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Title page

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"I think it depends…" The contextual nature of laypersons' confidence and willingness to act in a head injury: a qualitative study

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ABSTRACT

Objectives: To explore factors influencing confidence and willingness to act in a head injury situation among laypersons in the UK, in order to inform first aid education offered by the British Red Cross.

Design: Qualitative focus group study

Setting: South East England

Participants: Forty-four laypersons (37 women, 7 men) were purposively recruited from the general public using snowball sampling, into one focus group each for six population groups: parents of young children (n=8), informal carers of older adults (n=7), school staff (n=7), sports coaches (n=2), young adults (n=9), and 'other' adults (n=11). The median (range) age group across the sample was 25-34 years (18-24, 84-95). Participants were from Asian (n=5), Black (n=6), Mixed (n=2) and White (n=30) ethnic backgrounds.

Results: The majority of participants described being confident and willing to act in a head injury scenario if that meant calling for assistance, but did not feel sufficiently confident or knowledgeable to assist or make decisions in a more involved way. Individuals' confidence and willingness presented as fluid and dependent on an interplay of situational and contextual considerations, which strongly impacted decision-making: prior knowledge and experience, characteristics of the injured person, un/observed head injury, and location and environment. These considerations may be framed as enablers or barriers to helping behaviour, impacting decision-making to the same extent as – or even more so than – the clinical signs and symptoms of head injury. An individual conceptual model is proposed to illustrate inter-relationships between factors that impact confidence and willingness to act in a head injury situation.

Conclusions: Our findings serve as a framework upon which to understand laypersons as potential responders in case of head injury, and highlight the importance of addressing contextual and situational factors in first aid education and training to improve confidence and willingness to act.

Study registration number: not applicable

ARTICLE SUMMARY

Strengths and limitations of this study

- The sample was a targeted but self-selected group, likely to have a personal interest in head injury, and from one geographical region in the United Kingdom.
- Purposive recruitment of sports coaches did not achieve the desired number of participants.
- Diversity in sample demographics supports the representativeness and relevance of findings.
- Involvement of different stakeholders, including representatives from the British Red Cross, National Health Service (NHS) clinicians in emergency services, and service users, supports the credibility of findings and analysis.

INTRODUCTION

In the United Kingdom (UK), the National Institute for Health and Care Excellence (NICE) describes head injury as the most common cause of death and disability in children and adults under the age of 40 years.[1] However, only about 5% of those attending the emergency department (ED) have moderate or severe head injury, and death from head injury occurs in only 0.2% of those attending ED with a head injury.[1] It is suggested that the reduction of avoidable ED attendances for head injury could be supported by laypeople, for example through pre-triage.[1, 2] Guidance for laypeople for pre-triage, (self-)assessment and early management of head injury is available,[1] including which clinical signs and symptoms allow the differentiation of minor and more serious head injury and concussion.[3] These guidelines appear to assume that the layperson will engage with such decision-making. However, in trauma more broadly Oliver and colleagues noted that laypeople made calls for assistance in 93% of cases, but first aid was only administered to 43-57% of those alive at scene.[4] Commenting on these findings, McNulty suggests that when a person is injured, people mostly lack the skills and confidence to do more than calling for an emergency ambulance.[5]

Ambiguity in decision-making is a recognised factor impacting (lay) first responder behaviour, that is, their confidence and willingness to act.[6] A number of studies have explored laypersons' confidence and willingness to act in first aid scenarios, and identified that contextual and situational factors are influential in the decision whether to assist or not. For example, in an analysis of 16 million emergency services episodes in the United States, bystanders were more likely to exhibit helping behaviour when the patient was male or older; and in urban and institutional settings, as opposed to rural and public street settings.[7] The type of medical emergency also influenced first aid behaviour, with bystanders more likely to take action for cardiac arrest, chest pain, allergic reaction, respiratory distress and trauma; and least likely to help for sexual assault and psychiatric disorder.[7] The presence of other bystanders is understood to generally decrease the likelihood of lay responder action, a phenomenon described as 'diffusion of responsibility'.[6, 8]

Previous research undertaken by the British Red Cross (BRC) and others has identified ways to overcome some of these contextual barriers to helping,[9, 10] and these findings have been embedded in all BRC first aid education. But although this evidence is based on studies which partly included trauma populations, no research has explored these contextual and situational aspects and their impact on confidence and willingness to act specific to head injury. To address this gap in evidence, this article presents findings from a research project funded by the BRC to inform their larger programme of work on first aid education and training in head injury.

This article addresses the following research questions:

- How do laypersons describe their confidence and willingness to act in response to a head injury?
- What do laypersons see as enablers and barriers to changing their own behaviour, or that of others?
- Are any differences observed between population groups of differing demographics?

METHOD

Design

This study was a qualitative inquiry using focus groups and semi-structured interviews,[11, 12] nested within a larger pragmatic mixed methods study.[13, 14]

Participants and recruitment

Recruitment was purposive, aiming to recruit participants from six self-defined population groups. These groups were targeted because of their differing perspectives and experiences of head injury: parents of young children (babies and toddlers), informal carers of older adults (self-identification as informal carer), school staff (employed teacher or teaching assistant), sports coaches (including professional and amateur sports), young adults (age 18-24 years), and 'other' adults. It was recognised that participants might identify with more than one group, and participants were guided to focus primarily on their experiences within the group they were recruited to. Participants remained eligible if they had prior first aid training for lay responders; but were excluded if they were qualified or trainee healthcare professionals.

Participants were recruited by snowball sampling.[12] The researchers approached suitable lead contacts, for example a health visitor at a children's centre, a sheltered housing warden, a cycling coach, and a university lecturer. The researchers and/or initial lead contacts provided eligible individuals with participant information sheets (including researchers' contact details) and consent forms. Individuals expressed their interest in the study by contacting the research team directly. All participants gave written informed consent to take part in the research. They were asked to circulate study information to other potential participants within their social and/or professional networks. To facilitate recruitment, focus group or interview times and venues were arranged at participants' convenience, for example at their usual work or meeting place; and a shopping voucher was offered as compensation for participants' time and to cover any travel expenses. Childcare and carer costs were also offered where appropriate. Where participants could not practicably be formed into an in-person or virtual focus group, an individual face to face or telephone interview was offered.

Data collection

Focus groups were held in two stages within each population group, using semi-structured topic guides.[11] Topic guides were designed with project stakeholders, including the service user representative on the study team (AH). At the first stage, focus groups explored the meaning of head injury, participants' understanding of its signs and symptoms, and their confidence and willingness to act in response to a head injury. In the second focus group, materials to guide lay decision-making regarding action following head injury were introduced, with the aim of prompting further discussion about confidence and willingness to act when applied to hypothetical scenarios. Example questions to the groups included *What does 'head injury' mean to you?* and *What is your understanding of what to do when somebody has a head injury?* The complete topic guide is available in online supplement 1.

All focus groups were moderated by an experienced researcher (MH) and co-moderated by one or two other members of the research team (AB, AH, STK), who supported logistics, observed interpersonal group dynamics, took concurrent field notes (speaker order, non-verbal cues, reflective notes), and/or led in moderating parts of the discussion.

Data analysis

Focus groups were digitally audio recorded and transcribed verbatim by a professional transcription service. Transcripts were checked for accuracy against recordings by members of the research team and individual speakers were assigned unique pseudonyms, *e.g*. 'F1' or 'M2' denoting a female or male speaker, respectively.

Analysis of transcripts and field notes was by framework analysis.[15] Two researchers (MH, STK) read and re-read the transcripts and through discussion developed a coding framework, iterated further by a third researcher (AB) involved in the focus group data collection. Coding was carried out using NVivo11© software (QSR International, 2017). Themes were developed iteratively in discussion with the group of three researchers who also extracted illustrative direct quotes, within the framework of the population groups. Researcher reflexivity was enacted through open discussion in the group of researchers and with stakeholders, providing a forum to address and resolve alternative viewpoints, challenges and criticisms. In a final analysis step, the framework was developed into a conceptual model which crossed population groups.

Patient and Public Involvement

A service user representative (AH) was part of the study team and contributed to the study design, data collection, study oversight and the dissemination of findings.

RESULTS

Participants

Forty-four participants from the six population groups took part. In the sports coach group, only two participants could be recruited and were interviewed individually rather than in a focus group setting, but following the same topic guide. Participants in the group of informal carers of older adults consisted of one adult who cared for his parent, and six elderly residents of a sheltered housing scheme who were informal caregivers to each other. In the 'other' adults group, two first and second stage focus groups were held to accommodate the larger number of participants. Focus group/interview recordings ranged in duration from 34 to 69 minutes. The majority of participants took part in both stages of data collection. Participant characteristics are summarised in table 1.

Participants revealed a wide range of experience, knowledge and levels of confidence in dealing with head injury. Descriptions of their confidence and willingness to act in response to a head injury were embedded within their general understandings of 'head injury'. It was apparent that the term held different meanings for individuals. For some, head injury always represented a serious situation; while others appreciated that it included a range from the minor to the severe. Common to all groups was the reasoning that head injury was more problematic than other injuries for two reasons: the potential seriousness of brain damage due to the vital role of the brain; and the fact that the damage may not be seen. Within this shared perception of the potential seriousness of head injury, there was a wide range of knowledge and understanding – and sometimes misunderstanding – of clinical signs and symptoms, and what action to take as a first responder.

Table 1. Participant characteristics

Population group	Number of participants	Age group	Ethnicity	Gender
Parents of young children	Stage 1 focus group: 6 Stage 2 focus group: 5 Total: 8	Not available	Black British: 1 Mixed White/Caribbean: 1 White American: 1 White British: 3 White European: 2	Female: 8
Informal carers of older adults	Stage 1 focus group: 6 Stage 2 focus group: 7 Total: 7	55-64: 1 75-84: 4 85-94: 2	White British: 7	Female: 5 Male: 2
School staff	Stage 1 focus group: 7 Stage 2 focus group: 7 Total: 7	18-24: 2 25-34: 3 55-64: 2	White British: 7	Female: 6 Male: 1
Sports coaches	Stage 1 interviews: 2 Stage 2 interview: 1 Total: 2	35-44: 1 45-54: 1	White British: 2	Female: 1 Male: 1
Young adults	Stage 1 focus group: 4 Stage 2 focus group: 9 Total: 9	18-24: 9	African: 2 Asian: 1 Indian: 1 Mixed White/Asian: 1 Pakistani: 1 White British: 1	Female: 6 Male:3

			White European: 2	
'Other' adults	Stage 1 focus groups: 10 [a] Stage 2 focus groups: 11 [a] Total: 11	25-34: 5 35-44: 2 45-54: 1 55-64: 2 75-84: 1	Black British: 1 Caribbean: 2 Chinese: 1 Indian: 1 Other Asian: 1 White British: 4 White European: 1	Female: 11
[a] In this population group, two focus groups were held at each stage to accommodate group size				

Themes

While participants within and across the six population groups were heterogeneous in their responses, several distinct patterns (themes) emerged from focus group discussions. Against the background of respondents' shared awareness of the potential seriousness of head injury, it was apparent that individuals' confidence and willingness to act was not static, but rather fluid and dependent on a multitude of situational and contextual considerations. These contingent factors were often considered *before* focusing on clinical signs and symptoms of head injury. They therefore presented *a priori* enablers – or, conversely, barriers – in influencing how participants thought they would behave in a head injury situation. Discussion of these considerations was very prevalent in focus groups – more so than discussion of implications of clinical signs and symptoms – and clearly impacted on participants' reasoning. It either altered their decision-making ('If context A, then action X; but if context B, then action Y') or added layers of complexity, which remained unresolved ('If context A, then action X; but if context B or C, I'm not sure'). Moreover, situational and contextual factors were often discussed in various combinations and scenarios, resulting in an interplay between enablers and barriers in addition to the clinical signs and symptoms displayed by the injured person. There was overlap in findings from the first and second stage of data collection, overall corroborating and reinforcing the themes developed in analysis:

- Prior knowledge and experience
- Known or unknown injured person
- Observed or unobserved injury taking place
- Location and environment
- Interplay of situational and contextual factors

Prior knowledge and experience

The extent of prior knowledge and experience varied within and across population groups and appeared to be linked closely with individuals' levels of confidence and willingness to act as first responders. Some inaccuracies and misconceptions were noted, such as one participant's assumption that visible bruising was favourable, as lack of bruising could indicate 'a bleed on the inside' (F5, Parents of young children). Conversely, some participants displayed greater understanding of the role of medical diagnostics, for example referring to the need for a scan to

detect whether there was an internal bleed. Among those with less prior knowledge and experience, some stated that they would panic:

> *F1: I'd panic because there's something about the word, head injury, that would make me panic actually. ('Other' adults)*

Others explained that they would be more confident and willing to summon help than to provide advice or assistance in a more involved manner:

> *F2: Yes, maybe because I wouldn't know what to do, so instead of wasting time trying to figure out what to do, I'll just get someone who could help, keep it from getting worse. (Young adults)*

In contrast, some participants who had completed more in-depth first aid training spoke confidently about what to do in a head injury situation. For example, two participants in the focus group with school staff held designated first aider roles at work and talked with confidence about the steps they would take if a pupil had been knocked unconscious for a few seconds:

> *F6: That's normally where we'd clear the area of other children and send someone down to the office, so that they can obviously make a phone call for an ambulance.*
> *F8: Make sure the child stays lying on the floor. Doesn't sit up because they're very likely to go back over again. Check that they can still speak to us. They're coherent. They can breathe, and then wait to see what 999 [emergency ambulance call number] says we should do.*
> *(School staff)*

In these discussions participants mainly drew on prior knowledge from formal first aid training, but also talked about 'life experiences', for example from accounts or observations of head injury incidents at work or among family and friends:

> *M1: The experience you've had of life with bringing up a family and what you see at work, you see accidents at work and things like that, so you gain knowledge from each incident that you see. (Informal carers of older people)*

Known or unknown injured person

In terms of characteristics of the injured person, knowing or not knowing the person appeared to be highly influential in how comfortable participants felt, as well as how willing they might be to act. Although this point was raised in all groups/interviews, it was particularly prominent in the groups with parents of young children and school staff. Participants talked about calling staff members who knew the child well, or calling parents to assess their own child. This appeared at times to be double-edged in that knowledge of the individual was considered vital to judge in how far the child 'behaved differently' following the head injury; but knowing the child brought an emotional component into play, particularly for parents, that they recognised impacted on their objective decision-making:

> *F5: If you looked after other people's children if they hit their head you'd be like, 'Right, we've got to let mum know. What do we do from there?' When it's your own kid you're kind of like, 'Do I go to hospital? Do I ring someone? Do I ring somebody?' (Parents of young children)*

In general, participants discussed that they would respond in a more involved manner if they knew the injured person, for example escorting the person home if the injury had occurred outdoors, or accompanying them to hospital. A sense of belonging to the same group or community as the injured person also seemed to increase participants' willingness and confidence to be more involved:

> *F1: I think if also I can see similarities with that person in myself, I might be more willing to help as well. For example, I ride a bicycle, so if I saw a bike rider, I might respond quicker because I could be that person. ('Other' adults)*

For a stranger, in contrast, participants appeared more likely to call an ambulance or give advice and then move on. Children and older people were generally considered more vulnerable, prompting greater caution and a lower threshold for using medical and emergency services. Several participants also considered how the injured person themselves might wish or intend to deal with the situation, provided they were conscious and able to express themselves:

> *F7: I think partly also, you'd be influenced by what they wanted to do. If they were really stressing out and they were like, 'Oh my God! My head's hurting' or, 'I feel like I'm going to pass out' you'd be like, 'Okay, you might need to go and get checked out.' If they were like, 'No, I'm fine,' I think it would influence your decision. ('Other' adults)*

It was recognised that the injured person might not realise the seriousness of the situation, and at times one might have to act against someone's wishes for their own protection and the protection of others. Although not all participants would have been as confident as this sports coach:

> *Interviewer: It sounds like you would take it pretty seriously, you would sit them down, make them not get back on their bike.*
> *F1: Yes, they're going to be a danger to other people, […] the last thing you want is another [rider] out on the road again or on a racetrack or whatever it is, being a danger to other people. (Sports coaches)*

Observed or unobserved injury taking place

Having witnessed the head injury, or noting the presence of a bruise, lump or bleeding head wound, which would indicate that the person has sustained a head injury, made a difference to participants' confidence and willingness to act. Participants considered that if the injury was unwitnessed, they might not feel as confident in their decision-making, because other medical conditions (stroke, seizure or heart attack) or alcohol and drug misuse might lead to similar symptoms:

> *F2: But that comes back to if you've seen them and you've seen they've had a blow to the head or an accident, I mean it could be a drunk, couldn't it? If they're behaving or speaking really differently, you just wouldn't know if you hadn't seen the accident. ('Other' adults)*

In case of a witnessed head injury, several participants also talked about considering the mechanism of injury, for example the person hitting their head against concrete pavement as opposed to a door, or being hit by another person as opposed to bumping their head by accident. This observation could alter participants' perception of the potential injury severity and subsequent action taken:

> *F3: If they've been hit or something, then, yes, I would call an ambulance, but if it was a matter of them like hitting their head against a wall or something, like tripping over, then I wouldn't be inclined to. I think it depends on the situation and like their surroundings as well. (Young people)*

Location and environment

Considerations around the location and environment, in which the head injury occurred, also influenced individuals' confidence and willingness to act. In an institutional setting, such as the university, young people for example talked of trying to find a first aider or other figure of authority, to help them decide what action was best in response to head injury. Similarly, the impact of a workplace environment was described by participants in the focus group with school staff and 'other' adults, who described following certain organisational rules for injury at work. Informal carers of older adults discussed that in a sheltered housing environment guidance was always to hand, either in person (warden) or via an alarm call. It was noted that this guidance was usually to contact medical advice.

The impact of institutional policies was most strongly and consistently reflected in the focus group with school staff. Here, a clear chain of communication was in operation; a junior member of school staff explained:

> *F4: Well, the procedure that we know is you get [first aider 1] or you get [first aider 2]. […] We never make the final decision. We always pass it off. (School staff)*

School staff understood organisational policy to streamline and facilitate their duty of care towards school children, but also considered its function in protecting school staff and the organisation. For example, they commented on the value of providing written information to parents of children who sustained a head injury at school, as this 'also covers the school'. Sports coaches also described a similar chain of communication at professional or large-scale public sports events:

> *F1: If I came across somebody who had been involved in a head injury at one of our events, I always have a radio, so I would radio to event control and event control would then speak to our appointed medical provider. […] Depending on who it is, that help, that message would then be disseminated down through the channels. We have a medical director, so we have doctors as well as St. John and Red Cross. (Sports coaches)*

But sports coaches also raised another issue they had encountered in an extreme sports environment, which related to a sense of pressure and expectation to continue on after an injury, rather than stop and recover:

> *M2: I notice that from a lot of people, it's almost like a sign of some kind of reward if you get up after really banging your head or hurting yourself. It's like you're some kind of warrior. (Sports coaches)*

In contrast, some participants in other groups talked about taking a very cautious approach, and voiced their fear of doing something wrong and potential litigation, particularly in public and when dealing with a stranger:

F1: There's always that kind of thing where you want to help as a bystander, but at the same time you think so many people around you might be more qualified to do that, and you're like okay, I don't want to mess it up because it's the head! ('Other' adults)

Interplay of situational and contextual factors

These situational and contextual impacts on confidence and willingness to act were often discussed in combination and in layered scenarios. This prompted participants to think of additional contingent factors and appeared to create a situation of some concern for many participants, who might not have been overly alarmed about one of these factors in isolation. For example, participants commented on personal safety when considering a stranger in public following an unwitnessed head injury. This related to the potential danger of approaching a stranger who displays unusual behaviour, but also reluctance to provide hands-on assistance if blood were present. In this type of hypothetical scenario participants felt more comfortable to call for assistance rather than to get involved themselves. This became the underpinning concept to our analysis, *i.e.* participants described their confidence and willingness to act in relation to the situational and contextual factors of specific scenarios. Conceptually, these factors therefore represent an interplay of enablers and barriers, whereby *prior knowledge and experience* might be conceptualised as providing a backdrop to the situation-dependent aspects of *known or unknown injured person*, *observed or unobserved injury*, and *location and environment*. Additionally these situational and contextual considerations, rather than the clinical signs and symptoms of head injury, had primary influence over lay responders' decision-making and helping behaviour. Figure 1 presents a visualisation of this in an individual conceptual model.

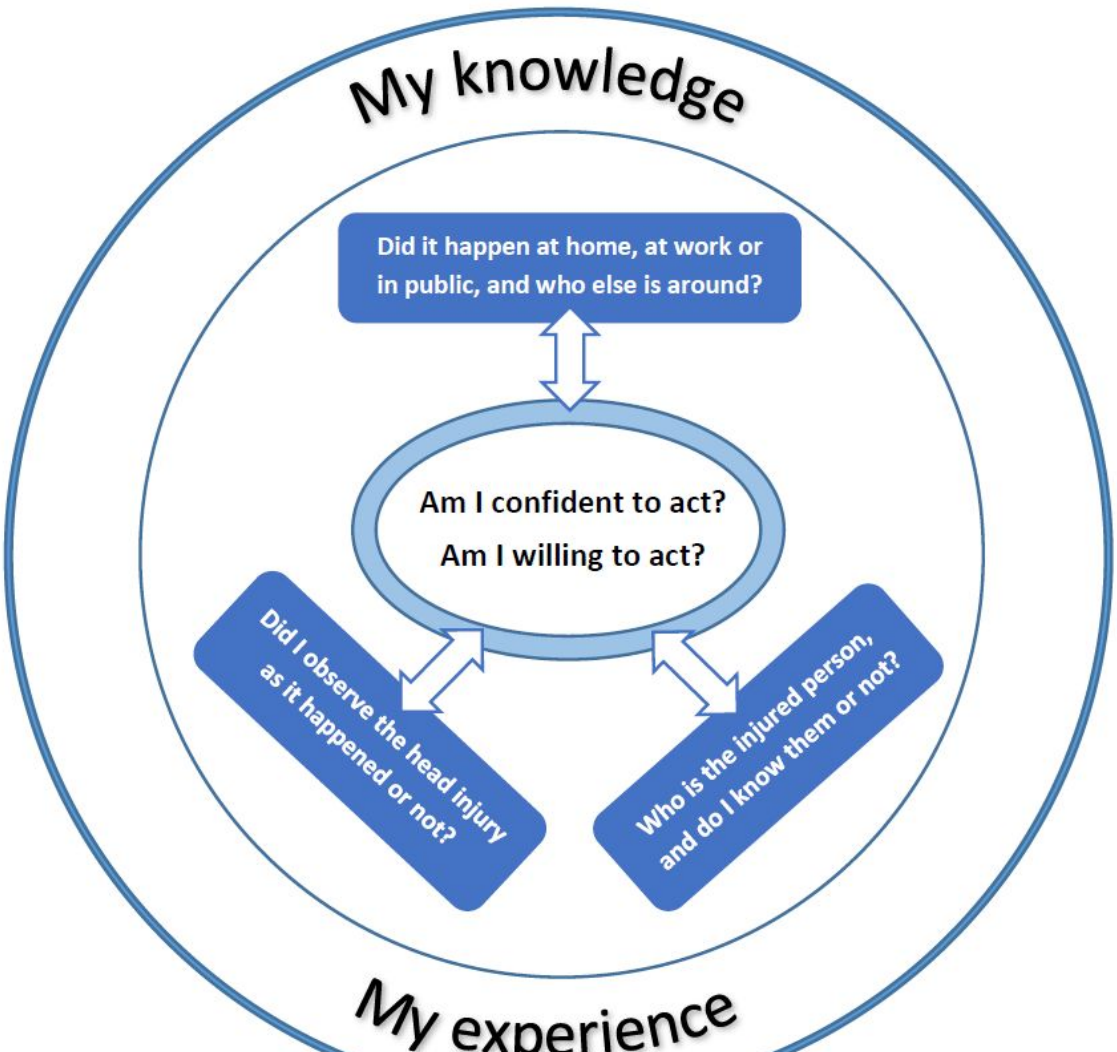

Figure 1. Individual conceptual model of confidence and willingness to act in a head injury situation. Against the background of individual knowledge and experience, situational and contextual factors have significant influence on the person's helping behaviour.

DISCUSSION

This study has explored laypersons' confidence and willingness to act as first responders in a head injury situation. In the majority, participants were willing to help if that meant calling for the assistance of someone else, but most did not feel confident or knowledgeable enough to either carry out physical intervention or observe and evaluate whether use of the ED could be avoided. Few participants felt confident to take charge of decision-making in a head injury situation. Participants raised multiple situational and contextual considerations, which impacted on their own confidence and willingness to act in a given situation. These factors may be framed as enablers and barriers, and include prior knowledge and experience, characteristics of the injured person, whether the injury was observed or unobserved, and the location and environment. While discussions within all six research population groups were wide-ranging and varied, there were some themes more prominent in certain groups, such as the impact of institutional policies and workplace practices in the groups with school staff and 'other' adults; and knowing or not knowing the child when judging behaviour following a head injury in the groups of parents with young children and school staff. The findings were summarised in an individual conceptual model (figure 1).

Study strengths and limitations relate to characteristics of the sample. The sample size was small, which is common in qualitative research that aims to generate in-depth findings for explanatory purposes.[12] While there was under-recruitment of sports coaches, recruitment to the other five research population groups was successful. We recruited to the six population groups primarily to achieve thematic coverage, rather than for comparison between groups, but were nevertheless able to comment on themes more prevalent in certain groups. Diversity across sample demographics adds to the potential transferability and relevance of findings. It is acknowledged that, due to the snowball recruitment method, the sample was a self-selected group, likely with a personal interest in head injury and a desire to learn. Geographically, participants were based in the South East of England. Although the findings do not appear to closely relate to participants' location, it is possible that individuals from other regions in the UK – or internationally – would contribute additional or alternative views and experiences. A further strength of this study was the involvement of different project stakeholders, including representatives from the British Red Cross, clinicians in National Health Service (NHS) emergency services, and service users. This added to the reflexive approach of the research team and the credibility of data and analysis.

The study concerned exploring confidence and willingness to act in head injury, as an assumed precursor to appropriate decision-making of laypersons in a head injury situation, which is topical in light of healthcare policy calling for a reduction in avoidable ED attendances and hospital admissions.[16, 17] However, this would not be simple – feeding into individuals' confidence and willingness to act in this way, the findings from this study suggest various situational and contextual considerations at play. These align with other literature on lay response and helping behaviour,[18, 19] which highlight problems due to lack of knowledge and experience, for example in identifying clinical symptoms and correct first aid measures in trauma,[20] sports injury,[21, 22] heart attack,[23] stroke,[24, 25] and mental illness.[26] Moreover, it has been suggested that in addition to individuals' knowledge and skills, the decision to act is dependent on acknowledgment of the situation and having confidence in one's own ability;[18, 19, 27, 28] and there is some evidence that first aid education needs to incorporate specific components to target positive attitudes and helping reactions towards emergencies (as opposed to factual knowledge and practical skills alone), in order to achieve improvements in helping behaviour.[10] In contrast to cardiopulmonary resuscitation and other more involved and complex first aid scenarios, helping behaviour in head injury more often

relates to observing the person and making decisions accordingly and should therefore be more easily amenable to interventions.

Most of the situational and contextual considerations identified in the present study have also been recognised in other first aid settings. In the context of road traffic collisions, the following barriers to providing first aid have been described: not being a first aider, poor knowledge of the importance of providing first aid, fear of making a mistake, the scene feeling overwhelming, victim refusal, concern about infection, the presence of bleeding, not remembering the details of first aid, and a concern about legal risk.[28-30] In cardiopulmonary resuscitation, it was found that people were less likely to intervene with strangers than with family members; while enablers included first aid training and a controlled environment, particularly the person's own home.[27] Interestingly, among the range of contingent factors identified in this study, the characteristics of the injured person, circumstances of the injury, and the environment appeared to impact individuals' confidence to the same extent as – or even more than – their knowledge and experience. Consequently, in contrast to a medical assessment which focuses mainly on clinical signs and symptoms of head injury, these factors were highly influential to laypersons' decision-making often *before* clinical signs and symptoms were considered. This mirrors previous research, which has highlighted the role of psychological and emotional, rather than technical factors.[18, 31] Therefore, to achieve maximum impact, first aid education should not only convey factual knowledge but must also address contextual barriers to lay responders' confidence and willingness to act.

A recent evidence review by the International Liaison Committee on Resuscitation (ILCOR) First Aid Task Force has highlighted the lack of scientific research into first aid education.[32] The present study has generated in-depth insights into behavioural enablers and barriers for laypersons to act as first responders in a head injury situation. These findings are relevant to inform educational interventions and public health campaigns on head injury, but may equally apply to first aid in general. The World Health Organization recommends that health education should be underpinned by suitable behaviour change theories or models, a number of which are available.[33, 34] While the individual conceptual model presented here (figure 1) closely reflects the data in this study, it is possible to cross-reference to other commonly used behaviour change theories. For example in Social Cognitive Theory,[35] self-efficacy (confidence in one's ability to take action and overcome barriers) and reciprocal determinism (the dynamic interaction of the person, their behaviour and the environment) constitute key concepts,[33] which show distinct parallels and relevance to the data in this study. Future research could develop tools to quantify the impact of different situational and contextual factors on helping behaviour, as research instruments or to facilitate individual learning. The findings of this study may therefore inform the future development, implementation and evaluation of targeted health education interventions for laypersons responding to a head injury. There also remains scope for further work to address study limitations and explore these issues in groups and regions that were underrepresented in this research.

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Author contributions: MH is Chief Investigator for this study. MH, AH, AG, BK, EO and HJ designed the study. MH, AB, STK and AH collected and analysed the data. All co-authors contributed to the interpretation of the data. STK prepared the manuscript. EO supported the writing and coordinated input from the British Red Cross study steering group led by BK. All co-authors critically reviewed and approved the final manuscript.

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Competing interests: MH reports grants from British Red Cross during the conduct of the study. BK reports grants from Elastoplast during the conduct of the study. EO reports grants from Elastoplast during the conduct of the study and outside the submitted work. EO reports the British Red Cross commissioned this study in the context of developing a lay responder pathway to head injuries. The British Red Cross is a first aid education provider and standard setter. AB, AH, HJ, SG and STK report no conflict.

Ethics approval: The study was approved by the Faculty Research Ethics Committee of the Faculty of Health, Social Care and Education at Kingston University and St George's, University of London (FREC 2017-12-014).

Data sharing statement: No additional data are available

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Online supplement 1. Topic guide for focus groups

<table>
<tr><th colspan="2">Focus group 1</th></tr>
<tr><td>Introduction</td><td>Researchers and participants briefly introduce themselves.
Moderator explains ground rules and confidentiality.
Moderator gives a brief overview of the study so far and how focus groups fit in the overall study.</td></tr>
<tr><td>Discussion topics</td><td>Explore participants' understanding of head injury:
• What does 'head injury' mean to you?
• What comes to mind when you think of 'head injury'?
• What signs or symptoms would you associate with 'head injury'?

Explore participants' decision making and information seeking as lay responders in a head injury situation:
• What is your understanding of what to do when somebody has a head injury?
• Where/how would you inform yourself about what to do?</td></tr>
<tr><td>Close</td><td>The group ends with any other questions, comments or queries.</td></tr>
<tr><th colspan="2">Focus group 2</th></tr>
<tr><td>Introduction</td><td>Researchers and participants briefly introduce themselves.
Moderator explains ground rules and confidentiality.
Moderator gives a brief update on the progress of the study so far.</td></tr>
<tr><td>Discussion topics</td><td>Participants self-rate (0-10, 0 being not confident at all, 10 being very confident) their confidence and willingness to decide what action to take in a head injury scenario using a score card, i.e. the 'before' score.

Participants are presented with a head injury decision aid for lay responders:
• Explore the participants' immediate response to the decision aid: How do you find this?
• Participants repeat their self-rating (0-10), i.e. the 'interim' score.

Participants split into pairs for discussion of hypothetical head injury scenarios. Presented with two hypothetical head injury scenarios, participants are asked to talk through their decision making and action as first responders.

<table>
<tr><th></th><th>Scenario 1</th><th>Scenario 2</th></tr>
<tr><td>Scenario description (wording for 'other' adults target group)*</td><td>You are at work, walking up the corridor and chatting with a colleague when a door swings open suddenly and hits her on the head. She tells you that her head hurts and she feels sick. There is a bruise on the front of her head. What would you do?</td><td>It is early evening and you're on your way home from work with your friend walking alongside you. He doesn't notice the loose paving slab. He trips and falls to the ground, hitting the side of his head as he does. He calls out immediately and sits up. You see straightaway that he has a</td></tr>
</table>
</td></tr>
</table>

			lump on this side of his head with a graze but no bleeding. He looks pale, and says he is feeling dizzy. What do you think you might do?
	Follow-on questions	If your friend immediately got up and talked to you in her usual manner and there are no other signs we just told you about – that is, she does not feel sick or have a headache - what would you do? If your friend was knocked out for a few seconds what would you do? If your friend started to vomit two hours later what would you do?	What would you talk to him about doing when it came to bedtime? What if he had a graze but was not pale and did not say he was feeling dizzy? What would you do if you noticed that he seemed confused and started to behave differently?
	Participants re-join the whole group and repeat their self-rating (0-10), *i.e.* the 'after' score.		
Close	Moderator explore any other issues. The group ends with any other questions, comments or queries.		

* In the description of these hypothetical scenarios, the wording of scenario descriptions was adapted to match the background of each research population group. For example, for the focus group with parents of young children, the 'scenes' included parents and children, *etc.* Decision-relevant clinical information with respect to acting in the head injury situation (*i.e.* signs and symptoms of head injury) remained consistent across all focus groups.

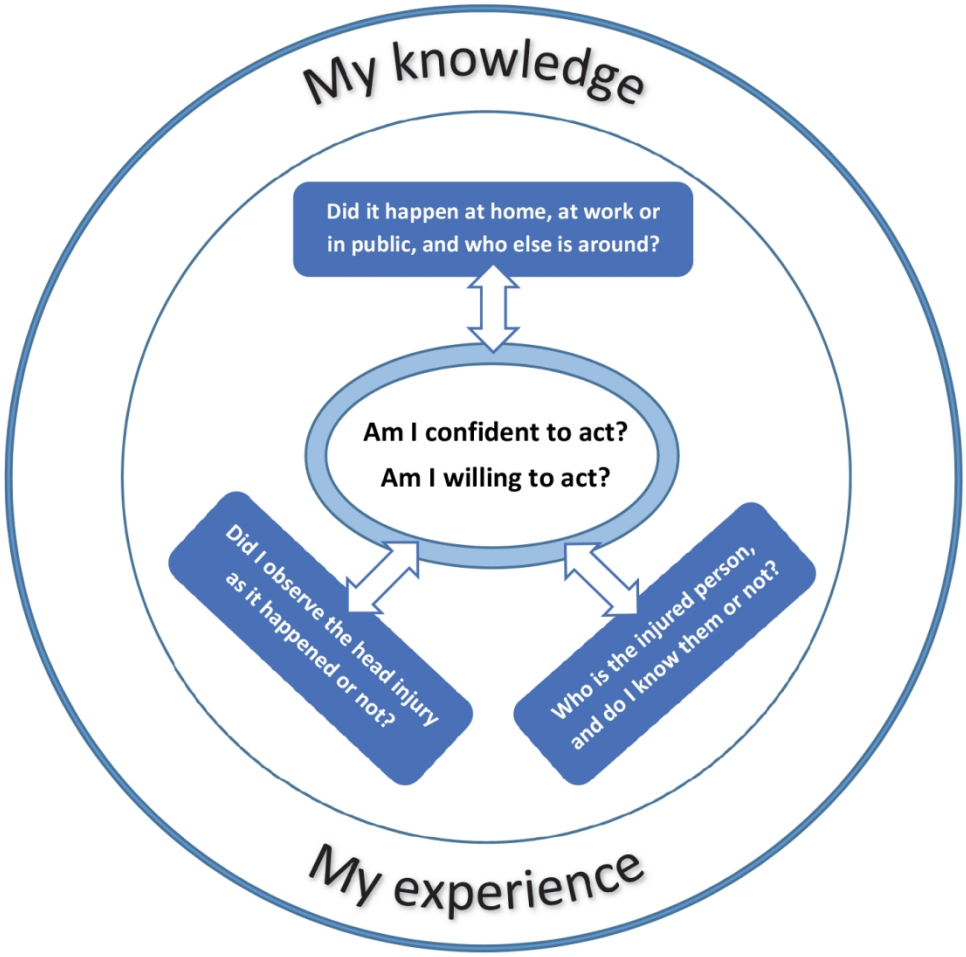

Figure 1. Individual conceptual model of confidence and willingness to act in a head injury situation. Against the background of individual knowledge and experience, situational and contextual factors have significant influence on the person's helping behaviour.

Standards for Reporting Qualitative Research (SRQR) Checklist

O'Brien et al. *Acad Med* 2014;89:1245–51. doi: 10.1097/ACM.0000000000000388

Manuscript title: "I think it depends…" The contextual nature of laypersons' confidence and willingness to act in a head injury: a qualitative study

Authors: Kulnik ST, Halter M, Hilton A, Baron A, Garner S, Jarman H, Klaassen B, Oliver E

SRQR items are listed in table 1.

Please refer to table 2 for cross-referencing of SRQR items with the manuscript.

Table 1

Standards for Reporting Qualitative Research (SRQR)[a]

No.	Topic	Item
	Title and abstract	
S1	Title	Concise description of the nature and topic of the study Identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended
S2	Abstract	Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions
	Introduction	
S3	Problem formulation	Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement
S4	Purpose or research question	Purpose of the study and specific objectives or questions
	Methods	
S5	Qualitative approach and research paradigm	Qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g., postpositivist, constructivist/ interpretivist) is also recommended; rationale[b]
S6	Researcher characteristics and reflexivity	Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with participants, assumptions, and/or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results, and/or transferability
S7	Context	Setting/site and salient contextual factors; rationale[b]
S8	Sampling strategy	How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale[b]
S9	Ethical issues pertaining to human subjects	Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues
S10	Data collection methods	Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale[b]
S11	Data collection instruments and technologies	Description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study
S12	Units of study	Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)
S13	Data processing	Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymization/deidentification of excerpts
S14	Data analysis	Process by which inferences, themes, etc., were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale[b]
S15	Techniques to enhance trustworthiness	Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale[b]
	Results/findings	
S16	Synthesis and interpretation	Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory
S17	Links to empirical data	Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings
	Discussion	
S18	Integration with prior work, implications, transferability, and contribution(s) to the field	Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/ generalizability; identification of unique contribution(s) to scholarship in a discipline or field
S19	Limitations	Trustworthiness and limitations of findings

(*Table continues*)

Table 1
(Continued)

No.	Topic	Item
	Other	
S20	Conflicts of interest	Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed
S21	Funding	Sources of funding and other support; role of funders in data collection, interpretation, and reporting

[a]The authors created the SRQR by searching the literature to identify guidelines, reporting standards, and critical appraisal criteria for qualitative research; reviewing the reference lists of retrieved sources; and contacting experts to gain feedback. The SRQR aims to improve the transparency of all aspects of qualitative research by providing clear standards for reporting qualitative research.

[b]The rationale should briefly discuss the justification for choosing that theory, approach, method, or technique rather than other options available, the assumptions and limitations implicit in those choices, and how those choices influence study conclusions and transferability. As appropriate, the rationale for several items might be discussed together.

Table 2

Cross-referencing of SRQR checklist items with the manuscript

No.	Topic	Manuscript page(s)
S1	Title	p. 1
S2	Abstract	p. 3
S3	Problem formulation	p. 5
S4	Purpose or research question	p. 5
S5	Qualitative approach and research paradigm	p. 6
S6	Researcher characteristics, reflexivity	pp. 4, 7 and 17
S7	Context	p. 6
S8	Sampling strategy	p. 6
S9	Ethical issues pertaining to human subjects	p. 17
S10	Data collection methods	p. 6
S11	Data collection instruments/ technologies	p. 6, online supplement 1
S12	Units of study	p. 8, table 1
S13	Data processing	p. 7
S14	Data analysis	p. 7
S15	Techniques to enhance trustworthiness	pp. 4 and 7
S16	Synthesis and interpretation	pp. 8-14
S17	Links to empirical data	pp. 8-13
S18	Integration with prior work, implications, transferability, and contribution(s)	pp. 15-16
S19	Limitations	p. 4 and 15
S20	Conflicts of interest	p. 17
S21	Funding	p. 17

BMJ Open

Confidence and willingness among laypersons in the United Kingdom to act in a head injury situation: a qualitative focus group study

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Primary Subject Heading:	Public health
Secondary Subject Heading:	Neurology
Keywords:	craniocerebral trauma, decision-making, first aid, head injury, health education, PUBLIC HEALTH

Title page

Title:

Confidence and willingness among laypersons in the United Kingdom to act in a head injury situation: a qualitative focus group study

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ABSTRACT

Objectives: To explore factors influencing confidence and willingness among laypersons in the UK to act in a head injury situation, in order to inform first aid education offered by the British Red Cross.

Design: Qualitative focus group study

Setting: South East England

Participants: Forty-four laypersons (37 women, 7 men) were purposively recruited from the general public using snowball sampling, into one focus group each for six population groups: parents of young children (n=8), informal carers of older adults (n=7), school staff (n=7), sports coaches (n=2), young adults (n=9), and 'other' adults (n=11). The median (range) age group across the sample was 25-34 years (18-24, 84-95). Participants were from Asian (n=6), Black (n=6), Mixed (n=2) and White (n=30) ethnic backgrounds.

Results: The majority of participants described being confident and willing to act in a head injury scenario if that meant calling for assistance, but did not feel sufficiently confident or knowledgeable to assist or make decisions in a more involved way. Individuals' confidence and willingness presented as fluid and dependent on an interplay of situational and contextual considerations, which strongly impacted decision-making: prior knowledge and experience, characteristics of the injured person, un/observed head injury, and location and environment. These considerations may be framed as enablers or barriers to helping behaviour, impacting decision-making to the same extent as – or even more so than – the clinical signs and symptoms of head injury. An individual conceptual model is proposed to illustrate inter-relationships between these factors.

Conclusions: Our findings show that confidence and willingness to act in a head injury scenario are dependent on several contextual and situational factors. It is important to address such factors, in addition to knowledge of clinical signs and symptoms, in first aid education and training to improve confidence and willingness to act.

Study registration number: not applicable

ARTICLE SUMMARY

Strengths and limitations of this study

- The sample was a targeted but self-selected group, likely to have a personal interest in head injury, and from one geographical region in the United Kingdom.
- Purposive recruitment of sports coaches did not achieve the desired number of participants.
- Diversity in sample demographics supports the representativeness and relevance of findings.
- Involvement of different stakeholders, including representatives from the British Red Cross, National Health Service (NHS) clinicians in emergency services, and service users, supports the credibility of findings and analysis.

INTRODUCTION

In the United Kingdom (UK), the National Institute for Health and Care Excellence (NICE) describes head injury as the most common cause of death and disability in children and adults under the age of 40 years.[1] However, only about 5% of those attending the emergency department (ED) have moderate or severe head injury, and death from head injury occurs in only 0.2% of those attending ED with a head injury.[1] It is suggested that laypeople could be supported in their decision-making as first responders, in effect conducting a type of pre-triage.[1, 2] The purpose of such an approach is to provide reassurance when it is safe to self-care outside of the ED, and at the same time ensure that individuals with serious symptoms of head injury understand that they need to attend the ED urgently. Guidance for laypeople for pre-triage, (self-)assessment and early management of head injury is available,[1] including which clinical signs and symptoms allow the differentiation of minor and more serious head injury and concussion.[3] These guidelines appear to assume that the layperson will engage with such decision-making. However, in trauma more broadly Oliver and colleagues noted that laypeople made calls for assistance in 93% of cases, but first aid was only administered to 43-57% of those alive at scene.[4] Commenting on these findings, McNulty suggests that when a person is injured, people mostly lack the skills and confidence to do more than calling for an emergency ambulance.[5]

Ambiguity in decision-making is a recognised factor impacting (lay) first responder behaviour, that is, their confidence and willingness to act.[6] A number of studies have explored laypersons' confidence and willingness to act in first aid scenarios, and identified that contextual and situational factors are influential in the decision whether to assist or not. For example, in an analysis of 16 million emergency services episodes in the United States, bystanders were more likely to exhibit helping behaviour when the patient was male or older; and in urban and institutional settings, as opposed to rural and public street settings.[7] The type of medical emergency also influenced first aid behaviour, with bystanders more likely to take action for cardiac arrest, chest pain, allergic reaction, respiratory distress and trauma; and least likely to help for sexual assault and psychiatric disorder.[7] The presence of other bystanders is understood to generally decrease the likelihood of lay responder action, a phenomenon described as 'diffusion of responsibility'.[6, 8]

Previous research undertaken by the British Red Cross (BRC) and others has identified ways to overcome some of these contextual barriers to helping,[9, 10] and these findings have been embedded in all BRC first aid education. But although this evidence is based on studies which partly included trauma populations, no research has explored these contextual and situational aspects and their impact on confidence and willingness to act specific to head injury. To address this gap in evidence, this article presents findings from a research project funded by the BRC to inform their larger programme of work on first aid education and training in head injury.

This article addresses the following research questions:

- How do laypersons describe their confidence and willingness to act in response to a head injury?
- What do laypersons see as enablers and barriers to changing their own behaviour, or that of others?
- Are any differences observed between population groups of differing demographics?

METHOD

Design

This study was a qualitative inquiry using focus groups and semi-structured interviews,[11, 12] nested within a larger pragmatic mixed methods study.[13, 14]

Participants and recruitment

Recruitment was purposive, aiming to recruit participants from six self-defined population groups. These groups were targeted because of their differing perspectives and experiences of head injury: parents of young children (babies and toddlers), informal carers of older adults (self-identification as informal carer), school staff (employed teacher or teaching assistant), sports coaches (including professional and amateur sports), young adults (age 18-24 years), and 'other' adults. It was recognised that participants might identify with more than one group, and participants were guided to focus primarily on their experiences within the group they were recruited to. Participants remained eligible if they had prior first aid training for lay responders; but were excluded if they were qualified or trainee healthcare professionals.

Participants were recruited by snowball sampling.[12] The researchers approached suitable lead contacts, for example a health visitor at a children's centre, a sheltered housing warden, a cycling coach, and a university lecturer. The researchers and/or initial lead contacts provided eligible individuals with participant information sheets (including researchers' contact details) and consent forms. Individuals expressed their interest in the study by contacting the research team directly. All participants gave written informed consent to take part in the research. They were asked to circulate study information to other potential participants within their social and/or professional networks. To facilitate recruitment, focus group or interview times and venues were arranged at participants' convenience, for example at their usual work or meeting place; and a shopping voucher was offered as compensation for participants' time and to cover any travel expenses. Childcare and carer costs were also offered where appropriate. Where participants could not practicably be formed into an in-person or virtual focus group, an individual face to face or telephone interview was offered.

Data collection

Focus groups were held in two stages within each population group, using semi-structured topic guides.[11] Topic guides were designed with project stakeholders, including the service user representative on the study team (AH). At the first stage, focus groups explored the meaning of head injury, participants' understanding of its signs and symptoms, and their confidence and willingness to act in response to a head injury. In the second focus group, materials to guide lay decision-making regarding action following head injury were introduced, with the aim of prompting further discussion about confidence and willingness to act when applied to hypothetical scenarios. Example questions to the groups included *What does 'head injury' mean to you?* and *What is your understanding of what to do when somebody has a head injury?* The complete topic guide is available in online supplement 1.

All focus groups were moderated by an experienced researcher (MH) and co-moderated by one or two other members of the research team (AB, AH, STK), who supported logistics, observed interpersonal group dynamics, took concurrent field notes (speaker order, non-verbal cues, reflective notes), and/or led in moderating parts of the discussion.

Data analysis

Focus groups were digitally audio recorded and transcribed verbatim by a professional transcription service. Transcripts were checked for accuracy against recordings by members of the research team and individual speakers were assigned unique pseudonyms, *e.g*. 'F1' or 'M2' denoting a female or male speaker, respectively.

Analysis of transcripts and field notes was by framework analysis.[15] Two researchers (MH, STK) read and re-read the transcripts and through discussion developed a coding framework, iterated further by a third researcher (AB) involved in the focus group data collection. Coding was carried out using NVivo11© software (QSR International, 2017). Themes were developed iteratively in discussion with the group of three researchers who also extracted illustrative direct quotes, within the framework of the population groups. Researcher reflexivity was enacted through open discussion in the group of researchers and with stakeholders, providing a forum to address and resolve alternative viewpoints, challenges and criticisms. In a final analysis step, the framework was developed into a conceptual model which crossed population groups.

Patient and Public Involvement

A service user representative (AH) was part of the study team and contributed to the study design, data collection, study oversight and the dissemination of findings.

RESULTS

Participants

Forty-four participants from the six population groups took part. In the sports coach group, only two participants could be recruited and were interviewed individually rather than in a focus group setting, but following the same topic guide. Participants in the group of informal carers of older adults consisted of one adult who cared for his parent, and six elderly residents of a sheltered housing scheme who were informal caregivers to each other. In the 'other' adults group, two first and second stage focus groups were held to accommodate the larger number of participants. Focus group/interview recordings ranged in duration from 34 to 69 minutes. The majority of participants took part in both stages of data collection. Participant characteristics are summarised in table 1.

Participants revealed a wide range of experience, knowledge and levels of confidence in dealing with head injury. Descriptions of their confidence and willingness to act in response to a head injury were embedded within their general understandings of 'head injury'. It was apparent that the term held different meanings for individuals. For some, head injury always represented a serious situation; while others appreciated that it included a range from the minor to the severe. Common to all groups was the reasoning that head injury was more problematic than other injuries for two reasons: the potential seriousness of brain damage due to the vital role of the brain; and the fact that the damage may not be seen. Within this shared perception of the potential seriousness of head injury, there was a wide range of knowledge and understanding – and sometimes misunderstanding – of clinical signs and symptoms, and what action to take as a first responder.

Table 1. Participant characteristics

Population group	Number of participants	Age group	Ethnicity (UK census categories)	Gender
Parents of young children	Stage 1 focus group: 6 Stage 2 focus group: 5 Total: 8	Not available	Any other White background: 3 White British: 3 Black British: 1 Mixed White and Black Caribbean: 1	Female: 8
Informal carers of older adults	Stage 1 focus group: 6 Stage 2 focus group: 7 Total: 7	55-64: 1 75-84: 4 85-94: 2	White British: 7	Female: 5 Male: 2
School staff	Stage 1 focus group: 7 Stage 2 focus group: 7 Total: 7	18-24: 2 25-34: 3 55-64: 2	White British: 7	Female: 6 Male: 1
Sports coaches	Stage 1 interviews: 2 Stage 2 interview: 1 Total: 2	35-44: 1 45-54: 1	White British: 2	Female: 1 Male: 1
Young adults	Stage 1 focus group: 4 Stage 2 focus group: 9 Total: 9	18-24: 9	Any other White background: 2 Black African: 2 Asian Indian: 1 Asian Pakistani: 1 Any other Asian background: 1 Mixed White and Asian: 1 White British: 1	Female: 6 Male: 3
'Other' adults	Stage 1 focus groups: 10 [a] Stage 2 focus groups: 11 [a] Total: 11	25-34: 5 35-44: 2 45-54: 1 55-64: 2 75-84: 1	White British: 4 Black Caribbean: 2 Asian Chinese: 1 Asian Indian: 1 Any other Asian background: 1 Any other White background: 1 Black British: 1	Female: 11

[a] In this population group, two focus groups were held at each stage to accommodate group size
UK, United Kingdom

Themes

While participants within and across the six population groups were heterogeneous in their responses, several distinct patterns (themes) emerged from focus group discussions. Against the background of respondents' shared awareness of the potential seriousness of head injury, it was apparent that individuals' confidence and willingness to act was not static, but rather fluid and dependent on a multitude of situational and contextual considerations. These contingent factors were often considered *before* focusing on clinical signs and symptoms of head injury. They therefore presented *a priori* enablers – or, conversely, barriers – in influencing how participants thought they would behave in a head injury situation. Discussion of these considerations was very prevalent in focus groups – more so than discussion of implications of clinical signs and symptoms – and clearly impacted on participants' reasoning. It either altered their decision-making ('If context A, then action X; but if context B, then action Y') or added layers of complexity, which remained unresolved ('If context A, then action X; but if context B or C, I'm not sure'). Moreover, situational and contextual factors were often discussed in various combinations and scenarios, resulting in an interplay between enablers and barriers in addition to the clinical signs and symptoms displayed by the injured person. There was overlap in findings from the first and second stage of data collection, overall corroborating and reinforcing the themes developed in analysis:

- Prior knowledge and experience
- Known or unknown injured person
- Observed or unobserved injury taking place
- Location and environment
- Interplay of situational and contextual factors

Prior knowledge and experience

The extent of prior knowledge and experience varied within and across population groups and appeared to be linked closely with individuals' levels of confidence and willingness to act as first responders. Some inaccuracies and misconceptions were noted, such as one participant's assumption that visible bruising was favourable, as lack of bruising could indicate 'a bleed on the inside' (F5, Parents of young children). Conversely, some participants displayed greater understanding of the role of medical diagnostics, for example referring to the need for a scan to detect whether there was an internal bleed. Among those with less prior knowledge and experience, some stated that they would panic:

> *F1: I'd panic because there's something about the word, head injury, that would make me panic actually. ('Other' adults)*

Others explained that they would be more confident and willing to summon help than to provide advice or assistance in a more involved manner:

> *F2: Yes, maybe because I wouldn't know what to do, so instead of wasting time trying to figure out what to do, I'll just get someone who could help, keep it from getting worse. (Young adults)*

In contrast, some participants who had completed more in-depth first aid training spoke confidently about what to do in a head injury situation. For example, two participants in the focus group with

school staff held designated first aider roles at work and talked with confidence about the steps they would take if a pupil had been knocked unconscious for a few seconds:

> *F6: That's normally where we'd clear the area of other children and send someone down to the office, so that they can obviously make a phone call for an ambulance.*
> *F8: Make sure the child stays lying on the floor. Doesn't sit up because they're very likely to go back over again. Check that they can still speak to us. They're coherent. They can breathe, and then wait to see what 999 [emergency ambulance call number] says we should do.*
> *(School staff)*

In these discussions participants mainly drew on prior knowledge from formal first aid training, but also talked about 'life experiences', for example from accounts or observations of head injury incidents at work or among family and friends:

> *M1: The experience you've had of life with bringing up a family and what you see at work, you see accidents at work and things like that, so you gain knowledge from each incident that you see. (Informal carers of older people)*

Known or unknown injured person

In terms of characteristics of the injured person, knowing or not knowing the person appeared to be highly influential in how comfortable participants felt, as well as how willing they might be to act. Although this point was raised in all groups/interviews, it was particularly prominent in the groups with parents of young children and school staff. Participants talked about calling staff members who knew the child well, or calling parents to assess their own child. This appeared at times to be double-edged in that knowledge of the individual was considered vital to judge in how far the child 'behaved differently' following the head injury; but knowing the child brought an emotional component into play, particularly for parents, that they recognised impacted on their objective decision-making:

> *F5: If you looked after other people's children if they hit their head you'd be like, 'Right, we've got to let mum know. What do we do from there?' When it's your own kid you're kind of like, 'Do I go to hospital? Do I ring someone? Do I ring somebody?' (Parents of young children)*

In general, participants discussed that they would respond in a more involved manner if they knew the injured person, for example escorting the person home if the injury had occurred outdoors, or accompanying them to hospital. A sense of belonging to the same group or community as the injured person also seemed to increase participants' willingness and confidence to be more involved:

> *F1: I think if also I can see similarities with that person in myself, I might be more willing to help as well. For example, I ride a bicycle, so if I saw a bike rider, I might respond quicker because I could be that person. ('Other' adults)*

For a stranger, in contrast, participants appeared more likely to call an ambulance or give advice and then move on. Children and older people were generally considered more vulnerable, prompting greater caution and a lower threshold for using medical and emergency services. Several participants also considered how the injured person themselves might wish or intend to deal with the situation, provided they were conscious and able to express themselves:

> *F7: I think partly also, you'd be influenced by what they wanted to do. If they were really stressing out and they were like, 'Oh my God! My head's hurting' or, 'I feel like I'm going to pass out' you'd be like, 'Okay, you might need to go and get checked out.' If they were like, 'No, I'm fine,' I think it would influence your decision. ('Other' adults)*

It was recognised that the injured person might not realise the seriousness of the situation, and at times one might have to act against someone's wishes for their own protection and the protection of others. Although not all participants would have been as confident as this sports coach:

> *Interviewer: It sounds like you would take it pretty seriously, you would sit them down, make them not get back on their bike.*
> *F1: Yes, they're going to be a danger to other people, […] the last thing you want is another [rider] out on the road again or on a racetrack or whatever it is, being a danger to other people. (Sports coaches)*

Observed or unobserved injury taking place

Having witnessed the head injury, or noting the presence of a bruise, lump or bleeding head wound, which would indicate that the person has sustained a head injury, made a difference to participants' confidence and willingness to act. Participants considered that if the injury was unwitnessed, they might not feel as confident in their decision-making, because other medical conditions (stroke, seizure or heart attack) or alcohol and drug misuse might lead to similar symptoms:

> *F2: But that comes back to if you've seen them and you've seen they've had a blow to the head or an accident, I mean it could be a drunk, couldn't it? If they're behaving or speaking really differently, you just wouldn't know if you hadn't seen the accident. ('Other' adults)*

In case of a witnessed head injury, several participants also talked about considering the mechanism of injury, for example the person hitting their head against concrete pavement as opposed to a door, or being hit by another person as opposed to bumping their head by accident. This observation could alter participants' perception of the potential injury severity and subsequent action taken:

> *F3: If they've been hit or something, then, yes, I would call an ambulance, but if it was a matter of them like hitting their head against a wall or something, like tripping over, then I wouldn't be inclined to. I think it depends on the situation and like their surroundings as well. (Young people)*

Location and environment

Considerations around the location and environment, in which the head injury occurred, also influenced individuals' confidence and willingness to act. In an institutional setting, such as the university, young people for example talked of trying to find a first aider or other figure of authority, to help them decide what action was best in response to head injury. Similarly, the impact of a workplace environment was described by participants in the focus group with school staff and 'other' adults, who described following certain organisational rules for injury at work. Informal carers of older adults discussed that in a sheltered housing environment guidance was always to

hand, either in person (warden) or via an alarm call. It was noted that this guidance was usually to contact medical advice.

The impact of institutional policies was most strongly and consistently reflected in the focus group with school staff. Here, a clear chain of communication was in operation; a junior member of school staff explained:

> *F4: Well, the procedure that we know is you get [first aider 1] or you get [first aider 2]. […] We never make the final decision. We always pass it off. (School staff)*

School staff understood organisational policy to streamline and facilitate their duty of care towards school children, but also considered its function in protecting school staff and the organisation. For example, they commented on the value of providing written information to parents of children who sustained a head injury at school, as this 'also covers the school'. Sports coaches also described a similar chain of communication at professional or large-scale public sports events:

> *F1: If I came across somebody who had been involved in a head injury at one of our events, I always have a radio, so I would radio to event control and event control would then speak to our appointed medical provider. […] Depending on who it is, that help, that message would then be disseminated down through the channels. We have a medical director, so we have doctors as well as St. John and Red Cross. (Sports coaches)*

But sports coaches also raised another issue they had encountered in an extreme sports environment, which related to a sense of pressure and expectation to continue on after an injury, rather than stop and recover:

> *M2: I notice that from a lot of people, it's almost like a sign of some kind of reward if you get up after really banging your head or hurting yourself. It's like you're some kind of warrior. (Sports coaches)*

In contrast, some participants in other groups talked about taking a very cautious approach, and voiced their fear of doing something wrong and potential litigation, particularly in public and when dealing with a stranger:

> *F1: There's always that kind of thing where you want to help as a bystander, but at the same time you think so many people around you might be more qualified to do that, and you're like okay, I don't want to mess it up because it's the head! ('Other' adults)*

Interplay of situational and contextual factors

These situational and contextual impacts on confidence and willingness to act were often discussed in combination and in layered scenarios. This prompted participants to think of additional contingent factors and appeared to create a situation of some concern for many participants, who might not have been overly alarmed about one of these factors in isolation. For example, participants commented on personal safety when considering a stranger in public following an unwitnessed head injury. This related to the potential danger of approaching a stranger who displays unusual behaviour, but also reluctance to provide hands-on assistance if blood were present. In this type of

hypothetical scenario participants felt more comfortable to call for assistance rather than to get involved themselves. This became the underpinning concept to our analysis, *i.e.* participants described their confidence and willingness to act in relation to the situational and contextual factors of specific scenarios. Conceptually, these factors therefore represent an interplay of enablers and barriers, whereby *prior knowledge and experience* might be conceptualised as providing a backdrop to the situation-dependent aspects of *known or unknown injured person*, *observed or unobserved injury*, and *location and environment*. Additionally these situational and contextual considerations, rather than the clinical signs and symptoms of head injury, had primary influence over lay responders' decision-making and helping behaviour. Figure 1 presents a visualisation of this in an individual conceptual model.

[INSERT FIGURE 1 ABOUT HERE]

DISCUSSION

This study has explored laypersons' confidence and willingness to act as first responders in a head injury situation. In the majority, participants were willing to help if that meant calling for the assistance of someone else, but most did not feel confident or knowledgeable enough to either carry out physical intervention or observe and evaluate whether use of the ED could be avoided. Few participants felt confident to take charge of decision-making in a head injury situation. Participants raised multiple situational and contextual considerations, which impacted on their own confidence and willingness to act in a given situation. These factors may be framed as enablers and barriers, and include prior knowledge and experience, characteristics of the injured person, whether the injury was observed or unobserved, and the location and environment. While discussions within all six research population groups were wide-ranging and varied, there were some themes more prominent in certain groups, such as the impact of institutional policies and workplace practices in the groups with school staff and 'other' adults; and knowing or not knowing the child when judging behaviour following a head injury in the groups of parents with young children and school staff. The findings were summarised in an individual conceptual model (figure 1).

Study strengths and limitations relate to characteristics of the sample. The sample size was small, which is common in qualitative research that aims to generate in-depth findings for explanatory purposes.[12] While there was under-recruitment of sports coaches, recruitment to the other five research population groups was successful. We recruited to the six population groups primarily to achieve thematic coverage, rather than for comparison between groups, but were nevertheless able to comment on themes more prevalent in certain groups. Diversity across sample demographics adds to the potential transferability and relevance of findings. It is acknowledged that, due to the snowball recruitment method, the sample was a self-selected group, likely with a personal interest in head injury and a desire to learn. We realise that the important issue of safeguarding, *e.g.* with respect to child or elder abuse or neglect, was not a talking point in our focus groups. This may be due to discussions focussing on willingness to act rather than the circumstances of injury. We acknowledge that it may have been helpful to elicit discussion around safeguarding through specific prompts. Geographically, participants were based in the South East of England. Although the findings do not appear to closely relate to participants' location, it is possible that individuals from other regions in the UK – or internationally – would contribute additional or alternative views and experiences. A further strength of this study was the involvement of different project stakeholders, including representatives from the British Red Cross, clinicians in National Health Service (NHS) emergency services, and service users. This added to the reflexive approach of the research team and the credibility of data and analysis.

The study concerned exploring confidence and willingness to act in head injury, as an assumed precursor to appropriate decision-making of laypersons in a head injury situation. This is topical in light of healthcare policy calling for a reduction in avoidable ED attendances and hospital admissions,[16, 17] which our study viewed alongside the need to ensure that individuals with serious symptoms of head injury receive the prompt attention they require at the ED. Although some of our participants expressed a willingness to self-care where first aid materials led them to believe this would be a safe option, our findings suggest that this would not be simple for all, or all of the time. Feeding into individuals' confidence and willingness to act in this way, the findings from this study suggest various situational and contextual considerations at play. These align with other literature on lay response and helping behaviour,[18, 19] which highlight problems due to lack of knowledge and experience, for example in identifying clinical symptoms and correct first aid measures in trauma,[20] sports injury,[21, 22] heart attack,[23] stroke,[24, 25] and mental

illness.[26] Moreover, it has been suggested that in addition to individuals' knowledge and skills, the decision to act is dependent on acknowledgment of the situation and having confidence in one's own ability;[18, 19, 27, 28] and there is some evidence that first aid education needs to incorporate specific components to target positive attitudes and helping reactions towards emergencies (as opposed to factual knowledge and practical skills alone), in order to achieve improvements in helping behaviour.[10] In contrast to cardiopulmonary resuscitation and other more involved and complex first aid scenarios, helping behaviour in head injury more often relates to observing the person and making decisions accordingly and should therefore be more easily amenable to interventions.

Most of the situational and contextual considerations identified in the present study have also been recognised in other first aid settings. In the context of road traffic collisions, the following barriers to providing first aid have been described: not being a first aider, poor knowledge of the importance of providing first aid, fear of making a mistake, the scene feeling overwhelming, victim refusal, concern about infection, the presence of bleeding, not remembering the details of first aid, and a concern about legal risk.[28-30] In cardiopulmonary resuscitation, it was found that people were less likely to intervene with strangers than with family members; while enablers included first aid training and a controlled environment, particularly the person's own home.[27] Interestingly, among the range of contingent factors identified in this study, the characteristics of the injured person, circumstances of the injury, and the environment appeared to impact individuals' confidence to the same extent as – or even more than – their knowledge and experience. Consequently, in contrast to a medical assessment which focuses mainly on clinical signs and symptoms of head injury, these factors were highly influential to laypersons' decision-making often *before* clinical signs and symptoms were considered. This mirrors previous research, which has highlighted the role of psychological and emotional, rather than technical factors.[18, 31] Therefore, to achieve maximum impact, first aid education should not only convey factual knowledge but must also address contextual barriers to lay responders' confidence and willingness to act.

A recent evidence review by the International Liaison Committee on Resuscitation (ILCOR) First Aid Task Force has highlighted the lack of scientific research into first aid education.[32] The present study has generated in-depth insights into behavioural enablers and barriers for laypersons to act as first responders in a head injury situation. These findings are relevant to inform educational interventions and public health campaigns on head injury, but may equally apply to first aid in general. The World Health Organization recommends that health education should be underpinned by suitable behaviour change theories or models, a number of which are available.[33, 34] While the individual conceptual model presented here (figure 1) closely reflects the data in this study, it is possible to cross-reference to other commonly used behaviour change theories. For example in Social Cognitive Theory,[35] self-efficacy (confidence in one's ability to take action and overcome barriers) and reciprocal determinism (the dynamic interaction of the person, their behaviour and the environment) constitute key concepts,[33] which show distinct parallels and relevance to the data in this study. Future research could develop tools to quantify the impact of different situational and contextual factors on helping behaviour, as research instruments or to facilitate individual learning, particularly impact on faster provision of first aid alongside greater self-care where appropriate. The findings of this study may therefore inform the future development, implementation and evaluation of targeted health education interventions for laypersons responding to a head injury. There also remains scope for further work to address study limitations and explore these issues in groups and regions that were underrepresented in this research.

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Author contributions: MH is Chief Investigator for this study. MH, AH, SG, BK, EO and HJ designed the study. MH, AB, STK and AH collected and analysed the data. All co-authors contributed to the interpretation of the data. STK prepared the manuscript. EO supported the writing and coordinated input from the British Red Cross study steering group led by BK. All co-authors critically reviewed and approved the final manuscript.

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Competing interests: MH reports grants from British Red Cross during the conduct of the study. BK reports grants from Elastoplast during the conduct of the study. EO reports grants from Elastoplast during the conduct of the study and outside the submitted work. EO reports the British Red Cross commissioned this study in the context of developing a lay responder pathway to head injuries. The British Red Cross is a first aid education provider and standard setter. AB, AH, HJ, SG and STK report no conflict.

Ethics approval: The study was approved by the Faculty Research Ethics Committee of the Faculty of Health, Social Care and Education at Kingston University and St George's, University of London (FREC 2017-12-014).

Data sharing statement: No additional data are available

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Figure 1. Individual conceptual model of confidence and willingness to act in a head injury situation. Against the background of individual knowledge and experience, situational and contextual factors have significant influence on the person's helping behaviour.

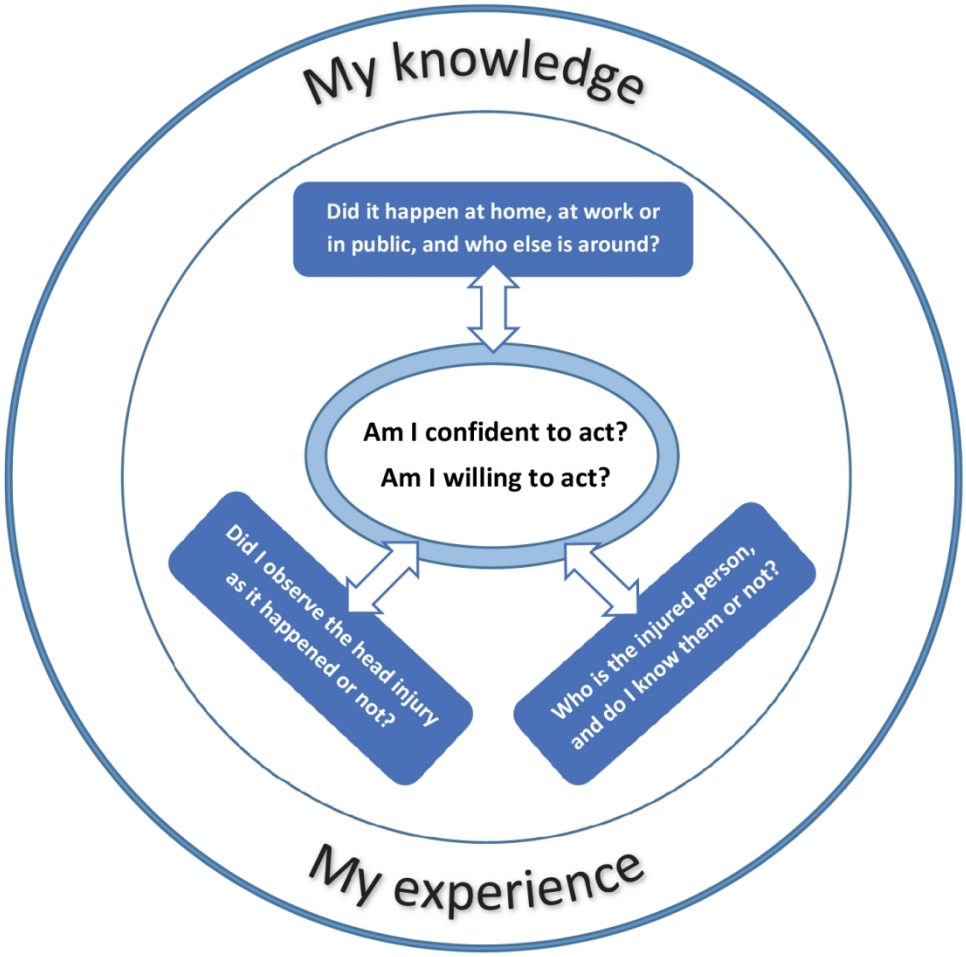

Figure 1. Individual conceptual model of confidence and willingness to act in a head injury situation. Against the background of individual knowledge and experience, situational and contextual factors have significant influence on the person's helping behaviour.

Online supplement 1. Topic guide for focus groups

Article title: Confidence and willingness among laypersons in the United Kingdom to act in a head injury situation: a qualitative focus group study

Authors: Kulnik ST, Halter M, Hilton A, Baron A, Garner S, Jarman H, Klaassen B, Oliver E

Focus group 1	
Introduction	Researchers and participants briefly introduce themselves. Moderator explains ground rules and confidentiality. Moderator gives a brief overview of the study so far and how focus groups fit in the overall study.
Discussion topics	Explore participants' understanding of head injury: • What does 'head injury' mean to you? • What comes to mind when you think of 'head injury'? • What signs or symptoms would you associate with 'head injury'? Explore participants' decision making and information seeking as lay responders in a head injury situation: • What is your understanding of what to do when somebody has a head injury? • Where/how would you inform yourself about what to do?
Close	The group ends with any other questions, comments or queries.

<table>
<tr><th colspan="2">Focus group 2</th></tr>
<tr><td>Introduction</td><td>Researchers and participants briefly introduce themselves.
Moderator explains ground rules and confidentiality.
Moderator gives a brief update on the progress of the study so far.</td></tr>
<tr><td>Discussion topics</td><td>Participants self-rate (0-10, 0 being not confident at all, 10 being very confident) their confidence and willingness to decide what action to take in a head injury scenario using a score card, i.e. the ‘before’ score.

Participants are presented with a head injury decision aid for lay responders:
• Explore the participants’ immediate response to the decision aid: How do you find this?
• Participants repeat their self-rating (0-10), i.e. the ‘interim’ score.

Participants split into pairs for discussion of hypothetical head injury scenarios. Presented with two hypothetical head injury scenarios, participants are asked to talk through their decision making and action as first responders.
<table>
<tr><th></th><th>Scenario 1</th><th>Scenario 2</th></tr>
<tr><td>Scenario description (wording for ‘other’ adults target group)*</td><td>You are at work, walking up the corridor and chatting with a colleague when a door swings open suddenly and hits her on the head. She tells you that her head hurts and she feels sick. There is a bruise on the front of her head. What would you do?</td><td>It is early evening and you’re on your way home from work with your friend walking alongside you. He doesn’t notice the loose paving slab. He trips and falls to the ground, hitting the side of his head as he does. He calls out immediately and sits up. You see straightaway that he has a lump on this side of his head with a graze but no bleeding. He looks pale, and says he is feeling dizzy. What do you think you might do?</td></tr>
<tr><td>Follow-on questions</td><td>If your friend immediately got up and talked to you in her usual manner and there are no other signs we just told you about – that is, she does not feel sick or have a headache - what would you do?

If your friend was knocked out for a few seconds what would you do?

If your friend started to vomit two hours later what would you do?</td><td>What would you talk to him about doing when it came to bedtime?

What if he had a graze but was not pale and did not say he was feeling dizzy?

What would you do if you noticed that he seemed confused and started to behave differently?</td></tr>
</table>
Participants re-join the whole group and repeat their self-rating (0-10), i.e. the ‘after’ score.</td></tr>
<tr><td>Close</td><td>Moderator explore any other issues.
The group ends with any other questions, comments or queries.</td></tr>
</table>

* In the description of these hypothetical scenarios, the wording of scenario descriptions was adapted to match the background of each research population group. For example, for the focus group with parents of young children, the

'scenes' included parents and children, *etc*. Decision-relevant clinical information with respect to acting in the head injury situation (*i.e.* signs and symptoms of head injury) remained consistent across all focus groups.

Article title: Confidence and willingness among laypersons in the United Kingdom to act in a head injury situation: a qualitative focus group study

Authors: Kulnik ST, Halter M, Hilton A, Baron A, Garner S, Jarman H, Klaassen B, Oliver E

This supplemental file provides the Standards for Reporting Qualitative Research (SRQR) Checklist (O'Brien et al. *Acad Med* 2014;89:1245–51. doi: 10.1097/ACM.0000000000000388).

Table 1 lists page numbers where each SRQR item is addressed within the manuscript.

Table 2 lists SRQR item descriptions, for readers' information.

Table 1

Cross-referencing of SRQR checklist items with the manuscript

No.	Topic	Manuscript page(s)
S1	Title	p. 1
S2	Abstract	p. 3
S3	Problem formulation	p. 5
S4	Purpose or research question	p. 5
S5	Qualitative approach and research paradigm	p. 6
S6	Researcher characteristics, reflexivity	pp. 4, 7 and 17
S7	Context	p. 6
S8	Sampling strategy	p. 6
S9	Ethical issues pertaining to human subjects	p. 17
S10	Data collection methods	p. 6
S11	Data collection instruments/ technologies	p. 6, online supplement 1
S12	Units of study	p. 8, table 1
S13	Data processing	p. 7
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S16	Synthesis and interpretation	pp. 8-14
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S20	Conflicts of interest	p. 17
S21	Funding	p. 17

Table 2

Standards for Reporting Qualitative Research (SRQR)[a]: item description

No.	Topic	Item
	Title and abstract	
S1	Title	Concise description of the nature and topic of the study Identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended
S2	Abstract	Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions
	Introduction	
S3	Problem formulation	Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement
S4	Purpose or research question	Purpose of the study and specific objectives or questions
	Methods	
S5	Qualitative approach and research paradigm	Qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g., postpositivist, constructivist/ interpretivist) is also recommended; rationale[b]
S6	Researcher characteristics and reflexivity	Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with participants, assumptions, and/or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results, and/or transferability
S7	Context	Setting/site and salient contextual factors; rationale[b]
S8	Sampling strategy	How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale[b]
S9	Ethical issues pertaining to human subjects	Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues
S10	Data collection methods	Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale[b]
S11	Data collection instruments and technologies	Description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study
S12	Units of study	Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)
S13	Data processing	Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymization/deidentification of excerpts
S14	Data analysis	Process by which inferences, themes, etc., were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale[b]
S15	Techniques to enhance trustworthiness	Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale[b]
	Results/findings	
S16	Synthesis and interpretation	Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory
S17	Links to empirical data	Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings
	Discussion	
S18	Integration with prior work, implications, transferability, and contribution(s) to the field	Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/ generalizability; identification of unique contribution(s) to scholarship in a discipline or field
S19	Limitations	Trustworthiness and limitations of findings

(*Table continues*)

Table 2
(Continued)

No.	Topic	Item
	Other	
S20	Conflicts of interest	Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed
S21	Funding	Sources of funding and other support; role of funders in data collection, interpretation, and reporting

[a]The authors created the SRQR by searching the literature to identify guidelines, reporting standards, and critical appraisal criteria for qualitative research; reviewing the reference lists of retrieved sources; and contacting experts to gain feedback. The SRQR aims to improve the transparency of all aspects of qualitative research by providing clear standards for reporting qualitative research.

[b]The rationale should briefly discuss the justification for choosing that theory, approach, method, or technique rather than other options available, the assumptions and limitations implicit in those choices, and how those choices influence study conclusions and transferability. As appropriate, the rationale for several items might be discussed together.