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1HR ON-CALL — Using Simulated ON-CALL to Underpin Experiential Learning in Final Year Medical Students

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ABSTRACT

A survey of Blackpool Foundation Year One (FY1) doctors found limited training about being on-call. We could not find any direct mention in Tomorrow's Doctors for preparing undergraduates for this.[1] Working out of hours, on-call and with a reduced workforce is a known area of anxiety among junior doctors. With few examples in literature,[2,3] we developed a novel approach to aiding final-year medical students prepare for this. A simulated teaching programme allowed students to experience the pressures of working on-call. We hoped to imitate stressors within a safe environment. Students were each given a bleep for an hour. Supervisors role-playing a concerned nurse "bleeped" the students. Each task was held in a folder on different wards (no patient interaction or information was involved). They were relatively simple and designed to stimulate resourcefulness, communication and triage skills. Various resources were available including the number for the medical registrar, played by supervisors. The final station was always the unwell patient aimed at drawing the student immediately to this scenario. A facilitated feedback session explored students' positive and negative experiences, concerns and coping mechanisms. Over the three years of this running, results were resoundingly positive with students taking great confidence from the programme. During the open feedback session, students valued using open wards and having to navigate in an unfamiliar hospital as a realistic preparation for next year. Being on-call is an inevitable part of a junior doctor's work and we believe there is scope for better preparation within undergraduate training. We have developed an effective and sustainable simulation that has shown excellent results. Due to the positive reaction and low maintenance of the project, we aim to cement our teaching programme as a permanent feature for undergraduate students at Blackpool Victoria Hospital.

Background

Feeling under-prepared for starting clinical practice is not an uncommon feeling among final year medical students [1]. Skills such as prioritising, prescribing and decision-making were noted as the main areas causing anxiety [2]. A survey of Blackpool Foundation Year One (FY1) doctors in 2015 found limited training about being on-call during medical school; few examples were identified in the literature [3,4]. Working out of hours, on-call and with a reduced workforce is known to provoke anxiety in junior doctors. This stress is noted to be a "rite of passage" that junior doctors go through as they work more independently [5]. A report from a programme of research commissioned by the General Medical Council (GMC) looked at several domains during the transition of a final year medical student to a junior doctor [6]. They felt that it would be impossible to "fully prepare" medical students for on-calls and reported that it is an area of anxiety for students. However, those who shadowed junior doctors found it less stressful. The reduction in anxiety with shadowing and online inductions were also supported by a survey carried out among the members and fellows of the Royal College of Physicians of Edinburgh and the Society of Acute Medicine [7] and Brennan et al. (2010) [8] also found that increasing levels of clinical experience gained as an undergraduate helped to manage this anxiety. We therefore developed an on-call simulation teaching programme that allowed students to gain more confidence and experience in on-call scenarios during which we hoped to imitate the stressors within a safe environment Figure 1.

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[1]Tomorrow's Doctors: Outcomes and standards for undergraduate medical education [Internet]. 1st ed. 2009 [cited 30 February 2015]. Available from: http://www.gmc-uk.org/Tomorrow_s_Doctors_1214.pdf_48905759.pdf

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Figure 1. Logo designed for teaching programme.

Programme Design

The teaching programme was initially set up in 2016 by Dr A Ball and has been developed by subsequent junior doctors based on feedback received. All student participants were 5th year medical students at the University of Liverpool and completing their final year of undergraduate education in Blackpool Victoria Hospital. There has been a varied uptake through the years; there were 6 students in 2016/7 (out of a total 9 students), 9 students in 2017/8 (total 12 students), and 2 students in 2018/9 (total 5 students). Unfortunately due to the COVID-19 pandemic and the withdrawal of medical students from placement, we were unable to run it in 2019/20 Table 1 and 3.

Prior to the sessions, students were contacted to identify the needs and perspectives of the learners at an individual level. The student then held a bleep for an hour. Colourful and labelled teaching programme folders were placed in various wards around the hospital containing simulated patient information and documentation. Key staff on the ward were made aware of the location of this folder and that students would be looking for these. The students received bleeps from "nurses" on the wards, played by the facilitators, sending them throughout the hospital to complete various common on-call tasks. These were relatively simple and designed to stimulate resourcefulness, communication and triage skills. There were deliberately too many

Table 1. Examples of tasks used in programme.

Task	Summary of task	Aim of task
Review a chest x-ray	Tachypnoeic patient, new oxygen requirement, pyrexic. Chest x-ray ordered by day team and handed over to chase.	Review x-ray, recognise new infection, begin antibiotics according to trust policy.
Review blood results	Patient with blood results this morning that haven't been reviewed. Patient has slightly low potassium.	This can be something that the nursing staff may be happy interpreting. Recognising that this is not a high priority job at present.
Review an ECG	Patient with chest pain, and significant risk factors. Nursing staff have done an ECG and request a review.	Recognising the possible diagnosis of a myocardial infarction so prioritising this patient higher than others.
Confirming death	Patient who has passed away, and death confirmation required.	Recognising that this is important, however, may have other jobs with higher priority.
Complete a discharge	Patient discharged this morning. Patient has already left. Nursing staff has requested an e-discharge.	Recognising that this is not a task of priority while on-call, especially as the patient had left. Explaining to the nursing staff that this can be completed by the patient's day team.
Prescribe antibiotics	Patient with symptomatic urinary tract infection. Urinalysis carried out by nursing staff.	Recognise that patient requires antibiotics. However, patient is not acutely unwell compare to other jobs.
Prescribe analgesia	Patient requiring analgesia after admission with a fractured wrist.	Recognising analgesic requirements in patients and addressing patient discomfort appropriately.
Prescribe a non-critical medication	Patient who has not had his statin prescribed.	Recognising that this is important in the whole care of patients, but is not a priority for an on-call shift. Appropriately explaining this to the nursing staff.
Review an acutely unwell patient	Review requested by nursing staff.	Recognising that the patient is unwell by obtaining more information from the nursing staff. Promptly attending to review this patient. Aimed to draw all students to the simulation skills lab at the end of the hour.

Table 2. Mean feedback score from participants.

	2017 (6 students)	2018 (9 students)	2019 (2 students)
The session was well organised	4.8	4.8	5
Learning objectives were clearly explained	4.8	4.8	4.5
The tutorial was clear	4.6	4.6	5
Before the session I felt nervous about being the on-call	4.4	4.4	4
This session has given me confidence	4.6	4.6	5
I received useful feedback	4.8	4.8	5
I am satisfied with the overall quality of the simulation	5	5	5
I would like the opportunity to repeat this simulation	4.4	4.4	5
I would recommend this simulation to a friend	5	5	5

Table 3. Free text comments on anonymous feedback.

	2016–17	2017–18	2018–19
What were the positive features of this simulation?	"Really useful, realistic simulation" "Good feedback + real life situations" "Good to go around the hospital"	"Great" "Several tasks to prioritise"	introduction to holding a bleep" "Lots of support when required" "Good opportunity to navigate around the hospital and prioritise"
What could we do to improve this simulation?	"More sessions"	"Individual feedback on paper" "Repeat once or twice"	"More sessions" "Individual feedback"
Any further comments:	"Excellent session"	"Excellent session"	"One of the most useful learning experiences in preparation for being a junior doctor" "Helped realise the importance of prioritising jobs"

tasks for them realistically to complete in an hour; therefore, forcing them to develop their prioritisation and communication skills to extract relevant information from the "nurses" enabling them to identify the urgency of tasks.

The focus of the programme was to support the students' development, confidence and the non-technical skills while being on-call, rather than assessing their performance in the individual tasks. Various resources are available including local and national guidelines on the intranet, formularies (online/paper), test results and the tel. number for advice from a relevant senior who was also played by one of the facilitators. Towards the end of the hour, the final bleep for all students was an acutely unwell patient aimed at drawing the students immediately to this task as the most urgent action. The simulated session was then followed by a guided debrief, allowing discussion with supervisors of the students' concerns and coping mechanisms as well as prioritisation and communication skills. The debrief began with an open discussion led by the students which raised comments regarding prioritisation of tasks and specific clinical knowledge. The discussion then focused on factors that influenced the priority of tasks (based on clinical significance and experience of facilitators). Group feedback was shared regarding positive actions made and further areas of development. Following the debrief, the students completed a Likert scale feedback questionnaire with a space for free text comments.

A simulation-based approach was chosen as this teaching method fits in well with the theory of experiential learning – specifically Kolb's learning cycle [9]. There is a growing body of evidence that shows students enjoy and engage in this style of teaching as well as show an improvement in competence of key non-technical skills [10,11]. We then followed the simulated experience with the use of facilitated debrief, allowing students to reflect on positive and negative experiences, using Gibb's reflective cycle [12]. Repetition of sessions with different tasks was implemented to help consolidate the learner's knowledge and experience. Sufficient planning and preparation were required to ensure the simulation sessions were delivered at an appropriate level of expertise and cognitive load to maximise learning without overwhelming students.

Results

The numbers involved in the programme have varied each year dependent on the number of final medical year students placed at Blackpool. Over the three years, 17 students have participated in the programme. The results have been resoundingly positive with all students reporting increased confidence from the programme and 100% of students recommending both individual and cohort repetition.

During the open feedback session, students valued using open wards and having to navigate unfamiliar areas of the hospital as a realistic preparation for the Foundation year.

Discussion and Limitations

Traditionally, much of medical education has depended on student contact with patients to assist knowledge and skill acquisition while exploring and moulding attitudes. However, with changes in societal attitudes and a push for more community-centred care with a reduction in inpatient beds, it has become more challenging to achieve this level of contact [13]. It is demanding to incorporate on-call experience into an already packed curriculum. For students to come in out of hours and for junior doctors to be willing to be shadowed and/or supervise them during this time is an additional responsibility on both parties. Simulation offers a number of advantages including reduction in potential for unnecessary harm to patients from inexperienced students, a standardised educational tool and the ability to enable students to practise and refine skills in a controlled environment [14–16]. Our results showed that not only did the students enjoy the session but they also felt that it improved their confidence in being on-call.

There are a number of limitations to the programme. First, the hospital has only a small number of 5th year medical students each year and so the numbers involved in the programme are quite small. There is some selection and volunteer bias in light of the small number of participants, and those that are likely to be interested would have volunteered.

Conclusion

Being on-call is an inevitable part of a junior doctor's work and we believe there is scope for better preparation within undergraduate training. Overall the feedback was extremely positive, with 100% believing this should be available to all students. We have developed an effective and sustainable simulation that has shown excellent results for all three year groups that have participated. Due to the positive reaction, low maintenance, and reproducibility of the project, we aim to cement our teaching programme as a permanent feature for undergraduate students at Blackpool Victoria Hospital. We will expand this to involve other essential skills required by an FY doctor, for example, the potential of using simulated ward rounds as a teaching method. This will be part of a larger programme with more emphasis on preparing for practice during the final year at hospital. Further research is required with a focus on evidence of an effect on competence, change in behaviour and patient safety.

Disclosure Statement

There are no financial benefits, or conflicts of interest to report.

Ethical Approval

At the development in 2016, the programme was discussed with the University of Liverpool and Blackpool Victoria Hospital Undergraduate Education and neither required ethical approval for the project and approved commencement of the teaching programme with the 5th year medical students at Blackpool Victoria Hospital in 2016.

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