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Not quite a doctor, but should I help? A qualitative exploration of medical students' attitudes towards responding to medical emergencies that occur in the public domain.

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Not quite a doctor, but should I help? A qualitative exploration of medical students' attitudes towards responding to medical emergencies that occur in the public domain.

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2 tables, 2 boxes

Abstract

Objective: To explore medical students' views and experiences of responding to out-of-hospital emergencies.

Setting: University College London (UCL).

Participants: 11 UCL Medical School (UCLMS) students.

Study Design: Qualitative.

Methods and Outcome Measures: We carried out 11 one-to-one semistructured interviews, with participant validation and reflective work. The data was analysed using thematic analysis.

Results: Three core themes were identified. (1) “**We Did Debate a Bit: Should We Go? Should We Not?**” – Decisions to intervene were based upon the casualty's appearance; bystanders' presence and actions; witnessing the incident; self-perceived competence, confidence and knowledge; and personal experiences and feelings associated with medical emergencies. (2) “**It Would Represent The Medical Profession Well if We Did Step In and Help**” – Students felt that they had an ethical and/or professional duty to help. (3) “**No One Should Die Because of a Lack of... Basic Life-Saving Techniques**” – Students felt that Medical School training alone had not sufficiently prepared them to respond to out-of-hospital emergencies. Improvements to training were suggested: integrating first aid/ response training into the horizontal (systems-based) modules; teaching both common and rare medical emergencies and presentations; training that is led by experienced first responders and that increases students' exposure to out-of-hospital emergencies; and providing more refresher training sessions.

Conclusions: Students felt Medical School training could be improved to better prepare them for responding to out-of-hospital emergencies, and wanted clarification on the laws and ethics surrounding this topic that concern them. Further mixed-methods research using a larger sample needs to be carried out to confirm whether findings are transferable to other UK Medical Schools.

Article Summary

Strengths and Limitations of this study

- This study provided in-depth exploration of medical students' thoughts and feelings towards their involvement in out-of-hospital medical emergencies.
- The credibility of the study was increased through participant validation and data triangulation (semistructured interviews and a reflective journal).
- Each author contributed their interpretation of the data, ensuring that a wide range of alternative perspectives on the data were considered.
- The sample was recruited from one Medical School, limiting the transferability of the findings to other Medical Schools
- The sample size was small. However, theoretical saturation was reached, implying that sufficient data has been obtained and strengthening the study's credibility.

Introduction

Up to 140,000 deaths in England and Wales could be prevented each year if appropriate first aid is performed quickly.⁽¹⁾ Since every minute delay of cardiopulmonary resuscitation (CPR) on a cardiac arrest victim decreases their chance of survival by 2.3%,⁽²⁾ effective early bystander intervention during the wait for the Ambulance Service to arrive at the scene has the potential to save lives.⁽³⁻⁵⁾ According to St John Ambulance's⁽⁶⁾ national survey, only one in ten bystanders would administer CPR in the public domain.

In the UK, Medical Professionals are not legally obliged to assist in medical emergencies. However, under the General Medical Service (GMS) contract, General Practitioners are contractually obliged to provide emergency treatment during core hours for any persons within their practice's area.⁽⁷⁾ Although it is not a General Medical Council (GMC) requirement, most UK Medical Schools teach their students basic life support (BLS) and advanced life support (ALS).⁽⁸⁾ One UK study⁽⁹⁾ found that only 33% of 115 medical students were able to perform the first step of BLS (assessing the scene for danger) correctly. Towards the end of Medical School training, students appear to be more confident: in Finland, 70.4% of 71 of penultimate-year medical students, and 85.7% final-year medical students, claimed to be confident in their BLS abilities.⁽¹⁰⁾ Confidence in BLS abilities appears to be directly correlated with the number of cardiac arrests that students have witnessed, suggesting experience is an important part of training.⁽¹¹⁾ However, whilst non-interventional experiences of medical emergencies are common prior to graduating (99% students), less than half of the Norwegian medical students surveyed had provided emergency care outside of the teaching environment.⁽¹²⁾ Information available about UK medical students' experiences of responding to out-of-hospital emergencies is limited.

When considering whether to provide CPR in clinical practice, UK doctors and medical students report making judgements on the basis of diagnosis and prognosis; age of patient; quality of life; opinions of doctors and other medical staff; the wishes of patients and relevant

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2
3 others; and doctors' beliefs and values.⁽¹³⁾ One key finding outlined in a Japanese study⁽¹⁴⁾
4 was that medical students may be unwilling to perform mouth-to-mouth resuscitation because
5 they fear that they will contract a disease. However, most previous studies of medical
6 students upon this topic are quantitative, conducted over 10 years ago outside the UK, and are
7 focused in the hospital settings. We therefore aimed to understand UK medical students'
8 experiences of providing out-of-hospital emergency care and to identify areas where students
9 feel they lack knowledge and/or skills, which could imply that education could be improved.
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13 **Methods**

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15 We carried out a qualitative study, using semi-structured interviews, participant validation
16 and a reflective journal to collect data. JX (a medical student studying the Medical Science
17 with Primary Health Care intercalated Bachelor of Science (iBSc)) carried out all data
18 collection and led the analysis. The study was conducted at UCL over six months.
19 Participants were recruited using purposive, convenience and snowball sampling.
20
21

22 **Box 1: Categorisation of Participants**

23
24 Participants were categorised according to the level of their exposure to out-of-hospital
25 emergencies.

- 26 • Category 1: participants who have, or have had, greater exposure to out-of-hospital
27 emergencies because they participate, or have participated, in activities (for
28 example, with St. John Ambulance) that increase their exposure.
- 29 • Category 2: participants who have not had greater exposure to out-of-hospital
30 emergencies because they have never participated in activities that increase their
31 exposure.

32
33 Participants were then sub-categorised based on their experiences.

- 34 • Sub-category A: participant intervened in at least one out-of-hospital emergency
- 35 • Sub-category B: participant witnessed, but did not intervene in, at least one out-of-
36 hospital emergency
- 37 • Sub-category C: participant has no experience (i.e has never witnessed or
38 intervened in an out-of-hospital emergency)

39
40 Twelve UCL medical students were invited to participate, sampled through convenience
41 (students known to JX) and purposively according to their medical emergency exposure
42 levels (categorisation in Box 1). Two participants (11 and 12) were sampled by snowball
43 sampling, as they were introduced to JX through a previous participant (09). One student
44 declined because they felt that they were too busy. Eleven students provided written informed
45 consent and completed the study. Recruitment ceased when no new codes were generated
46 during coding of the last three transcripts, signifying that theoretical saturation had been
47 reached.
48
49

50
51 JX carried out face-to-face semistructured interviews, based upon a topic guide developed in
52 conjunction with RM and RF. Topics included features of a medical emergency, experiences
53 of responding to medical emergencies, legal, professional and ethical obligations to intervene,
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3 and training. Participants who had no personal experience of intervening in medical
4 emergencies in the public domain were asked how they think they would respond in a
5 theoretical situation (see Box 2). Interviews lasted on average 35 minutes and were audio
6 recorded. Field notes were made by JX during the interview in a reflective journal.
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9 **Box 2:** Proposed Theoretical Scenario

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11 You are walking down a busy street. A person across the road to you collapses. No one
12 stops to help them.
13

14 **Patient and Public Involvement**

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16 The research question and study objective and design were informed by identifying a gap in
17 the existing literature: a lack of qualitative research on UK medical students' experiences of,
18 and attitudes towards, out-of-hospital emergencies.
19

20
21 JX presented the study to ten Medical Science with Primary Health Care iBSc to confirm the
22 relevance of the study to medical students.
23

24
25 Participants did not contribute to the design, planning or management of the study. However,
26 one participant directed JX to recruit a further two participants (snowball sampling).
27

28
29 All eleven participants received a summary of the study findings and six participants
30 completed participant validation.
31

32 **Ethical Approval**

33
34 Ethical approval to carry out this study was received from University College London
35 Research Ethics Committee (ref.12471/001). JX was prepared to signpost participants who
36 found the interview upsetting to UCL student support.
37

38 **Analysis**

39
40 All aspects of participants' verbal narrative that were recorded were transcribed verbatim by
41 JX. Theoretical saturation was identified at an early stage of the data collection, as JX
42 commenced analysis alongside data collection.⁽¹⁵⁾ Thematic analysis was used to identify core
43 themes.⁽¹⁶⁾ JX familiarised herself with the data by listening to audio recordings and rereading
44 the transcripts, field notes and validation feedback. Codes were derived deductively from the
45 topic guide and inductively from the data.⁽¹⁷⁾ Only data relevant to the research question were
46 coded.⁽¹⁸⁾ JX coded the full dataset. A subset of transcripts was independently coded by RF
47 (project supervisor with expertise in qualitative methods) to gather different perspectives on
48 the emerging data.⁽¹⁹⁾ Emerging codes were compared against existing codes, which were
49 then refined. Previous transcripts were re-coded using the revised codes, until no new codes
50 emerged, ensuring thorough coding and more robust analysis.⁽²⁰⁾ Codes with common
51 elements were grouped together under sub-themes, which were subsequently categorised
52 under core themes.⁽¹⁵⁾ JX examined the coherence of the data within each theme, the
53 credibility of each theme in relation to the dataset, and ensured that there was no overlap
54 between themes. RM and RF independently reviewed the themes and a final interpretation
55 was agreed.
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60 **Participant Validation**

All eleven participants were e-mailed the finalised themes and a description of each sub-theme and JX's interpretation of their individual interview. Six participants responded to participant validation. All of these participants agreed with the study findings and JX's interpretations of their interview. No subsequent changes were made to the themes.

Results

Eleven participants, reflecting a range of first aid/response experiences (Table 1), were interviewed and three core themes were identified (see Table 2).

Table 1: Description of Study Participants

Participant Identification Number	Year of Medical School Training (Out of 6 Years)	Category, Sub-category and Activity (if applicable)
01	2	2A
02	3	1A – St. John Ambulance
03	3	1A – St. John Ambulance, paid-work as a first aider at Wembley Stadium
04	3	1A – St. John Ambulance, Pre-hospital Care Student-Selected Component
05	3	1A & B - paid-work as a first aider at Wembley Stadium
06	3	1A - Pre-hospital Care Student-Selected Component
07	5	1A & B – UCL Save a Baby's Life Society, Wilderness Medicine Student-Selected Component
08	5	1A & B – UCL Wilderness Medicine Society, volunteers with the Scout Association, member of rescue team run by Hertfordshire County Scouts, sports medic for primary schools
09	1	2C
11	1	2C
12	1	2B

Table 2: Themes and sub-themes identified

	Core Theme	Sub-themes
1	“We Did Debate a Bit: Should We Go? Should We Not?”	What is The Situation?
		Knowledge, Competence and Confidence
		Personal Experiences and Feelings Associated with Medical Emergencies

2	“It would represent the medical profession well if we did step in and help”	Obligations: Legal, Ethical And Professional
3		Expectations of Medical Students
4	“No One Should Die Because of a Lack of... Basic Life-Saving Techniques”	How Useful is Training?
5		Training Responsibility
6		What Training Should Look Like
7		Differences Between Individuals

“We Did Debate a Bit: Should We Go? Should We Not?” (07, 5th year, 1A & B)

What is The Situation?

All participants described how they would assess the situation before deciding whether or not to intervene. In particular, participants stated that they would observe the age and physical appearance of the victim and the presence and actions of bystanders.

“if it was a child, I would probably [intervene] because a sick child is often a situation that unsettles people quite a lot... Elderly people as well, because they’re obviously quite vulnerable” (08, 5th year, 1A & B).

“if I was... the only [or] the first person at the scene, I would [be more likely to] help... than if there... were other people [already there]” (07, 5th year, 1A & B).

A few participants considered the potential risks to the safety of others and themselves, if they were (not) to intervene.

“If you see that the situation is dangerous for you... you shouldn’t go and help... your safety is priority” (09, 1st year, 2C).

Knowledge, Competence and Confidence

Most participants felt that their knowledge of, and competency and confidence in providing, emergency care somewhat depended on the extent of their medical and/or emergency care training.

“medical students have varying degrees of knowledge and confidence [depending on] their [year of] studies... some students may not feel confident going to help” (09, 1st year, 2C).

Increased exposure to medical emergencies appeared to be the main driver behind participants’ confidence. Participants with greater exposure to out-of-hospital emergencies (category 1; see Box 1) and/or in the later years of Medical School tended to feel highly knowledgeable and competent, and believed that they would intervene .

“I think confidence is really achieved by exposure” (08, 5th year, 1A & B).

“I would be quite comfortable if I had to provide immediate medical care” (08, 5th year, 1A & B).

Likewise, those with less exposure to out-of-hospital emergencies (category 2; see Box 1) and/or in the earlier years of the MBBS programme tended to feel that their knowledge and competence were low.

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“[hesitation, says whilst nervously laughing] honestly I-I don’t feel like I could help anyone with the knowledge that I have now” (01, 2nd year, 2A).

Those who did not feel confident providing emergency medical care alone stated that they would seek ‘the right help’ from fellow ‘medical students [with] previous experience in [responding to] medical emergencies’ (11, 1st year, 2C, participant validation). A few felt that, if one’s competence is low, it would be best to avoid making the situation worse by not intervening.

“[It is] good to act on the... student’s... ability... if the student can’t perform first aid, it would be better for them not to help and make things worse” (01, 2nd year, 2A).

Personal Experiences and Feelings Associated with Medical Emergencies

A range of feelings were reported in association with first-time involvement in an out-of-hospital emergency. One participant described being emotionally unaffected by out-of-hospital emergency encounters. However, positive feelings (excitement, calm and feeling useful) and negative feelings (overwhelmed, helplessness, embarrassment, burden, stress, doubt and fear) were reported.

On responding to a patient in cardiac arrest: “I was not ready for this. It was very overwhelming” (05, 3rd year, 1A).

“it makes you feel quite responsible... I felt useful” (06, 3rd year, 1A & B).

Few felt their experiences were an opportunity for learning and personal development.

“the first time... you always panic because you don’t know what you’re doing, but then you learn from each mistake, get better over time” (03, 3rd year, 1A).

Participants who had positive experience(s) believed that they would be more likely to intervene again in the future.

“knowing that I have dealt with some medical incidents, and things didn’t end up disastrous, then I feel more reassured that I will make a positive difference if I was to step in” (02, 3rd year, 1).

Participants who were given a theoretical situation (see Box 2) stated they would perform BLS if necessary, but did not acknowledge the potential physical, mental and emotional stress of the situation.

“I would go and see what’s wrong, like, if they’re breathing or not; do the basic... life support... if they need it” (12, 1st year, 2B).

“It would represent the medical profession well if we did step in and help” (01, 2nd year, 2A).

Obligations: Legal, Ethical and Professional

All participants agreed that UK medical students have no legal obligation to help in a medical emergency, but disagreed on the existence of a UK Good Samaritan law.⁽²¹⁾ Few were confident about the implications of the law.

“We’re not legally obliged to respond to emergencies” (07, 5th year, 1A & B).

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“there’s the concept of Good Samaritan and law sort of stuff, that, in theory, protects those who respond to emergencies... it’s quite recent legislation here... I’m a bit, sort of, deficient in facts on this” (08, 5th year, 1A & B).

All participants believed that medical students have an ethical obligation to respond appropriately, but only if they believe that intervening could improve the situation.

“we have a moral obligation” (05, 3rd year, 1A).

“the ambulance were already there..., so I [did not offer my] help because I’d probably just be in the way” (07, 5th year, 1A & B).

For a few, this ethical obligation for a person to help extended to all citizens – not just medical students. However, some felt that medical students have a professional duty, as representatives of the Medical Profession and/or Medical School, to intervene.

On a woman who had collapsed in the street and her head was bleeding: *“I wouldn’t just want to, just ignore her because I feel that, as a medical student... I don’t think that’s right [laughs, embarrassed].”* (01, 2nd year, 2A).

“when you go and help somebody... you... represent the Medical School... it makes not only yourself look helpful [but] the Medical School as well” (09, 1st year, 2C).

Expectations of Medical Students

All participants felt that the public expected them to respond to medical emergencies. There were mixed views of public expectations of medical students’ competencies.

“some members of the public... would expect us to just gawk and standby, whereas others would think “Well, you’re basically doctors, why don’t you do something?!” (08, 5th year, 1A & B).

Most participants believed that the Medical School and the GMC expect medical students to respond medical emergencies, but within the limits of their competency.

“The Medical School would expect you to go help” (09, 1st year, 2C).

“No One Should Die Because of a Lack of... Basic Life-Saving Techniques” (03, 3rd year, 1A)

How Useful is Training?

Whilst a mix of theory and practical training had equipped participants with the skills required to make potentially life-saving interventions, a few highlighted that this had not prepared them for the possible emotional trauma of medical emergencies, since reactions were context-dependent.

“I wasn’t prepared at all. I was not ready for this. It was very overwhelming” (05, 3rd year, 1A).

One participant believed that anyone (even people not trained in first aid/response) can help in an emergency, perhaps implying that training is not always necessary to make a positive impact on the situation.

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3 “if... ‘help’ is seeing an ill patient and calling an ambulance... anyone should go and
4 help” (06, 3rd year, 1A & B).
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6 Training Responsibility 7

8 Most thought that the responsibility to train medical students to be prepared to intervene in
9 out-of-hospital emergencies lies with the Medical School.
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11 “I think the Medical School bears a burden” (08, 5th year, 1A & B).
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13 “I don’t know whose responsibility it should be” (06, 3rd year, 1A & B).
14

15 One participant believed that the Medical School was responsible for recognising students’
16 (in)competencies and acting accordingly. However, opinions were divided on whether, if the
17 Medical School provide insufficient training, students then become responsible for ensuring
18 that they are prepared.
19

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21 “for somebody with no knowledge of how to respond to pre-hospital emergency to go
22 and... look up how to... leaves them open to receiving... wrong advice that could
23 potentially be detrimental to somebody” (04, 3rd year, 1A).
24

25 “I think by all means” (08, 5th year, 1A & B).
26

27 What Training Should Look Like 28

29 Most participants expressed complete dissatisfaction with Medical School emergency care
30 training, describing it as illogical and lacking depth.
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32 “we were informally taught recovery position... by [a medical student] in a maths
33 lecture? Why wasn’t it taught with CPR?” (02, 3rd year, 1A).
34

35 “I don’t remember that being massively comprehensive” (05, 3rd year, 1A).
36

37 All participants suggested ideas for improving the training provided by the Medical School.
38 Students wanted first aid/ response training to be integrated into the horizontal (systems-
39 based) modules to increase their understanding of disease pathophysiology and management.
40 One student expressed the desire to be taught both common and rare presentations in medical
41 emergencies, in order to be prepared for realistic situations. A few students thought that
42 teaching should be delivered by individuals who are experienced first responders and to be
43 offered more opportunities to gain greater understanding and/or exposure to out-of-hospital
44 emergencies (for example, through a Pre-hospital Care module). Most students wanted more
45 refresher sessions to consolidate their knowledge and skills.
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49 “getting a London Ambulance service paramedic to teach us, or someone with pre-
50 hospital experience, who can give tips of the trade, would be a benefit.” (04, 3rd year,
51 1A).
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54 Differences Between Individuals 55

56 Personal interest in emergency medicine was a strong influence upon seeking extracurricular
57 training, which in turn is likely to have resulted in increased exposure and experiences,
58 knowledge and skills.
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“my clinical interest... is acute emergency medicine, especially outside of the hospital... it’s... more than natural [for me] to go on courses and further my skills and skills, beyond... what the Medical School teaches” (08, 5th year, 1A & B).

Discussion

Prior to this study, little was known about whether UK medical students feel that they should intervene in out-of-hospital emergencies. Our qualitative study findings revealed that students believe they have ethical and/or professional obligations to respond within the limits of their competency. However, they did not always feel knowledgeable or confident about this, and this related strongly to their prior experience(s) and training. Medical School training was felt to have significant limitations with regards to preparing students for these situations. In particular, students expressed dissatisfaction with the frequency, and comprehensiveness, of teaching.

These findings are consistent with previous studies. One study⁽¹¹⁾ found that increased exposure to medical emergencies (in this case witnessing more than five cardiac arrests) was the main driver behind students’ confidence to provide BLS. Students who are confident in their skills are more likely to help.⁽¹⁴⁾ However, our study explored the broader context of how students’ personal interests and their emotions guide their helping behaviour. Students’ competence and self-confidence in performing CPR appears to decline over time,⁽²²⁾ which is consistent with our study’s participants wanting more refresher sessions throughout the curriculum to increase skill retention.

Strengths and Limitations

In the semistructured interviews, some participants struggled to recall details of past events. However, this method allowed for deep exploration of students’ feelings, whereas quantitative methods, such as surveys, would fail to capture in-depth contextual data and it would have been difficult to collect observational data on this topic. JX (a medical student), RM (senior clinical academic) and RF (a health services researcher) each contributed their interpretation of the data, ensuring that a range of interpretations were considered.

The credibility of the findings was increased through participant validation and triangulation of interview and reflective journal data.⁽²³⁾ Our sample of students varied according to year of study and exposure to emergencies, ensuring that we captured a wide variety of perspectives. The convenience nature of the sample may mean that we did not capture all experiences (no student in the category 2B was interviewed), however we reached theoretical saturation after 11 interviews. As the sample was based upon UCLMS students only, our findings may not be transferable to other Medical Schools with different approaches to first aid/response training.

JX was a UCL medical student. Therefore, participants were able to freely use medical jargon, allowing for a more organic verbal narrative, but they may have been reluctant to share thoughts and/or experiences that may portray them negatively to JX (particularly those in lower years) or be regarded as concerning behaviour by the GMC or Medical School. To limit this, JX reassured participants’ anonymity pre- and post-interview and that there would be no ‘right’ or ‘wrong’ answers to any of the questions.

Implications

The lack of certainty and the importance of knowledge and training in this study suggests that medical students need to be reminded that they do not have a legal duty to help⁽²⁴⁾ and should only act with the limits of their competence to avoid inappropriate actions that could increase the risk of harm to other persons' health and wellbeing.⁽²⁵⁾ Clearer guidance from the GMC and/or the Medical School, and emphasis upon this throughout undergraduate medical training, may facilitate this.

When sharing how they felt Medical School emergency care training could be improved, students thought it would be particularly helpful for training to be integrated into horizontal (systems-based) modules, for example to be taught cardiac anatomy and physiology in relation to CPR; to learn about both common and rare medical emergencies, and common and rare presentations of medical conditions through case studies; to be offered more opportunities to gain greater exposure to out-of-hospital emergencies, for example providing all students with the opportunity to work shadow paramedics, rather than as a Student-Selected Component with limited spaces for enrolment; and to have more refresher sessions throughout their Medical School training.

Future research needs to encompass a larger sample of medical students from multiple UK Medical Schools. Further quantitative research would highlight the prevalence of these views and the extent to which there is a need to improve training in this area.

Conclusions

Medical School emergency care training could be further developed to better improve students' knowledge, confidence and competence in responding to out-of-hospital emergencies. Students feel this could be achieved through increasing the frequency of training and exposure to out-of-hospital emergencies. Students expressed the need for clearer guidance regarding their duties to respond to medical emergencies, which could be reiterated throughout training to minimise the risk of any misunderstanding. Further mixed-methods research on this topic using a larger, more heterogenous sample needs to be carried out to confirm the findings of this study and whether they are transferable to other UK Medical Schools.

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Author Contributors

JX was the main author who designed the study, collected and analysed the data and was the main author for the write-up. RM (third author) was the chief investigator. RF (second

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3 author) was the project supervisor with expertise in qualitative methods. Both RM and RF
4 helped with every stage of the study, in particular the designing and analysis stages, and
5 provided input in the write-up. All authors have read and approved the final manuscript.
6
7

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10 or not-for-profit sectors.
11

12 **Competing Interests**

13 None declared.
14

15 **Ethics Approval**

16 University College London Ethics (ref.12471/001).
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18 **Provenance and Peer Review**

19 Not commissioned; externally peer reviewed.
20

21 **Data Sharing Statement**

22 This is a qualitative study and therefore the data generated is not suitable for sharing beyond
23 that contained within the report. Further information can be obtained from the corresponding
24 author.
25

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BMJ Open

Not quite a doctor, but should I help? A qualitative exploration of medical students' attitudes towards responding to medical emergencies that occur in the public domain.

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Not quite a doctor, but should I help? A qualitative exploration of medical students' attitudes towards responding to medical emergencies that occur in the public domain.

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Keywords: medical education & training, qualitative research, basic life support, medical ethics, medical law

Abbreviations: University College London (UCL), University College London Medical School (UCLMS), Cardiopulmonary Resuscitation (CPR), the General Medical Council (GMC), the General Medical Service (GMS), Basic Life Support (BLS), Advanced Life Support (ALS), intercalated Bachelor of Science (iBSc), Jessica Xie (JX), Richard Meakin (RM), Rachael Frost (RF), Research Department of Medical Education (RDME)

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3 2 tables, 2 boxes
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5 **Abstract**

6 **Objective:** To explore medical students' views on and experiences of responding to out-of-
7 hospital medical emergencies.
8

9 **Setting:** University College London (UCL).
10

11 **Participants:** 11 UCL Medical School (UCLMS) students.
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13 **Study Design:** Qualitative.
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15 **Methods and Outcome Measures:** We carried out 11 one-to-one semistructured interviews,
16 with participant validation and reflective work. The data was analysed using thematic
17 analysis.
18

19 **Results:** Three core themes were identified. (1) **“We Did Debate a Bit: Should We Go? Should
20 We Not?”** – Students' decisions to respond were based upon the appearance of the casualty; the
21 presence and actions of bystanders; witnessing the incident; self-perceived competence, confidence
22 and knowledge; and personal experiences and feelings associated with medical emergencies. (2) **“It
23 Would Represent the Medical Profession Well if We Did Step In and Help”** – Students felt that
24 they had an ethical and/or professional duty to help. (3) **“No One Should Die Because of a Lack
25 of... Basic Life-Saving Techniques”** – Students felt that medical school training alone had not
26 sufficiently prepared them to respond to out-of-hospital medical emergencies. Improvements to
27 training were suggested: integrating first aid/ response training into the horizontal (systems-based)
28 modules; teaching both common and less common medical emergencies and presentations; training
29 that is led by experienced first responders and that increases students' exposure to out-of-hospital
30 medical emergencies; and providing more revision training sessions.
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33 **Conclusions:** Students felt that medical school training could be improved to better prepare
34 them for responding to out-of-hospital medical emergencies, and wanted clarification on
35 whether or not they have an ethical and/or professional duty to help. Further mixed-methods
36 research using a larger sample needs to be carried out to confirm whether findings are
37 transferable to other UK Medical Schools.
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Article Summary

Strengths and Limitations of this Study

- This study provided in-depth exploration of medical students' thoughts and feelings towards their response to out-of-hospital medical emergencies.
- The credibility of the study was increased through participant validation and data triangulation (semistructured interviews and a reflective journal).
- Each author contributed their interpretation of the data, ensuring that one researcher's preconceptions did not dominate the analysis and that a wide range of alternative perspectives on the data were considered, to allow more insightful interpretations to be drawn from the data.
- A small sample of students were recruited from a single Medical School, limiting the range of experiences and opinions that were gathered and reducing the transferability of the findings to other Medical Schools.
- Theoretical saturation was reached, implying that sufficient data was obtained regarding UCL medical students' views and strengthening the study's credibility.

Introduction

A medical emergency may be defined as any situation in which appropriate and rapid medical intervention is essential to prevent death or serious injury.

Up to 140,000 deaths in England and Wales could be prevented each year if appropriate first aid is performed quickly.⁽¹⁾ Since every minute delay of cardiopulmonary resuscitation (CPR) on a cardiac arrest victim decreases their chance of survival by 2.3%,⁽²⁾ effective early bystander intervention during the wait for the Ambulance Service to arrive at the scene has the potential to save lives.⁽³⁻⁵⁾ According to a national survey conducted by St John Ambulance⁽⁶⁾, only one in ten bystanders would administer CPR in the public domain.

The General Medical Council (GMC) states that qualified doctors in the UK must be competent to diagnose a medical emergency and provide immediate support.⁽⁷⁾ General Practitioners are contractually obliged under the General Medical Service (GMS) to provide emergency treatment during core hours for any persons within their practice's area.⁽⁸⁾ UK medical students do not have a legal or professional duty to help, nor the same ethical obligation as a qualified doctor.⁽⁹⁾

Most UK Medical Schools provide emergency care training.⁽¹⁰⁾ Students at UCLMS receive training in adult, paediatric and obstetric basic life support (BLS), adult and paediatric advanced life support (ALS) and critical care in the hospital setting. One UK study⁽¹¹⁾ found that only one third of 115 medical students were able to perform the first step of BLS (assessing the scene for danger) correctly. Towards the end of undergraduate medical training, students appear to be more confident: the results of a study conducted in Finland showed that 70% of 71 of penultimate-year medical students and 85.7% of 56 final-year medical students claimed to be confident in their BLS abilities.⁽¹²⁾ Confidence appears to be directly correlated with the number of cardiac arrests that students have witnessed, suggesting

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3 experience is an important part of training.⁽¹³⁾ A survey conducted at a Norwegian medical
4 school found that most final-year medical students had had non-interventional experiences of
5 medical emergencies (for example, 72% of 76 students had observed defibrillation); however,
6 fewer students had provided emergency medical care outside of the teaching environment
7 (for example, 47% had participated in CPR).⁽¹⁴⁾
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10 When considering whether to provide CPR in clinical practice, UK doctors and medical
11 students report making judgements on the basis of diagnosis and prognosis; the age of the
12 patient; quality of life; opinions of doctors and other medical staff; the wishes of the patient
13 and relevant others; and doctors' beliefs and values.⁽¹⁵⁾ One key finding of a Japanese
14 study⁽¹⁶⁾ was that medical students may be unwilling to perform mouth-to-mouth
15 resuscitation because they fear that they will contract a disease.
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18 Most studies that have investigated medical students' physical and emotional reactions to
19 medical emergencies are quantitative studies that have been conducted over 10 years ago
20 outside the UK and are predominantly focused in the hospital setting. There has been little
21 research in the area of UK medical students responding to out-of-hospital medical
22 emergencies, whereby out-of-hospital refers to a non-clinical setting with limited access to
23 medical personnel and resources and response refers to a person's thoughts, emotional
24 reaction and physical action that immediately follow encountering the situation. We therefore
25 aimed to explore UK medical students' views on experiences of responding to out-of-hospital
26 medical emergencies. We hoped that our study findings would reveal areas where students
27 feel they lack knowledge and/or skills, which could identify areas for future improvement in
28 education.
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34 **Methods**

35 We carried out a qualitative study, using semi-structured interviews, participant validation
36 and a reflective journal to collect data. We chose to conduct interviews rather focus groups as
37 we were interested in individual experiences (rather than exploring group norms and social
38 interactions) and wanted to be able to probe more deeply regarding these.⁽¹⁷⁾ JX (a medical
39 student studying the Medical Science with Primary Health Care intercalated Bachelor of
40 Science (iBSc)) carried out all data collection and led the analysis. The study was conducted
41 at UCLMS over six months. Participants were recruited using purposive, convenience and
42 snowball sampling.
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47 **Box 1: Categorisation of Participants**

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49 Participants were categorised according to the level of their exposure to out-of-hospital
50 medical emergencies.
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- 52 • Category 1: participants who currently have greater exposure to out-of-hospital
53 medical emergencies because they participate, or have participated, in activities (for
54 example, with St. John Ambulance) that increase their exposure.
- 55 • Category 2: participants who do not currently have greater exposure to out-of-
56 hospital medical emergencies because they have never participated in activities that
57 increase their exposure.
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Participants were then sub-categorised based on their experiences.

- Sub-category A: participant intervened in at least one out-of-hospital medical emergency
- Sub-category B: participant witnessed, but did not intervene in, at least one out-of-hospital medical emergency
- Sub-category C: participant has no experience (i.e. has never witnessed or intervened in an out-of-hospital medical emergency)

Twelve UCL medical students were invited to participate. One student declined because of the time commitment of the study (one interview lasting up to 45 minutes and participant validation, which would take approximately 15 minutes). Ten participants were sampled through convenience (students known to JX) and purposively according to their medical emergency exposure levels (categorisation in Box 1). Two participants (10 and 11) were sampled by snowball sampling, as they were introduced to JX through a previous participant (09). Participants who were interested in participating were e-mailed brief screening questions about their exposure to out-of-hospital medical emergencies and experiences of witnessing or intervening in out-of-hospital medical emergencies in order to categorise them prior to recruitment. Eleven students provided written informed consent and completed the study. Recruitment ceased when no new codes were generated during coding of the last three transcripts, signifying that theoretical saturation had been reached.

Interviews

JX carried out all face-to-face semistructured interviews between February 2018 and March 2018 using a topic guide developed in conjunction with RM and RF, which was refined in light of data collection.

Interview topics included features of a medical emergency; experiences of responding to medical emergencies; legal, professional and ethical obligations to intervene; and training. Interviews focused solely on experiences of out-of-hospital medical emergencies rather than incidents that had been encountered in a teaching environment. Participants who had no personal experience of intervening in out-of-hospital medical emergencies were asked how they believe they would respond in a theoretical situation (see Box 2) in order to understand their potential response and the decision-making process behind this.

Interviews lasted on average 35 minutes and were audio recorded.

Field notes were made by JX during the interview in a reflective journal. For example, JX noted the need to rephrase questions to minimize ambiguity to improve data collection and considered the possibility of interviewer influence on participants' responses.

Box 2: Proposed Theoretical Scenario

You are walking down a busy street. A person across the road to you collapses. No one stops to help them.

Patient and Public Involvement

JX presented the study to ten Medical Science with Primary Health Care iBSc students to confirm the relevance of the study to medical students.

Participants did not contribute to the design, planning or management of the study. However, one participant directed JX to recruit a further two participants (snowball sampling).

All eleven participants received a summary of the study findings and six out of the eleven participants responded to the request for participant validation.

Ethical Approval

Ethical approval to carry out this study was received from University College London Research Ethics Committee (ref.12471/001). JX was prepared to signpost participants who found the interview upsetting to UCL student support.

Analysis

All aspects of participants' verbal narrative that were recorded were transcribed verbatim by JX. Theoretical saturation was judged to have occurred after completion of the eighth interview (as JX commenced analysis alongside data collection).⁽¹⁸⁾ Three additional interviews were conducted to confirm this.

Thematic analysis was used to identify core themes.⁽¹⁹⁾ JX familiarised herself with the data by listening to audio recordings and rereading the transcripts, field notes and validation feedback. Codes were derived both deductively from the topic guide and inductively from the data.⁽²⁰⁾ Only data relevant to the research question were coded.⁽²¹⁾ JX coded the full dataset using NVivo 11.⁽²²⁾ A subset of transcripts was independently coded by RF (project supervisor with expertise in qualitative methods). JX and RF compared codes to gather different perspectives on the emerging data.⁽²³⁾ Emerging codes were compared against existing codes and the codes were refined. Previous transcripts were re-coded using the revised codes, until no new codes emerged, ensuring thorough coding and more robust analysis.⁽²⁴⁾ Codes with common elements were grouped together under sub-themes, which were subsequently categorised under core themes.⁽¹⁸⁾ JX examined the coherence of the data within each theme and the credibility of each theme in relation to the dataset, and ensured that there was no overlap between themes. The authors independently reviewed the themes and a final interpretation was agreed.

Participant Validation

All eleven participants were e-mailed the finalised themes and a description of each sub-theme and JX's interpretation of their individual interview. Six participants responded to participant validation. All of these participants agreed with the study findings and JX's interpretations of their interview. No subsequent changes were made to the themes.

Results

Eleven participants were interviewed, who reported a range of first aid/ response experiences (see Table 1). Three core themes were identified (Table 2). Of those who had responded to an out-of-hospital medical emergency, four had provided assistance when someone had collapsed by performing BLS, calling for help and/or putting the patient in the recovery

position. Three participants had helped people who had sustained traumatic injury by applying pressure to the injured area to stop bleeding. Two participants had encountered out-of-hospital medical emergencies but did not offer their help or intervene in the situation in any way, and two had never witnessed an out-of-hospital medical emergency.

Half of the participants who had responded to an out-of-hospital medical emergency had intervened whilst on duty in a voluntary or paid first aid role and half had intervened upon encountering the situation whilst off duty. Participants who responded as a first aider on duty reported having never responded alone to situations. One participant who was not on duty also described responding to someone who had collapsed as part of a group of medical students. However, five students had responded to out-of-hospital medical emergencies alone. Two participants also described experiences of managing bystanders, for example asking them to step away, call for help and/or provide assistance in BLS.

Table 1: Description of Study Participants

Participant Identification Number	Year of Medical School Training (Out of 6 Years)	Category, Sub-category and Activity (if applicable)
01	2	2A
02	3	1A – First aider (volunteer)
03	3	1A – First aider (volunteer and paid work)
04	3	1A – First aider (volunteer) and pre-hospital care training
05	3	1A & B - First aider (paid work)
06	3	1A - Pre-hospital care training
07	5	1A & B – Paediatric life-saving training and Wilderness Medicine training
08	5	1A & B – Member of a Wilderness Medicine society, first aider (volunteer)
09	1	2C
10	1	2C
11	1	2B

Table 2: Themes and sub-themes identified

	Core Theme	Sub-themes
1	“We Did Debate a Bit: Should We Go? Should We Not?”	What is The Situation?
		Knowledge, Competence and Confidence
		Personal Experiences and Feelings Associated with Medical Emergencies

2	“It would represent the medical profession well if we did step in and help”	Obligations: Legal, Ethical And Professional
		Expectations of Medical Students
3	“No One Should Die Because of a Lack of... Basic Life-Saving Techniques”	How Useful is Training?
		Training Responsibility
		What Training Should Look Like
		Differences Between Individuals

“We Did Debate a Bit: Should We Go? Should We Not?” (07, 5th year, 1A & B)

What is The Situation?

All participants described how they would assess the situation before deciding whether or not to intervene. In particular, participants stated that they would observe the age and physical appearance of the victim.

“if it was a child, I would probably [intervene]... a sick child is often a situation that unsettles people quite a lot... Elderly people as well, because they’re obviously quite vulnerable” (08, 5th year, 1A & B).

A few participants considered the potential risks to the safety of others and themselves, if they were (not) to intervene.

“If you see that the situation is dangerous for you... you shouldn’t go and help... your safety is priority” (09, 1st year, 2C).

Most participants felt that they would be more likely to intervene if no one appears to be helping the victim, or if bystanders’ (lack of) action(s) appear to be worsening the situation and if they felt that they could improve the situation by intervening.

“if I was... the only [or] the first person at the scene, I would [be more likely to] help... than if there... were other people [already there]” (07, 5th year, 1A & B).

When medically-trained professionals were already present at the scene of the medical emergency, participants reported that they would be less likely to intervene as the situation was already being managed.

“I’ve walked past in things before where people are already helping... the ambulance were already there... I wouldn’t... help because I’d probably just be in the way” (07, 5th year, 1A & B).

Knowledge, Competence and Confidence

Most participants felt that their knowledge of, and competency and confidence in providing, emergency care somewhat depended on the extent of their medical and/or emergency care training.

“medical students have varying degrees of knowledge and confidence [depending on] their [year of] studies” (09, 1st year, 2C).

Increased exposure to medical emergencies appeared to be the main driver behind participants’ confidence. Participants with greater exposure to out-of-hospital medical

emergencies (category 1; see Box 1) and/or in the later years of medical school training tended to feel highly knowledgeable and competent, and believed that they would intervene.

“I think confidence is really achieved by exposure” (08, 5th year, 1A & B).

“I would be quite comfortable if I had to provide immediate medical care” (08, 5th year, 1A & B).

Likewise, those with less exposure to out-of-hospital medical emergencies (category 2; see Box 1) and/or who were in the earlier years of medical school training tended to feel that their knowledge and competence were low.

“[hesitation, says whilst nervously laughing] honestly I-I don’t feel like I could help anyone with the knowledge that I have now” (01, 2nd year, 2A).

Those who did not feel confident providing emergency medical care alone stated that they would seek ‘the right help’ from fellow ‘medical students [with] previous experience in [responding to] medical emergencies’ (11, 1st year, 2C, participant validation).

A few felt that, if one feels that their competence is low, it would be best to not intervene to avoid potentially making the situation worse.

“[It is] good to act on the... student’s... ability... if the student can’t perform first aid, it would be better for them not to help and make things worse” (01, 2nd year, 2A).

Personal Experiences and Feelings Associated with Medical Emergencies

Only one student felt that the experience of responding to an out-of-hospital medical emergency had not had an emotional impact upon them. For other students, a range of positive feelings (excitement and feeling useful) and negative feelings (overwhelmed, helpless, embarrassment, burden, stress, doubt and fear) were reported in association with first-time involvement in an out-of-hospital medical emergency.

“it makes you feel quite responsible... I felt useful” (06, 3rd year, 1A & B).

On responding to a patient in cardiac arrest: *“I was not ready for this. It was very overwhelming”* (05, 3rd year, 1A).

A few felt that their experiences were an opportunity for learning and personal development.

“the first time... you always panic because you don’t know what you’re doing, but then you learn from each mistake, get better over time” (03, 3rd year, 1A).

Participants who had positive experiences believed that they would be able to help if they were required to in the future.

“knowing that I have dealt with some medical incidents... I feel more reassured that I will make a positive difference if I was to step in” (02, 3rd year, 1A).

Participants who were given a theoretical situation (see Box 2) stated they would perform BLS if necessary. However, they did not acknowledge the potential physical, mental and emotional stress of the situation.

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“I would go and see what’s wrong, like, if they’re breathing or not; do the basic... life support... if they need it” (11, 1st year, 2B).

“It would represent the medical profession well if we did step in and help” (01, 2nd year, 2A).

Obligations: Legal, Ethical and Professional

All participants agreed that UK medical students have no legal obligation to help in a medical emergency, but disagreed on the existence of a Good Samaritan law in the UK.⁽²⁵⁾ Few were confident about the implications of the law.

“We’re not legally obliged to respond to emergencies” (07, 5th year, 1A & B).

“there’s the concept of Good Samaritan and law sort of stuff, that, in theory, protects those who respond to emergencies... it’s quite recent legislation here... I’m a bit, sort of, deficient in facts on this” (08, 5th year, 1A & B).

All participants believed that medical students have an ethical obligation to respond appropriately. Participants reported that they would be more likely to intervene if they felt that they would be able to improve the situation.

“we have a moral obligation” (05, 3rd year, 1A).

“the ambulance were already there..., so I [did not offer my] help because I’d probably just be in the way” (07, 5th year, 1A & B).

However, for a few, this ethical obligation for a person to help extended to all citizens – not just medical students.

“There’s a moral obligation for anyone to help another human if they know they can help” (03, 3rd year, 1A).

Some felt that medical students also have a professional duty to intervene, as representatives of the Medical Profession and/or Medical School.

“when you go and help somebody... you... represent the Medical School... it makes not only yourself look helpful [but] the Medical School as well” (09, 1st year, 2C).

Expectations of Medical Students

All participants felt that the public expected them to respond to medical emergencies. There were mixed views of public expectations of medical students’ competencies.

“some members of the public... would expect us to just gawk and standby, whereas others would think “Well, you’re basically doctors, why don’t you do something?!” (08, 5th year, 1A & B).

Most participants believed that the Medical School and the GMC expect medical students to respond medical emergencies, but within the limits of their competency.

“The Medical School would expect you to go help” (09, 1st year, 2C).

“No One Should Die Because of a Lack of... Basic Life-Saving Techniques” (03, 3rd year, 1A)

How Useful is Training?

Whilst a mix of theory and practical training had equipped participants with the skills required to make potentially life-saving interventions, a few highlighted that this had not prepared them for the possible emotional trauma of encountering medical emergencies, since reactions were context-dependent.

“I wasn’t prepared at all. I was not ready for this. It was very overwhelming” (05, 3rd year, 1A).

One participant believed that anyone, including people not trained in first aid/response or Medicine, can help in an emergency, perhaps implying that training is not always necessary to make a positive difference.

“if... ‘help’ is seeing an ill patient and calling an ambulance... anyone should go and help” (06, 3rd year, 1A & B).

Training Responsibility

Most thought that the responsibility to train medical students to be prepared to intervene in out-of-hospital medical emergencies lies with the Medical School, but one participant was unsure.

“I think the Medical School bears a burden” (08, 5th year, 1A & B).

“I don’t know whose responsibility it should be” (06, 3rd year, 1A & B).

However, opinions were divided on, to what extent, if the Medical School provides insufficient training, students then become responsible for ensuring that they are prepared.

‘If students aren’t adequately trained, this should foremost be identified by the Medical School to teach them before they seek extra-curricular training’ (07, 5th year, 1A & B participant validation).

JX: *“do you think that students should take the responsibility in the own hands... to [ensure that they are] prepare[d]... for these situations?”*

Student: *“I think by all means”* (08, 5th year, 1A & B).

What Training Should Look Like

Most participants expressed complete dissatisfaction with emergency care training delivered by the Medical School, describing it as illogical and lacking depth.

“we were informally taught recovery position... by [a medical student] in a maths lecture? Why wasn’t it taught with CPR?” (02, 3rd year, 1A).

“I don’t remember that being massively comprehensive” (05, 3rd year, 1A).

All participants suggested ideas for improving the training provided by the Medical School. A few students wanted first aid/ response training to be integrated into the horizontal (systems-based) modules because they believed that this would increase their understanding of the management of medical emergencies. One student expressed the desire to be taught a greater range of potential presentations, in order to be prepared for realistic situations. A few students thought that teaching should be delivered by individuals who have more experience

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3 of being first responders and to be offered more opportunities to gain greater understanding
4 and/or exposure to out-of-hospital medical emergencies (for example, through a Pre-hospital
5 Care module). Most students wanted more revision sessions to consolidate their knowledge
6 and skills.
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9 *“getting a London Ambulance service paramedic to teach us, or someone with pre-*
10 *hospital experience, who can give tips of the trade, would be a benefit.”* (04, 3rd year,
11 1A).
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13 Differences Between Individuals

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15 Personal interest in emergency medicine was a strong influence upon seeking extracurricular
16 training, which in turn is likely to have resulted in increased exposure and experiences,
17 knowledge and skills.
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20 *“my clinical interest... is acute emergency medicine, especially outside of the*
21 *hospital... it's... more than natural [for me] to go on courses and further my skills*
22 *and skills, beyond... what the Medical School teaches”* (08, 5th year, 1A & B).
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24 Discussion

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26 Prior to this study, little was known about whether UK medical students feel that they should
27 respond to out-of-hospital medical emergencies. Our qualitative study findings revealed that
28 students believe they have ethical and/or professional obligations to respond within the limits
29 of their competency. However, they did not always feel knowledgeable or confident about
30 this, and this related strongly to their prior experience(s) and training. Medical School
31 training was felt to have significant limitations with regards to preparing students for these
32 situations. In particular, students expressed dissatisfaction with the frequency, and
33 comprehensiveness, of teaching.
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37 These findings are consistent with previous studies. One study⁽¹³⁾ found that increased
38 exposure to medical emergencies (in this case witnessing more than five cardiac arrests) was
39 the main driver behind students' confidence to provide BLS. Students who are confident in
40 their skills are more likely to offer their help.⁽¹⁶⁾ However, our study explored the broader
41 context of how students' personal interests and emotions guide their helping behaviour.
42 Students' competence and self-confidence in performing CPR appears to decline over
43 time⁽²⁶⁾ which is consistent with our study's participants wanting more revision sessions
44 throughout the curriculum to increase skill retention.
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48 Strengths and Limitations

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50 In the semi-structured interviews, some participants struggled to recall details of past events,
51 for example the thought process involved in their response. However, this method allowed
52 for deep exploration of students' feelings and experiences, whereas quantitative methods,
53 such as surveys, would fail to capture in-depth contextual data and it would have been
54 difficult to collect observational data on this topic. JX (a medical student), RF (a health
55 services researcher) and RM (senior clinical academic) each contributed their interpretation
56 of the data, ensuring that a range of interpretations were considered.
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3 The credibility of the study findings was increased through participant validation and
4 triangulation of interview and reflective journal data.⁽²⁷⁾
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6 Our sample of students varied according to year of study and exposure to emergencies,
7 ensuring that we captured a wide variety of perspectives. The convenience nature of the
8 sample may mean that we did not capture all experiences, however we felt we had reached
9 theoretical saturation after the eighth interview. As we only sampled students studying at
10 UCLMS, the study findings may not be transferable to other Medical Schools with different
11 approaches to first aid/response training.
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14 JX was a UCL medical student. Therefore, participants were able to freely use medical
15 jargon, allowing for a more organic verbal narrative. However, students (particularly those in
16 lower years) may have been reluctant to share thoughts and/or experiences that may portray
17 them negatively to JX or be regarded as concerning behaviour by the GMC or Medical
18 School. To limit this, JX reassured participants' anonymity pre- and post-interview and
19 emphasised that there would be no 'right' or 'wrong' answers to any of the questions.
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23 **Implications**

24 It is only possible to draw tentative conclusions from a small qualitative study. Our study
25 findings suggest that medical students understand that they do not have a legal duty to help⁽⁹⁾.
26 Students demonstrated their abilities to judge the situation and consider how their actions
27 could potentially impact the situation. However, they may need to be reminded, perhaps by
28 the GMC and/or the Medical School, that their ethical and professional duty as medical
29 students is to only act with the limits of their competence to avoid potentially causing harm to
30 others.⁽²⁸⁾
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35 Students believe it is important that emergency care training is included on the undergraduate
36 medical curriculum. However, some felt that extra-curricular training (for example training
37 provided by St John Ambulance) is more comprehensive, with regards to teaching a wider
38 range of potential situations. When students shared how they felt medical school emergency
39 care training could be improved, they thought it would be particularly helpful for training to
40 be integrated into horizontal (systems-based) modules; to learn about both common and less
41 common acute medical emergency presentations; to be offered more opportunities to gain
42 greater exposure to out-of-hospital medical emergencies, for example providing all students
43 with the opportunity to work shadow paramedics in a Pre-hospital Care module, which is
44 currently a Student-Selected Component with limited spaces for enrolment; and to have more
45 revision sessions throughout their undergraduate medical training.
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50 Future research needs to encompass a larger sample of medical students from multiple UK
51 Medical Schools. Further quantitative research would highlight the prevalence of these views
52 and the extent to which there is a need to improve undergraduate medical training in this area.
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55 **Conclusions**

56 Medical School emergency care training could be further developed to better improve
57 students' knowledge, confidence and competence in responding to out-of-hospital medical
58 emergencies. Students feel this could be achieved through increasing the frequency of
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3 training and providing more opportunities for exposure to out-of-hospital medical
4 emergencies. Students expressed the need for clearer guidance regarding their duties to
5 respond to medical emergencies, which could be reiterated throughout training to minimise
6 the risk of any misunderstanding. Further mixed-methods research on this topic using a
7 larger, more heterogenous sample needs to be carried out to confirm the findings of this study
8 and whether they are transferable to other UK Medical Schools.
9

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16 (Director of the Research Department of Medical Education (RDME) of UCLMS), for
17 granting us permission to interview UCL medical students. Finally, we are thankful to all the
18 study participants, who donated their time and shared their experiences and thoughts.
19

21 **Author Contributors**

22
23 JX was the main author who designed the study, collected and analysed the data and was the
24 main author for the write-up. RF (second author) was the project supervisor with expertise in
25 qualitative methods. RM (third author) was the chief investigator. Both RM and RF helped
26 with every stage of the study, in particular the designing and analysis stages, and provided
27 input in the write-up. All authors have read and approved the final manuscript.
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29

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35

36 **Competing Interests**

37
38 None declared.
39

40 **Ethics Approval**

41
42 University College London Ethics (ref.12471/001).
43

44 **Provenance and Peer Review**

45
46 Not commissioned; externally peer reviewed.
47

48 **Data Sharing Statement**

49
50 This is a qualitative study and therefore the data generated is not suitable for sharing beyond
51 that contained within the report. Further information can be obtained from the corresponding
52 author.
53

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Standards for Reporting Qualitative Research (SRQR)*

<http://www.equator-network.org/reporting-guidelines/srqr/>

Page/line no(s).

Title and abstract

<p>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</p>	<p>Page 1, lines 1 - 5</p>
<p>Abstract - Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions</p>	<p>Page 2, lines 1 - 26</p>

Introduction

<p>Problem formulation - Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement</p>	<p>Page 3, lines 33 - 35 Page 4, lines 9 - 15</p>
<p>Purpose or research question - Purpose of the study and specific objectives or questions</p>	<p>Page 4, lines 15 - 19</p>

Methods

<p>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**</p>	<p>Page 4, lines 21 - 24 Page 5, lines 1 - 27</p>
<p>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</p>	<p>Page 4, lines 24 - 26 Page 5, lines 3 - 7, lines 14 - 27, 33 Page 12, lines 37 - 42</p>
<p>Context - Setting/site and salient contextual factors; rationale**</p>	<p>Page 4, lines 26 - 27</p>
<p>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**</p>	<p>Page 4, lines 22 - 24</p>
<p>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</p>	<p>Page 5, lines 10 - 11 Page 6, lines 4 - 6</p>
<p>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**</p>	<p>Page 4, lines 21 - 27 Page 5, lines 7 - 9, 13 - 27 Page 6, lines 26 -</p>

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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	Page 5, lines 13 – 27
Units of study - Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)	Page 5, lines 1 – 7, line 13 - 27, lines 29 – 33 Page 6, lines 1 – 2, lines 26 - 30
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/de-identification of excerpts	Page 6, lines 7 – 22 Page 10, table 1
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**	Page 6, lines 14 – 25
Techniques to enhance trustworthiness - Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale**	Page 4, lines 21 – 22 Page 6, lines 22 – 30 Page 12, lines 29 - 30

Results/findings

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	Page 6, line 31 - page 12, line 3
Links to empirical data - Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings	Page 8, line 5 – page 12, line 3

Discussion

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	Page 12, lines 4 - 20
Limitations - Trustworthiness and limitations of findings	Page 12, lines 21 – 42

Other

Conflicts of interest - Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed	Page 14, lines 9 - 10
Funding - Sources of funding and other support; role of funders in data collection, interpretation, and reporting	Page 14, lines 6 – 8

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2 *The authors created the SRQR by searching the literature to identify guidelines, reporting
3 standards, and critical appraisal criteria for qualitative research; reviewing the reference
4 lists of retrieved sources; and contacting experts to gain feedback. The SRQR aims to
5 improve the transparency of all aspects of qualitative research by providing clear standards
6 for reporting qualitative research.
7

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9 **The rationale should briefly discuss the justification for choosing that theory, approach,
10 method, or technique rather than other options available, the assumptions and limitations
11 implicit in those choices, and how those choices influence study conclusions and
12 transferability. As appropriate, the rationale for several items might be discussed together.
13

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15 **Reference:**

16 O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. **Standards for reporting qualitative**
17 **research: a synthesis of recommendations.** *Academic Medicine*, Vol. 89, No. 9 / Sept 2014
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