

Improving Final Year Undergraduate Medical Students' Exposure to Medical Emergencies to Assess Impact on Self-Reported Anxiety Levels

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Received: 28 April 2020; Accepted: 19 May 2020; Published: 21 May 2020

Abstract

Introduction: It is widely known that medical students in the United Kingdom and newly qualified doctors find the thoughts of dealing with medical emergencies stressful and daunting, and that this causes high levels of anxiety amongst new graduates. What appears apparent in the current literature is that it is not a lack of knowledge or perceived competence that underpins this anxiety, but rather that its root lies elsewhere. There is however, as of 2019, a lack of research detailing what exactly, if not this, could underly this anxiety. With most medical students however graduating having never seen a cardiac arrest or medical emergency in real life, it could be hypothesised that this is a key underlying factor.

Objective: This study looked at whether anxiety levels have improved over time in regard to emergencies and whether providing final year medical students the opportunity to witness real life medical emergencies reduced their anxiety levels at the thought of dealing them, and as such whether or not undergraduate curricula could benefit from this.

Methods: Final year medical students at one medical school were asked to self-report anxiety levels at attending medical emergencies. 82 students then carried a supernumerary cardiac arrest bleep in order to attend medical emergencies and offered a debriefing session afterwards. They were then asked to assess their anxiety after attending the calls and debriefing.

Results: The results of this study showed that anxiety levels amongst medical students has done little to improve over the previous decade, but that providing such a system to improve real-world exposure significantly reduced anxiety levels amongst 82 medical students, and that it is an effective and low-cost way of reducing anxiety levels which has very few barriers for medical schools incorporating this into their undergraduate curricula. It also adds weight to the hypothesis that knowledge alone is not the answer to reducing stress levels, but that lack of exposure is a key underlying reason that needs to be addressed.

Conclusion: UK medical schools should look at incorporating super-numerary cardiac arrest bleeps in to their undergraduate curricula and placements as a way of reducing medical student anxiety surrounding medical emergencies.

Keywords: Resuscitation; Undergraduate; Medical student; Medical emergencies

Introduction

It is widely known that UK medical students and newly qualified doctors find the thoughts of dealing with medical emergencies stressful and daunting, and that this causes high levels of anxiety amongst new

graduates [1-3]. What appears apparent in the current literature is that it is not a lack of knowledge or perceived competence that underpins this anxiety, but rather that its root lies elsewhere. There is however at present, a lack of research detailing what exactly, if not this, could underly this anxiety. With most medical students however graduating having never seen a cardiac arrest or medical emergency in real life, it could be hypothesised that this is a key underlying issue [1,2]. At present, undergraduate curricula across UK medical schools mandate a high level of theoretical knowledge, but stop short of maximising opportunities for students to translate this, or witness it in practice. This, in addition to other attempts at reducing doctors stress around such events, such as the Foundation Programmes inclusion of the Advanced Life Support Course in compulsory criteria for getting a job seem to be addressing the issue in the wrong way and miss what is possibly a key reason for this anxiety [4]. With studies reporting 73% of students finding the thought of CPR stressful, but 76% feeling competent in delivering it, it seems a different approach may be needed [2].

This issue goes deeper however, as there is growing evidence that doctors stress and anxiety levels are linked with job satisfaction, and even suicide rates [3,5]. With workforce supply becoming ever more of an issue, it is key that all is done to maximise every opportunity to support newly qualified doctors. Furthermore, evidence also shows one of the biggest prognostic indicators to a successful outcome is the speed at which good quality resuscitation is provided [5,6]. To ensure optimal outcomes, medical students should be confident in attempting resuscitation, and with evidence showing negative correlations between anxiety and clinical performance, if a low cost and effective intervention could be found to reduce stress, then ultimately patient care could improve [7,8].

This study aimed to look at whether or not medical student anxiety appears to have reduced in recent years, and if not, whether a simple, low-cost intervention aimed at improving real world exposure to medical emergencies could better target medical students and newly qualified doctors anxiety at the thought of dealing with such emergencies, and if so, whether or not this could feasibly be incorporated into undergraduate curricula.

Method

An online survey was sent via official university emails to all 134 final-year medical students registered email addresses at one UK medical school in 2019. The survey was voluntary and allowed one response per participant. Eight questions were asked, including questions relating to anxiety around and exposure to medical emergencies, using a 5-point Likert scale. Data was collected over a one-month period.

Next, final-year students on their "student assistantship" module were sent another email giving the opportunity to volunteer to carry a supernumerary cardiac arrest bleep for one day. They were informed about the conduct expected of them should they attend any emergencies and what to expect. They were primarily an observer, but if appropriate, they could be involved in the resuscitation attempt. Afterwards, the student was offered a debriefing session with a doctor to discuss any emotional or academic issues raised. They then completed a feedback form where they were asked the same questions as to those in the initial group, plus some additional questions such as "Would you recommend this experience to your peers?" This data was collected over a 5-month period to maximise student opportunity to participate given busy timetables, time to discuss the study with study-leads if required and practically due to the course structure.

Ethical approval was received from the University of East Anglia's Faculty of Medicine and Health Sciences Research Ethics Committee.

Participants

82 final-year medical students were included in the initial group and had all completed their ALS & Acute Life Threatening Events – Recognition & Treatment (ALERT) course.

All participants were told the study was voluntary and they could withdraw at any point, however no students withdrew. Participants carrying the cardiac arrest bleep were given the contact details for two doctors always present on site should they encounter any problems, including emotional issues. 71 students opted to carry this bleep. They had all completed their ALS and ALERT courses.

Data Analysis

Analyses were conducted using SPSS version 25. The Mann-Whitney U test was used to analyse the differences in Likert Scale scores. Alpha <0.05 was considered statistically significant. Median scores, U scores and p values were reported for the Mann Whitney test.

Results

In the initial group, 95% (n=78) disagreed or strongly disagreed with the statement “I feel I have had adequate exposure to medical emergencies”. 88% (n=72) had never witnessed a cardiac arrest and 100% (n=82) said they would like more incorporation of real-world emergencies into their curriculum. 76% (n=62) agreed or strongly agreed with the statement that they felt they would be able to “manage patients adequately” in an emergency.

All participants ranked their anxiety in attending a medical emergency as part of a team and also being first on scene using a 5-point Likert scale. Table 1 displays the results (Table 1).

When the initial group were asked to rate their anxiety attending a medical emergency as part of a team, they had a median score of 2. In contrast, the 71 students who had carried the bleep gave a median anxiety score of 4. When ranking their anxiety on being first on scene to manage a medical emergency, the control group had a median score of 2, those carrying the bleep had scored 3. Both results were statistically significant ($p < 0.0001$).

Of the 71 students who carried the bleep, 58 attended at least one call. Some attended multiple calls, as shown in Table 2. The types of call attended are summarised in Table 3. The median anxiety score for those who carried the bleep but didn't attend a call was 2 and for the same group the median anxiety score for being first on scene to manage an emergency was 2. Those who attended an emergency call had a median anxiety score of 4 in both categories (part of a team and first

Table 2: Number of calls attended per student.

| Number of calls attended | Number |
|--------------------------|-----------|
| 0 | 13 |
| 1 | 37 |
| 2 | 16 |
| 3 | 5 |
| >3 | 0 |
| Total | 71 |

Table 3: Types of calls attended by students.

| Type of call attended | Number |
|-----------------------|-----------|
| Collapse/fall | 22 |
| Unconscious | 8 |
| Sepsis | 5 |
| Cardiac Arrest | 13 |
| Paediatric Emergency | 3 |
| Paediatric Arrest | 0 |
| Peri-arrest | 13 |
| Anaphylaxis | 2 |
| Other Emergency | 17 |
| Total | 83 |

on the scene). The difference in anxiety between those who attended an emergency call and those who did not was statistically significant ($p < 0.00001$ and $p < 0.00036$ respectively) (Table 2).

All participants were asked to rate their anxiety in being part of a team attending a medical emergency. 49% (n=35) of students who held the bleep were debriefed at the end of the day and had a median anxiety of 4, whereas those who did not attend a debrief (n=36) had a median score of 3. The difference between those who had a debrief and those who did not was statistically significant ($p = 0.01785$) (Table 3).

Discussion

This study has shown there is a strong case for integrating increased real-world exposure to medical emergencies into the undergraduate curriculum. Most student participants felt they had adequate knowledge to manage medical emergencies and medical emergencies but were very anxious at the thought of doing so, which mirrors previous research [1-3]. This implies the issue does not lie in the teaching of the theory, but rather students' exposure to emergencies. It is interesting that anxiety was not only there at the prospect of attending emergencies

Table 1: Student anxiety at managing a medical emergency as part of a team and being first on scene to manage a medical emergency.

| | Median Anxiety* initial group (IQR) n = 82 | Median Anxiety Bleep group(IQR) n = 71 | U Score | p value** |
|--------------------------------|---|---|---------|-----------|
| Anxiety as part of a team | 2 (1.75 - 3) | 4 (3-4) | 1004.00 | <0.00001 |
| Anxiety being 'first on scene' | 2 (2-3) | 3 (3-4) | 1285.5 | <0.00001 |
| | Median anxiety no call attended (IQR) n = 13 | Median anxiety calls attended (IQR) n = 58 | U Score | p value |
| Anxiety as part of a team | 2 (2-3) | 4 (3.75-4) | 689.5 | <0.00001 |
| Anxiety being 'first on scene' | 2 (1-3.5) | 4 (3-4) | 604.5 | 0.00036 |
| | Median anxiety no debrief (IQR) n = 35 | Median anxiety debrief (IQR) n = 36 | U Score | p value |
| Anxiety as part of a team | 3 (3-4) | 4 (4-4) | 436.00 | 0.01785 |
| Anxiety being 'first on scene' | 3 (2-4) | 4 (3-4) | 752.50 | 0.13794 |

*Ratings were given as median; 5 – Not at all anxious 1 – Extremely anxious

**Considered significant at $p < 0.05$

individually, but also as part of a team, although, they did feel less anxious in the latter.

The primary objective of this study was to assess the impact of exposing medical students to medical emergencies. The breakdown of all emergencies attended are listed in Table 3. The most common call attended was a collapse or fall. Although not a true medical emergency, it was interesting that students valued attending these as it showed them the process by which the cardiac arrest team assembles. Lack of knowledge of the process was identified as key causes of anxiety during de-briefs.

Despite increased resuscitation training (compulsory courses and more integration of ever more realistic simulation) it is surprising to see anxiety levels are little better now than previously reported [1,2]. This suggests there is little substitute for first-hand experience in emergencies which is a concept well supported in other aspects of medical education, for example, clinical examinations and communication skills [12,13]. Learning the theory is essential but perhaps experiencing real scenarios first-hand as an observer will minimise anxiety at future events. Medical students are exposed to almost all other medical conditions to which they are expected to manage but this appears not to be the case with regards to such acute emergencies.

As a side note, there is a large amount of recent and ongoing research into ways to improve cardiac arrest outcomes, including the inducement of hypothermia, the utilisation of different airways and the use of adrenaline [7-11]. Such research can undoubtedly play a vital role in management of these events, but given evidence stating early CPR and defibrillation is the most effective intervention, arguably more real-life training and incorporation of the basics at an early stage in a physician's medical career could potentially make the biggest difference to outcomes given that if doctors are less anxious, they may be able to provide the above treatments quicker.⁶ This however is speculative, but would provide interesting future studies.

When looking at the feasibility of introducing this into undergraduate curricula we found no significant obstacles during this study. The bleeps used were already held by the medical school so next extra cost was encountered and there was very little extra organisational requirements. Debrief sessions however would require additional hours should this be encountered as during this study they were undertaken on a voluntary basis by staff. We do not see however any significant barrier to the implementation of this intervention in UK medical schools.

Limitations

This study only looks at final-year medical students at one medical school in the UK and given the differing curriculums the results may not be translatable across the UK. The study design also means the data is not paired meaning it is not possible to determine any change in anxiety levels at an individual level. There are plans to replicate this study in all UK medical schools to allow a full assessment of this intervention as well as to acquire paired data and to assess whether the issues identified are local to this one medical school or a national issue.

Another potential problem is those who volunteered to hold an additional cardiac arrest bleep could have more of an interest in acute medicine, and as such less anxious in dealing with emergencies resulting in selection bias.

Recommendations

- Medical students seem to have a good theoretical knowledge of managing emergency situations, suggesting university-based training is satisfactory but that anxiety levels have changed little suggesting that other factors are important in lowering anxiety levels, not just knowledge.
- Medical schools and individual doctors should endeavour to expose medical students to real world emergencies to allow them to witness and implement the theory, and subsequently reduce stress in managing them
- Should any students witness an emergency on the ward, clinicians should hold a debriefing session as this is associated with reduced anxiety.

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