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Review

A scoping review of support interventions for bystanders involved in out-of-hospital cardiac arrest



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Abstract

Background: Bystanders witnessing or performing cardiopulmonary resuscitation (CPR) during out-of-hospital cardiac arrest (OHCA) may experience significant psychological distress. Although the need to support bystanders after OHCA is increasingly recognised, existing post-event support interventions have not been previously described.

Objective: To identify and describe existing post-event support interventions for bystanders involved in OHCA.

Methods: A scoping review was conducted using Joanna Briggs Institute methodology and PRISMA-ScR reporting. Databases and grey literature were searched from inception to March 2026 for sources describing post-event support interventions for adult OHCA bystanders. Data were charted and synthesised descriptively.

Results: Sixteen peer-reviewed articles or published studies, pertaining to eleven support interventions were included, alongside three additional interventions identified through grey literature, giving a total of fourteen interventions. Most interventions were developed in the past decade in high-income Western countries. Support mainly consisted of information-giving and debriefing, which could be delivered on scene, shortly after the event via telephone or in person, or through digital platforms. Promotional methods included on-scene written materials, emergency medical service dispatcher- or clinician-initiated contact, app-triggered messages, and public-facing websites or social media. Only five studies reported participant outcomes, with two assessing psychological distress. No study evaluated intervention effectiveness.

Conclusions: New support interventions for bystanders involved in OHCA are emerging, particularly in Western countries. The most common component of these interventions is information-giving, with the majority also providing debriefing and psychological support. However, more research is needed on the most effective ways to promote these interventions and on the effects of these interventions on outcomes important to bystanders.

Keywords: Support interventions, Bystanders, Out-of-hospital cardiac arrest

Introduction

Worldwide, an estimated 3.8 million out-of-hospital cardiac arrests (OHCA) occur annually,¹ with 80,000 of them in the UK.² Resuscitation is attempted in around 30,000 OHCA cases each year.³ More than half of these are witnessed, and around 70% occur at home.⁴

Bystanders may include family members, friends, colleagues, or strangers.⁵ Survival rates after OHCA average around 8% in Europe.^{3,6}

Witnessing or performing cardiopulmonary resuscitation (CPR) exposes individuals to a potentially acutely stressful event that may trigger immediate psychological reactions such as hyper-alertness, intrusive recollections, sleep disturbance, anxiety, guilt, or helplessness.

Abbreviations: OHCA, out-of-hospital cardiac arrest, CPR, cardiopulmonary resuscitation, PTSS, post-traumatic stress symptoms, JBI, Joanna Briggs Institute, OSF, Open Science Framework, PCC, Population-Concept-Context, GP, general practitioner, ITQ, International Trauma Questionnaire, PTSD, post-traumatic stress disorder, CPTSD, chronic post-traumatic stress disorder, AED, automated emergency defibrillator, EMS, emergency medical services, SMS, short messaging service

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ness.^{7–9} Post-traumatic stress symptoms (PTSS) have been found to affect up to 90% of lay bystanders and 67% of CPR-trained lay-responders,^{10–12} with higher symptom burdens reported among family witnesses.^{8,13} Therefore not only is an OHCA a life-threatening emergency for the patient but may also profoundly affect the bystanders who witness or assist during the resuscitation.^{10,14}

In a recent scoping review, family members commonly reported a significant and persistent psychological burden, including difficulty transitioning to life at home, after a loved one's hospital discharge or death after OHCA.⁸ These emotional and psychological effects can persist in the long term, leading to reduced quality of life.¹²

At the scene of an OHCA, emergency services have to prioritise patient care; hence, the bystander's well-being can become secondary due to limited time or resources.¹⁵ However, a qualitative study in Norway found that even a short debrief with bystanders, by emergency medical dispatchers, stimulated reflection and improved bystanders' ability to cope with their emotional reactions.¹⁶

Evidence from crisis response research and bereavement counselling following natural disasters indicates that structured post-event psychosocial support, including early intervention programmes and community follow-up, can reduce the escalation of psychological distress and lower the risk of developing posttraumatic stress disorder.^{8,13,17,18} Given the comparable nature of witnessing or participating in the resuscitation it would be reasonable to consider that similar interventions may be effective for bystanders after OHCA events.

There is growing evidence for the need to support bystanders after OHCA.^{7–13} However, little is known about what interventions already exist. This knowledge is essential to inform the development and evaluation of interventions that meet the needs of bystanders. Hence, this scoping review aims to identify and describe existing interventions providing support to bystanders after involvement in an OHCA.

Methods

Review approach

This scoping review was conducted in accordance with the Joanna Briggs Institute (JBI) methodological guidance for scoping reviews (2024) and is reported using the PRISMA-ScR checklist.¹⁹ This scoping review was prospectively registered on the Open Science Framework (OSF), prior to manuscript submission (<https://doi.org/10.17605/OSF.IO/J9WR7>). The objective was to map support interventions for bystanders involved in OHCA in terms of characteristics (participants, content, mode of delivery and timeframe), methods of promotion, participant data (observational or qualitative), and effect.

A preliminary search of MEDLINE, the Cochrane Database of Systematic Reviews, JBI Evidence Synthesis and PROSPERO was conducted and no current or ongoing systematic reviews or scoping reviews on the topic were identified.

Eligibility criteria

Eligibility criteria were defined using the Population-Concept-Context (PCC) framework recommended by JBI for scoping reviews.¹⁹

Population: Adults (≥ 18 years) who witnessed an OHCA and/or participated in the resuscitation attempt. For this review, "bystanders" included family members, friends or acquaintances, incidental witnesses, lay rescuers, citizen responders/volunteer responders, and healthcare professionals acting outside their formal professional role.

Concept: any type of support provided after the OHCA event, including but not limited to information/education, debriefing on the event, emotional or psychosocial support including self-management strategies, signposting/referral to other services, or peer-support.

Context: any setting (pre-hospital, hospital, community or digitally based platforms) and any time point after the OHCA.

All study designs were eligible, including qualitative and quantitative studies, observational studies, interventional studies, pilot programmes, case reports/series, conference abstracts and theses. Also, grey literature such as publicly accessible third-sector organisational reports.^{20,21} No limits were placed on publication date.

Consistent with JBI guidance, no critical appraisal was conducted, as the purpose was to map the existing evidence rather than evaluate study quality.²²

Search strategy and study selection

A comprehensive search strategy was developed and refined through preliminary searches. The following electronic databases were searched: MEDLINE (via PubMed and Ovid), Embase, PsycINFO, CINAHL, AMED, and the Cochrane Library.

Searches were initially conducted on 21 December 2024 and updated on 03 March 2026.

A three-step search strategy consistent with JBI methodology was used:

1. An initial limited search of MEDLINE and Embase to identify relevant articles. Text used in titles, abstracts, and index terms used to describe these articles were then identified and analysed ready for step 2.
2. Full search of all databases using the identified keywords and controlled vocabulary. Search strategies were adapted for each database ([Supplementary Table 1](#)).
3. Additional searches were conducted to identify further relevant studies, and grey literature, defined as information and research outputs not controlled by commercial publishers and not typically indexed in major bibliographic databases.^{20,21} Grey literature searching included Google Scholar, targeted searches of relevant organisational and charity websites, consultation with subject-matter experts in OHCA research and bystander support, and backward citation searching of the reference lists of already included studies.

Study selection

Search results were imported into the online platform Covidence and duplicates removed. Two authors (US and VLJ) independently screened the titles and abstracts of all search results for relevance against the eligibility criteria, followed by a full-text screen of the articles to confirm final inclusion. Any disagreements in the screening process were discussed between the two authors and, if necessary, discussed with a third person (TK).

Data charting

A data-charting form was developed in accordance with JBI guidance²² and piloted on a subset of the included studies. The form was iteratively refined as familiarity with the evidence increased, reflecting the flexible, dynamic approach recommended by JBI. Extracted data items included: article/study characteristics (author, year of publication, country, number of participants, inclusion and exclusion criteria, setting, promotion method, aim of study, study design, length of study), characteristics of participants (mean age, gender, prior CPR training), description of support intervention (provider, mode of delivery, duration, timing after CPR), any included intervention theory, service level outcomes (uptake by bystanders,

length of intervention, themes of discussions), and any participant outcomes for example, measures of quality of life or psychopathology and data collection time points.

Synthesis of results

Data were synthesised descriptively and mapped across (i) participants; (ii) content and mode of delivery; (iii) timing of intervention; (iv) methods of promotion; (v) participant outcomes (observational or qualitative). Quantitative counts were used where appropriate, but no meta-analysis or inferential analysis was undertaken.

Results

Study selection

The search identified $n = 14,688$ unique articles and abstracts (Fig. 1). After removal of duplicates, titles and abstracts were screened, and $n = 64$ full texts were assessed for eligibility. Sixteen articles met the inclusion criteria and were included in the review, representing eleven distinct support interventions. An additional three support interventions were identified through grey literature, (conference abstracts,²³ websites,²⁴ and conversations with peers and experts³¹). The article selection process is summarised in the PRISMA-ScR flow diagram (Fig. 1), and reasons for exclusion at the full text stage are provided in Supplemental Table 2.

Article characteristics

Sixteen peer-reviewed articles or published studies, pertaining to eleven support interventions, were published from 2014 to 2025 (Table 1), with support interventions established between 2013 and 2024. Most articles reported prospective qualitative studies^{16,25–28}, some using surveys^{9,27,29} and/or interview-based methods.^{16,25,27,28,30}

The three interventions identified from grey literature were established in 2000,³¹ 2015²⁴ and 2024.²³ All three are website-based resources, and none had associated peer-reviewed outcome evaluations.

Intervention characteristics

All fourteen included support interventions were from Western countries. Five were from the United Kingdom,^{23,24,28,31,32} three from Canada,^{25,26,33} three from Denmark,^{9,16,29,34–37} and one each from the USA,^{38,39} Ireland,³⁰ and Norway.²⁷

Support intervention characteristics were summarised according to components, timing, delivery modality, recipient group and follow-up pathways (Table 2).

Participants

Three support interventions reported age and gender of the intervention participants ranging from 17–81 years (median of 45.6 years) and 48–53% males.^{9,25,27} (Table 3).

Six support interventions included all bystanders, regardless of first aid training, relation to OHCA patient or nature of OHCA.^{28,29,31–33,37} Two interventions excluded bystanders who were relatives of the victim,^{16,26} while two interventions included only bystanders from non-traumatic OHCA.^{28,32}

Content and mode of delivery

Six support interventions offered debriefing as the primary means of support, either on-scene,^{25,26,30,32,35,36,40} post-event via tele-

phone,^{9,16,27–29,32,40} or in-person^{25–27,32,40,41} (Table 1). On-scene debriefing was provided either by attending paramedics,^{32,40} community/volunteer first responders,^{25,34–37,41} or volunteer general practitioners (GPs).³¹ Six support interventions provided a dedicated website with online digital resources,^{23,24,31–33,38–40} of which two included peer support.^{24,33}

Five support interventions offered the option of follow-up or referral to specialist services if needed.^{16,26,29,30,32,40} Five interventions offered multi-component support,^{25–27,33,36} including an on-scene debrief,^{27,28,32} a digital survey (either to rate the bystanders' self-perceived mental effects,³⁶ or to provide feedback on the on-scene debriefing²⁵), followed by in-person/telephone debrief²⁷ and/or digital resources.³²

Timeline of interventions

Eight interventions offered on-scene or immediate (within 24 h) support either in the form of debriefing or signposting with the contact details for the interventions^{25,27–30,32,35,36} (Table 1). Three interventions provided support within 48 h after the event,^{16,26,29} while four interventions offered support in the first few days to weeks after the event.^{25,26,30,36} Six support interventions^{23,24,31–33,38–40,42} provided longer term support by means of digital resources or peer support groups. Six support interventions offered support at multiple timepoints.^{9,26–28,30,32}

Methods of promotion

Ten articles provided information on methods of promotion of the intervention.^{9,16,25–28,30,32,37,38} Five interventions used news and social media to promote their services.^{23,24,31,33,38} Promotion of two support interventions was via digital surveys sent 90 min after the event to the community first responders or lay-rescuers who had attended or accepted the OHCA alarm through the HeartRunner app (Table 1).^{9,29} Other methods of promotion included telephone contact made by the medical dispatcher,¹⁶ paper wallet cards at the event with contact details for the support intervention,^{27,28} or by an offer of registration by paramedics using a digital app at the OHCA event.^{32,40}

Participant outcomes

Five of the included studies reported participant outcomes in addition to describing the support interventions (Table 2). These included emotional support as well as an exploration of the thoughts and perceptions of bystanders.^{16,25,26,28,37}

Two studies investigated psychological distress. One found 1.2% of bystanders reported severe psychological impact and 5.4% reported moderate impact.²⁸ In another study,²⁷ outcomes were assessed using the International Trauma Questionnaire (ITQ). Overall, 84% of bystanders reported at least one symptom of functional impairment, with 19% meeting criteria for post-traumatic stress disorder (PTSD) or chronic post-traumatic stress disorder (CPTSD).²⁷ Among those followed up beyond one month, 81% continued to report at least one symptom of functional impairment (see Table 2 for further details).²⁷

Four studies collected qualitative data on the psychological impact of being a bystander and the experience of being debriefed afterwards.^{9,16,28,34} Bystanders reported shock, fear, guilt and a strong need for explanation and closure. They stated the included debriefs were reassuring, clarifying events and explaining the victim's survival outcome, which helped "make sense" of the distress experienced.^{16,30,37,43} Psychological distress was more likely in younger (<30 years of age) and female bystanders, or when an auto-

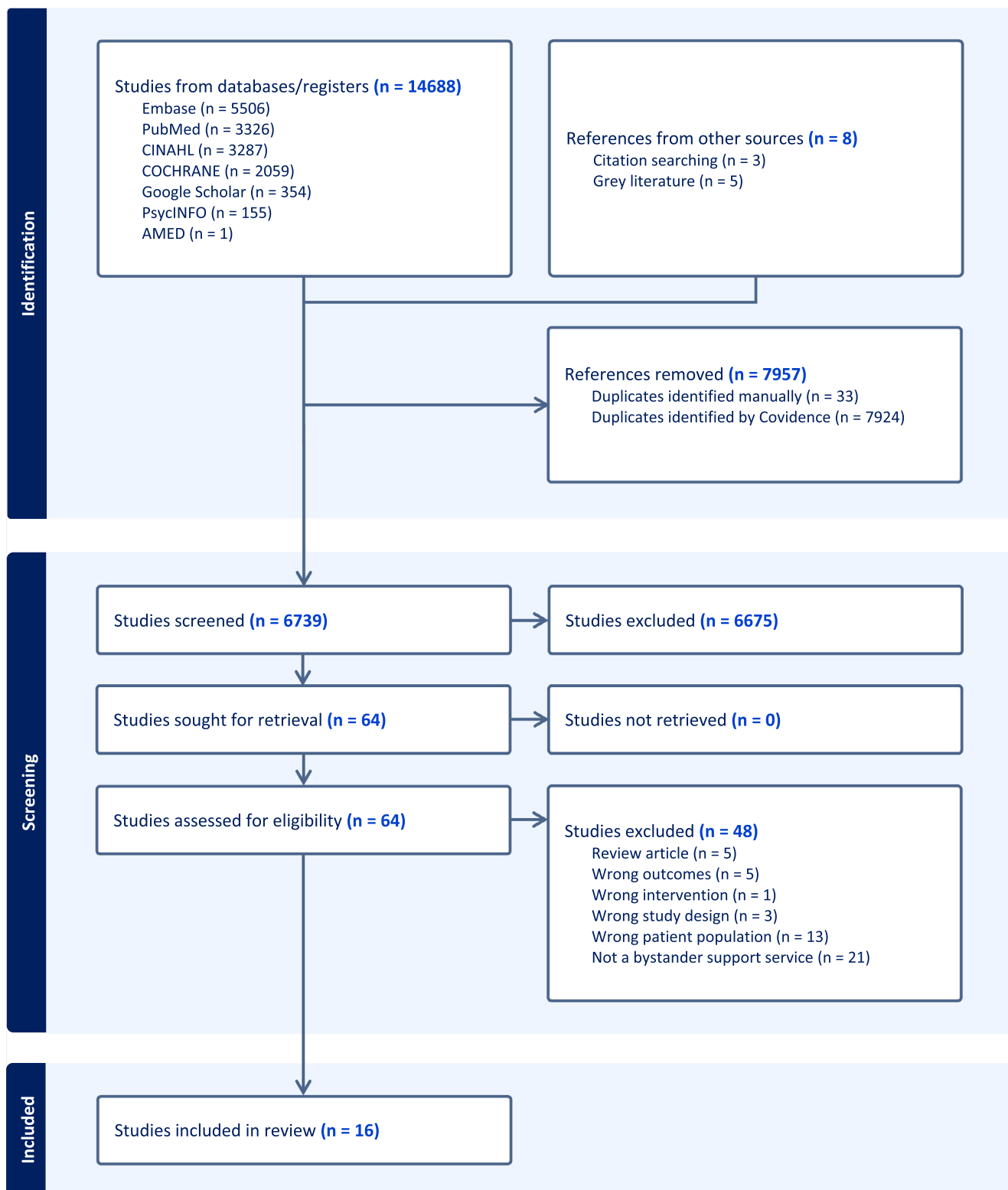


Fig. 1 – PRISMA-ScR flow diagram.

mated emergency defibrillator (AED) was used^{34,37}; many felt standard CPR training did not prepare them for the sensory and emotional realities of an OHCA.²⁵

None of the support interventions investigated the effect of the intervention on the participants.

Discussion

This scoping review aimed to identify and describe existing interventions that provide support to bystanders after an OHCA. The term bystander encompasses a heterogeneous population with differing

Table 1 – Intervention characteristics, content and mode of delivery, recruitment, and timelines of all included interventions.

Study/intervention/setting	Intervention characteristics (mode, provider, timing)	Recruitment/promotion	Content of intervention	Emotional responses or needs addressed; further referrals or sign posting
Moller et al., 2014, Denmark, Intervention established 2013	Telephone debriefing by medical dispatchers 2–4 days post-event; lasting median 15 min	Bystanders recruited at the end of each call with suspected OHCA after the ambulance had arrived at the OHCA scene	Structured telephone debriefing (2–4 days post-event) led by a medical dispatcher, focusing on bystander narrative and coping strategies.	Short term effects: Safety net, emotional relief, importance of receiving debriefing from a healthcare professional. If coping strategies were insufficient, dispatchers advised GP contact and provided a dedicated EMD phone number for further support
Snobelen et al., 2018, Canada, Intervention established 2014	In-person structured debrief delivered by paramedic service or trained practitioner, lasting 1.5–2 h	Individuals involved with the incident, from witnesses to CPR/AED providers, are identified to the CSPS (community safety programme specialist)	Stage 1: Identification of lay responders; Stage 2: structured 4-phase debrief reviewing technical aspects, exploring responder experience, normalising symptoms, and providing stress-reduction strategies; Stage 3: follow-up (phone/email/in-person) to assess use of support, with facilitated referral if ongoing distress	Exploration of lay responders' thoughts and perceptions. Secondary follow-up (phone, email, or in person) assessed use of support options, with facilitated mental health referral if ongoing symptoms were identified.
Mausz et al., 2018, Intervention established 2018	In-person debrief conducted by experienced advanced care paramedic with 13–20 years' experience, within ~24 h, lasting 45–90 min	After being notified of a cardiac arrest event in a public setting, the specialist attended the scene, typically with 24 h of the event, and attempted to make contact with the lay rescuers involved.	Debrief, single one-on-one interview and 5 focus groups (ranging from 2 to 7 participants)	Exploratory qualitative study using semi-structured interviews of bystander intervention in sudden cardiac arrest.
Barry et al., 2020, Ireland, Intervention established 2015	On-scene support provided by volunteer GPs responding to OHCA	GPs attending the OHCA identify the family and bystanders and provide debrief and support on the scene	GPs described 'caring for families' as a central OHCA role, extending beyond resuscitation into ongoing aftercare, viewed as an integral GP skill and one they felt particularly well equipped to provide.	GPs identified 'caring for families' as a key component of their role in OHCA care. Some GPs conducted aftercare visits around one-month post-event to identify ongoing or additional needs.
Katie Dainty et al., 2017, Canada, Intervention established 2017	Digital peer-support network and online community	Connects OHCA lay rescuers; peer community; community-based research network; boosts public engagement.	Established a community of OHCA lay rescuers, connecting individuals with shared experiences, enabling longitudinal community-based research, and strengthening public engagement in resuscitation research design and priority setting.	
Kragh et al., 2017, Denmark, Intervention established 2017	On-scene emotional support provided by citizen responders alerted via HeartRunner app	90-minute post-OHCA survey to HeartRunner citizen responders on resuscitation actions and emotional support provided to bystanders	Volunteer responder providing on-scene support to relatives	
Kragh et al., 2017, Denmark, Intervention established 2017	Telephone "defusing" conversation with healthcare professionals if psychological impact reported, under supervision of psychologist, lasting mean 48 min	Volunteer responders within 5 km were alerted via dispatch; those accepting the alert received a 90-min post-event text survey assessing their involvement, self-rated immediate psychological impact, and any physical injuries	Respondents with severe psychological impact were offered telephone debriefing by a healthcare professional within 24–72 h post-event.	Defusing intervention centred on volunteer responders' personal narratives, informed by Critical Incident Stress Debriefing. If required, nurses recommended supplementary psychologist assessment, with responders advised contacting their GP for onward referral.
Ovstebo et al., 2023, Norway, Intervention established 2020	Initial conversation with emergency care professionals followed by in-person interview, lasting approx. 90 min	First aid providers were offered follow-up via EMS leaflets, text messages, or media. Participants completed the ITQ to assess PTSD/CPTSD. Recruitment sources varied: 39% via texts, 23% via leaflets, and 15% via on-scene EMS information	Programme included an initial conversation with emergency care-experienced healthcare professionals, followed by an in-person interview with two experts.	
Newman et al., 2024, USA, Intervention established 2023	Online peer-support platform with webinars and discussion forums	Members recruited via SCAF's Survivor Network, online outreach, media coverage, and partner/community invitations. Platform analytics were used to assess 12-month engagement.		

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Table 1 (continued)

Study/intervention/setting	Intervention characteristics (mode, provider, timing)	Recruitment/promotion	Content of intervention	Emotional responses or needs addressed; further referrals or sign posting
Joshi et al., 2024, Scotland, Intervention established 2023	Telephonic or in person debriefing, open phone line for the bystanders to contact and seek support at any time, with health care professional	Promoted via wallet cards distributed by the Scottish Ambulance Service, social media, posters in hospital departments, and health-professional networks	Bystanders discussed thoughts and feelings related to the OHCA event; anonymised service data captured contact volume, mode, location, referral route, and key support themes	
Sajjad et al., 2024, UK, Intervention established 2024	On-scene registration via paramedic app followed by digital resources and optional follow-up with liaison officers, Long-term access to dedicated website and access to liaison officer service	Paramedics register rescuers via a geo-linked app, triggering an automated text with a website link where rescuers can self-refer for debriefing, psychological assessment, and referral to specialist services	On-scene signposting to a dedicated resource website, with option for self-referral to patient liaison officers for further assessment and onward referral to specialist services.	Referral to a Psychologist, mental health counsellor and peer support as needed
SCAUK and Chain of survival, UK, Intervention established 2015	Online peer-support community via website and social media	Facebook community and website with resources and peer support		
SADs UK, UK, Intervention established 2015	Online resources and optional counselling support	Website with resources and option of contact with mental health counsellor		
Save a Life Cymru, Wales, Intervention established 2024	Online educational and support resources	Website with resources		

Abbreviations: NA-not applicable; NR- not reported; AED (automatic emergency defibrillator); CR (citizen responders); EMS (emergency medical services); FAP (first aid responder); ITQ (international trauma questionnaire); SCAF (sudden cardiac arrest foundation).

relationships to the patient, previous CPR experience and levels of involvement in the event, all of which may influence psychological responses and support needs. Fourteen support interventions were identified across all resources: eleven from sixteen peer-reviewed studies and three from grey literature. Most support interventions were established in the last 5 years, and all were in higher-income Western health systems. Interventions were delivered, or coordinated, by a range of emergency medical services, hospital-based teams or third sector organisations. Although the terminology describing the interventions differed across studies, common features were identified (Table 2). Most interventions included information-giving, debriefing, emotional support, or signposting to further support services.

No studies investigated the effect of the intervention on bystanders. Several factors may explain the absence of outcome evaluation. Many interventions have been established only recently and may currently be in feasibility or service-development phases. Additionally, bystanders are not routinely identifiable within healthcare systems, making longitudinal follow-up difficult. There is also limited consensus regarding the most appropriate psychological outcomes and follow-up periods for this population on which to base outcome reporting.

The support interventions included somewhat different populations. Several supported only family members, which fits with much of the literature on psychosocial support after bereavement, which focuses primarily on family. However, evidence from trauma, disaster and emergency response settings indicates that non-family member witnesses and responders can experience substantial psychological impact,^{44,45} even when they have no prior relationship with the victim, suggesting interventions should be available to both family and non-family members.

The interventions were predominantly located in higher income, Western countries, with no examples from low or middle-income countries. This geographical pattern is consistent with those observed in other post-trauma and disaster response services, which are often first developed in high-income countries with established emergency medical services (EMS) systems,^{17,18} formalised bystander CPR programmes, and stronger mental health infrastructures. This finding also aligns with the global disparity in OHCA systems of care and, resuscitation practice, where countries with high bystander CPR rates and well-developed cardiac arrest registries may have greater visibility of bystander experience and need for post-event support.^{1,3,6}

Structural and contextual factors may further influence implementation, including differences in EMS organisation, public CPR initiatives, digital infrastructure, healthcare funding models, and cultural attitudes towards trauma, bereavement, and psychological support. In lower-resource settings, where the burden of OHCA remains substantial, support interventions may be more difficult to establish or may compete with priorities focused on improving survival and strengthening emergency care systems. In settings where bystander CPR is widely promoted and performed, a greater proportion of the population is likely exposed to emotionally challenging resuscitation attempts, which may in turn heighten recognition of the need for structured bystander support. Thus, the locations of the support interventions identified by this review may reflect local drivers, such as active promotion of bystander CPR, community first responder schemes, or dispatcher-assisted CPR. Again, perhaps leading to greater visibility of bystanders and an increased awareness of the 'need to look after life savers'. As bystander CPR continues to be promoted globally, similar support models may begin to appear in new locations with different EMS structures, cultural and social

Table 2 – Overview of characteristics of support interventions for OHCA bystanders by core components, timing, mode of delivery, recipient group and onward referral/follow-up provision.

Intervention	Core components					Time after event	Delivery mode	Recipient group	Onward referral/follow-up
	Support focused on debriefing/explanation based on bystander's experience	Signposting to other resources	Peer Support	Promotion of coping strategies	Support based on psychological assessment				
Møller et al.	x			x		2–4 days	Telephonic	Bystanders excluding relatives	GP advice if needed
Snobelen et al.	x			x		24–48 h post-event	In-person/email/telephonic follow-up	Bystanders excluding relatives	Facilitated mental health referral if distress persists
Mausz et al.	x			x		Within 24 h	In-person, single one-on-one and focus groups	All bystanders	Not stated
Barry et al.	x					At event	In-person	All bystanders/relatives often family	Some GPs would provide the family with an aftercare visit in a month or so.
Kragh et al. (for Bystanders)	x					At event	In-person	All bystanders	Not stated
Øvstebø et al.	x			x	x	Variable, dependent on when bystander seeks support	Telephone + in-person	First aid providers/bystanders	Referred to qualified personnel for diagnosis and treatment for PTSD or CPTSD, if needed.
Joshi et al.	x			x		Variable, dependent on when bystander seeks support	In-person/email/telephonic follow-up	All bystanders	Not stated
Sajjad et al.	x	x		x		At event	Website/telephonic/in-person	All bystanders	Referral to a psychologist, mental health counsellor and peer support as needed
Kragh et al. (for Citizen Responders)	x				x	90 min post event	Telephonic/digital via app	Volunteers/Citizen responders	Citizen responders asked to contact their GP if further follow-up needed
Save a Life Cymru		x				NA	Website	Accessible to anyone	External signposting to Resuscitation Council UK (RCUK) website
SCAUK and Chain of Survival UK		x	x			NA	Website	Bystanders	External signposting RCUK, British Heart Foundation and other websites
SADS UK		x		x		NA	Website	General public/bystanders	Not stated
Dainty et al., 2017		x	x			NA	Online peer support community	Survivors/co-survivors/bystanders	Community moderation/peer support to connect those with similar experience
Newman et al., 2023–2024		x	x			NA	Online peer support, access to experts, with webinars and discussion forums	Survivors/co-survivors/bystanders	Pathways to further clinical support are mentioned

Abbreviations: GP: general practitioner; NA-not applicable; PTSD: post-traumatic stress disorder; CPTSD: chronic post-traumatic stress disorder; RCUK: Resuscitation council UK.

Table 3 – Target Participant information, demographic characteristics and outcomes.

Author, year, country	Participants	Participant characteristics	Methods/measurement tools (survey, interview, ITQ, self-reported scales)	Results/outcomes (a. Observational, b. Qualitative, c. Service level results)
Moller et al., 2014, Denmark	Bystanders, relatives excluded	Dispatcher-led debriefing was offered to 33 bystanders, with 15 purposively sampled for qualitative evaluation. 48% female; relationship to patient included neighbours, colleagues and acquaintances	Post-debriefing interviews at two months assessed retention of effects, including emotional benefits, confidence in skills, and staying up to date.	a. Short-term effects included a perceived safety net, emotional relief, and reassurance from debriefing with a healthcare professional. b. Six themes from debriefing audio analysis: OHCA identification; emotional/perceptual experience; collaboration with healthcare professionals; patient outcome; coping; and general reflections.
Snobelen et al., 2018, Canada	Bystander, relatives excluded	66 OHCA, 227 lay responders, demographic data NR	Exploratory qualitative study of bystander intervention in sudden cardiac arrest using semi-structured interviews.	a. Exploration of lay responders' thoughts and perceptions
Barry et al., 2020, Ireland	All Bystanders (usually family members)	Over 150 GPs volunteered to participate, with 51 OHCA attendances recorded in the first project year, demographic data NR		a. provision of compassionate care by GPs to families and bystanders.
Katie Dainty et al., 2017, Canada	All bystanders	Network growth included 65 lay rescuers, 32 shared stories, and over 500 website visits. demographic data NR		
Kragh et al., 2017, Denmark	All bystanders	Across included abstracts and studies, 23.2% of citizen responders reported providing support to relatives at the OHCA scene. demographic data NR		a. Volunteer responders identified relatives' care needs and challenges in providing support. b. Interview themes covered relatives' relief, responders' caregiving role, healthcare competence, motivation to act, task coordination, emotional aftermath, trust, and responder identity.
Kragh et al., 2017, Denmark	Citizen Responders	Consistently high engagement across years, with strong survey response rates and substantial uptake of defusing conversations, including self-initiated requests. Mean age 47 years; 52% males; 34.6% healthcare professionals		a. Severe psychological impact (1.2%) was uncommon, 5.4% reported moderate psychological impact. b. psychological impact was associated with younger age, female sex, early arrival, and AED use among citizen responders.

Table 3 (continued)

Author, year, country	Participants	Participant characteristics	Methods/measurement tools (survey, interview, ITQ, self-reported scales)	Results/outcomes (a. Observational, b. Qualitative, c. Service level results)
Ovstebo et al., 2023, Norway	First aid responders	102 FAPs participated. Age 17–81 years; 64% female; all CPR trained	All family and friends of patients completed the International Trauma Questionnaire, a self-report measure of PTSD and complex PTSD.	a. ITQ scores ranged 0–63 (scale 0–72); 84% of 102 family/friends endorsed ≥ 1 symptom or functional impairment. At >1-month follow-up, 81% reported symptoms and 19% met PTSD or CPTSD criteria. PTSD was defined as meeting all PTSD symptom criteria together with additional disturbances in self-organisation— affective dysregulation, negative self-concept, and relational difficulties, measured via the ITQ.
Mausz et al., 2018, Canada	Bystanders	15 lay rescuers from 6 OHCA. Mean age 45.6 years; 53% male; all CPR trained		a. Lay rescuers reported a common experiential process, with CPR training perceived as insufficient preparation for emotional and physical realities of cardiac arrest.
Newman et al., 2024, US	All bystanders	1435 members primarily from the U.S. (92%), plus members from 26 other countries. co-survivors 22%. Demographics not reported		c. High community engagement over 12 months (10,058 contributions; 923 active members), with strong private interaction (40% sending DMs) and expert-led monthly webinars attended by 22–47 participants
Joshi et al, 2024, Scotland	All bystanders	Over seven months, 37 contacts were recorded (26 telephone, 11 email) across all Scottish regions, mainly via social media or health professionals, with few from wallet cards. Mostly female; mixed relationship to patient (relatives and strangers)		b. Focus on emotional well-being, with themes including sleep, diet, flashbacks, post-ambulance concerns, and recurrence risk.
Sajjad et al 2024, UK	All adult bystanders	74bystanders (59 known, 15 unknown) were registered; 1% declined and four were <18 years. Website engagement was high (94%), with ~15 return visits per bystander, and four requested liaison officer support		c. Early results showed high bystander registration and sustained website engagement, with rapid PLO follow-up when requested.

Abbreviations: GP (general practitioner); ROSC (return of spontaneous circulation); CR (citizen responders); EMS (emergency medical services); FAP (first aid responder); ITQ (international trauma questionnaire); SCAF (sudden cardiac arrest foundation); HCP (health care professionals).

norms around OHCA or death or where there is limited mental/psychological health provision. Hence, more research is needed to understand why specific content and models are chosen in existing interventions to support context-sensitive adaptation to new locations.

Across identified interventions, debriefing varied widely in timing and format, ranging from early, informal contact to later, more structured sessions. Though specific delivery models differed, there were common underlying elements such as opportunities to ask questions, to have explanation and normalisation conversations, deliv-

ered flexibly over one or more sessions. This echoes the findings from psychological post-trauma literature, where early, information-focused contact and question–answer opportunities appear the most acceptable to trauma-exposed individuals.^{17,46} These are associated with greater engagement and satisfaction than highly structured, mandatory, single-session debriefs delivered soon after an event.^{17,46,47}

Most interventions offered an explanation of the OHCA event/resuscitation, emotional support, normalisation of reactions and signposting to relevant resources. Five interventions explicitly included the option of referral to specialist mental-health services, but none reported referral uptake or engagement with these services. Gathering this information is essential to determine the proportion of bystanders who need referral to specialist services for planning or resource management, or to understand whether formal referral pathways should be a standard component of all interventions. The finding by Kragh et al that only 6.6% of bystanders had severe or moderate psychological impact suggests the need for further referral might be low but this needs further investigation.

Compared with psychological interventions developed for disasters, mass trauma, or critical incidents, the OHCA interventions identified here were generally lower intensity and less standardised, with limited or no use of formal trauma-focused therapies.^{45,46} This may be appropriate given that not all bystanders will develop persistent symptoms or experience psychological distress, but the absence of consistent reporting of intervention content or effect makes it difficult to determine which components may be essential to include.

A small number of interventions employed in-person contact. This may offer advantages in terms of rapport, personalisation, and the ability to respond to complex emotional reactions particularly when delivered by clinicians familiar with the specific clinical event (e.g. EMS staff, hospital teams, or GPs).^{47–49} This also aligns with broader evidence that face-to-face psychological interventions may be considered the first-line or best-practice in many contexts, particularly for individuals with high levels of distress.^{47–49} However, several support interventions also incorporated digital or remote elements to extend reach beyond the immediate event. These included follow-up short messaging service (SMS), app-based information, or online resources that could be accessed asynchronously. Such approaches parallel trends in digital mental health and post-trauma support, where online and blended models are increasingly used to overcome geographic barriers, reduce costs, and provide flexible support.^{47,50} In the OHCA context, publicly available digital resources may be especially valuable for reaching bystanders who are not easily identifiable at the scene or who prefer to remain anonymous.

Promotional routes for post-event support varied across interventions and included on-scene wallet cards or leaflets, dispatcher- or clinician-initiated telephone contact, app-triggered SMS messages following alert acceptance, and public-facing websites or social media platforms. Some limited descriptive data from two interventions^{27,28} suggested differential uptake across promotional channels with text message invitations and social media generating greater engagement than passive materials such as wallet cards or leaflets; however, no study has formally compared the effect or reach of different promotional routes. The routes chosen in the included interventions appear to align with different points at which bystanders may be most reachable, at the scene, shortly after contact with emergency services, or later through online web searches. The absence

of comparative evaluation limits understanding of which promotional methods are most effective, and critically, which groups of bystanders may not be reached, highlighting an important area for future research and service design.

The strength of this scoping review lies in the diverse range of data sources included, using both traditional peer-reviewed published literature, grey literature and experts in the field to identify existing bystander support interventions. The review followed established methodological guidance for scoping reviews and used a comprehensive search strategy across multiple databases. However, several limitations should be acknowledged. Unpublished interventions are challenging to identify systematically, which may explain why only interventions from Western countries were identified. The research team, based in the UK, may also have had greater visibility of English-language or Western initiatives when searching grey literature sources. In addition, consistent with scoping review methodology, no formal critical appraisal of included studies was undertaken, and therefore the quality of the underlying evidence was not assessed in this review.

Most of the included studies reported bystander characteristics, intervention uptake, and satisfaction as well as some information on promotion routes.²⁷ We need to find ways to identify and follow up bystanders to allow recruitment into future high-quality studies to determine which interventions are most effective. Further research is also needed to identify the primary outcome for these studies, whether it should be domain-specific, such as psychological distress, or more generic quality-of-life measures. Effort should be made to include bystander populations who are underrepresented in current research including: non-family bystanders, citizen/volunteer responders and populations from non-Western healthcare systems. Routes for promotion should also be investigated and evaluated given that bystanders do not come through traditional health systems as “patients” and need to know a support service exists in order to participate in it.

Conclusion

New support interventions for bystanders involved in OHCA are emerging, particularly in Western countries. The most common component of these interventions is information-giving, with the majority also providing debriefing and psychological support. However, more research is needed on the most effective ways to promote these interventions and on the effects of these interventions on outcomes important to bystanders.

Availability of data and other materials

No new data was generated in this study.

CRedit authorship contribution statement

Uzma Sajjad: Writing – original draft, Project administration, Methodology, Formal analysis, Data curation, Conceptualization. **Marco Mion:** Writing – review & editing, Methodology, Conceptualization. **Sarosh Khan:** Writing – review & editing, Methodology. **Thomas W. Lindner:** Writing – review & editing, Visualization, Conceptualization. **Nilesh Pareek:** Writing – review & editing, Visu-

alization, Conceptualization. **Thomas R. Keeble:** Writing – review & editing, Visualization, Formal analysis, Conceptualization. **Vicky L. Joshi:** Writing – review & editing, Visualization, Supervision, Project administration, Methodology, Formal analysis, Data curation, Conceptualization.

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Appendix A. Supplementary material

Supplementary material to this article can be found online at <https://doi.org/10.1016/j.resuscitation.2026.111202>.

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