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A Spectrum of Emotional Responses: How Emergency Dispatch Staff Interpret Obstacles to Performing CPR During Out-of-Hospital Cardiac Arrests

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Abstract

This study set out to understand how emergency dispatch staff interpret the primary obstacles that prevent CPR from being started during calls for out-of-hospital cardiac arrest. A total of thirty call-handlers from seven ambulance control centres across the UK were selected through purposive sampling and took part in in-depth, semi-structured interviews. These conversations examined their day-to-day experiences guiding callers through CPR and their views on the factors that most commonly hinder its initiation. The participants (20 women, 9 men, and 1 non-binary individual), aged between 21 and 57 years and possessing between six months and twenty-five years of experience, reported confidence levels ranging from 3 to 10 out of 10. All had familiarity with NHS Pathways and MPDS, and most handled at least one CPR-related call per shift. Nearly all interviewees noted that barriers to CPR emerged frequently. They described a range of impediments, with intense emotional reactions from callers being the most prominent. Additional challenges included physical limitations related to the caller, patient, or environment; uncertainty about the necessity of CPR—especially confusion around breathing status; and anxiety about causing potential harm. Call-handlers emphasized that these elements often interact, making every call complex in a different way. They also outlined difficulties arising in ambiguous scenarios such as care-home situations, involvement of carers, DNACPR considerations, and identified factors that could help overcome these barriers. The obstacles highlighted by call-handlers mirror those documented in previous research while also drawing attention to issues not fully addressed in existing protocols. Their insights offer a useful foundation for refining guidance systems and enhancing the effectiveness of telephone-delivered CPR instructions.

Keywords: Emergency medical service communication systems, Cardiopulmonary resuscitation, out of hospital, Cardiac arrest

Introduction

Bystander cardiopulmonary resuscitation (CPR) during out-of-hospital cardiac arrest (OHCA) improves survival; however, it frequently does not occur before emergency services arrive [1-3]. To enhance CPR rates and consequently OHCA survival, dispatcher-assisted CPR (DA-CPR), also known as telephone- or telecommunicator-assisted CPR (T-CPR), has been widely adopted internationally, in which trained call-handlers provide live instructions to callers on how to perform CPR [4, 5]. DA-CPR has been shown to increase the likelihood of bystander CPR [6-9] and improve survival following OHCA [6, 10-12], yet CPR is not consistently delivered [13-15], and the time to CPR initiation can vary substantially even when highly protocolised DA-CPR instructions are followed [16].

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Research exploring barriers to CPR in the context of dispatcher assistance remains limited, though evidence has been growing in recent years [17-21]. Most studies rely on analyses of registry data and call recordings [18–28], identifying communication difficulties [19-22], emotional factors [19, 21, 23, 24], and physical challenges [19, 21, 25, 26, 28] as frequent obstacles to DA-CPR. Emerging strategies to enhance DA-CPR effectiveness are also beginning to be reported [14, 29, 30]. Few investigations have focused on the perspectives of call-handlers themselves, despite their likely possession of valuable tacit knowledge [31]. Tacit knowledge develops through repeated clinical practice, whereby individuals refine their actions intuitively to achieve optimal outcomes [32]. Understanding the tacit knowledge of those providing CPR instructions by phone is therefore crucial to inform interventions aimed at improving effectiveness.

Aim

This study aimed to examine call-handlers' perceptions of the primary barriers to achieving CPR during emergency calls to the ambulance service.

Materials and Methods

Design

A qualitative study using semi-structured interviews was conducted with staff in UK ambulance dispatch centres who provide CPR instructions (job titles varied but are referred to here as 'call-handlers').

Study setting

The study was conducted in UK Emergency Medical Dispatch Centres (EMDCs).

Participants

Call-handlers employed in UK EMDCs who were responsible for providing CPR instructions were eligible. No exclusion criteria were applied.

Sampling and sample size

Participants were recruited from seven EMDCs, chosen to represent the four UK countries and to ensure diversity in geographical location, urban versus rural settings, centre size, dispatch software used (MPDS and NHS Pathways), published outcomes for return of spontaneous circulation (ROSC) in OHCA [33], and Care Quality Commission ratings [34] **(Table 1)**. A purposive sample of 30 call-handlers was selected from 64 volunteers to achieve variation in age, gender, years of experience, and confidence in providing CPR instructions. Experiences were notably consistent across participants, so no further sampling for saturation was necessary **(Table 2)**.

Table 1. Characteristics of ambulance service

	Geography	Software	Population
Ambulance Service A	mix of rural & cities	MPDS	3–6 million
Ambulance Service B	mostly rural	Pathways	3–6 million
Ambulance Service C	urban	MPDS	>6 million
Ambulance Service D	mix of rural & cities	MPDS	>6 million
Ambulance Service E	mix of rural & cities	MPDS	<3 million
Ambulance Service F	mix of rural & cities	MPDS	3–6 million
Ambulance Service G	mix of rural & cities	MPDS	<3 million

Table 2. Participant characteristics

Participant ID	Ambulance Service	Age (years)	Years of professional experience	Self-reported confidence level (0–10)	Gender
P101	Service F	27	4.5	9	Female
P103	Service F	22	1	7	Male
P104	Service F	45	0.83	6	Female
P105	Service F	27	1	5	Female
P110	Service F	57	8.5	9	Female
P113	Service A	35	4	10	Female
P114	Service A	26	5	9	Male
P118	Service A	39	3.5	9	Female
P119	Service C	31	2	9	Female
P120	Service A	53	13.5	10	Female
P123	Service C	35	8	9	Female
P124	Service C	23	0.5	3	Male
P126	Service C	39	0.5	8	Female

P127	Service C	52	3	8	Female
P128	Service E	33	8	10	Male
P133	Service E	26	1.3	9	Female
P134	Service C	34	9	7	Female
P135	Service E	32	1	8	Male
P137	Service E	36	18.5	10	Female
P140	Service D	24	1.5	10	Male
P143	Service D	58	25	10	Female
P144	Service D	36	6	10	Female
P145	Service D	59	19	10	Female
P152	Service G	44	2	9	Female
P154	Service G	27	6	9	Male
P155	Service B	51	8	9	Female
P156	Service B	21	1	8	Male
P161	[Data withheld]*		4	7.5	Non-binary
P163	Service B	46	12	9	Male
P164	Service B	27	2	10	Female

*Service affiliation and age withheld to protect participant confidentiality.

Procedures

The study received ethical clearance from the NHS Invasive & Clinical Research Committee at the University of Stirling (Ref: 0539 25/02/2021), as well as approval from the Research and Development teams at each participating site, before any participant contact occurred. EMDC identified eligible candidates, who were then invited to participate through emails and staff bulletins. Individuals who expressed interest contacted the research team via phone or email, were given the chance to ask questions, and provided written informed consent prior to any data collection.

Semi-structured qualitative interviews were carried out with consenting call-handlers to explore their experiences in giving CPR instructions, their perspectives on common obstacles, and the strategies they employ to encourage CPR initiation. The topic guide was developed based on the authors' expertise and literature review to investigate this relatively underexamined area.

Due to restrictions imposed by COVID-19, interviews were conducted online using Teams or Zoom according to participant preference. With participants' consent, sessions were audio-recorded on an encrypted device, transcribed verbatim, anonymised, and imported into NVivo v14 for coding. Participants received a £50 voucher to acknowledge their contribution.

Analysis

Transcripts were anonymised and analyzed by BF and RO using a modified grounded theory methodology. A coding framework was created by combining predetermined research questions with themes that emerged inductively during data familiarisation. The analysis followed a constant comparison method, involving iterative reflection and comparison of data within and between interviews [35, 36]. Each sentence or paragraph was assessed to determine whether it aligned with the existing framework or challenged emerging interpretations, prompting revisions as needed. Initially, half of the transcripts were coded using this preliminary framework, and after discussion and consensus between RO and BF, the refined framework was applied to all transcripts. Early 'analytic conversations' [37] between RO and BF helped align perspectives and focus on potentially significant themes. BF primarily concentrated on barriers and facilitators to CPR, while RO examined participants' experiences in greater depth, which will be explored in separate reports.

Results and Discussion

Participants

The study included call-handlers from seven ambulance services that differed in size, geography, and software platforms **(Table 1)**, with ROSC rates ranging from 10% to 29% and CQC ratings from 'requires improvement' to 'outstanding'. Thirty call-handlers participated, aged between 21 and 57 years; 20 identified as female, 9 as male, and 1 as non-binary. Their experience ranged from 6 months to 25 years, and self-reported confidence in providing CPR instructions ranged from 3/10 (among the least experienced) to 10/10. At least two participants were recruited from each ambulance service and each UK nation. Five participants used NHS Pathways, while the remainder used MPDS **(Table 2)**.

Frequency of CPR calls

Call-handlers reported that CPR calls were a routine part of their work, though they did not occur frequently, with participants experiencing anywhere from 0 to 9 calls per day that required CPR guidance. On average, call-

handlers expected to handle roughly one CPR call per shift, but emphasised that the timing and number of such calls were unpredictable and could vary widely.
"Sometimes it feels like that's all you do; you can have a day filled with CPR calls one after another, and then go for weeks without any" (P161, non-binary, 4 years' experience).

Barriers to CPR
Participants indicated that obstacles during CPR calls ranged from rare to almost every call, reflecting differences in personal experience or in what they considered a 'delay' or 'interruption': "It depends on how you define a hold-up; honestly, I think every single call encounters some sort of interruption at some point" (P155, 51, female, 8 years' experience). Most call-handlers suggested that delays occurred in the majority of calls.
Four main barriers were consistently highlighted: intense emotional reactions from callers, physical limitations, uncertainty about whether CPR was necessary, and fears of causing harm. Additional challenges reported by at least a third of participants included situations where the patient was a stranger, multiple urgent issues occurring simultaneously, COVID-related concerns, callers struggling to comprehend instructions, uncooperative or physically incapable callers, trauma-related cardiac arrests, system-related difficulties (such as trouble accessing CPR guidance mid-call), and cases where the rescuer was a professional carer or working in a nursing home.

Emotional barriers
Strong emotional responses were frequently identified as a major obstacle to initiating CPR. Callers often had difficulty hearing or following instructions: "They can't really focus on what you're saying; they just don't seem able to take in the instructions" (P145, 59, female, 19 years' experience), or they processed information very slowly:
"I was counting compressions and thinking, 'there's no way she's doing this correctly, I don't think she's actually hearing me, none of this is getting through,' and I wasn't even sure she had the phone to her ear because all I could hear was screaming" (P105, 27, female, 1 year experience).
Call-handlers also described how callers' intense emotions could affect their own ability to manage the call. Calls involving suicides, child deaths, or abusive situations were perceived as particularly challenging, especially when the caller was a close relative, due to heightened emotional distress. Callers were often described as "in a panic," "yelling" (P105, 27, female, 1 year experience), or "screaming that the patient was dead" (P119, 31, female, 2 years' experience), making it difficult to even obtain the location of the incident, let alone guide CPR effectively (P110, 57, female, 8.5 years' experience).
"When I receive a CPR call, the caller is almost always extremely stressed, upset, frantic – you can imagine all sorts of emotions" (P163, 46, male, 1 year experience).

Physical barriers
Physical challenges were reported for both rescuers and patients. Some call-handlers noted that their own age, medical conditions, or physical limitations could hinder their ability to provide instructions effectively. Patient-related difficulties most commonly involved moving or positioning heavier individuals: "'I can't lift him; I weigh nine stone and he's 15 stone'" (P120, 53, female, 13.5 years' experience). Complicated environments, such as patients being trapped between furniture or inside vehicles, further hindered efforts. The majority of physical difficulties arose when attempting to place patients flat on their backs:
"Getting a patient off a bed or out of a chair and onto the floor is usually the hardest part, especially for older patients; positioning them flat on their back can be very challenging" (P105, 27, female, 1 year experience).
Some participants noted that physical limitations could also reduce the quality and duration of CPR: "The rescuer might have a heart condition or asthma; while it might not stop them from performing CPR, it could limit their endurance and ability to maintain compressions" (P152, 44, female, 2 years' experience).

Uncertainty about whether CPR was needed
Breathing or Not?
A common source of uncertainty for call-handlers was whether the patient was actually breathing. Callers frequently mistook agonal or irregular breathing for normal respiration, making it challenging to persuade them to begin CPR.
"Sometimes they insist, 'oh yes, they're breathing,' but in the background you can clearly hear it's abnormal gasping" (P101, 27, female, 4.5 years' experience).
Assessing breathing over the phone was often described as difficult. Several call-handlers noted that callers sometimes confused 'breathing' with 'bleeding,' especially when there were language or communication barriers. Many callers simply lacked the knowledge to determine whether someone was breathing, complicating the assessment. More experienced call-handlers could occasionally detect agonal breathing from background sounds, whereas newer staff often struggled:

"When you're new, it's easy to be swayed by the caller that the patient is breathing, and you end up going in circles" (P105, 27, female, 1 year experience).
Some call-handlers also reported that callers struggled to follow the breathing assessment tool, which involves saying 'now' each time the patient inhales so the handler can gauge the rate:
"You tell them, 'say "now" every time he breathes,' and they just stop. You ask, 'was he breathing?' They say, 'yeah,' but they forget to keep saying 'now.' I've had to restart this tool five times and keep saying, 'only stop when I say,' while they keep getting distracted. It's frustrating" (P137, 36, female, 18.5 years' experience).

Already Beyond Help?
Determining whether CPR was appropriate was also complicated when callers believed the patient was already deceased. Call-handlers noted that instructions to withhold CPR are limited to very specific situations, such as when the patient is described as cold and stiff in a warm environment or in extreme cases like decapitation. Nevertheless, callers often declared, "they're gone" or "he's dead," even when CPR might still be beneficial, delaying initiation:
"Trying to get someone to do CPR when they're insisting, 'I can't, he's dead,' is very difficult, especially when it's not an obvious death" (P133, 26, female, 1 year experience).

Concerns about Appropriateness
Call-handlers also reported that callers sometimes hesitated to start CPR on older patients: "You hear comments like, 'I guess their time's up'" (P123, 35, female, 8 years' experience). Similar uncertainty arose for patients with terminal illness: "Callers may be unsure if CPR is appropriate, or if the patient had a DNAR in place, they might not even know the patient's wishes" (P103, 22, male, 1 year experience).
Ambiguous DNAR arrangements frequently caused confusion, particularly for care home calls.
"Most care home residents have DNARs, but we can't see them, so we can't tell staff not to do CPR. It's up to the ambulance crew when they arrive, but usually the staff are hesitant to act" (P164, 27, female, 2 years' experience).
Experiences with care home or professional carers were mixed. Some call-handlers found these calls easier because carers were less emotionally involved (P154, 27, male, 6 years' experience), while others noted problems: some carers were highly distressed, despite their professional experience (P155, 51, female, 8 years' experience). Call-handlers empathised with young or inexperienced carers, though some were indifferent or unwilling to perform CPR. A common misconception among carers was that patients who had fallen could not be moved, complicating CPR instructions:
"It's tough convincing them that they can move a patient from the floor and start compressions, even though they think it's not allowed" (P135, 32, male, 1 year experience).
Uncertainty was not limited to carers; some fully trained healthcare staff also showed hesitation, surprising call-handlers who expected them to act independently:
"I shouldn't have to persuade a healthcare professional to start CPR. They should know what to do and begin before calling me; I'm not medically trained, you are" (P135, 32, male, 1 year experience).

Facilitating factors
Although the interview questions were primarily aimed at exploring obstacles to CPR (see Supplementary File 1), several participants spontaneously identified factors that made CPR easier to perform. Four call-handlers noted that children were generally more responsive to instructions, likely because they follow guidance without much questioning:
"Kids are incredible. Often I'll ask, 'how old are you?' and they'll say, 'seven' … and it's amazing. It makes me pause and think… it shows that if people just follow the instructions and respond to questions as asked, many of the problems we face could be avoided" (P127, 52, female, 3 years' experience).
The adoption of compression-only CPR during the COVID-19 pandemic was viewed positively, as it simplified instructions for call-handlers and removed hesitancy related to performing rescue breaths. Other facilitators mentioned included callers remaining calm and having multiple rescuers at the scene who could take on different roles, though managing several people simultaneously could sometimes introduce its own challenges.
Across the UK, call-handlers consistently identified similar obstacles to CPR, with almost all highlighting intense emotions, physical limitations, uncertainty about whether CPR was necessary, and callers' concerns about causing harm. These barriers align with findings from studies analysing call recordings [19, 21, 28, 23–26] and examining difficulties in recognising cardiac arrest [38]. Likewise, qualitative research exploring call-handlers' experiences has previously emphasised emotional responses [38–40], physical challenges [39], and difficulties in recognising cardiac arrest [39, 41].
With accumulating evidence about the most common impediments to DA-CPR, it is timely to equip call-handlers with strategies to overcome these barriers. For example, training in persuasive communication has been shown to reduce time to first compression and increase ROSC [42]. Our team is investigating whether integrating behaviour

change techniques into specific phrases could help call-handlers address the most frequent obstacles and achieve faster CPR.

This study adds to existing qualitative literature by demonstrating that, despite the protocol-driven nature of their role, call-handlers develop significant tacit knowledge. All participants reported that CPR calls were the most critical calls they handled. Even in the limited quotations presented here, it is evident that call-handlers reflect on previous calls, understand the caller's perspective, and recognise recurring patterns that hinder CPR. Leveraging this experiential knowledge may be a valuable approach for improving DA-CPR, and further efforts should be made to explore and utilise it. Alongside identifying barriers, our team is also analysing the tacit strategies call-handlers consider effective in facilitating CPR.

The combined experience of our participants provided nuanced insights into challenges unique to calls from care homes and healthcare professionals—details that may be difficult to capture through call sampling alone. Ambulance services may benefit from targeted initiatives to optimise procedures for health and care staff. Participants emphasised that each call represents a complex intersection of multiple issues that can delay CPR, making every situation unique and not always addressed by protocols. Call-handlers' perspectives can help identify priorities for improving response, yet many reported feeling under-consulted and undervalued—a sentiment noted in other research [40, 41].

Strengths and limitations

One key strength of this study is that it captured rich, detailed insights from a relatively large and diverse group of call-handlers across seven ambulance services spanning all four nations of the UK. This enabled an in-depth exploration and explanation of call-handlers' perspectives on barriers to CPR, providing a level of detail not previously reported. Including participant quotations offered a vivid, contextualised understanding of how these barriers are experienced in practice.

However, there are limitations to this approach. Although call-handlers were encouraged to share personal experiences, CPR calls are often discussed among colleagues, which may shape perceptions and introduce confirmation bias or 'groupthink' in responses. Despite this, the consistency of these findings with studies employing other methodologies, such as registry analyses or retrospective reviews of call recordings, supports the credibility of the data.

Conclusion

Handling CPR calls is a critical component of the call-handlers' role, and participants demonstrated a strong commitment to initiating CPR as promptly as possible. Call-handlers consistently identified key obstacles—intense emotions, physical challenges, uncertainty about the need for CPR, and concerns about causing harm—and provided detailed insight into how these factors can delay CPR initiation. While these barriers align with those observed in call-recording and registry studies, this study also highlighted complexities in ambiguous situations, such as those involving carers, care homes, and DNACPR considerations. Insights from call-handlers can inform priorities for refining protocols and enhancing the effectiveness of CPR instruction.

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