs or other similar stressful events. We also

aim to identify what are the recommendations from the included interventions for improving the effectiveness of the programmes implementation in health organisations.

METHODS

This scoping review is conducted using the six-stage approach proposed by Arksey and O'Malley²⁶ and is guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Extension for Scoping Reviews to ensure the transparency of the results obtained²⁷ and follows The Joanna Briggs Institute Methodology (JBI) for Scoping Reviews.²⁸

All the methodological steps are described in further detail in the scoping review protocol published in a previous publication.²⁹

Stage 1: identifying the research question(s)

In this study, we focus on the main research question:

- ▶ What are the key factors that contribute to an effective implementation of interventions to support HCWs after PSIs or other similar stressful situations in health organisations?

To answer the primary research question, five secondary questions were formulated based on the specific objectives and outcomes of interest of the study :

- ▶ What are the organisational factors that contribute to an effective implementation of these interventions?
- ▶ Who are the relevant actors that contribute to an effective implementation of these interventions?
- ▶ What are the contextual factors that contribute to an effective implementation of these interventions?
- ▶ What recommendations, as identified in previous studies, can be applied to effectively implement these interventions?
- ▶ What are the operational attributes that contribute to an effective implementation of these interventions?

Stage 2: search strategy

A comprehensive search strategy using relevant electronic databases was developed with the support of a qualified research librarian. The search comprised Medical Subject Headings terms along with free-text keywords. We applied the search strategy in nine electronic databases and the last update was done in November 2022 (CINAHL, Cochrane Library, Embase, Epistemonikos, PsycINFO, PubMed, SciELO Citation Index, Scopus, Web of Science Core Collection). The applied search strategies in the electronic databases can be consulted in online supplemental table 1. In addition to the database search, relevant websites were consulted and reference lists of the studies included in the full-text screening were screened to identify any other potential articles to include.

Stage 3: study selection

We used EndNote to import articles from the different databases and we used Rayyan as a tool to facilitate the screening of titles and abstracts. The articles were

independently and manually screened by two authors between April 2022 and February 2023. In the case of disagreement on article inclusion, a third author was involved to evaluate the paper independently and contribute to making a final decision.

We did not restrict the period of time or language of the included studies in order to reduce the selection bias and to undertake a comprehensive overview of the existing literature on a topic with still limited number of publications. Empirical studies (original articles) were prioritised along with systematic reviews and meta-analyses for collecting potential eligible studies. Grey literature (theses and other documents) was also considered eligible for the study.

The inclusion and exclusion criteria were defined in accordance with a preliminary search strategy, guided by the population, concept and context (PCC) framework (recommended by the JBI for scoping reviews²⁸) and are further described in the published protocol of this study.²⁹

Based on the PCC framework, we defined the following criteria:

Population: Support interventions in health organisations in which HCWs are physically and/or emotionally affected by PSIs and other distressing situations. We considered support interventions destined to health professionals, residents and other allied health professionals (such as technicians and supply workers).

Concept: Support interventions that were fully implemented and executed in health organisations and provided measurable results that assessed the achievement of desired outcomes.

Context: Support interventions from a variety of health-care contexts, including those in high-income, middle-income and low-income countries (eg, primary care, urgent and acute care, ambulatory services, long-term facilities).

Exclusion criteria

Editorials, letters to the editor, case series, case reports, narrative reviews and commentaries were excluded.

Stage 4: charting the data

A data extraction template was created to show the characteristics of the eligible studies (detailed information can be consulted in online supplemental table 2).

Quality assessment

We used the Mixed Methods Appraisal Tool (MMAT) Version 2018 to conduct a quality assessment of the eligible studies.³⁰ We believe that this appraisal will be important to enhance the quality and rigour of our study, ensuring greater transparency and validity of the data. The eligible studies were evaluated by two independent reviewers. A third reviewer was involved in cases of disagreement in the quality assessment.

Stage 5: collating, summarising and reporting the results

The information from the eligible studies was collected and organised into different conceptual categories, as presented in the OPERA (figure 1):

Organisational factors

- ▶ Organisational structures (eg, infrastructures, resources, tools, equipment, units and staffing levels functional for managing and delivering services, leadership structure/authority and organisational culture).
- ▶ Organisational processes (eg, organisational actions, procedures, recruitment criteria, training, programme implementation, communication processes, quality of interactions and coordination during programme implementation and dissemination as well as the sustainability of the practice).
- ▶ Organisational outcomes (eg, implementation measures, process quality measures, utilisation measures, effectiveness measures that assess the attainment of an end state).

People

Relevant actors (individuals and organisations that actively participate in the development and implementation of the programme).

Environment

Contextual factors (type of healthcare setting and cultural context).

Recommendations described in the included studies

Recommendations to improve the implementation process of the support interventions.

Operational attributes of the interventions

Format/type of programme, accessibility, usability and confidentiality of the programme/intervention.

Stage 6: consultation exercise and stakeholder involvement

We invited a group of five experts working on SVP research from five different countries (Finland, Germany, Italy, Portugal and Spain) to complement the literature search with additional sources of information. All of them are members of The European Researchers' Network Working on Second Victims (ERNST).

Patient and public involvement and engagement

None.

RESULTS

A total of 9708 records were retrieved from 9 electronic databases, 43 articles were retrieved from the reference lists of the included articles, 11 from websites and 4 were collected from stakeholders' group inputs.

Based on the screening of titles and abstracts, 7262 articles were excluded and 13 articles could not be retrieved

Table 1 Characteristics of the included studies

Categories	Subcategories	No of articles	Total
Type of scientific article*	Level II—evidence obtained from randomised controlled trial	3	29
	Level VI—evidence from a single descriptive or qualitative study	26	
Type of study design	Mixed method	15	29
	Quantitative descriptive	8	
	Qualitative	3	
	Randomised controlled trial	3	
Country where the study was developed	Denmark	1	29
	Germany	3	
	New Zealand	1	
	Spain	2	
	Sweden	1	
	UK	2	
	USA	19	

*This rating scale is based on Ackley *et al.*³²

after trying to contact the authors. A total of 156 articles were assessed for eligibility.

A third independent author was involved in solving four conflicts in the authors' decision, leading to the inclusion of one article. In total, 127 articles were excluded after the screening, and 29 articles ultimately met the eligibility criteria. Detailed information about the data collection, screening process, duplicates removed and reasons for exclusion is exhibited in the flow chart (online supplemental figure 1), in line with the original Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement.³¹

Studies with levels of evidence II and VI³² met the eligibility criteria. We have included the following types of studies: mixed methods (n=15); quantitative descriptive (n=8); qualitative (n=3); randomised controlled trial (n=2) (for further details about the included studies consult online supplemental table 2). Bearing in mind that we only included empirical studies, we didn't include the first two screening questions in the MMAT evaluation (optional for MMAT).³⁰

The characteristics of the included studies are outlined in table 1.

Most of the programmes included in this study have a multidisciplinary application and were focused on supporting HCWs after traumatic work experiences directly associated with PSIs. Several programmes were

Table 2 Resources identified in the included HCWs' support programmes

Marketing and dissemination materials	Print marketing materials: posters ^{40 59} ; handouts such as brochures and flyers ^{39 45 55} identification badge of peer support for easy recognition and quick reference cards. ⁵⁵ Digital marketing material: promotional videos ⁵⁰ website ^{45 46 50} ; email box. ^{41 46 47}
Selfcare and well-being related resources	Packets with aromatherapy ^{36 37} ; chocolate ^{35 36 56} ; snacks ^{51 54} ; kind messages ^{35 36 51} ; self-care pockets with essential support resources and guidance for coping with normal grief responses, ³⁶ others contain a journal, a stress ball and tissues ⁵⁶ ; general mental and emotional wellness advices, ⁴⁹ and use existing resources. ⁴⁹
Functional resources for programme implementation	Electronic mailbox ^{36 41–43 45–48 52 55} ; access to virtual zoom ^{41 46} and WebEx platform ⁴⁶ ; dedicated mobile phone/pager/hotline/phone call system for peer supporter sessions ^{35 40 47 48 53 57 60} ; web-based collaborative administrative platform for sharing information and managing the programme ⁴⁵ such as Sharepoint ^{43 55} ; checklist of responsibilities for the development team ³⁶ ; list of peer support schedules ^{38 39} ; peer encounter forms ^{43 47} secure database of outreach attempts. ⁴⁸
Educational resources (most of them are related with peer support training)	Online training focused on psychological first aid ^{33 47} PowerPoint presentations with voice narrations ³³ training scenarios ^{44 56 57} ; videos ^{33 45 87} ; 'Do's' and 'Don'ts' list, self-affirmations resources ^{48 87} and specific facilitator's guide ⁴⁶ made available to peer supporters for guidance during the encounters with SV/HCWs; tutorial for peer support facilitation. ⁵⁴
The most recent studies have an investment in administrative support resources such as the use of SharePoint, a collaborative platform for programme management. ^{43 45 55} Posters, brochures and flyers were the most widely used marketing resources. HCW, healthcare worker; SV, second victim.	

particularly focused on responding to severe adverse events.^{33–35}

Although one-to-one sessions were the most commonly provided support, some programmes also included group sessions. We also included interventions focused on raising awareness of SVP and creating a supportive and proactive culture to manage critical incidents and enhance HCWs' well-being.

The included interventions are described in online supplemental table 3.

In the following section, we present the results based on the organisation of the OPERA.

(Organisational factors)PERA

Organisational factors: structure Resources

We found four main types of useful resources used in the interventions according to different applications.³⁶ These resources are described in [table 2](#).

Infrastructures

The acquisition of materials and human resources was, in most cases, voluntarily. However, some studies mentioned that the intervention received specific funding for acquiring resources.^{36 37}

The existence of a specific room for sharing information and emotions in privacy was referred to by two studies.^{35 38}

Organisational culture

We identified the following factors associated with the organisational culture that are facilitators of the implementation of HCW support programmes after PSIs:

- ▶ Openness of the health organisation to innovation.³⁹

- ▶ Implementation of previous initiatives that have contributed to the creation of a proactive organisational culture to manage PSIs⁴⁰, to support HCWs after PSIs /other stressful situations and promote their well-being.^{36 37 41 42}
- ▶ The existence of formalised structures directed at fostering a PS culture, based on a just culture approach,^{35 36 42} and at supporting HCWs and enhancing their well-being.^{35 42–44}
- ▶ Active involvement of leadership members in initiatives that support SVs and HCWs' well-being.^{35 37 39 42 45–48}
- ▶ Existence of established policies promoting a supportive organisational culture (such as the application of paid time off after a critical incident occurs)³⁵ and organisational accountability for employees' support and well-being after PSIs.⁴⁹

We also identified some potential organisational barriers to the implementation of programmes:

- ▶ A lack of staff and leadership awareness regarding the support programmes for HCWs.⁵⁰
- ▶ An organisational culture that does not prioritise PS and HCWs' support and doesn't disclose wellness problems.^{51–53}

Organisational factors: process

Most of the implemented programmes had developed a needs assessment^{43 45 47 49 53 54} and/or conducted a literature review^{33 45 48} prior to the design and creation of the programme. The needs assessment makes it possible to adapt the interventions to the needs of the clinical teams and adjust them to the institutional context and culture in accordance with the most recent literature.

The team was recruited using three different methods: direct nomination of the team members based on their ability to provide support in an empathic way^{37 40 42 47 48}; votes from the clinical team^{36 48} and voluntarily.^{45 47 53}

An advertising campaign for raising attention of all the staff that would benefit the programme and show how to activate the service was carried out in a large number of interventions.^{39 40 45 46 49 50 55}

We describe below some of the implemented communication strategies described in the included studies:

- ▶ Digital marketing: dissemination of the programme on computer screensavers⁵⁰ and digital communication through the institutional website.^{39 46 50}
- ▶ Internal communication: hospital magazine, newsletters or email.^{41 47 50}
- ▶ Networking: presentation of programme in divisional meetings^{38 42 45 47 50 52} or in hospital-wide events and conferences.^{38 56}
- ▶ Involvement of the leadership members in the dissemination process^{50 51} and some programmes have included unit-level champions.⁵⁰
- ▶ Previous staff training on the topic of SVP^{45 50} including training for staff provides the first level of support after a PSI in the local.⁵⁷

Dissemination was also carried out for recruiting peer supporters to join the peer support programmes.^{42 43 45 48} Most of the peer supporters received specific training to prepare them for providing assistance to others.^{36 37 39 40 42 43 45 47 48 50–52 54 55 57 58}

Sustainability of the programmes

After implementing the pilot intervention, several projects have effectively expanded the pilot intervention to other departments,⁴³ other healthcare facilities^{45 59} or hospital wide.^{49 55} The full integration of the programme in the departments underlies the inclusion of the programme in the scheduled activities and in the available services of the institution.⁵⁷

Leadership support was an important factor for the implementation of the programme and its sustainability.^{40 47 50} Other programmes nominated unit champions to ensure the implementation of the programme and its sustainability by promoting a more supportive culture within the unit.^{52 53 55}

Regular meetings were found to be important to maintain the cohesion of the team over time.^{37 40 56 57} Annual courses and the implementation of an interactive virtual platform were important for the expansion of the workforce working in these programmes.^{40 45} The high level of motivation and interest of the team⁴⁸ and retention of peer supporters were given particular consideration for programme sustainability and this was associated with work meaningfulness, staff satisfaction, commitment, a high level of resilience and a high level of confidence as a peer supporter.⁵⁰

Some of the programmes were implemented in health-care organisations where some PS initiatives and 'culture-shifting interventions' had already taken place.^{37 39 50 55} In

other cases they were integrated in major projects developed by the organisations.^{42 56 60} Both situations were considered potential facilitators for maintaining the programmes over time.

Funding was also an important aspect to consider for the sustainability of several programmes.^{37 42 46 52 59}

Organisational factors: outcomes

Most of the studies included in the analysis focused on collecting outcomes related with programme's utilisation and the evaluation conducted by both peer supporters and users (HCWs/second victims that attended to the programmes).

In [table 3](#), we describe in further detail the outcomes evaluated in the included studies.

O(People)ERA: relevant actors

The establishment of a multidisciplinary team for the development and implementation of the support programmes was common to all the programmes. This team was predominantly composed by leadership members (hospital administrators and unit leaders), front-line workers, academics and experts in quality and safety.^{33 34 38 43 50 52} In some cases, it also included chaplains,³⁸ social workers^{38 43} and legal department members.⁵²

Most of the programmes' development and implementation were dependent on volunteer efforts. However, some programmes hired specific elements of the team, such as the programme directors and coordination members.^{39 42 57 60} Several studies highlighted the importance of these members in the programme activation process, particularly in matching the profile of peer supporters with HCWs' needs and in the contact with peer supporters and outreach people in need of support.^{42 48 52 53 56} One programme included contract freelancer work by psychotherapists to provide more specialised support⁶⁰ and other programmes remunerated peer supporters for their work.^{37 49 60}

Trained peer supporters are crucial for providing effective support for HCWs involved in PSIs. Specialised trainers from different types of backgrounds (such as psychology, nursing, quality improvement and PS, workplace wellness, legal services, executive sponsors, department representatives) provided workshops and seminars for peer supporters.^{36 43 48} In some cases, there was a specialist to facilitate monthly debriefing meetings for peer supporters to process their experiences and to receive assistance.^{36 37 43}

Most of the programmes also provided access to specialised external support that represents the third level of support in the case of programmes that follow the Scott Three-Tier Model.^{34 36 45 51 57} In other types of programmes, complementary support was provided by chaplains, social workers or Employee Assistance Programme counselors.^{35 38 43 45}

On a department level, unit leaders performed different types of essential functions by contributing to

Table 3 Collected outcomes from the included interventions

Outcomes related to support services utilisation	Frequency of the HCWs who attended the programme ^{36 40 42 60 87} ; frequency of programme activation ^{34 37 40 42 43 45 47–49 51 52 55–57} ; average duration of the encounters ⁵⁷ ; no of programme dropouts ³³ ; median no of interactions per month ^{52 53 57} ; frequency of peer support encounters ^{50 53} ; no of HCWs who need external support. ⁵⁷
Evaluation of the programme by the peer supporters perspective	Overall peer support satisfaction with the training ^{33 34 47 49 87} ; perception of acquired knowledge, meaningfulness, motivation and interest to learn more and apply the learning ⁴⁴ ; satisfaction about how encounter end out ⁴⁵ ; need for additional training and experience ⁴⁵ ; feeling able to provide support and being comfortable with their knowledge and skills as a peer supporter. ⁴⁵
Evaluation of the programme by the user perspective (HCWs involved in PSIs/SV)	Overall satisfaction with the programme ^{33 36–38 40 43 45 49 51 54 58 59 87} ; knowledge/skills acquisition ^{33 41} ; usefulness of the contents ³³ ; timeliness of the programme ⁴⁸ ; perceived helpfulness of the programme ^{46 53} ; HCWs awareness of SVP phenomenon ³⁹ ; qualitative experience after attending the programme (how much HCWs benefit from the programme). ^{33 36–38 40 43 45 49 51 54 58 59 87}
Health-related outcomes	Psychological and physical distress ⁴⁷ ; emotional distress ⁴⁶ ; perceived stress ^{44 60} anxiety and burn-out ^{54 58} ; assessment of quality of life ³⁶ ; perceptions of individual coping skills such as emotion regulation, self-efficacy and resilience. ^{39 44 47 87}
Work-related outcomes	Job satisfaction ³⁶ ; turnover intention and absenteeism ⁴⁷ ; return to work ³⁵ ; confidence in coping with adverse events. ⁸⁷
HCWs, healthcare workers; PSIs, patient safety incidents; SVP, second victim phenomenon.	

the development of the programme,^{37 48} participating in the recruitment of peer supporters,^{33 43 50 51} providing first-level support for HCWs in need,³⁴ coordinating programme's components and mentoring peer support team members within the facility.⁵⁷

OP(Environment)RA: contextual factors

On an internal level, we found that most of the programmes were implemented in large and academic hospitals, characterised by an environment with multiple and complex divisions,^{34 35 39 40 42 45–47 52 55 57} and with a high level of specialisation (tertiary and quaternary care).^{37 41 48 49 51} Some programmes were specifically implemented in stressful and busy environments, such as emergency medicine departments, intensive care units and psychiatric departments.^{39 44 51 54 55}

We found that in some cases the organisational environment was beneficial to the implementation of the programme, particularly when healthcare organisations were already working towards creating a more supportive environment for their staff and strengthening the safety culture.^{36 37 42 43 56 60}

We also found that previous occurrence of a very serious adverse event helped in recognising the need to implement a programme to support staff in supporting them to cope after PSIs.^{35 50}

On an external level, several studies have mentioned that programme implementation was affected by the COVID-19 pandemic, such as the possibility of handling face-to-face encounters, and it also affected the data collection/monitoring process of the interventions.^{6 8 9 11 22 24 27}

OPE(Recommendations)A: recommendations related with the implementation process and directly related with HCWs experience

Different types of recommendations for improving the programmes were mentioned in the included studies with the ultimate goal of achieving a more effective intervention. They were identified from the user perspective (HCWs in need of support after being involved in a PSI) and also from the perspective of the implementation process (described in table 4).

OPER(Attributes): operational attributes of the programmes

Accessibility

The access of HCWs to the programmes was done by different channels to find the most convenient format for the users: phone call,^{40 43 50 55 60} email^{41 43 44 55} or direct contact with peer supporters or with core team members.^{43 44 55}

Programmes can be activated by the following people:

- ▶ Anyone who was involved in the stressful event.^{34 42 47 49 56 57}
- ▶ Safety and risk management staff.^{52 56}
- ▶ Peer supporters.⁵²
- ▶ Nurse in charge.³⁸
- ▶ Leadership members.^{34 35}
- ▶ Programme directors.^{42 48 52}

In some cases, the entire clinical team is contacted by the implementation team or by leadership members with a view to integrating in the support programme after a PSI, however, acceptance only depends on the individual choice of the HCWs.^{34 48 53 58}

In the case of programmes that have online resources, they could be accessed through a website.^{33 39 45}

Although most of the programmes were provided voluntarily, some of them have mandatory activities for

Table 4 Main recommendations referred to in the included studies from both the user and the implementation process perspectives

Recommendations related with the implementation process	Recommendations directly related with users' experience (HCWs involved in PSIs/SV)
<p>Conditions to facilitate the implementation process:</p> <p>To allocate protected time for teams to implement the programme and actively participate in the tasks and training.^{34 45}</p> <p>Administrative framework should be ensured to support programme implementation.⁵⁷</p> <p>To develop an institutional policy to guide the management of the critical event and support the affected HCWs and patients.³⁵</p> <p>Funding was an important facilitator for programme development and implementation.^{37 46 55}</p> <p>To be formally recognised as an institutional programme.³⁴</p> <p>To invest in telehealth solutions to support HCWs in the workplace.⁴⁶</p> <p>Procedures related with the implementation process:</p> <p>To invest in programme's dissemination and marketing for increasing HCWs' adherence to the programme.^{34 46-49 51 55 57 60}</p> <p>To actively involve the target group in the development of the programme and to conduct a needs assessment helps fostering interest and adapt to the specific needs of the target population.^{54 58}</p> <p>To integrate staff working in the unit in the programme's team, helps to understand the needs of the unit.³⁷</p> <p>To promote active involvement of leadership members facilitates the implementation of the programmes and contributes for staff engagement.^{33 35 40 42 45 49 51 54 56 57}</p> <p>To promote training sessions and resources to increase managers awareness about the SVP and about the existing support programmes.^{51 56}</p> <p>To create a multidisciplinary support team to facilitate a comprehensive programme's development and address different areas for support while leveraging a range of expertise.⁵²</p> <p>To set regular debriefings (in person or virtual meetings) to exchange experiences and to foster a culture of mutual support among the members of the programme's team.^{40 56}</p> <p>Training should be provided to peer support training and role play is one of the most recommended formats.^{34 50 56}</p> <p>To develop a list of key phrases that peer supporters can use in their interactions with SVs.⁵⁰</p> <p>To evaluate the impact of the programme and monitor its longer term effects and drive continuous improvement.^{37 43 44 46 47 49 50 56}</p> <p>To use pre-existing structures, resources and adapt existing programmes to facilitate the development and implementation of the programme.^{45 49 55 56}</p> <p>Having an electronic dashboard for sharing documentation and data collection.⁵⁵</p>	<p>Conditions to facilitate users' experience:</p> <p>To allocate protected time for HCWs to attend the programme's activities and the support sessions.^{54 59 87}</p> <p>Participation in the process should be entirely voluntary and confidential.^{34 40 45 52-54 57 87}</p> <p>To invest in creating an organisational culture that addresses and acknowledges clinicians' vulnerability, while promoting a supportive environment after stressful incidents.^{42 57}</p> <p>To involve legal and risk management departments to address concerns about confidentiality or related issues.^{34 35 52}</p> <p>To ensure that SV have an adequate access to the programme, feel safe and not stigmatised when accessing resources⁵¹;</p> <p>Procedures focused on user's experience:</p> <p>Appropriate timing for programme's activation (ideally it should be immediately available to the HCWs after a stressful event⁵⁷) and adequate duration of the support.^{40 87}</p> <p>All HCWs involved in a critical incident should be contacted to receive support.^{40 52}</p> <p>Active surveillance in the units should be done to identify potential SV (particularly in high risk environments).⁵⁷</p> <p>To increase programme awareness for front-line staff and prepare them how to give first level of support.^{43 47 51}</p> <p>To train the leadership to support staff to cope with stressful situations and to direct them to support resources in case of need.^{34 36 37 56 87}</p> <p>To enhance the level of education on staff resiliency in the services.³⁹</p> <p>To establish an interdisciplinary support team to open the scope of support according to the different staff's needs and background.^{43 50 55}</p> <p>To create a safe place for sessions.^{36-38 54}</p> <p>Smaller groups are preferred for sharing experiences and support.⁵⁹</p> <p>To make resources available and close to the staff, to make them easy to reach.^{38 42 51}</p> <p>To identify barriers and facilitators for HCW to seek mental health support (eg, stigma, career concerns, protected time).⁴⁶</p> <p>To provide channels to reach the programme even when the HCW was not involved in a PSI.⁴⁸</p> <p>To provide a holistic support (eg, incorporating integrative therapy techniques; cognitive based therapy).^{37 44}</p>

HCWs, healthcare workers; PSIs, patient safety incidents; SV, second victim.

all staff in the departments, such as a seminar to promote a shared understanding of SVP and the need for peer support,⁴⁹ or attendance at debriefing sessions to enhance the recovery of all staff in the unit.³⁵

Programmes based on the Scott Three-Tier Model establish the access to the programme according to different levels of HCW needs.^{34 40 57} The first level of support should be available immediately after the incident has happened and team members should be prepared to provide it (local-level support). For accessing the second level of support, anyone can activate peer support with a trained peer. For the third level of support, the HCW is referred to specialised support.⁵⁷

In some cases, programmes can be accessed 7 days a week.^{39 43 46 47 55 57 60} In a support programme implemented in New Zealand, the phone number to reach the

support team was added into the staff contact list and on-call phones within the unit to facilitate the activation process.⁴⁰ The dissemination of schedules, timelines and contacts was a useful strategy employed to facilitate access to the programme.^{39 47}

Lack of staff awareness about the programme^{50 51} and difficulty finding time to attend the interventions were the main barriers to accessing the programmes.⁵⁹ Moreover, some HCWs resisted accessing support since they did not recognise the need for it or preferred to avoid dealing with the situation again by talking about it.³⁵

Usability

To ensure the maximal attendance of staff, in several programmes the communication process was facilitated by peer supporters or the programme director

after the activation of the programme. These actors have the responsibility of contacting the HCWs immediately after the incident to schedule a one-to-one peer support encounter.^{42 45 48 49 52 53} In several programmes, the schedule was negotiated with HCWs according to their needs,^{37 40 45 48 52 53 56} and in some cases the location^{37 45} and format (in person, phone call or email) of the sessions were also negotiated.^{48 56}

In some cases, staffing relief at the workplace and protected time were provided to allow HCWs to attend the support programmes during their working time.^{37 38 41 45 54 58}

To facilitate initiation of the programme, a leadership member or the programme director matched the peer supporter profile with the HCWs' needs according to the different criteria, such as geographic proximity and the same medical specialty.^{45 48 56} In other situations, such as in the Buddy Study Programme, the HCWs selected the peer supporter according to their preferences so they could contact if they needed support.⁴⁹

To facilitate the HCWs' participation in the programme, some programmes prioritised the virtual format^{41 45 46 52} and limited the duration of sessions to 60 min.^{37 40 46 54 59}

A peer support intervention in Sweden defined the topics to approach in the sessions based on participants' suggestions and beliefs.⁵⁸ This made it possible to attend to the needs of the participants and to promote their adherence to the interventions.⁵⁸

In online programmes such as MISE (Mitigating Impact in Second Victims), we found that browsing, amount of time required to complete the activities and comprehension of the programme content were valued attributes to facilitate the usability of the programme.³³

DISCUSSION

In this study, we focused on identifying the highest number of reported programmes and other initiatives to support HCWs after PSIs. The majority of the included programmes are based on peer support. These types of programmes are founded on social support with the ultimate goals of increasing professional quality of life, decreasing emotional stress and ensuring patients' safety.^{61–63}

We found that these types of programmes should be voluntary, with easy access and widely disseminated in healthcare organisations. This will make it possible to provide immediate psychological first aid after a distressful event and to overcome obstacles related to a lack of awareness of SVP and stigmatisation associated with HCW vulnerability.^{50 55 63–65}

The association between just culture and empathic and non-judgemental responses to PSIs has been clear.^{18 50 66 67} This is identified as a core condition for an open communication, and to establish positive relationships between peer supporters and HCWs, thereby enhancing programme adherence.^{67 68} Namely, willingness to give support with empathy, leadership skills, reliability, being

communicative and not being judgemental are essential elements for effective peer support.⁶² Another study pointed out that the ability to understand others' feelings and experiences after a PSI can be beneficial to the support process, by improving emotional regulation and reinforcing the cooperation between HCWs and peer supporters.⁶⁹ In our study we have identified that all these principles were mentioned to improve the effectiveness of the interventions and, therefore it should be taken in consideration in peer supporters training when implementing the programme.

We found that specific training for peer supporters was provided in most of the programmes to prepare them to adequately provide psychological support according to HCWs' needs. Training is believed to be one of the key components to consider when implementing a support programme.^{50 55 63} According to implementation research, it is essential for an effective programme implementation.⁷⁰

Many of the included studies also mentioned the importance of setting regular multidisciplinary meetings to share important learning and experiences and to keep the team motivated over time. Rosak-Szyrocka points out that having a motivated team is very important to ensure their commitment to and engagement in work.⁷¹ This study also points out that in hospitals, HCWs are particularly motivated by strong interpersonal relations and a positive atmosphere, as they foster cooperation and mutual support among the team members.⁷² Another study indicates that multidisciplinary teamwork is an essential element for improving outcomes at an organisational level.⁷³

We found that active participation by leaders in the initiatives can influence the effectiveness of programmes implementation and their sustainability. Helping to create a safe and resilient environment can increase the programmes' acceptability among HCWs and their engagement in the activities.^{73–76} Leaders' participation was not only important in the implementation process, but also in the development of the programmes. In particular, it can contribute to adjust the programmes to the healthcare context, facilitate the acquisition of resources and recruitment of peer supporters.

We also found that leadership engagement in HCWs/SVs support initiatives is very important for strengthening the organisational culture towards a non-punitive response to error. Leadership members are essential actors in helping to create stimulating and supportive environments in healthcare among teams.^{72 77} Boguslavsky *et al*⁷⁴ refer the importance of having leaders with empathic and communication skills, that are able to listen, empower and encourage others, in line with non-blame culture principles. Therefore, the involvement of leaders with these types of skills will benefit the support programme's implementation.

Moreover, we also found that the success of the implementation is also dependent on how closely aligned it is with HCWs' needs. Therefore, HCWs should be consulted



and involved in the programme development process. Our results corroborate Søvold *et al*'s findings, which highlight the importance of HCWs participating more in the decision-making process as well as in the development, implementation, testing and evaluation of the interventions, with the ultimate aim of improving their health, well-being and job satisfaction.⁷⁸ Interventions that include the target population's perspectives from the first steps of development exhibit a higher level of adherence and adoption and are more sustainable over time.⁷⁰

However, HCWs are very often overloaded with duties that could be undertaken by other staff, and prevented from performing other necessary tasks that need their qualifications, with few opportunities to apply for training, develop their professional skills and be available to participate in workplace initiatives.⁷³ This contributes to less work satisfaction and more costs for the system.⁷³ We found that working conditions are one of the main pillars for ensuring effective implementation and its sustainability. Providing protected time and staffing relief were identified as two of the main priorities for ensuring that, on the one hand, qualified HCWs could participate in the development and implementation of support interventions, and on the other, HCWs would be able to attend the support programmes if they needed support. Financial incentives play also an important role in keeping the support teams over time and to facilitate the programme implementation. Some evidence corroborates these findings, namely in what concerns to HCWs retention.^{70 73}

Finally, it is agreed that monitoring programme outcomes over time is essential for assessing programme effectiveness, and evaluating its progress and impact on HCWs/SVs and in health organisations.⁷⁹ This process should be continuous and facilitates the ongoing improvement of the programmes.²² However, there are a limited number of studies that follow-up interventions over time. According to Wade *et al*, it is still not clear how much time would be necessary to monitor the impact of programmes on HCWs' skills and knowledge.⁸⁰ Thus, we recommend that future programmes invest in monitoring their results over time and for longer periods.

In hospital settings, we have found that programmes frequently monitor before and after interventions, by collecting both qualitative and quantitative data. It is agreed that monitoring process should follow rigorous and feasible when assessing both types of measures.⁷⁹

Although hospital settings are increasingly investing in the monitoring process, the study of the impact of HCWs' support programmes it is still limited and unreported in non-hospital settings.⁸¹ This might be due to the insufficient emphasis on safety culture in non-hospital settings,^{81 82} which could be improved by increasing PS initiatives and awareness campaigns in these contexts.

The experience from support programmes directly and not directly associated with supporting HCWs after PSIs was particularly useful to identify barriers and challenges in the access and adherence to the programmes and sustainability concerns. One of the main topics of discussion is

focused on programmes' confidentiality.^{50 83–85} Wade *et al* highlighted the need to establish a consensus and build a body of evidence to evaluate these types of programmes in ethically and confidentially which involves protecting the privacy and confidentiality of the attendees of these types of programmes.⁸⁰ We also highlight that the legal framework of each country can influence the success of the programmes' implementation. Professional liability is often not cited in articles describing interventions, despite its influence on the programmes and its impact on transitioning from a reactive safety culture to a generative safety culture.⁸⁶

Ultimately, we found that these types of programmes should be formalised and have defined structures to facilitate its sustainability and to overcome potential institutional barriers to the implementation of the programmes. Examples, such as RISE (Resilience in Stressful Events) programme, have demonstrated that the formal recognition of the support programme in all the large academic medical centre, the use of existing structures and involvement institutional stakeholders have not only strengthen its visibility within the institution, but also inspired other external health settings to implement their own support programmes.⁵⁰

In summary, we have organised the main findings in online supplemental table 4, organised according to the OPERA.

LIMITATIONS

In this study, we have found that long-term evaluation of programmes it is still limited for the most part, and in some cases, evaluating the outcomes is not recognised as a priority for reasons of confidentiality and ethics. We recognise the need to strengthen the organisational culture towards a non-punitive response to error in order to overcome potential barriers to programme adherence and evaluation. It is very important to increase the follow-up time to understand the impact of these types of programmes and their effectiveness in the long term.

We evaluate all the included studies using the MMAT quality assessment tool since this tool is suitable for different types of methodologies, however, some of the criteria could not be applied in the descriptive studies. We suggest that this tool could be adapted in the future to these types of studies.

CONCLUSION

This is the first time that a study has focused on understanding the set of characteristics and elements necessary for a successful programme' implementation to respond to HCWs needs after PSIs, based on the fact that their success highly depends on an adequate implementation and evaluation process.

This study was inspired in the previous experience from other support programmes with the ultimate propose of guiding the implementation of HCWs support

programmes in health organisations and contributing for future evidence-based practice.

In summary, we concluded that programmes should be easily accessible and voluntary for all HCWs in health organisations. Dissemination should be prioritised in order to give higher level of visibility to these programmes. The effectiveness of programmes' implementation is highly dependent on the organisational culture, the active involvement of leadership and a multidisciplinary team. Training should be provided for both peer supporters and leadership members, to make it possible to respond to HCWs' needs in a more prepared and satisfactory way. Regular communication among support teams should be maintained over time to keep teams motivated and increase their retention. Moreover, it is recommended to allocate dedicated time and staffing resources to engage in these types of interventions. Establishing formalised structures and securing funding sources it is important for the programmes's sustainability. The use of existing resources can overcome potential institutional barriers. Finally, programmes should be monitored for their continuous improvement without compromising the confidentiality of the data.

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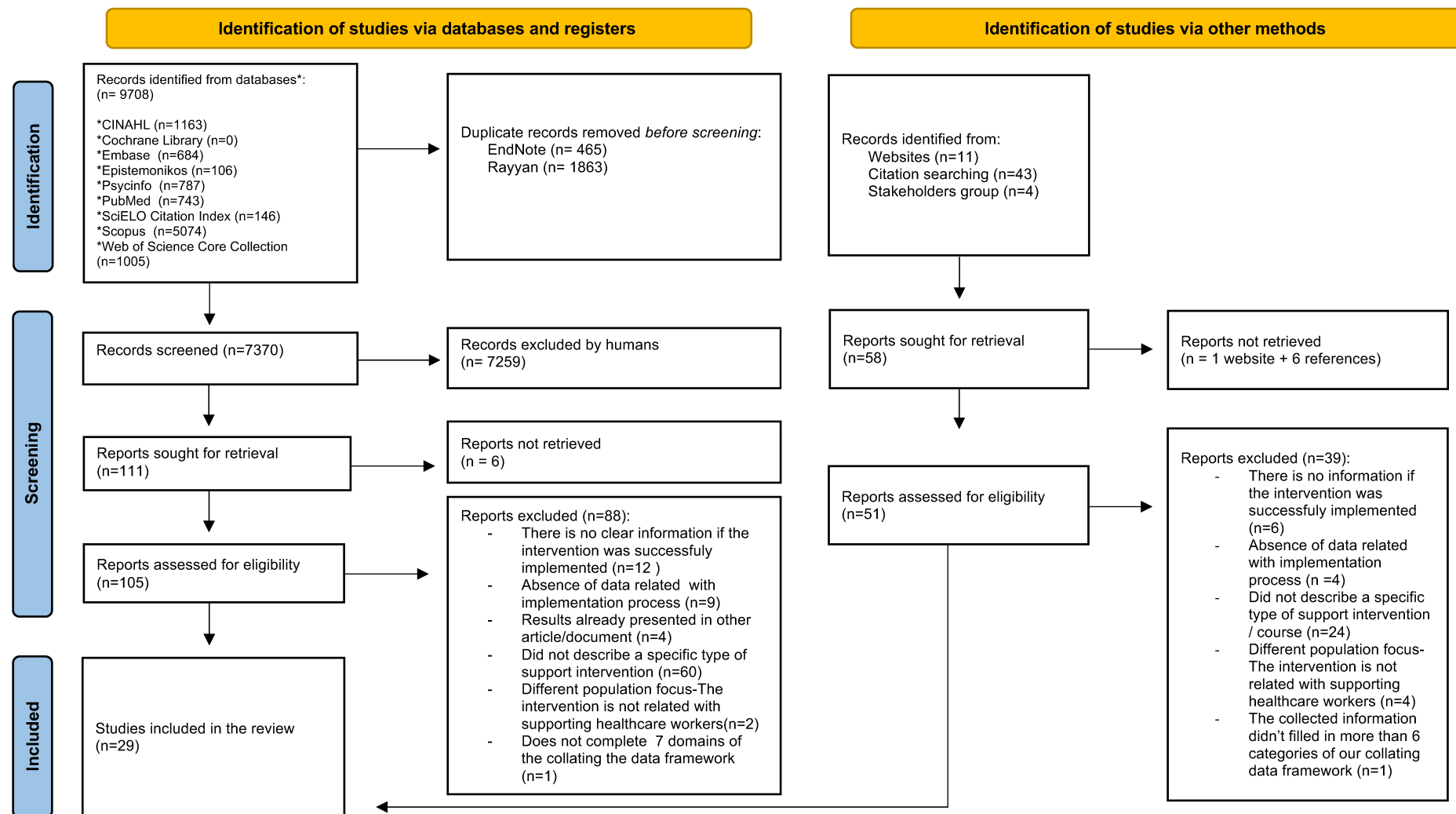
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Supplementary Table 1 - Search strategies applied to the different electronic databases

Applied search strategies :			Results
<i>Context</i>	#1	"Health Services" OR "Health Facilities" OR "Healthcare" OR "Primary health care" OR "General Practice" OR "Family practice" OR "Ambulatory Care" OR "Nursing Care" OR "Family unit" OR "Hospitals"	
<i>Content</i>	#2	"Program evaluation" OR "Support program" OR "Peer support" OR "Support strategies" OR "Organizational factors" OR "Organizational culture"	
<i>Population</i>	#3	("Health personnel" OR "Physicians" OR "Nurses" OR "Doctor" OR "Practitioner" OR "Medical students" OR "Medical residents" OR "Healthcare providers" OR "Healthcare worker" OR "Healthcare staff") AND ("Error" OR "Near miss" OR "Adverse Event" OR "Clinical Error" OR "Medical error" OR "Second victim" OR "Wounded caregiver" OR "Wounded healer" OR "Secondary trauma")	
Web of Science Core collection <i>All databases</i> Last updated 2022/10/31	#1 AND #2 AND #3	Error OR Adverse Event OR Clinical Error OR Medical error OR Second victim OR Wounded caregiver OR Wounded healer OR Secondary trauma (Topic) and Health Services OR Health Facilities OR Healthcare OR Primary health care OR General Practice OR Family practice OR Ambulatory Care OR Nursing Care OR Family unit OR Hospitals (Topic) and Program evaluation OR Support program OR Peer support OR Support strategies OR Organizational factors OR Organizational culture (Topic) and Health personnel OR Physicians OR Nurses OR Doctor OR Practitioner OR Medical students OR Medical residents OR Healthcare providers OR Healthcare worker OR Healthcare staff (Topic) and Article or Review Article or Early Access or Editorial Material (Document Types)	1005 results
Complete search on Pubmed (Medline) Last updated 2022/10/31	#1 AND #2 AND #3	(((((("Health Services"[MeSH Terms]) OR ("Health Services"[Title/Abstract]) OR (("Health Facilities"[MeSH Terms])) OR ("Health Facilities"[Title/Abstract]) OR ("healthcare"[Title/Abstract]) OR ("Primary health care"[MeSH Terms])) OR ("Primary health care"[Title/Abstract]) OR ("General Practice"[MeSH Terms])) OR ("General Practice"[Title/Abstract]) OR ("Family practice"[MeSH Terms])) OR ("Family practice"[Title/Abstract]) OR ("Ambulatory Care"[MeSH Terms])) OR ("Ambulatory Care"[Title/Abstract]) OR ("Nursing Care"[Title/Abstract]) OR ("Family unit"[Title/Abstract]) OR ("Hospitals"[Title/Abstract]))) AND (("Program evaluation"[Title/Abstract]) OR ("Support program"[Title/Abstract]) OR ("Peer support"[Title/Abstract]) OR ("Support strategies"[Title/Abstract]) OR ("Organizational factors"[Title/Abstract]) OR ("Organizational culture"[MeSH Terms]) OR ("Organizational culture"[Title/Abstract]))) AND (("Health personnel"[MeSH Terms]) OR ("Health personnel"[Title/Abstract]) OR ("Physicians"[Title/Abstract]) OR ("Nurses"[Title/Abstract]) OR ("Doctor"[Title/Abstract]) OR ("Practitioner"[Title/Abstract]) OR ("Medical students"[Title/Abstract]) OR ("Medical residents"[Title/Abstract]) OR ("Healthcare providers"[Title/Abstract]) OR ("Healthcare worker"[Title/Abstract]) OR ("Healthcare staff"[Title/Abstract]))) AND ((Error[Title/Abstract]) OR ("Near miss"[Title/Abstract]) OR ("Adverse Event"[Title/Abstract]) OR ("Clinical Error"[Title/Abstract]) OR ("Medical error"[MeSH Terms]) OR ("Medical error"[Title/Abstract]) OR ("Second victim"[Title/Abstract]) OR ("Wounded caregiver"[Title/Abstract]) OR ("Wounded healer"[Title/Abstract]) OR ("Secondary trauma"[Title/Abstract])))	743 results

Complete search on PsycInfo Last updated 2022/11/3	#1 AND #2 AND #3	((health services) OR (health facilities) OR (healthcare) OR (primary health care) OR (general practice) OR (family practice) OR (ambulatory care) OR (nursing care) OR (family unit) OR (hospital)) AND ((program evaluation) OR (support programs) OR (peer support) OR (support strategies) OR (organizational factors) OR (organizational culture)) AND ((health personnel) OR (physician) OR (nurse) OR (doctors) OR (practitioner) OR (medical students) OR (medical residents) OR (healthcare providers) OR (healthcare workers) OR (healthcare staff)) AND ((errors) OR (near miss) OR (adverse events) OR (clinical errors) OR (medical errors) OR (second victim) OR (wounded healer) OR (secondary trauma))	787 results
SCOPUS Last updated 2022/11/2	#1 AND #2 AND #3	(TITLE-ABS-KEY (health AND services) OR TITLE-ABS-KEY (health AND facilities) OR TITLE-ABS-KEY (healthcare) OR TITLE-ABS-KEY (primary AND health AND care) OR TITLE-ABS-KEY (general AND practice) OR TITLE-ABS-KEY (family AND practice) OR TITLE-ABS-KEY (ambulatory AND care) OR TITLE-ABS-KEY (nursing AND care) OR TITLE-ABS-KEY (family AND unit) OR TITLE-ABS-KEY (hospitals)) AND (TITLE-ABS-KEY (program AND evaluation) OR TITLE-ABS-KEY (support AND program) OR TITLE-ABS-KEY (peer AND support) OR TITLE-ABS-KEY (support AND strategies) OR TITLE-ABS-KEY (organizational AND factors) OR TITLE-ABS-KEY (organizational AND culture)) AND (TITLE-ABS-KEY (health AND personnel) OR TITLE-ABS-KEY (physicians) OR TITLE-ABS-KEY (nurses) OR TITLE-ABS-KEY (doctor) OR TITLE-ABS-KEY (practitioner) OR TITLE-ABS-KEY (medical AND students) OR TITLE-ABS-KEY (medical AND residents) OR TITLE-ABS-KEY (healthcare AND providers) OR TITLE-ABS-KEY (healthcare AND worker) OR TITLE-ABS-KEY (healthcare AND staff)) AND (TITLE-ABS-KEY (error) OR TITLE-ABS-KEY (near AND miss) OR TITLE-ABS-KEY (adverse AND event) OR TITLE-ABS-KEY (clinical AND error) OR TITLE-ABS-KEY (medical AND error) OR TITLE-ABS-KEY (second AND victim) OR TITLE-ABS-KEY (wounded AND caregiver) OR TITLE-ABS-KEY (wounded AND healer) OR TITLE-ABS-KEY (secondary AND trauma)) AND (LIMIT-TO (DOCTYPE , "ar") OR LIMIT-TO (DOCTYPE , "re") OR LIMIT-TO (DOCTYPE , "cp") OR LIMIT-TO (DOCTYPE , "cr"))	5074 results
Complete search on CINAHL Last updated 2022/10/31	#1 AND #2 AND #3	TX ("health services" OR "health facilities" OR healthcare OR "primary health care" OR "general practice" OR "family practice" OR "ambulatory care" OR "nursing care" OR "family unit" OR hospital) AND TX ("program evaluation" OR "support programs" OR "peer support" OR "support strategies" OR "organizational factors" OR "organizational culture") AND TX ("health personnel" OR physician OR nurse OR doctors OR practitioner OR "medical students" OR "medical residents" OR "healthcare providers" OR "healthcare workers" OR "healthcare staff") AND TX (errors OR "near miss" OR "adverse events" OR "clinical errors" OR "medical errors" OR "second victim" OR "wounded healer" OR "secondary trauma")	1163 results
Complete search on Embase Last updated 2022/10/31	#1 AND #2 AND #3	('health services':ab,ti OR 'health facilities':ab,ti OR 'healthcare':ab,ti OR 'primary health care':ab,ti OR 'general practice':ab,ti OR 'family practice':ab,ti OR 'ambulatory care':ab,ti OR 'nursing care':ab,ti OR 'family unit':ab,ti OR 'hospitals':ab,ti) AND ('program evaluation':ab,ti OR 'support program':ab,ti OR 'peer support':ab,ti OR 'support strategies':ab,ti OR 'organizational factors':ab,ti OR 'organizational culture':ab,ti) AND ('health personnel':ab,ti OR 'physicians':ab,ti OR 'nurses':ab,ti OR 'doctor':ab,ti OR 'practitioner':ab,ti OR 'medical students':ab,ti OR 'medical residents':ab,ti OR 'healthcare providers':ab,ti OR 'healthcare worker':ab,ti OR 'healthcare staff':ab,ti) AND (error:ab,ti OR 'adverse event':ab,ti OR 'clinical error':ab,ti OR 'medical error':ab,ti OR 'second victim':ab,ti OR 'wounded caregiver':ab,ti OR 'wounded healer':ab,ti OR 'secondary traumatic stress':ab,ti)	684 results
Scielo citation index through. Web of Science Last updated: 2022/11/4	#1 AND #2 AND #3	("Health Services" OR "Health Facilities" OR "Healthcare" OR "Primary health care" OR "General Practice" OR "Family practice" OR "Ambulatory Care" OR "Nursing Care" OR "Family unit" OR "Hospitals") AND ("Program evaluation" OR "Support program" OR "Peer support" OR "Support strategies" OR "Organizational factors" OR "Organizational culture") AND ("Health personnel" OR "Physicians" OR "Nurses" OR "Doctor" OR "Practitioner" OR "Medical students" OR "Medical residents" OR "Healthcare providers" OR "Healthcare worker" OR "Healthcare staff" and "Error" OR "Near miss" OR "Adverse Event" OR "Clinical Error" OR "Medical error" OR "Second victim" OR "Wounded caregiver" OR "Wounded healer" OR "Secondary trauma")	146 results

Complete search on Epistemonikos Last updated 2022/11/2	#1 AND #2 AND #3	(title (((health services) OR (health facilities) OR (healthcare) OR (primary health care) OR (general practice) OR (family practice) OR (ambulatory care) OR (nursing care) OR (family unit) OR (hospital)) AND ((program evaluation) OR (support programs) OR (peer support) OR (support strategies) OR (organizational factors) OR (organizational culture)) AND ((health personnel) OR (physician) OR (nurse) OR (doctors) OR (practitioner) OR (medical students) OR (medical residents) OR (healthcare providers) OR (healthcare workers) OR (healthcare staff)) AND ((errors) OR (near miss) OR (adverse events) OR (clinical errors) OR (medical errors) OR (second victim) OR (wounded healer) OR (secondary trauma))) OR abstract:(((health services) OR (health facilities) OR (healthcare) OR (primary health care) OR (general practice) OR (family practice) OR (ambulatory care) OR (nursing care) OR (family unit) OR (hospital)) AND ((program evaluation) OR (support programs) OR (peer support) OR (support strategies) OR (organizational factors) OR (organizational culture)) AND ((health personnel) OR (physician) OR (nurse) OR (doctors) OR (practitioner) OR (medical students) OR (medical residents) OR (healthcare providers) OR (healthcare workers) OR (healthcare staff)) AND ((errors) OR (near miss) OR (adverse events) OR (clinical errors) OR (medical errors) OR (second victim) OR (wounded healer) OR (secondary trauma))))	106 results
<i>Language</i>		No language filter/restraint will be applied	
<i>Period</i>		No period filter/restraint will be applied	
<i>Exclusion criteria</i>		Article types not included: editorial , letter to the editor, cases series, case reports, narrative review, commentary	

Supplementary Table 2- Characteristics of the included studies

Authors (year of publication)	Type of study and level of evidence	Main aim of the study	Study design	Methods	Key findings	Quality assessment
Allen, Spencer, McEwan, Catarino, Evans, Crooks et al (2020)	Scientific article – Level VI ¹	To evaluate the experience of HCWs working in a mental health service after attending the Schwartz Rounds.	Mixed Method	Application of a quantitative evaluation form after the rounds and focus group and 6 years follow up.	Rounds were helpful, insightful and relevant to support HCWs in a non-blaming environment. The six-year follow-up revealed that the Rounds were still rated positively.	4*/5 of the MMAT criteria *there are no inconsistencies between results
Bryant (2022)	Graduate Theses, Dissertations - Level VI ¹	To raise staff awareness on resilience, SVP and SupportingYOU intervention in a large academic children's hospital.	Quantitative descriptive	Application of preintervention and postintervention quantitative surveys,	Intervention increased the staff awareness on SVP, their perception on resilience and contribute for a proactive culture to manage critical incidents, by increasing the sense of feeling cared by the institution.	5*/5 of the MMAT criteria
Civil, Hoskins (2022)	Scientific article- Level VI ¹	To describe the design and implementation of a critical incident peer response team program at Waikato Hospital.	Quantitative descriptive	Application of postintervention quantitative survey.	Positive feedback from the attendants was given after the intervention. The program contributed to a supportive culture and enhanced teamwork.	2*/5 of the MMAT * 3 criteria were evaluated as "can't tell": the sample is not representative of the target population, there is a risk of nonresponse bias; absence of statistical analysis
Edrees, Connors, Paine, Norvell, Taylor, Wu (2016)	Scientific article- Level VI ¹	To describe the development of RISE, initial evaluation of pilot programme and hospital-wide implementation at Johns Hopkins Hospital.	Mixed Method	Application of pre and post implementation quantitative surveys and focus group.	Although there were few calls in the first year of implementation, the rate of calls increased during the next years. Evaluation indicates the success of most encounters with callers and effectiveness of training to prepared the peer supporters to support second victim.	4*/5 of the MMAT criteria *there are no inconsistencies between results
Finney, Jacob, Johnson, Messner, Pulos, Sviggum (2021)	Scientific article Level VI ¹	To describe the implementation and evaluation of a SV program – Healing Emotional lives of Peers (HELP) in a Department of Anaesthesiology.	Mixed method	Application of post implementation quantitative surveys with open questions.	The program developed during 3 years was successfully implemented in the first 2 years of the program inception and is now a resource for other institutions in the region.	4*/5 of the MMAT criteria *no confounders accounted for in the design and analysis
Foreman (2014)	Paper Level VI ¹	To describe the development and implementation of a plan to help perinatal nurses to cope with stress after critical incidents and deaths in a family birth centre.	Qualitative	Qualitative description of the programme testing and the learning from its implementation.	Feedback on the use of the critical event plan has been positive. Nurses found the plan very useful after a tragedy on the unit related with the death of a new-born.	3*/5 of the MMAT criteria * 2 criteria were evaluated as "can't tell": qualitative data collection methods are not described; coherence between qualitative data sources, collection, analysis and interpretation is not clear;
Graham, Zerbi, Norcross, Montross-	Scientific article	To describe the Caregiver Support Team programme implementation in	Mixed-method	Application of baseline and post implementation (3 months follow up)	As an addition to the previous implemented Code Lavender intervention, the program was accepted and positively evaluated. Efforts will	4*/5 of the MMAT criteria *no confounders accounted for in the design and analysis

Thomas, Lobbestael, Davidson (2019)	Level VI ¹	an academic medical centre and evaluate its feasibility.		quantitative surveys. Self reported experiences of attendants.	be made to disseminate the program system-wide.	
Johnson, Simms-Ellis, Janes, Mills, Budworth, Atkinson, Harrison (2020)	Scientific article Level VI ¹	To evaluate a psychological resilience coaching intervention for National Health Services (NHS) trust sites and university premises.	Mixed-method	Application of pre and post implementation, follow up after the coaching phone call (10–20 days after the workshop) and 4–6 weeks after the workshop. Interviews application.	The program seems to be feasible and effective on improving general resilience of clinicians, by improving their knowledge and confidence in coping after adverse events.	5/5 of the MMAT criteria
Krzan, Merandi, Morvay, Mirtallo (2015)	Scientific article Level VI ¹	To describe YOU Matter Support program implementation at Nationwide Children's Hospital.	Mixed-method	Application of pre and post (after 5 months) online surveys. Collection of peer encounters documentation of the Second Victim SharePoint site.	Most of the surveyed staff reported that the department benefited from implementation of the SV program. After the success of the pilot program, the hospital has decided to expand the YOU Matter program hospital-wide.	4*/5 of the MMAT criteria *no confounders accounted for in the design and analysis
Merandi, Liao, Lewe, Morvay, Stewart, Catt, Scott (2017)	Scientific article Level VI ¹	To describe the replication of the ForYOU Matter program and expansion of the program to a large pediatric institution.	Quantitative descriptive	Description of the program implementation and of the collected data from electronic tracking system via SharePoint.	Application of the MUHC support model in the Nationwide Children's Hospital was validated and demonstrates that it's suitable and transferrable to other healthcare facilities and contexts.	3*/5 of the MMAT criteria 2 criteria was evaluated as "can't tell": no clear information if the risk of nonresponse bias was low: absence of statistical analysis
Lane, Newman, Taylor, O'Neill, Ghatti, Woltman, Waterman (2018)	Scientific article Level VI ¹	To describe the Washington University School of Medicine Clinician Peer Support Program.	Quantitative descriptive	Description of the program development and its implementation.	Program was successfully implemented, however difficulties were found in sustaining the program over time, since peer supporters don't have protected time to be part of the program and therefore the programme activities have conflict with their operative schedules.	3*/5 of the MMAT criteria – *2 criteria was evaluated as "can't tell": nonresponse bias was not applicable to this study; absence of statistical analysis
Mellins, Mayer, Glasofer, Devlin, Albano, Nash et al (2020)	Scientific article Level VI ¹	To describe the application of CopeColombia programme in a Department of Psychiatry of a large urban medical centre's.	Mixed method	Description of the key issues/themes and facilitator responses emerged in the sessions (facilitator interventions); post peer supporter group online survey (perceived impact of the program).	HCW emotional distress decreased after the program implementation. Peer Support Groups were the most used, valued and recommended. Sustainability of the program is critical due to financial constraints.	3*/5 of the MMAT criteria *there are no inconsistencies between results; 1 criteria was evaluated as "can't tell": it's not clear if the study follows the traditional quality criteria of the qualitative methods involved
Merandi, Winning, Liao, Rogers, Lewe, Gerhardt (2018)	Scientific article Level VI ¹	To assess healthcare providers satisfaction in the early implementation of a SV program in a group of neonatal intensive care units.	Mixed method	Application of pre and post implementation surveys with closed and open – ended questions. Thematic content analysis of the qualitative data from the survey.	This study suggest that peer support programs are likely to be viewed as positive and helpful for frontline HCW and managers. However, additional work should be done to assure the accessibility and effectiveness of the program.	4*/5 of the MMAT criteria *no confounders accounted for in the design and analysis

Rivera-Chiauszi,Smith,Moore-Murray, Lee, Goffman, Bernstein, Chazotte (2022)	Scientific article Level II ¹	To describe the development and evaluation a structured peer support program to address the needs of providers involved in obstetric adverse outcomes and to compare it with a routine support for HCW after the same type of events.	Pilot Randomized controlled trial	Application of needs assessment survey before program implementation. Surveys were applied at baseline, 3 months, and 6 months follow up.	Structured peer support program was successfully implemented with limited resources. The enhanced support group was significantly more likely to consider departmental leadership as one of the most helpful resources for support after adverse event. All participants refer were thriving at 6-month follow-up.	4*/5 of the MMAT criteria *outcome assessors are not blinded to the intervention provided
Roesler, Ward, Short (2009)	Scientific article Level VI ¹	To describe the recovery and reintegration of Neonatal Intensive Care Unit staff after a critical incident based on the Just Culture philosophy.	Qualitative: Single Case	Description of the protocol activation and application after the involvement of a severe adverse event.	The protocol was successfully applied and helped the affected HCW to thrive and return back to work after their involvement in the severe adverse event.	3*/5 of the MMAT criteria *2 criteria were evaluated as "can't tell": qualitative data collection methods are not described ; it's not clear if there is coherence between qualitative data sources, collection, analysis and interpretation
Schröder, Bovil,, Jørgensen, Abrahamsen (2022)	Scientific article Level VI ¹	To evaluate the Buddy Study program by assessing HCW experiences with having the program in the department, attending the compulsory seminar, and using a buddy or being activated as a buddy.	Mixed method	Application of quantitative questionnaires to assess HCW experiences of attending the Buddy Study seminar and participating in the Buddy Study program using a buddy or being activated as a buddy, along with two open-ended questions and three individual interviews for more elaborate answers.	The buddy study program was evaluated positively. It allowed to acknowledge the SVP and strengthen a supportive organizational culture by creating buddy relationships to support HCW after stressful events during care.	4*/5 of the MMAT criteria *no confounders accounted for in the design and analysis
Shapiro, Galowitz (2016)	Scientific article Level VI ¹	To describe the development and implementation of Brigham and Women's Hospital peer support program to support HCW after the impact of an emotional stressful event.	Quantitative descriptive	Description of the program and quantitative data collection of outreached calls and peer support sessions.	The peer support program has been implemented for 4 years and it's expected to be expanded hospital-wide. The program does not yet reach many clinicians that might be in need of support after stressful events.	3*/5 of the MMAT criteria *3 criteria were evaluated as "can't tell": it's not clear if the sample is representative of the target population; risk of nonresponse bias low and statistical analysis are not applicable
Thompson, Hunnicutt, Broadhead, Vining, Aroke (2022)	Scientific article Level VI ¹	To describe the implementation of SV support program in a large academic medical centre based on a quality improvement project.	Quantitative descriptive	Application the SVEST survey pre and post peer support program implementation.	Although the study didn't find statistically significant differences in pre and post implementation the program has received a positive feedback among leadership members and peer supporters.	4*/5 of the MMAT criteria *2 criteria were evaluated as "can't tell": low response rate in post-implementation survey may have decreased generalizability of results which can affect the sample representative ; potential for response bias was identified in the study

El Hechi , Bohnen, Westfal, Han, Cauley, Wright, Schulz et al (2020)	Scientific article Level VI ¹	To describe the design and implementation of a SV surgical peer support program and its 1 year impact.	Mixed method	Programme design: literature review and multidisciplinary expert group discussion; Evaluation of the impact of the programme: quantitative and qualitative surveys application – evaluation of the peer supporters and of the program.	The first surgery-specific peer support program in US was successfully implemented. After 1 year experience, the program is highly used and well received.	4/5 of the MMAT criteria *inconsistencies between quantitative and qualitative are not addressed in the study
Mira, Carrillo, Guilabert, Lorenzo, Pérez- Pérez, Silvestre et al (2017)	Scientific article Level VI ¹	To describe the development and assessment of Mitigating Impact in Second Victims (MISE) programme on the awareness and information focused on the SVP.	Quantitative descriptive	Description of accreditation process; quantitative survey applied to 26 experts to assess structure and content; Quantitative survey applied to frontline HCW; evaluation of knowledge gained from the online program after each online module.	The online program was positively assessed by the accreditation agency, by the experts and the HCWs. The programme increases knowledge about patient safety, SVP and how to act after a severe adverse event. The time demand is reasonable for complete the course.	5/5 of the MMAT criteria
Scott, Hirschinger, Cox, McCoig, Hahn- Cover, Epperly et al. (2010)	Scientific article Level VI ¹	To describe the deployment of ForYOU Team programme , an institutional rapid response system (RRS) for second victims at University of Missouri Health Care (MUHC).	Mixed method	Interviews and quantitative surveys application by the MUHC faculty and staff to support the development of the programme.	After identifying the need for support the SV in MUHC , the programme was designed, developed and successfully implemented. The programme has been integrated in the healthcare in the scheduled activities of the team leaders and clinical teams.	4*/5 of the MMAT criteria *inconsistencies between quantitative and qualitative are not addressed in the study
Schuster (2021)	Scientific article Level VI ¹	To describe the implementation of the HART programme and assess its impact on the Hematology/Oncology/Stem Cell Transplant Unit.	Mixed method	Preintervention and midpoint survey (after 3 months of pilot program), and qualitative subjective information collection from daily coach documentation entries.	HART programme was successfully implemented in the department and with high level of utilization from the staff. After implementation of HART, mental, emotional and physical wellbeing of all staff members improved.	4*/5 of the MMAT criteria *inconsistencies between quantitative and qualitative are not addressed in the study
Calder- Sprackman; Kumar; Gerin- Lajoie; Kilvert; Sampsel (2018)	Scientific article Level VI ¹	To describe the implementation, adaptation and evaluation of the ice cream rounds intervention in an emergency medicine training programme.	Quantitative descriptive	Application of a pre- implementation survey for needs assessment and a post implementation for feedback after intervention.	This Canadian initiative increased the overall perception of support and companionship, decreased feelings of stress, anxiety and burnout and can have a positive impact on the clinical practice in emergency medicine residents.	3*/5 of the MMAT criteria *2 criteria were evaluated as “can’t tell”: it’s not clear if the sample is representative of the target population; absence of statistical analysis

Peterson, Bergström, Samuelsson, Åsberg, Nygren (2008)	Scientific article Level II ¹	To evaluate the effect a reflecting peer-support group on self-reported health, burnout and on perceived changes in work conditions of multidisciplinary group of HCW in 3 hospitals of a county council in Sweden.	Randomized controlled trial.	Application of a baseline survey (7 months before the interview started), pre implementation questionnaire , immediately after the intervention ended (post intervention), 7 and 12 months after the intervention follow up.	The study showed positive intervention effects (after 12 months of the programme implementation) on overall health and decreased perceived work demands. A decrease in exhaustion, depression and anxiety symptoms was observed , as well as an increase in vitality.	5/5 of the MMAT criteria
Rubin, Rassman (2021)	Scientific article Level VI ¹	To describe the social work led peer support model, COVID-19 Am I Resilient (cAIR), developed and implemented during the first wave of the COVID-19 pandemic in a large urban healthcare system.	Mixed method	Application of pre and post intervention surveys with quantitative and open ended questions.	The pilot programme cAIR was successfully implemented and provided support to normalize frontline HCW experience during Covid 19 pandemic, encouraged coworkers connections and developed coping skills . Participant engagement in cAIR were strong, however overall utilization of programme activities was low.	4*/5 of the MMAT criteria *inconsistencies between quantitative and qualitative are not addressed in the study
Bernburg, Groneberg , Mache (2019)	Scientific article Level II ¹	To develop, implement and evaluate the effectiveness of a mental health intervention programme on nurses' perceived job stress, perceptions of individual coping skills and the quality of patient relations in a group of psychiatric hospital departments.	Randomized controlled trial	Pre and post intervention surveys were applied using Perceived Stress Questionnaire; the Brief Resilient Coping Scale; the Self- Efficacy, Optimism and Pessimism Questionnaire; Emotion Regulation Skills Questionnaire and the German Quality of Relationship Inventory – at baseline , follow up after 3 months, 6 months and after 12 months.	After the intervention being successfully implemented, psychiatric nurses significantly increased their perception about job stress, emotion regulation skills, resilience, and self-efficacy; quality of patient-relationship were significantly higher ($p < 0.05$). The results indicate that self- care skills training may improve such as resilience and self-efficacy.	4*/5 of the MMAT criteria *outcome assessors are not blinded to the intervention provided
Morales, Brown (2019)	Scientific article Level VI ¹	To describe the development of the Care for the Caregiver Program in a 10 hospital system.	Qualitative	Description of the “Care for the Caregiver” programme and of practical scenarios after the programme was been activated.	Both described scenarios of support after stressful events indicate that the programme has been useful and well received by the clinicians.	4*/5 of the MMAT criteria * 1 criteria was rated as can't tell : coherence between qualitative data sources, collection, analysis and interpretation is not applicable in this study
Cobos-Vargas, Pérez-Pérez, Núñez-Núñez, Casado-Fernández, Bueno-Cavanillas (2022)	Scientific article Level VI ¹	To describe the Procedure for Serious Adverse Events (PSAE), integrated into a sentinel event operational procedure and to describe its accumulated results over two years of implementation in a university hospital.	Mixed method	Collection of quantitative data related with programme application, characteristics of involved HCWs and adverse events; HCWs qualitative feedback on programme improvement solutions and	The programme had a positive impact on patient safety culture and it increased the adverse event reporting in the hospital. The level of programme acceptance was high and HCWs valued to be individually interview after their involvement in the event and to contribute for future improvement actions.	4*/5 of the MMAT criteria *inconsistencies between quantitative and qualitative are not addressed in the study

				their experience after attending the programme.		
Hinzmann, Forster, Koll-Krüsmann, Schießl, Schneider, Sigl-Erkel et al (2022)	Scientific article Level VI ¹	To evaluate the burden, benefits, and mechanisms of action of a telephone support service for HCWs (PSU-HELPLINE).	Mixed methods	Application of two surveys: i) quantitative survey during the call(socio-demographic data, current stress ,relief from the counselling interview); ii) meta-questionnaire (to document the call and for quality assurance proposes) . Memory transcripts for thematical analysis were also collected.	The PSU-HELPLINE was mainly used for processing serious events and in phases of overload. The programme was well received by a specific region of Germany and callers consider it useful and supportive service.	4*/5 of the MMAT criteria *inconsistencies between quantitative and qualitative are not addressed in the study

Supplementary Table 3 - Characteristics of the included interventions

Note: We have contacted the authors to complete the missing information, however some of the authors didn't reply to our contact.

Author (Year of publication)	Starting year of the intervention	Duration of the intervention	Country and Setting	Target population	Aim of the intervention	Main outcomes related with the intervention
Allen, Spencer, McEwan, Catarino, Evans, Crooks et al (2020)	Missing data	6 months	UK - Mental health service, inpatient acute psychiatric unit	Nursing care, healthcare assistance, occupational therapy, psychiatry, psychological assistance, domestic support building states, administration services, crisis resolution, home treatment team and perinatal mental health team	To understand experiences of emotional distress and reflecting on its impact and ways of coping	<p>i) Evaluation of Schwartz Rounds*: From an average evaluation form response was 3.42 out of 4;</p> <p>ii) Experience of the participants after attending Schwartz Rounds: In the Rounds, HCWs could express their emotions in a non-judgemental and empathic environment. Rounds were considered helpful, insightful and relevant;</p> <p>iii) Long-term follow-up of 6 years: Rounds were still rated positively.</p> <p><small>*Based on the following criteria: plan to attend the Rounds again, gained insight into thoughts and feelings, facilitator helped the discussion, the overview and presentation of the Rounds were helpful, it helped to improve the relation with colleagues in the work, the knowledge was useful for caring patients, the case was relevant to the clinical work</small></p>
Bryant (2022)	2021	13 months	US - Intensive care unit, lactation services, child-life services, paediatrics medical surgical units	Staff members from lactation services and paediatric medical-surgical units. child life specialists, physicians, nurses, respiratory therapists, social workers, clinical associates, pharmacist and chaplains	To raise awareness of SVP and SupportingYOU. To increase resiliency by establishing a proactive culture to manage critical incidents prior they occur	<p>i) Staff perception on resiliency: 100% of the surveyed staff reported an enhanced perception of resilience (p<0,001, CI 95%);</p> <p>ii) Staff awareness of SVP significantly increased (p<0,001, CI 95%);</p> <p>iii) Staff awareness of SVP resources and of SupportingYOU: it was limited since that most of participants were already aware of it;</p> <p>iv) Sense of preparedness in handling critical incidents: there was an increased sense of managing emotional response after critical incidents among the participants (p<0,01, CI 95%);</p> <p>v) Feeling cared by the institution – participants felt care for in the workplace (p<0,01, CI 95%).</p>
Civil, Hoskins (2022)	2018	36 months	New Zealand – Department of Anaesthesia and Pain Medicine	Anaesthetists, surgeons, anaesthetist technicians, theatre nurse coordinator/charge nurse; theatre and recovery room nurses and midwives	To provide peer-led group psychological first aid to full theatre team stressful events?	<p>i) Number of participants that attended the defuse: over 200 members;</p> <p>ii) Number of interventions : 28 defuse interventions have been delivered;</p> <p>iii) Participants feedback of the defuse : Defuses were rated through neutral to very helpful, all surveyed participants would attend a defuse again in the future and would recommend to colleague or a friend.</p>

Edrees, Connors, Paine, Norvell, Taylor, Wu (2016)	2011	52 months (from november 2011 to march 2016)	US- Johns Hopkins Hospital	All hospital staff	To provide timely psychological first aid and emotional support after critical incidents based on a call system	<p>i) Frequency of encounters: 119 encounters from November 2011 and march 2016;</p> <p>ii) Caller interaction: rated as excellent 66,7% or neutral (22,8%).</p>
Finney, Jacob, Johnson, Messner, Pulos, Sviggum (2021)	2018	23 months (from July 2018 to June 2020)	US- Department of anaesthesiology at a large academic institution in the Midwest	Anaesthesiologist, certified nurse anaesthetics , residents, students registered nurse anaesthetics	To provide three-tiered support psychological first aid : first level given by peer and leadership at the local, second level provided by trained peer supporters; third level was provided by external services (from the institution or outside the institution)	<p>i) Experience after receiving peer support: From 31 surveyed participants, 25 (80.0%) evaluated the received support as “extremely” or “very beneficial”, and 28 (90.3%) referred that were “extremely” or “very satisfied” with their experience; 30 (96.8%) would recommend HELP programme to a colleague;</p> <p>ii) HELP Programme Activations for Peer Support: 91 electronic activations were utilized to assist 179 HCWs (the most common events leading to HELP activation were intraoperative patient demise, cardiac arrest, and pediatric care);</p> <p>iii) Trained peer support self-assessments: From 85 surveyed peer supporters, 81 (95.3%) felt satisfied with how the peer support encounter turned out; 19 (22.4%) felt that they needed additional training and experience, 80 (94.1%) felt comfortable with their knowledge and skills as a peer supporter.</p>
Foreman (2014)	Missing data	Info missing	US- Family birth centre Wilcox Women’s Pavillon at Legacy Good Samaritan Hospital	All perinatal nurses of the family birth caring for women and newborns in all phases of childbearing	To create a critical event plan and implement it in the centre for helping staff to organize and manage critical events	<p>i) Experience on the use of the Critical Event Plan: Nurses found it very useful and helpful.</p>
Graham, Zerbi, Norcross, Montross-Thomas, Lobbestael , Davidson (2019)	Missing data	3 months	US- 4 target units in an academic medical centre: telemetry unit, emergency department, neonatal ICU and medical and neurologic ICU	Staff and physicians employed in the units	To provide emotional first aid in the workplace after critical events	<p>i) Programme activation : 38 activations of the programme;</p> <p>ii) Experience after the programme: all surveyed staff found it helpful and would recommend it to other colleagues; HCWs referred an improvement in feeling cared-for and also noted the sense of safety at the workplace;</p> <p>iii) Quality of life assessment and job satisfaction: No significant changes were demonstrated before and after the intervention in Quality ofLife Scores or job satisfaction. One suicide was prevented;</p> <p>iv) Organizational changes : Debriefings started to be requested after significant events affecting the entire department.</p>
Johnson, Simms-Ellis, Janes, Mills, Budworth, Atkinson	2018	7 months	UK- National Health Services (NHS) trust sites and University of Leeds	HCWs or students that complete an education programme: midwives, paramedics , obstetrics and gynaecology trainee	To strengthen resilience and preparedness in dealing with adverse events : more flexible thinking, higher self-	<p>i) Experience after the programme: workshop was useful, relevant and adequate in length. The participants highly valued the peer learning, the level of engagement and the format of the workshop delivery. The coaching call was critical to the consolidation of the knowledge and to</p>

Harrison (2020)				doctors , paediatric trainee doctors, paediatric consultant, physician associate students and sonography and mammography students.	esteem, better explanatory style	understand how to apply the acquired skills in practice. Knowledge about coping strategies led to a significant increase in self-perceived resilience, as well as confidence in coping with adverse events.
Krzan, Merandi, Morvay, Mirtallo (2015)	2013	5 months	US- pharmacy department at Nationwide Children's Hospital (NCH): one main inpatient pharmacy, inpatient pharmacy satellites, two outpatient pharmacies and home care pharmacy	Staff from all areas of pharmacy services	To provide three-tiered support psychological first aid (based on Susan's Scott model) to support HCWs involved in adverse drug events, patient-related injuries, and other traumatic work experiences	i) Activation of the programme: 3 respondents personally used the programme and 11 had recommend it; ii) Experience after the programme : 85% of the pharmacy (95 of 112 respondents) refer that the department had benefit from the programme's implementation.
Merandi, Liao, Lewe, Morvay, Stewart, Catt, Scott (2017)	2012	60 months (5 years)	US- Nationwide Children's Hospital (NCH)	Staff from Nationwide Children's Hospital (NCH): all inpatient units as well as urgent cares, outpatient primary care clinics, and ambulatory specialty clinics	To provide three-tiered support psychological first aid (based on Susan's Scott model) to support HCWs involved in adverse drug events, patient-related injuries, and other traumatic work experiences	i) Activation of the programme: 21 group encounters were documented since November 2013; ii) Quantitative description of peer encounters: 62% of peer encounters occurred in the emergency department, and 8% in pediatric intensive care unit and cardiothoracic intensive care unit ; nurses have the highest number of peer support encounters. Patient death and emotional stress were the most common reasons for peer encounter.
Lane, Newman, Taylor, O'Neill, Ghetti, Woltman, Waterman (2018)	2014	33 months	US- Two Hospitals affiliates of the Washington School of Medicine: Barnes -Jewish Hospital and St. Louis Children's Hospital	Doctors, junior doctors, physician associates, nurse practitioners, and registered nurse anaesthetists, trainees providing care in the inpatient and outpatient settings	To facilitate the support of clinicians who have been involved in an adverse event or another adverse outcome during medical care	i) Programme activation: 165 clinicians were referred to the programme; ii) Median number of interactions per month: 4.8 referrals per month (Range 0-12).
Mellins, Mayer, Glasofer, Devlin, Albano, Nash et al (2020)	2020	3 months	US-Large urban , academic, tertiary care - Columbia University Irving Medical Centre (CUIMC)	All CUIMC clinical and non-clinical staff, residents and faculty students	To provide peer support after stressful situations and enhance resilience of HCWs	i) Emotional distress assessment: The average emotional distress had significantly decreased ($p<0.05$); ii) Perceived helpfulness of the peer support group: Perceived helpfulness was high (76% rating helpfulness as "quite a bit" or "extremely."): all respondents (with the exception of two) recommended the support group to a colleague.

Merandi, Wining , Liao, Rogers, Lewe, Gerhardt (2018)	2015	12 months	US-7 neonatal intensive care units (NICUs) from quaternary-care, paediatrics hospital	All staff from the 7 NICUs	To provide three-tiered support psychological first aid (based on Susan's Scott model) to support HCWs involved in adverse drug events, patient-related injuries, and other traumatic work experiences	<p>i) Attendance to the programme: A small number of healthcare providers (n=6) used the program. Some HCWs (not quantified) did not find the programme accessible.</p> <p>ii) Satisfaction with the programme: The majority of the participants (56.3%, n=9) reported moderate benefit of the programme. From 250 surveyed HCWs in the units, 73.2% indicated that the NICUs benefited at least a little from the SV peer support programme. The manager reported that the programme enhanced the team leadership.</p>
Rivera-Chiauzzi,Smith,Moore-Murray, Lee, Goffman, Bernstein, Chazotte (2022)	2015	8 months	US- Department of obstetrics & Gynaecology and Women Health	HCWs and residents (physicians and nurses) who experienced an obstetric adverse outcome.	To provide peer support to HCWs and residents, who have experienced an obstetric adverse outcome, through phone calls	<p>i) Attendance to the programme : Out of 34 programme activations, 23 participants were placed in the enhanced group and 19 were assigned in the routine group;</p> <p>ii) Use of support resources and perception of its helpfulness: Peer support was the most common source of assistance ($p<0.05$); departmental leadership was considered one of the most helpful resources for the enhanced support group;</p> <p>iii) Identified barriers: Time ($P = 0.26$) was reported as a constraint by participants in the enhanced group, and routine group reported privacy concerns ($P = 0.39$) and stigma ($P = 0.12$);</p> <p>iv) Effect of the programme on the stage of recovery: At 6-month follow-up, all participants in the enhanced group reported that they were thriving after the event;</p> <p>v) Duration of peer support interventions: most participants required less than 3 months of support to recover from the event.</p>
Roesler, Ward, Short (2009)	2006	No clear information (estimated time : approx. 6 months)	US- Neonatal Intensive Care Unit (NICU), Methodist Hospital of Indianapolis	Staff of the NICU	To provide an institutional incident response after a paediatric serious adverse event	<p>i) Staff and unit recovery: The pharmacist technician and 5 out of 6 nurses affected by the incident were back to work after the adverse event (1 nurse didn't return to work for familiar reasons). None of the affected HCWs experienced job changes. Debriefing and healing sessions were essential to the staff unit overcome the situation;</p> <p>ii) Impact on work culture- Reinforcement of the culture of disclosure after applying the protocol.</p>
Schröder, Bovil,, Jørgensen, Abrahamsen (2022)	2018	18 months	Denmark-2 departments at Odense University Hospital: Department of Obstetrics and Gynaecology (OB-GYN) and Svendborg	All midwives in the OB-GYN and all physicians at the IME	To provide one-on-one peer support to HCW following a stressful event, including adverse events	<p>i) Attendance to the programme: Out of 156 respondents, 26 of them reported using one of their buddies during the study period;</p> <p>ii) Evaluation of the Buddy Study programme in the department: The programme encouraged more attentiveness among participants towards one another following adverse events (n=82, 52.6%) ; have</p>

			and Internal Medicine and Emergency Department (IME)			<p>contributed to more inter-collegial talks about adverse events (n=57,36.5%); sense of more openness to talk with colleagues about feelings in the aftermath of adverse events (n=65, 41.7%); increased willingness to ask for leadership support (n=53, 34.0%);</p> <p>iii) Overall experience with the programme: an open and compassionate culture was encouraged; increased attentiveness to the staff wellbeing; increased sense of safety (n=91, 58.3%).</p>
Shapiro, Galowitz (2016)	2012	47 months (January 2012 and December 2015)	US- Brigham and Women's Hospital (BWH)	HCWs of Brigham and Women's Hospital	To provide one-on-one peer support or group peer support (if a team is likely to be affected), after a stressful event, including adverse events	<p>i) Activation of the programme: 220 outreach calls to one-on-one peer support;</p> <p>ii) Attendance to the group sessions: 240 clinicians participated in multidisciplinary group peer support sessions.</p>
Thompson, Hunnicutt, Broadhead, Vining, Aroke (2022)	May, 2020 through October, 2020	1 month (trial period)	US – Anaesthesia department of the large academic centre	Certified registered nurses of the anaesthesia department.	To provide a peer support program to decrease SV distress after stressful events	<p>i) Frequency of the encounters: Over the course of one month, a total of 8 peer support encounters were reported;</p> <p>ii) HCWs' distress: It wasn't possible to observe a significant change in distress level after one month period, however the study found a statistically significant relationship between increased distress and insufficient colleagues support.</p>
El Hechi , Bohnen, Westfal, Han, Cauley, Wright, Schulz et al (2020)	Missing data	12 months	US-Department of surgery at a tertiary academic medical centre	Surgeons and surgical trainees from general surgery, transplantation, pediatric surgery, thoracic surgery, cardiac surgery, vascular surgery, and trauma/acute care surgery.	To provide a peer support - based on three-tiered support psychological first aid - to surgeons and surgical trainees dealing with intraoperative adverse events, catastrophic patient outcomes, and/or long- term litigation cases.	<p>i) Programme activation: 47 outreach calls;</p> <p>ii) Evaluation of the programme impact: The majority of surgical staff was satisfied with the following domains – programme's confidentiality (89%), safe/trusting environment (73%), timeliness of the intervention (83%). It was also perceived a positive impact on the department's culture, as it raised awareness about the importance of supporting colleagues facing difficult situations at work, and fostered a general sense of "safety and support" in the workplace.</p>
Mira, Carrillo, Guilabert, Lorenzo, Pérez-Pérez, Silvestre et al (2017)	2015	15 months	Spain – without a specific location (online programme)	HCWs from hospitals and primary care that access the webpage of the online programme	To provide an online preventive programme to mitigate the impact of severe adverse events in HCWs and raise awareness about the SV phenomenon.	<p>i) Knowledge improvement (main outcome): After completing the informative and demonstrative package, users significantly improved their knowledge about patient safety terminology, impact and prevalence of adverse events, SV support strategies and recommended actions following a severe adverse event ($P<0.001$).</p>

Scott, Hirschinger, Cox, McCoig, Hahn-Cover, Epperly et al. (2010)	2009	10 months	US-University of Missouri Healthcare	University of Missouri Health Care faculty and healthcare staff	To provide a peer support programme to facilitate the second victim's transition through the six stages of emotional recovery	i) Frequency of the encounters: 49 encounters with forYOU Team members ,13 of which involved referrals to external support; there were 6 team debriefings with an average of 15 HCWs each. The average duration of the encounter with forYOU Team members lasted 30 minutes, while debriefings extended to 77 minutes.
Schuster (2021)	End of 2019	6 months	US- Department of Hematology/Oncology /Stem Cell Transplant Unit- Boston Children's Hospital – 2 separate units: a 30-bed hematology/oncology unit and a 14-bed stem cell transplant unit. Both units are under one hematology/oncology/ bone marrow transplant department within the inpatient pediatric free-standing children's hospital.	Multidisciplinary staff caring for hematology/oncology patients and their families (registered nurses, advanced practice nurses, clinical assistants, physicians, dieticians, child life specialists, environmental services, food tray distributors, patient experience representatives, social workers, resource room staff, chaplains, pain service staff, supply restockers, and students on the floor).	To provide peer to peer support program to promote a safer, supportive and resilient workplace culture, improve staff wellbeing and decrease the frequency of contacts among colleagues for work-related support outside of working hours to cope with stressful situations	i) Frequency of the programme interventions: 98 HART shifts; ii) Outcomes related with HART application: improvement of HCWs' well-being, the number of HCWs reaching out coworkers for support outside working hours decreased after implementing HART; number of breaks increased during the work shifts, the use of hospital resources increased after HART coaches recommend them; iii) Satisfaction with the work-related support after HART implementation: 25.6% of participants reported to be extremely satisfied with the received support; 49.4% of HCWs felt more supported by leadership. iv) Interactions resolutions: The majority of interactions were solved in real time (83.2%); v) Subjective Feedback: The programme fostered a safe, supportive and open work environment. HCWs felt more connected to their colleagues in the workplace.
Calder-Sprackman; Kumar; Gerin-Lajoie; Kilvert; Sampsel (2018)	2014	24 months	Canada – Department of emergency medicine , university of Ottawa	Residents from the emergency department at the university of Ottawa	To provide a peer-support sessions to improve residents wellbeing and create a supportive and resilient workplace	i) Perception of change after the support programme: From a total of 20 surveyed HCWs, 95% referred that support and companionship among residents increased after the support the sessions; 58,8% gained an increased awareness of coping strategies to deal with challenges during residency ; ii) Impact of the Rounds on clinical practice: Half of HCWs referred that the rounds helped them to reflect about their clinical practice, a quarter of HCWs expressed that the rounds had not significantly impacted their clinical practice. Nevertheless, they acknowledged the value of having this type of support available to them;

						<p>iii) Perception of stress, anxiety and burnout: 20% of HCWs decreased sensation of burnout and 10% decrease their perceived stress and anxiety;</p> <p>iv) Programme recommendation: 89% of respondents would recommend ice cream rounds to other colleagues</p>
Peterson, Bergström, Samuelsson, Åsberg, Nygren (2008)	2002	2 months	Sweden- 3 hospitals of the county council	Physicians, registered nurses, nursing assistants, social workers, occupational therapists, physiotherapists, psychologists, dental nurses and hygienists, dentists, service staff, administrators, teachers and technician. participants scored above the 75th percentile on the exhaustion dimension of the Oldenburg Burnout Inventory	To provide a reflecting peer-support group to discuss and reflect on work-related stress and burnout; to help to find out alternative ways to handle perceived stressful situations on an individual level; to provide an opportunity for mutual support between colleagues, to share and compare experiences and learn from each other.	<p>i) Frequency of the encounters: 8 peer-support groups with 5–8 participants in each group;</p> <p>ii) Perceived impact of the peer support group: The space for reflection on ‘real problems’ was valued by the participants; increased knowledge about stress and coping strategies, increased sense of belonging/community; Increased self-confidence; the existence of structured group was appreciated, decreased stress symptoms and anger; behavioural change; sleep improvement;</p> <p>iii) Work-related symptoms and burnout: Both groups showed an overall decrease from baseline to follow up after 12 months in exhaustion, disengagement, depression and anxiety measures;</p> <p>iv) General health and vitality: both increased after the intervention;</p> <p>v) Change in work conditions: statistical significant difference was found in participation at work and support at work after 12 month follow-up.</p>
Rubin, Rassman (2021)	2020	“During spring”	US-large urban healthcare system: Clinical education and practice department in Swedish Health Services	Clinical and non-clinical staff (nurse educator, professional development specialist, programme manager, student intern) and disciplines (nursing, social work) within the Clinical Education and Practice department.	To provide informational and emotional support to help frontline staff thrive in the first wave of the Covid 19 Pandemic	<p>i) Programme utilization: 13 out of 71 HCWs participated in the programme;</p> <p>ii) Evaluation of programme’s resources: Approximately 85% of surveyed HCWs agreed or strongly agreed that there were adequate resources to support the HCWs during and after stressful events in the healthcare organization. All respondents agreed that assisting the cAIR video presentation was a valuable use of their time. The nature of the content and dedicated time for staff support stood out as the most helpful aspects of the video presentation. Most respondents improved their knowledge and/or skills with the cAIR resources.</p>

Bernburg, Groneberg, Mache (2019)	Missing data	3 months	Germany - psychiatric hospital departments	Nurses full time working in psychiatric hospital department	To provide a mental health promotion intervention to develop self-care skills in psychiatric nurses	<p>i) Programme's attendance: 44 nurses were part of the intervention group and 42 nurses of the control group;</p> <p>ii) Perceived job stress: intervention group perceived lower levels of stress after attending the programme;</p> <p>iii) Relation with patients: After the programme, significant improvements in nurses' relationship with their patients and lower levels of perceived conflicts were observed ($p < 0.05$);</p> <p>iv) Emotion regulation: Large effects on emotion regulation skills were found in the first follow up (3 months) and medium effects sizes were found after 6 and 12 months;</p> <p>v) Resilience and self-efficacy: statistically difference was found in these measures within groups ($p < 0.05$);</p> <p>vi) Final course evaluation: Overall satisfaction with the training (1.39; 1-best score, 5-worse score); nurses displayed a strong level of motivation and interest in learning self-care techniques and applying them in their work. All participants verified that the training was worth attending (learning was meaningful and motivating for selfcare).</p>
Morales, Brown (2019)	Missing data	No info	US- 10-hospital health system	Clinicians working in the 10-hospital system	To provide immediate emotional first aid after a serious adverse event and coach to HCWs on how to respond to patients and their families in a timely, empathetic, consistent, and patient-centred way.	<p>i) Process and outcome's results of two different scenarios have been described:</p> <p>Scenario 1 (death after health condition deterioration of a patient affected all ICU nursing team) - Process outcomes: programme activation was done by the nursing director; group sessions were applied to all nurses of the ICU, Employee Assistant Programme was provided to several nurses; Outcome results: after nurses had receive support from the programme, they described "feeling grateful for the opportunity to talk openly without judgment" about the event. Sessions also enabled for peer support among the nursing team members;</p> <p>Scenario 2 (intensivist involved in a stressful situation during intubation of a patient) - Process outcomes: critical care unit director activated the programme; "Thinking of You" bag was delivered to the HCW in need. Outcome results: the intensivist expressed gratitude for both unit staff and members of the programme.</p>
Cobos-Vargas, Pérez-Pérez, Núñez-Núñez, Casado-	2020	24 months	Spain- Clinico San Cecilio University Hospital	Hospital staff involved in any type of serious clinical incidents that caused or could have been caused (death or	To provide support to patients and their families, to HCWs and the healthcare institution after serious events, and to investigate and develop improvement	<p>i) Programme activations: From 25 activations, 23 severe adverse events were investigated;</p> <p>ii) Frequency of the peer support encounters: 1 to 17 HCWs per adverse event received trained peer support;</p>

Fernández, Bueno-Cavanillas (2022)				serious harm of a patient)	actions, based on Susan's Scott model.	<p>iii) Time from the event until the activation of the programme: ranged from 12h to one week;</p> <p>iv) Number of second victims identified: 34.8% (n=47) were identified as second victims;</p> <p>v) Referral for third level of support : 7 cases (14.9%) were referred, however 4 refused it;</p> <p>vi) Participants experience after participating in the programme: increased sense of safety in the workplace; participants valued the interview provided in the second level of support and being able to contribute for the improvement actions after the adverse event occurrence;</p> <p>vii) Feedback for programme improvement: The programme must be disseminated for all HCWs to have access to it; leaders should be trained to be more aware of the problem; first level of approach is identified has a problem in the units.</p>
Hinzmann, Forster, Koll-Krüsman, Schießl, Schneider, Sigl-Erkel et al (2022)	2020	24 months	Germany- health and emergency services	Clinicians and managers from the health and emergency services	To stabilize and restore the ability to act in highly stressful situation including adverse events, preserving clinical teams health and work capacity – in case of need, to transfer HCWs and managers with for specific treatment, initial structures of standard psychotherapeutic care in a low-threshold and timely manner.	<p>i) Evaluation of the programme: In 81.4% of the cases the programme provided strong and very strong support to the callers in coping with the burden after a stressful event;</p> <p>ii) Follow up call after the first call : 52.9% of callers needed a follow-up appointment with the same supporter after the first call;</p> <p>iii) Qualitative feedback after the programme : there was an increased understanding of one's own reactions; openness to listen and understand that emotions are welcomed in a safe environment; knowing where to turn for help; enhanced mutual understanding and peer validation, as well as self-awareness and self-reflexion; leadership involvement increased.</p>

Supplementary Table 4 – Main findings of the study according with the acronym OPERA

Main outcomes of interest	Main findings of the study
O rganisational factors P eople E nvironment R ecommendations from previous studies on an organisational level A tttributes of the interventions	Dissemination of the programme should be prioritised.
	Communication processes should be facilitated between HCWs and supporters.
	Specific training to peer supporters should be provided.
	Communication between the support team members should be regularly maintained.
	It's essential to create a multidisciplinary team with empathic skills.
	Leadership members should be actively engaged in both implementation and development of the programmes.
	A supportive and open organisational culture will benefit the programme implementation.
	To provide protected time and relief in staffing to participate in the programme (either for the programme's implementation team and for HCWs/SV that seek support) it's important for programme's sustainability.
	Evaluation of the support programme should be regular and overt time.
	Funding is important for programme sustainability.
	Programmes should be formally recognised in the institution and have designated structures.
	Programmes should be easily accessible and on voluntary basis.
Confidentiality should be ensured to facilitate HCWs' adherence and overcome potential barriers to participate in the programme.	
Programme's characteristics should be align with HCWs' needs.	