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I don't want to put myself in harm's way trying to help somebody: Public knowledge and attitudes towards bystander CPR in North East England – findings from a qualitative interview study

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ABSTRACT

Background: Bystander cardiopulmonary resuscitation (BCPR), and public access defibrillator (PAD) use are essential links in the 'Chain of Survival' for out of hospital cardiac arrest (OHCA). In England, BCPR is delivered in only 40% of cases and population-level studies suggest this may be because of lower socio-economic status (SES). There is little qualitative evidence exploring BCPR and SES in Northern England. The aim of this study was to explore the perceptions and willingness of members of the public to deliver BCPR and use a PAD in communities of varying SES across Northern England.

Methods: In-depth interviews between September 2021–January 2022 with 20 participants. Interviews were transcribed verbatim and analysed using reflexive thematic analysis.

Findings: Perceptions and attitudes towards BCPR were underpinned by multiple, intersecting factors, contextualised by the individual's unique societal position. A poor understanding of BCPR and very limited knowledge of PAD use was identified, precipitated by language and education marginalisation. Willingness and confidence to attempt BCPR was driven by a sense of social cohesion. Barriers to delivering BCPR initiatives centred upon difficulties with engagement in all communities, particularly closed communities and those not in employment.

Conclusions: Willingness and ability to deliver BCPR lie beyond SES alone. Future initiatives to improve rates of BCPR should take an intersectional, place-based approach, and be co-developed in conjunction with local communities and delivered in a format that people find convenient. Further research is required to understand how targeted initiatives should be delivered and how these result in improved outcomes from OHCA.

1. Introduction

Out of hospital cardiac arrest (OHCA) is the sudden cessation of effective circulation due to the absence of cardiac pump function, in an out of hospital setting (Myat et al., 2018). Bystander cardiopulmonary resuscitation (BCPR), CPR delivered by lay providers prior to the arrival of emergency medical services, is an essential link in the 'Chain of Survival' for OHCA (Perkins et al., 2015). Patients with ventricular fibrillation (VF) or pulseless ventricular tachycardia (pVT) can be treated by transthoracic electrical shocks using an automated external defibrillator (AED). Rapid defibrillation delivered by bystanders using public access defibrillators (PADs) and early initiation of chest compressions are known to improve survival (Pollack et al., 2018). For every 30 patients receiving BCPR, one additional life will be saved (Sasson et al., 2010). In the UK, National Health Service (NHS) ambulance services treat approximately 30,000 OHCA's annually but the survival rate in England

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remains persistently poor at around 7–8% (Riva et al., 2019). This has been attributed in part to the low rate of BCPR, which registry data suggests is undertaken in only 40% of OHCA's (Hawkes et al., 2017).

Populations living in socially deprived areas are more likely to suffer an OHCA but are less likely to receive BCPR or treatment from a PAD, making deprived communities doubly disadvantaged (Dobbie et al., 2020). This has previously been correlated with socio-economic status (SES) related to lower income, lower education level, and higher percentage of older or ethnically diverse populations (Vadeboncoeur et al., 2008; Root et al., 2013; Fosbol et al., 2014). However, SES and population diversity vary across different regions in England, and it remains unclear if the influence of these factors is universal. Further, recent developments in the broader field of health inequalities have argued that exploration of SES and/or area level deprivation alone may mask important characteristics within local communities and places (Bambra, 2022). Much previous research focusing on geographical inequalities has focused upon examining area-level deprivation framed through a compositional-contextual lens, with any demonstrated relationships driven by vertical macro-economic and political/policy drivers (Cummins et al., 2007).

Instead, a growing body of work has recognised the importance of how geographical place and space, in other words that where we live, work and play, can interact with other axes of inequality in order to have more nuanced influences on our health and the care we experience (Bambra et al., 2019). In other words, the experiences residents have in Byker, a ward in Newcastle, may be vastly different (and warrant different responses) than that which is experienced in Lewisham, London. In particular, intersectionality has emerged here as a critical theoretical and methodological framework which can be used to examine inequalities beyond simple markers (Abrams et al., 2020). This approach recognises that the characteristics of individuals are influenced by the characteristics of the area. In doing so, it takes a relational approach in order to understand how compositional and contextual factors interact to produce geographical inequalities in health and seeks to integrate individual compositional level factors with horizontal contextual factors (Bambra, 2022; Cummins et al., 2007). In this vein, place-based community initiatives may have a role to play in building collective control and improving health and health equity within smaller community boundaries or parameters (Egan et al., 2021; McGowan et al., 2022). Indeed, there is increasing, powerful evidence demonstrating associations between individual and collective control over the places in which we live and better health outcomes (McGowan et al., 2019).

Previous (predominantly quantitative) research has linked rates of BCPR and PAD use with socio-economic status and area-level deprivation. This body of research also suggests that barriers in public willingness to deliver BCPR include fear of injuring the patient by performing BCPR incorrectly, the physical ability of the bystander to perform BCPR, litigation and risk of disease transmission (Bradley and Rea, 2011; Swor et al., 2006; Kanstad et al., 2011). However, much of this data derive from population level studies and fail to consider the nuances that may exist within the deprived communities in which BCPR is less likely to occur. Identification of individual and community, rather than population, level factors, and improved understanding of how these factors influence the behaviour of local populations towards BCPR and PAD use, are essential considerations when developing targeted initiatives and policy regarding improving survival rates from OHCA. To our knowledge no published qualitative research has been conducted in Northern England which has a higher than average incidence of OHCA but lower rates of BCPR (Brown et al., 2019). Therefore, the aim of this qualitative study was to explore the perceptions, experience and willingness of individuals to deliver BCPR and use a PAD in communities of varying SES across Northern England.

2. Methods and materials

2.1. Study design and setting

This study is reported using the consolidated criteria for reporting qualitative research (COREQ) guidelines (Tong et al., 2007). A qualitative study using semi-structured interviews was conducted between September 2021 and January 2022, in areas of varying SES across Northern England and North Cumbria (NENC) and formed one phase of a broader mixed methods project focused on understanding the role of health and social inequalities within BCPR (Charlton et al., 2022). This paper reports findings from the qualitative phase of data collection only. As a region in England, NENC has a higher proportion of people living in the 20% most deprived areas than the national average; in 2020/21, it also overtook London to have the highest rate of child poverty in the UK (North East Child Poverty Commission, 2022). This geographical study setting is important, with the impacts of de-industrialisation of coal and steel industry in the 1980s still keenly felt in some areas (Forster et al., 2018). Such trends have continued under austerity and have been exacerbated further during the Coronavirus pandemic and the ensuing cost of living crisis that we now face. It is these conditions that have seen NENC hit harder by cuts in spending, leaving it vulnerable to further welfare and public sector cutbacks (Ford et al., 2021). Meanwhile, NENC faces the additional challenge of increasing rural inequality, with the region covering a large geographical area coupled with a relatively small population (Corris et al., 2020).

2.2. Sampling and recruitment

All participants resided in NENC and were identified from those who took part in a survey conducted during an earlier phase of the study (Charlton et al., 2022). The researchers reached these participants by targeting busy commercial areas such as shopping centres and precincts within areas of varying SES, from least to most deprived. From those taking part in the survey ($n = 601$), two hundred and seventy-seven participants gave consent to be re-contacted for interview. Participants were then purposively sampled according to SES, age and gender and the researchers balanced the final sample regarding these characteristics SES was classified using the Index of Multiple Deprivation (IMD) decile (where 1 is 'most deprived' and 10 is 'least deprived') (English Indices of Deprivation, 2019) and determined by participant home postcodes. Whilst the researchers recruited interview participants in communities of varying SES, it is important to note that, in itself, NENC has comparatively higher levels of deprivation than elsewhere in England, often described as 'the North-South divide' (Copelend et al., 2015). Sample size was ultimately guided by: the breadth and focus of the research aims and objectives; the demands placed on participants; the depth of data likely generated; pragmatic constraints; and the analytic goals and purpose of the overall project (Braun & Clarke, 2021 a[a]).

2.3. Study participants and data collection

All participants from the survey phase of the study expressing an interest in participating in a follow-up interview received a study information leaflet which included details about the researchers' credentials, reasons for conducting this study and an assurance of anonymity. Eligible participants were aged $\geq$18 years, had mental capacity to provide informed written consent and agreed to be interviewed. The researchers wore ambulance service uniform for both the interviews and preceding survey in order to promote recruitment, a decision which we reflect upon later in this manuscript. Team members who conducted interviews [LB, EB & KC] varied depending on availability. Interviews took place in participant homes, their workplace, on the telephone or online via Microsoft Teams, according to participant preference and within the constraints of Coronavirus restrictions. All interviews were audio-recorded and observational fieldnotes taken and maintained in a research diary. Interviews were semi-structured and steered by a topic guide based on the survey (Supplementary file 1) and then modified iteratively, allowing space to continually re-evaluate emergent findings and perspectives.

2.4. Ethics

Health Research Authority approval was not required as participants were members of the public in non-healthcare settings, and were not patients (IRAS: 299065, 4th May 2021). The study received ethical approval from NEAS Research Ethics Committee on 1st July 2021 (NEAS/2021/299065). All interview participants provided informed consent prior to interview.

2.5. Data analysis

Primary data comprised interview transcriptions and fieldnotes. Interviews were transcribed verbatim and analysed using reflexive thematic analysis (Braun & Clarke, 2019). Reflexive thematic analysis involves the coding of qualitative data into conceptual categories in order to identify patterns and relationships between themes in these data leading to a theoretical explanation of the studied topic. Further, by taking a reflexive approach to thematic analysis, we advocate a coding approach which is collaborative and reflexive, designed to develop a richer more nuanced reading of the data, rather than simply to seek consensus on meaning (Braun & Clarke, 2021 ab). Thus, in this study, all transcripts were coded by either LB or TD, with TD coding 6 transcripts and LB coding the remainder, 20% of transcripts (n = 5) were also independently double coded by SS. This was designed to add rigour but also to allow for differing interpretations of data, and themes were discussed and challenged at regular, collaborative analysis meetings, using a process defined as pragmatic double coding (Barbour, 2003). Transcripts were first coded line-by-line and then systematically indexed into data tables to generate detailed descriptive themes. These descriptive themes were compared to identify patterns, similarities and differences in the data, and relationships between them elaborated, in order to generate analytical themes, and a consistent interpretation of the dataset as a whole (**A1**).

2.6. Findings

Twenty in-depth semi-structured interviews were conducted (10 = Male, 10 = Female). The age range of participants was 21–73 years (mean = 50 years) and IMD ranged 1 to 10 (median = 4.5). Eleven interviews were conducted face-to-face (55%). Participant characteristics (gender, age, indices of deprivation, ethnicity) and interview mode are presented below (Table 1). Mean interview length was 49 min.

Data analysis yielded four broad themes; 1) Knowledge, understanding and experience of CPR and PAD (termed as defibrillators by participants, hereafter) use, 2) Factors affecting willingness and confidence to perform CPR and use a PAD, 3) Barriers to delivering BCPR, and 4) Future initiatives.

2.6.1. Theme 1. Knowledge, understanding and experience of CPR and PADs

Participants described what they perceived as a cardiac arrest and when BCPR would be required. Correct understanding was variable and limited in most cases and had been acquired during practical training, or passively through films and television. When participants had received training, it was largely related to work. The benefits of CPR training seemed to be tactile, by creating muscle memory, and increased familiarisation with CPR. Motivators for learning CPR included people having their own family and wanting to feel helpful rather than helpless. Barriers discussed included the financial costs associated with BCPR training and working in an environment where others already know how to provide CPR.

Table 1
Participant characteristics.

Participant Number	Indices of Multiple Deprivation[a]	Age (years)	Gender	Ethnicity	Interview mode
1	1	56	Female	White	Face to face
2	3	66	Male	White	Face to face
3	9	66	Female	White	Face to face
4	4	41	Male	Other (Free text Kurdish)	Face to face
5	10	40	Female	Asian or Asian British	Face to face
6	4	21	Male	White	Face to face
7	4	33	Male	Black, African, Caribbean or Black British	Face to face
8	8	48	Female	White	Face to face
9	6	42	Female	White	Telephone
10	9	57	Male	White	Online
11	5	71	Male	White	Face to face
12	3	59	Male	White	Face to face
13	1	24	Female	White	Face to face
14	10	37	Male	Asian or Asian British	Online
15	1	33	Female	White	Telephone
16	9	73	Female	White	Telephone
17	1	66	Female	White	Online
18	9	43	Male	White	Telephone
19	8	72	Male	White	Telephone
20	1	46	Female	White	Telephone

[a] 1 = most deprived, 10 = least deprived.

Furthermore, whilst some participants were confident in their understanding and ability to deliver BCPR, others expressed frustration and regret with their lack of knowledge,

> *"very frustrating … I know what CPR is … how to position my hands … how to hold my hands … But I can't remember what order to do things in, or how many times to push, and how many times to breathe … which means that I might not be doing it effectively which kind of makes me pointless" (P18, Male, age 43).*

Symptoms of cardiac arrest were often confused with those of myocardial infarction and the term of cardiac arrest was poorly understood. A participant with good knowledge of CPR described the confusion that use of medical terms can create,

> *"it was the words … doesn't directly say that person is like unresponsive … I'd be like 'what is a cardiac arrest?' … it would be like does the person need help? Are they unresponsive? Are they doing such and such?..Which obviously, all leads to mean that they're in cardiac arrest, but I wouldn't know that straight off the bat." (P13, Female, age 24).*

Several interview participants expressed a poor understanding of how to locate and use a PAD, when it's use would be needed and there were several misconceptions about PAD use. Just two participants had 'lived through' real OHCA events where lay resuscitation had been delivered, reinforcing the notion that high profile community events and personal loss result in long lasting memories. One of these participants had experience of providing BCPR whilst the other had provided bystander mouth to mouth resuscitation only. The person recounting their experience of providing BCPR had evocative memories, yet still expressed a natural instinct to help,

> *"it was scary, and it was horrible … I can still taste, taste it, I can still smell it … everything you read about that could be it, it was there and sick … but you still did it … I remember hearing the ribs crack … and I mean that minute that you heard him breathing again, was just, it was, it was like amazing … it wasn't nice, but I would definitely do it again" (P8, Female, age 48).*

> *"at the time when I did that CPR … it was mouth to mouth … no it wasn't the most pleasant thing … but at the end of the day, it, it helped him"* (P8, Female, age 48).

For the participant who provided bystander mouth to mouth resuscitation, they spoke of viewing the health advisor (usually an emergency call handler, the first point of contact for people calling the 999-service (NHS Professionals, 2022) as someone more knowledgeable and their advice gave them confidence and 'permission' to perform CPR.

2.6.2. Theme 2. Factors affecting willingness and confidence to perform CPR and use a PAD

In this theme participants explored the specific factors that affected their willingness to intervene in an OHCA such as the risk of potential litigation, exacerbating or causing injuries to the patient, the consequences of inappropriate CPR and PAD use, differences in providing BCPR to the different genders and personal safety. Participants expressed a general desire to help in OHCA situations, nevertheless, these factors were at the fore of participants' concerns.

> "*I want to help, but in the process of helping, if it didn't go very right, I might actually be sued … I would withdraw from doing it … Because I don't want to put myself in harm's way trying to help somebody" (P7, Male, age 33).*

Two female participants expressed concern for their personal safety with regard to violence towards women and concern the person may be faking collapse. Two males were specifically concerned about attaching the PAD to the bare skin of a female, although one confirmed they would be comfortable performing mouth to mouth and chest compressions,

> *"I don't know if I'd be … confident enough to … if it was a female, I'd be very embarrassed if I had to open her clothes. 'Cause I thought it would just work on your clothes". (P11, Male, age 71).*

Mixed opinions were expressed about helping people of varying familiarity, with some participants being less willing to help a stranger. Reasons given included not wanting the responsibility for others, concerns over personal safety and the requirement to be in close physical proximity, especially if the patient appeared unkempt. Nevertheless, other participants discussed a genuine willingness to help everyone irrespective of appearance or familiarity,

> *"if it was someone older I would help them, if it was someone younger I would help them, if it was someone a different colour I would help them, if it was someone, anyone, you just would" (P13, Female, age 24).*

When asked about whether they would be comfortable resuscitating a family member, participants spoke of being more anxious and emotional yet more adamant to try. As such, worry and anxiety could conceivably be lessened when resuscitating a stranger,

> *"somebody you don't know, you've got less inhibitions … they don't matter so much to me, so, well I'll give it a shot" (P18, Male, age 43).*

Several participants recalled their survey answers where they stated they would help individuals equally; upon reflection during interviews, they modified their response to being more willing to help family members, more so than individuals less familiar to them. Meanwhile, one participant changed their view in the opposite direction to say they would instead be willing to help all individuals irrespective of familiarity. This change occurred after reflecting upon the natural death of a close family member,

> *"you re-evaluate things slightly … 'cause it's stranger to me, but the person will have family and children and … would have loved ones … And if it was my relative, and there was somebody there that could possibly help and didn't, I wouldn't be very happy"* (*P12, Male, age 59*).

Knowing how to help the person could offset any guilt felt after a resuscitation attempt, especially if the patient was known to the rescuer. However, other participants described a lack of individual responsibility or obligation to help, illustrated well by P14:

> *"if my car breaks down, they send a mechanic. If someone breaks down, we send an ambulance and they'll deal with it" (P14, Male, age 37).*

Lack of training in, or knowledge and understanding of, CPR appeared to be associated with a reluctance to act and people not wanting the responsibility bestowed in a resuscitation situation. Conversely, increased knowledge of BCPR appeared to be associated with an increased likelihood to act. Differing views however were expressed regarding CPR training and whether it prepares bystanders with sufficient confidence and skills required to perform BCPR in real OHCA events. Some participants believed BCPR training introduced how a real-world cardiac arrest event would present and what to anticipate; this helped to reduce the anxiety surrounding these events. However, the participant with first-hand experience of resuscitation believed their training had failed to prepare them for the physical demands associated with providing BCPR.

> *"I don't think anybody, no matter how much training you do, it never would prepare you for actually doing it … because you don't appreciate the force that you have to use" (P8, Female, age 48)*

Reassurance and guidance from a health advisor regarding cardiac arrest recognition and the interventions required to provide CPR was almost always seen as helpful and reassuring by participants and resulted in seemingly increased bystander confidence and capability, even in those who had already received CPR training. On the other hand, a divergent view was that people on scene could be too emotionally upset to follow instructions,

> *"at the same time, as you're watching somebody dying … You're not going to be able to think about what somebody's telling you down a phone. You're gonna panic … And then you're worrying about are you doing it right, are you not doing it right (P15, Female, age 33)*

Conflicting views were expressed as to whether the presence of others on scene would be helpful or not. Nevertheless, if the other person were 'more trained' or a first aider, that seemed to provide reassurance and a relinquishing of control of the situation to the more qualified person. Meanwhile, participants held several misconceptions regarding how bystanders would interact with a PAD but expressed increased confidence after learning PADs provide verbal prompts and the decision to deliver a shock is taken by the PAD itself,

> *"it is just following instructions and I think I would be able to sort of disconnect and say right, press that button … I would be fine with that" (P6, Male, age 21).*

In relation to the Coronavirus pandemic, most participants believed it had no impact on their potential actions, although with the caveat of vaccination status providing them with a sense of reassurance and taking precautions such as mask wearing. Barriers specific to the pandemic were the person's own health concerns, as well as having caring responsibilities and the concern of virus transmission to their dependent. One participant was concerned about transmitting Coronavirus to the person in cardiac arrest, others were concerned about catching the virus themselves and the worry appeared more profound early in the pandemic,

> *"when it was early on, I– I don't think I would be would have been as willing ….there's a lot of fear in the community … um you did- didn't want to catch it … So, you kinda kept your distance …" (P9, Female, age 42).*

Pandemic aside, there was a pre-existing uneasiness around providing mouth to mouth rescue breaths, which was exacerbated during the pandemic and when the patient was a stranger. Most participants were unaware that this aspect of bystander resuscitation was no longer recommended. Discussions focussed on participants' awareness of this and how this would influence their behaviour regarding BCPR, and participants expressed relief when advised of this change,

> *"If I didn't have to do that* [mouth to mouth] *at all then I would, I would just crack on" (P12, Male, age 59).*

In linking the influence of the Coronavirus pandemic and willingness to help individuals of varying familiarity, several participants said they would help strangers and family equally. Other participants were more inclined to help family versus strangers, with uncertainty deriving from a strangers unknown Coronavirus status.

2.6.3. Theme 3. Barriers to delivering BCPR initiatives

Participants appeared to possess a desire to learn CPR and wanted to be able to help people in cardiac arrest. However, there were perceived barriers preventing participants from accessing BCPR training and opinions varied as to how any training could and should be delivered,

> *"for me, personally … face-to-face training in the community, would be something that I would absolutely, positively respond to … Quite interactive … But that's how I respond versus maybe for others, if you do like a YouTube video or something … And, so I do think it depends on who you're kind of dealing with" (P14, Male, age 37)*

> *"obviously everybody's different … I like to have something to read first, erm … before I,..watch a demonstration or anything like that" (P19, Male, Age 72)*

Participants suggested that initiating a conversation around knowledge of CPR created a natural inquisitiveness in people and piqued their interest to learn, especially in those who felt they had no need to know CPR. Two participants acknowledged that without the preliminary discussion of the survey they would have ignored any attempts to promote CPR tuition,

> *"something like this* [conversation] *first, would spur people on … if you had just seen me at the shops that day, and said there's a session on to do CPR, there's a leaflet it would probably honestly more than likely would have went in the bin … But when you start speaking about it … when you ask us questions … I go actually do I know that, it sort of gets you thinking to where now that I will do the CPR classes"* (*P13, Female, age 24*).

Emphasising CPR is a core skill in resuscitation, the role the public can play and the difference they can make to the outcome was suggested. That could also alleviate an individual's anxiety at the scene and help to limit any feelings of guilt afterwards,

> *"comes with giving the training to the public … You can't exactly say to people, 'by the way, you've got a part in this' and then not give them the tools to be part of that … Didn't just make the ambulance job's worthless" (P15, Female, age 33).*

Participants who had previously undertaken CPR training were aware recommendations may have changed. This caused confusion and anxiety, particularly if the individual believed their knowledge was out of date and could be harmful. For those who had undertaken CPR training more recently, refresher training, perhaps every 1–5 years, was considered valuable.

2.6.4. Theme 4. Future initiatives to improve uptake of BCPR

Through discussion of BCPR, and both existing and hypothetical training for BCPR, participants provided suggestions on how to improve BCPR uptake. Discussions were oriented around the geographical locality of possible training sessions and how these could be delivered, the potential for a role for community champions responsible for promoting BCPR training and awareness and the role of publicity campaigns.

For the practicalities of tuition, just under half of participants preferred interactive face-to-face training. Being able to receive feedback about their CPR performance was deemed to increase people's confidence thus addressing their previously discussed anxieties. Participants appeared to have less knowledge about PADs than CPR and suggested that allowing hands-on practice of PADs would also help reduce their fear and anxiety by increasing familiarity.

> "*Hugely, it's hugely important* [of knowing that the decision to shock would be made by defibrillator, not person]*, yeah, I didn't know it and that was one of the reasons that I wouldn't have wanted to try it*" (*P18, Male, age 43*).

Meanwhile, aligning with recommendations around place-based or community approaches emphasised in theme 3, participants preferred training being offered within their community, with the unique demographics of that community considered; and participants felt that some initiatives would need to prioritise locations accessible on foot. Allowing natural promotion by word of mouth within local communities was thought to be effective,

> *"once you've kind of tapped into one person, it just kind of spirals, doesn't it?"* (*P14, Male, age 37*).

Further, some also suggested exploiting already formed groups where there is a captive audience.

Emergence from the Coronavirus pandemic was mentioned both as ways to return to in-person events, as well as harnessing an increased sense of community spirit (in some regions) from the pandemic. Employing a community champion or central pillar of the community was viewed as beneficial and this person could be best placed to drive future initiatives. When promoting stories of successful resuscitation that was deemed more powerful if told from the perspective of the bystander and how they helped, highlighting that they too are just 'normal people',

> *"I think the other thing that would make training alive is someone actually talking through their kind of first-hand experience of dealing with someone in cardiac arrest … I think there's no substitute to someone like a real-life person" (P14, Male, age 37).*

This was deemed to encourage the notion that BCPR can be delivered by all and that positive outcomes can be achieved.

Views were mixed about the value of debriefing the bystander; one person actually changed their mind during answering this question. They started by saying

> *"yeah, I think possibly … having a de-brief in person, somebody just to say …" (P14, Male, age 37)*

Then the participant paused and approached the answer from a different perspective, suggesting that debriefs would be most beneficial when the resuscitation was not successful but would have to be delivered by someone qualified and empathic to the bystander's attempts, allaying any feelings of guilt,

> "*I think it would be useful, erm, if done right … It could, could easily be a 'ah yeah, I wouldn't have done that' … Then all of a sudden you have actually not made things any better, you've actually almost validated their guilt … the only purpose of a de-brief would be to make somebody who has actually got on gone and done their best … to feel that whatever they have achieved or not achieved, they still win for having tried" (P18, Male, age 43)*

Research suggests debriefing may be a strategy to improve CPR quality, although there is a lack of standardization regarding terminology and methods used for debriefing (Couper & Perkins, 2013).

Alternatives to face-to-face training were online tuition videos, with the option of preceding written information. Online means could also be preferred by those concerned by post-pandemic in-person contact. Alternatively, written information was suggested to be cascaded to people and displayed in prominent locations. Ideal locations were largely influenced by the individual characteristics of that community and in some places seemed split by age; for younger groups social media was suggested, whereas for older groups places that people likely visit were suggested, such as GP practices, pharmacies, or community centres.

> *"I guess it's, it depends on what kind of age bracket you want to tap in to … eighteen to fifty, sixty-year-olds, there's various kind of Facebook groups … sixty to upwards … some sort of flyer through their door … second best might be something on a notice board … this is just a massive generalisation, but I'd imagine as people get older, they go to health clinics and doctors' settings or whatever, the GPs more regularly. And therefore, that could be a good setting" (P14, Male, age 37)*

The optimal age to teach CPR was discussed in some of the interviews. A few participants had been taught CPR at school, although then had no further training. There were mixed views as to whether Primary school age was too young, because of communicating the gravity of the situation. Secondary school age was thought to be better, along with the ability of those children to then teach family. An overall feeling was that this should be one of the core subjects in school, not just a one-off, ad hoc session. Similarly, familiarising children and teenagers with PADs once they have been placed in a community was thought to reduce the likelihood of vandalism and inappropriate use. A small number of participants were particularly concerned that they did not know the location of their nearest PAD but explaining that is not necessary and all information will be provided by the health advisor provided reassurance. Participants suggested they would also benefit from universal signs on buildings and streets.

> *"those signs in … roundabouts … if it says the next defib is you know, like 50 … metres from you. That would probably help" (P5, Female, age 40)*

Finally, in the absence of being able to encourage people to learn CPR, the value of public campaigns was discussed. Participants suggested that campaigns should be kept short, simple and memorable, and should involve the local community being targeted. When providing information about PADs it was suggested to use visual imagery as some people were unsure of the term public access defibrillator, yet recognised it once described. Further, it became apparent during this study that merely by participating, participants' knowledge and awareness of this subject increased. People reported their familiarity with terms such as cardiac arrest had increased, were more willing to learn CPR and had increased confidence regarding using a PAD,

> *"I didn't realise that you couldn't kill anybody by using the machine on them 'cause it won't let you use the machine … I've learned off yourself that it talks to you … maybe if there is training around local, to go and do some now. And that means I'm changing my mind a little bit" (P11, Male, age 71).*

2.7. Discussion

Previous research has correlated low rates of BCPR with low SES and area level deprivation but has provided limited explanation of why this association exists and how this influences individual behaviour within local communities. Our findings support evidence which already exists in the broader field of health inequalities, and which suggests it would be appropriate to reject population-level approaches (and their emphasis on SES and deprivation) in favour of a relational, intersectional lens (Charlton et al., 2022). In the context of BCPR, this would enable initiatives and interventions to focus on BCPR and PAD use in local places, spaces and communities and build on mechanisms within local communities that we know can support health equity and successful public health interventions such as empowerment, control, word of mouth, trusted pillars/spokespeople and cohesion/belonging (Townsend et al., 2020).

We identified varied knowledge and understanding of OHCA and PAD function and use, which underpinned anxiety and fear surrounding the incorrect delivery of these interventions by bystanders. The terminology associated with OHCA were often misunderstood and symptoms confused with those of myocardial infarction. The inability to recognise the symptoms of an OHCA has been reported elsewhere and leads to disempowerment and inaction, and a misconception regarding the urgency of the event and a delay in providing help (Sasson et al., 2013; Bradley et al., 2011). This highlights the disconnect between clinical terminology used by clinicians and current BCPR initiatives, and terms that are easily understood by various populations. Through an intersectional lens, the problem of language, underpinned by education, represents inequality and disadvantage (López & Gadsden, 2017) which can be difficult for many individuals to overcome. Furthermore, language presents different facets of social reality for different individuals (Yuval-Davis, 2015), meaning future initiatives to improve rates of BCPR need to carefully consider the language used in order to reach different places and communities.

Opinions varied between participants regarding their willingness or confidence to help. For some, personal risk arising from litigation or consequences of causing unintentional harm to others were paramount. Meanwhile, other participants described a lack of responsibility for others, believing resuscitation should be delivered by trained personnel. This is consistent with research by Dobbie et al. (2020) who found people living in deprived communities in Scotland were prevented from intervening due to feeling unsafe or fear of reprisals. Many participants in our study discussed not wanting to provide mouth to mouth resuscitation because of the risk of infection or because of a perception of inappropriateness. However, willingness to help appeared to be associated with patient familiarity. Participants perceived not knowing the patient increased personal risk but reduced the possibility of personal loss through emotional detachment. Both were motivators for action and reluctance or hesitancy to initiate BCPR.

The Coronavirus pandemic and its influence on willingness to deliver BCPR further divided opinion, with some participants describing increased hesitancy, especially when they believed mouth to mouth resuscitation was required. These concerns were not universal and reflect the literature, which is inconsistent. For example, Grunau et al. (2020) conducted a survey involving 1360 participants and found respondents less willing to check for a pulse or deliver BCPR during the pandemic, with willingness further decreased when the patient was a stranger. Meanwhile, Shibahashi et al. (2022) analysed OHCA registry data in Tokyo and reported rates of BCPR increased, rather than decreased, during the pandemic. This suggests willingness to deliver BCPR during the pandemic was related to the unique characteristics of the community, bystander, patient and OHCA event, rather than a universal disregard for, or apprehension or reluctance to help, because of the virus. Nevertheless, these views perhaps reflect the social disconnectedness of some participants and lack of solidarity with others in their community. Socially disadvantaged communities have higher rates of almost all of the known underlying clinical risk factors that increase the severity and mortality of Coronavirus (Guo et al., 2019; Bambra et al., 2016), meaning individuals from these communities are more vulnerable to infection from the virus, even in the absence of underlying health conditions (Bambra et al., 2022). Previous literature indicated disadvantaged communities often possess weaker social resources, norms of engagement, or civic infrastructures (Sampson et al., 2005), which may have precipitated a withdrawal from community life during the pandemic. However, more recent research suggests communities with social deprivation have increased social cohesion and collective control which improve mental health and well-being, as well as self-rated health (McGowan et al., 2022). Interventions may be required to strengthen the sense of belonging in those communities where willingness to deliver BCPR is most lacking.

In our study, only two participants recalled intervening in an OHCA. Nevertheless, the memories from these events had a significant and evocative impact on the participants concerned, who were able to vividly recall undesirable, involuntary, physiological responses associated with their experience. These recollections mirror those described elsewhere in a cohort of lay providers who had provided BCPR, and who exhibited signs of stress and anxiety as a result, particularly when the resuscitation attempt was unsuccessful (Mathiesen et al., 2016). Møller et al. (2014) support this notion of persistent, adverse feelings subsequent to resuscitation attempts, and the associated emotional cost to the involved bystander. These are important considerations for policy makers attempting to improve the rates of BCPR, and bystander welfare should be paramount in any such interventions. Place-based initiatives designed by, and for the benefit of, local communities, could involve support mechanisms such as debriefing interventions, which may help ensure those delivering BCPR retain confidence and are happy to repeat their involvement in OHCA's.

Finally, although participants in this study described a willingness to engage with BCPR initiatives, challenges remained regarding reaching all communities, irrespective of SES, and when needing to disseminate changes in policy or recommendations. CPR initiatives are nearly always delivered in the workplace (Rasmus & Czekajlo, 2000; Clark et al., 2002), which serves to exclude and marginalise unemployed populations or those unable to work. Unemployed populations are constructed to be unable to access public health interventions, further entrenching health inequality. A broad approach to targeting BCPR initiatives in unconventional settings, close to the homes of individuals (Thoren et al., 2004), is required to strengthen access to BCPR training and improve outcomes. These initiatives need to be developed with, rather than for, populations of interest, and be appropriate for the social intersections relevant to different communities and places.

2.8. Strengths and limitations

Many studies focusing upon BCPR utilise population level data and are unable to fully explain the range of behaviours and attitudes related to this under-researched area of public health. By collecting qualitative data and taking an intersectional approach, this study provides greater depth and understanding as to how BCPR is perceived across diverse communities. Data were collected by paramedic researchers wearing ambulance service uniform which may have encouraged or discouraged respondents to participate, and their responses to both the survey and interview questions. However, given the diverse and varied perceptions expressed, we do not believe this has unduly influenced our findings. Furthermore, we believe this may have encouraged those from hard-to-reach communities who would otherwise not participate in research, to openly discuss their perceptions and feelings towards BCPR. In addition, participants asked practical questions and received BCPR tuition during interview, which would not have been possible with non-paramedic researchers.

Study data were collected during the Coronavirus pandemic, which offered a unique opportunity to explore how pandemic non-pharmaceutical interventions impacted behaviours and attitudes. This also means that the study was conducted at a timepoint when gratitude towards the NHS was high and this may have influenced respondents' discourse towards socially acceptable responses. However, our data reveal diverse opinion, freely expressed by participants, and we do not believe participants felt indebted to respond in any particular way. Data were also collected in late 2021 when some of the initial anxiety of the pandemic may have waned, though this may have led to recall bias given the duration since the initial wave of the pandemic. Regarding consistency of interview method, it is recognised that interviews were conducted by different modes (e.g., face-to-face versus remote platforms). This was due to Coronavirus restrictions and participant choice, but it is not believed these differences impacted on the information gathered. Rather, we believe it served to facilitate interview participation during times of increased rates of infection. Finally, it is acknowledged that some participants modified their answers during the survey and interview interval, but this could be expected because of natural reflection and the period of time elapsed between both methods of data collection.

2.9. Conclusion

Willingness and ability to deliver BCPR and use a PAD lie beyond SES and are informed by intersected factors, such as age and gender, individual perceptions, and a concern for an individuals' community. Focussing on SES, to the exclusion of these other factors, will result in continued health inequality for those from deprived communities. Irrespective of SES, general misunderstandings surrounded BCPR and PAD use. A general desire to help those suffering OHCA and requiring BCPR was expressed by participants, although further interventions are required to address misconceptions and unwarranted concerns regarding litigation and personal safety are required. Further research is required to establish if improved health literacy translates into improved willingness to undertake BCPR and use a PAD.

Strategies targeted at population level are unlikely to improve rates of BCPR, rather a more nuanced approach is required, directly involving communities of interest and centred upon. Further research is required to understand what future, targeted initiatives may look like, how these should be delivered and how these translate to improved outcomes from OHCA.

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Author contributions

KC, JS and GM conceived and designed the study. KC, LB and EB collected the interview data. Data were analysed by LB, SS and TD. The manuscript was written by KC, LB, SS and TD. Critical appraisal and review of the manuscript was provided by JS, GM, EB and AM.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ssmqr.2023.100294.

A1. Themes and subthemes

Theme 1 – Knowledge, understanding and experience of CPR and PADs.

- Range of CPR knowledge and related actions
- Range of knowledge surrounding PADs
- Sources of knowledge
- Knowledge of medical terms
- Recognition of OHCA
- Range of CPR and PAD tuition
- Experience of CPR and PAD tuition
- Motivators, barriers and benefits to learning BCPR
- Range of experience of BCPR

Theme 2 – Factors affecting willingness and confidence to perform CPR and use a PAD.

- Fear of consequences
- Personal characteristics affecting the decision to help
- Awareness of the reality of an OHCA event
- Mouth to mouth
- Impact of others on scene
- Effects of possessing or lacking knowledge
- Differences in helping people of varying familiarity
- Impact of the Coronavirus pandemic

Theme 3 – Barriers to delivering BCPR initiatives.

- Formats of training provided
- Gaining initial interest
- Promoting the chain of survival
- Reassurance regarding existing knowledge

Theme 4 – Future initiatives to improve uptake of BCPR.

- Maximising engagement and initial interest
- Provide a range of convenient training formats
- Bite size, memorable content of CPR and PAD training sessions
- Practical hands on content for face-to-face sessions
- Utilise public awareness campaigns methods with relevant content
- Reassurance around fear of consequences
- Promoting the chain of survival
- Caring for the bystander

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