



ORIGINAL ARTICLE

Attitude of interns towards implementation and contribution of undergraduate Emergency Medicine training: Experience of an Ethiopian Medical School



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ABSTRACT

Introduction: Emergency Medicine is a medical specialty based on knowledge and skills required for the prevention, diagnosis and management of the acute and urgent aspects of illness and injury affecting patients of all age groups with a full spectrum of undifferentiated physical and behavioural disorders. Addis Ababa University School of Medicine started its Emergency Medicine Residency in 2010 and Emergency Medicine training for fourth-year medical students started in 2013. This study aims to assess attitudes of fifth year medical students towards Emergency Medicine training and its contribution to their final year of medical school training.

Methods: Two hundred fifth year medical students participated in the study by convenience sampling. Self-administered questionnaires and Likert scales were used for data collection. Descriptive frequencies and chi-square analysis were done for categorical data. Ethical oversight was provided by the Institutional Review Board of the Addis Ababa University College of Health Sciences.

Results: Of the 200 participants, 150 were male and 50 were female. 80% agreed its relevance for undergraduates. Relevance was significantly associated with recommendation to other medical schools ($\chi^2 = 8.34$, $Pr = 0.004$). 72% of respondents agreed lectures are appropriate teaching methods, 70% agreed group activity, 68.5% skill sessions, 67.5% morning discussions, 64% diagnostic session, 60% duty exposures and 45% seminars. Difficulties faced during internship are primarily attributed to lack of facilities, ranging from the setup of the emergency centre to instruments and emergency drugs. 60% of respondents agreed that Emergency Medicine training is important to future careers. 65% agreed recommending training to other medical schools.

Conclusion: An Emergency Medicine rotation during the final year of medical school provides opportunities to learn about undifferentiated medical emergencies and it should be included for other medical schools in the country. Participants suggest that leadership aspects of Emergency Medicine need more emphasis as the curriculum is further developed in the future.

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African relevance

- The need for undergraduate teaching in Emergency Medicine has been well documented in the literature.
- Worldwide, there has been a push to integrate Emergency Medicine in the undergraduate curriculum.
- Undergraduate Emergency Medicine training should ideally start in the pre-clinical years.

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Introduction

Emergency Medicine (EM) is a specialty focused on the knowledge and skills required for the prevention, diagnosis and management of the acute conditions [1]. The ability of students graduating from medical school to manage critically ill patients is one of the most important aspects of their curriculum as medical emergencies can occur at any place at any time and can cause an immense burden on the health system. In as much, there have been increased efforts to expose clinicians to this medical discipline [2,3]. As the specialty has matured and evolved in different regional locales and different health systems, there have been increased

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efforts to incorporate EM within the didactic and clinical curriculum during medical school training [3,4].

The specialty of Emergency Medicine remains markedly underdeveloped in many parts of the world, particularly in the continent of Africa [5]. In many African countries emergency care is not available for the majority of the population. The first formal Emergency Medicine systems were developed South Africa in the late 1990s mainly driven by the Trauma Society of South Africa [6]. In the following years, many of these interested and motivated individuals formed the Emergency Medicine Society of South Africa (EMSSA) [6]. Similarly, in the post conflict nation of Liberia a collaborative project was designed and supported by a consortium of academic medical centres in the United States of America. These medical centres worked in conjunction with a local non-governmental organization (NGO), Health Education and Relief Through Teaching (HEARTT) to develop a nascent EM educational program. These two bodies brought cohorts of academic EM faculty and residents from ten institutions from the US. Since 2007, this collaboration has delivered Emergency Medical care and medical education services at the John F. Kennedy (JFK) Medical Centre which is the largest teaching hospital in Liberia and located in the capital, Monrovia. [7]. Over the course of last ten years, post-graduate educational programs have also been developed in Tanzania, Botswana, and post-conflict Rwanda [8–10]. Similarly, the African Federation for Emergency Medicine (AFEM) has recently been formed and has started working to expand Emergency Medicine's footprint on the continent. In partnership with many national EM organisations, it has begun to develop many clinical, administrative, educational and oversight programs [11].

The modern undergraduate and graduate medical education programs in Ethiopia started in 1964 at Addis Ababa University School of Medicine. As these programs developed, training in emergency care was implemented by the individual medical disciplines (Internal Medicine, General Surgery, Paediatrics, etc.) rather than by a defined EM program [12]. In March 2009, Addis Ababa University engaged in a multi-disciplinary agreement with People 2 People, the University of Wisconsin, the American International Health Alliance and the University of Toronto to develop and implement an Emergency Medicine residency training program at Tikur Anbessa Hospital in Addis Ababa, Ethiopia [13]. At this same time, EM was also included as an elective within Addis Ababa University College of Health Sciences, School of Medicine. This seven week clinical and didactic program was successfully launched in the 2013 with 300 medical students, and included

rotations in Adult EM, Paediatric EM, and Anaesthesiology. Primary teaching responsibilities were taken on by EM faculty, Paediatric EM faculty and EM residents within the Department of Emergency Medicine at Addis Ababa University.

The aim of this research study was to determine the attitude of fifth year medical students at Addis Ababa University towards the implementation of a novel Emergency Medicine elective within the medical school's fourth year curriculum.

Methods

The study was conducted at the Addis Ababa University School of Medicine between March and August 2014. It involved supervised fifth year medical students who had done at least a two week rotation in the emergency centre at Tikur Anbessa Hospital in Addis Ababa, Ethiopia. After written consent forms were provided with the survey, 200 fifth year medical students that participated in the aforementioned Emergency Medicine training were included. Self-administered questionnaires were used for data collection. A nine-item survey ([Appendix 1 – data supplement](#)) was prepared (six questions of multi-point Likert scale and three open ended questions). 180 students completed the survey, a 90% response rate. Non-responders were students that were on a week vacation during the day of survey implementation. The investigator and four study representatives collected the data. The survey included specific questions about attitudes towards the didactic, clinical and administrative structure of the rotation and were collected on a multi-point Likert scale. In addition, there were additional open-ended questions ascertaining opinions about strengths and weaknesses of the curriculum. Approval was obtained from the Addis Ababa University College of Health Sciences Institutional Review Board (IRB) prior to the study. Data were analysed using STATA version 14 [14]. Descriptive statistics with frequencies were used for data collected using multi-point Likert scales. Chi-square analyses were done for categorical data and responses were summarised for open-ended questions.

Results

One hundred eighty fifth year medical students completed the survey (a 90% response rate); 145 were male and 45 were female. Responses to questions on relevance of the EM training in the fourth year medical school curriculum are included in [Fig. 1](#). The

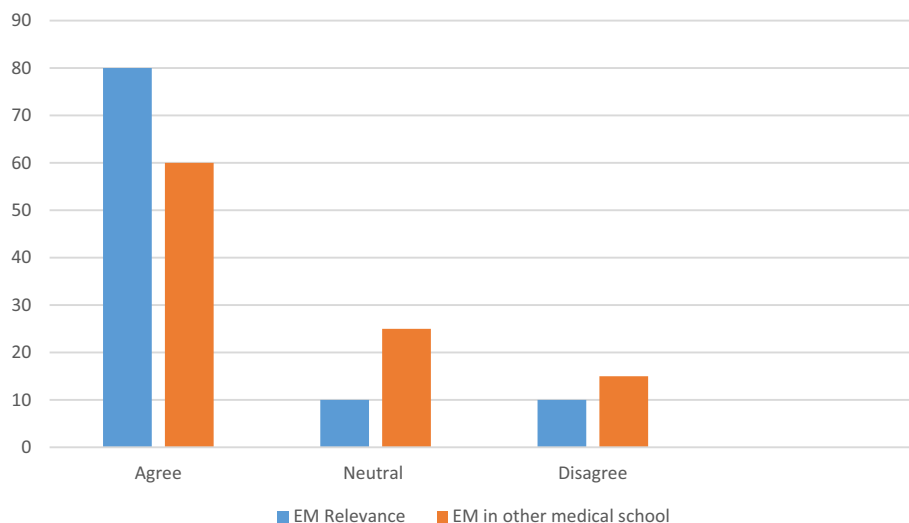


Fig. 1. Relevance of emergency medicine training in undergraduate medical curriculum in AAU and recommendations to other medical schools in Ethiopia.

Table 1
Grading of satisfaction of different teaching methods of undergraduate emergency medicine training.

Teaching Modality	Strongly agree/Agree	Neutral	Disagree/Strongly Disagree
Lecture	72	13	15
Skill sessions	68.5	17.5	14
Group activity	70	13	17
Duty hours Clinical exposure	60	20	20
Students Morning Session Discussions	67.5	12.5	20
Diagnostic session discussions	64	16	20
Seminars	45	17	38

concept of “relevance” in this question means its importance in developing knowledge and skills for acute and emergency care. Teaching modalities are rated on [Table 1](#).

Chi-Square analysis was done comparing relevance of training versus training recommendation to other medical schools ($\chi^2 = 8.34$, Pr = 0.004) ([Table 2](#)). Chi-Square analysis was also done for relevance versus each of the means of education with lectures ($\chi^2 = 28.5$, Pr = 0.000), skill sessions ($\chi^2 = 27.8$, Pr = 0.001), small group activity ($\chi^2 = 25.5$, Pr = 0.01), clinical exposure ($\chi^2 = 25.4$, Pr = 0.01), morning report educational session ($\chi^2 = 27.1$, Pr = 0.015), didactic diagnostic session ($\chi^2 = 26.9$, Pr = 0.012). Each of these analyses were significant, as outlined by P-values above. Only the didactic seminar session ($\chi^2 = 0.5051$, Pr = 0.477) was not significantly associated.

Self-reporting of learners’ perceptions of whether or not the curriculum’s goals and objectives were successfully implemented is outlined in [Table 3](#).

60% of respondents reported that Emergency Medicine training was an important part of training for their career choice. Along with the results reported above, fifth year medical students were able to provide narrative feedback on the perceived strengths/weaknesses of the educational curriculum for all of the open-

Table 2
Chi-square statistics for curriculum relevance by recommendation and curriculum relevance by teaching modality.

Analysis	χ^2	Pr
Relevance of training versus training recommendation to other medical schools	8.34	0.004
Relevance of training versus lectures	28.5	<0.001
Relevance of training versus skill session	27.8	0.001
Relevance of training versus group activity	25.5	0.01
Relevance of training versus duty exposure	25.4	0.01
Relevance of training versus morning session	27.1	0.015
Relevance of training diagnostic session	26.9	0.012
Relevance of training versus seminar	0.5051	0.477

Table 3
Grading of satisfaction of objectives of emergency medicine training as per its implementation.

Objectives	Agree/Strongly agree	Neutral	Disagree/Strongly disagree
Medical student will be able to understand emergency medical problems (%)	52	13	35
Medical students will be able to manage emergency medical problems (%)	50.5	22	27.5
Medical students will be able to develop competency on life saving techniques (%)	69	11	20
Medical students will have knowledge and skills on emergency medical services organization and leadership (%)	40	15	15

ended questions. These responses are summarised in narrative form in [Table 4](#).

Discussion

The results of our study lead us to believe that there is interest for the further development and implementation of more formalised training in Emergency Medicine within the Addis Ababa University School of Medicine. These findings are in line with the International Federation of Emergency Medicine (IFEM) mission statement and are important as the specialty continues to develop both in Ethiopia and in other locations in Africa [19].

This study revealed that a large portion of the students going through a four-year clinical rotation in Emergency Medicine found the experience valuable and worthwhile. This is in line with findings by authors in both Africa and abroad. In these studies, there has been a push to begin integrating the study of EM in the undergraduate medical school curriculum [1,19]. In the Federal Democratic Republic of Ethiopia, only Addis Ababa University School of Medicine has undertaken this endeavour. More than 60% of our study participants felt that consideration should be given to expanding this educational offering to other medical schools in the country.

As outlined in the results section above, many different educational modalities were used in the fourth-year medical students’ curriculum. Of these, learners significantly favoured lectures, skill sessions, small group activities, clinical exposure, morning didactic sessions, and diagnostic sessions as value added components of the clinical elective. This is similar to other studies which have shown use of problem based learning and other didactic modalities, all under the supervision of an Emergency Medicine provider. In Botswana, studies show that ten-week rotations in Emergency Medicine were given through problem based sessions, case presentations, clinical exposure at emergency centres and keeping maintenance logbooks [1].

The respondents in our study suggested that the curriculum make use of a simulation centre for improving procedural skills, while giving the learners the ability to learn lifesaving procedures and difficult clinical scenarios in a controlled setting. Similarly, they suggest access to other clinical competencies as outlined in the IFEM core competencies for worldwide undergraduate Emergency Medicine curricula. Specific skills that were cited were access to learn elective intubations (Anaesthesia/operating Room) and difficult orthopaedic procedures (Orthopaedics/operating Room). Many respondents suggest having more “intern orientation” that would help them develop clinical expertise on diagnosis and management of different emergent medical conditions. A small study in Australia showed EM rotations increased students’ clinical management knowledge and confidence in their abilities and skills, but they overwhelmingly wanted more structured teaching. Students preferred practical, interactive, case-based and problem-based teaching [15]. Other studies have shown that the use of Practice Based Learning and student presentations, especially with EM faculty member presence, increases student discussion and encourages feedback and evaluation over the course of the rotation [16]. Our study agreed with these findings, although there were a limited number of EM professionals involved in this clerkship rotation, as the specialty is in its beginning stage. Procedural training has also become a challenge in medical education in recent years. A US study in 2005 looked at procedural skills attained by medical students in seven medical schools and found that they were deficient in many procedural skills. 20% of the medical students in their final year had never performed phlebotomy or intravenous cannulation and the majority had never performed CPR [17]. Similarly, in a recently published study of over 200

Table 4

Narrative responses to open-ended survey questions.

Question 5: What areas of emergency medicine training should be emphasized and added to the fourth-year medical student curriculum?

- More practical sessions on procedures like ECG, intubation, emergency orthopaedics, bedside emergency ultrasound and emergency drugs.
- Simulation centres should be established due to ever increasing numbers of medical students. Every clinical department should have exposure to Emergency Medicine during their rotations in the fourth year, so that medical students can learn about respective emergency medicine cases.
- Duty hours in the emergency centre should be mandatory for medical students to increase exposure to practical cases.
- Video presentations of emergency procedures should be encouraged. Lectures should include important areas of emergency and should be case oriented.
- Medical students should be taught the concept of prehospital care and emergency triage.

Question 6: What difficulties did you face during your fourth-year Emergency Medicine rotation?

- The logistics of having a clinical rotation in the emergency centre are challenging due to certain administrative issues. Specifically, the centre is very congested and has very limited resources (not enough portable ECG machines, defibrillators, blood pressure apparatuses, airway devices, etc.) These were major difficulties faced both during training and internship practice.
- Challenges having staff that had limited practical experience in Emergency Medicine
- Not having exposure to interdepartmental health care professional interactions and cooperation

Question 9: What are your recommendations about further implementation of fourth year Emergency Medicine training?

- Increasing numbers of practical small group skill sessions with appropriate oversight and equipment
- Overview of emergency practice and treatment guidelines, along with admission and discharge criteria.
- Having management algorithms for commonly encountered emergency case presentations
- Small group sessions focused on systems based practice in the emergency centre, including: interpersonal communication, professionalism, teamwork and public education campaigns
- Offering basic first aid trainings during the first two years of medical school, such that students will become familiar with basic concepts of emergent medical care

fourth-year medical students on EM rotations, students rated significantly greater confidence with assessment, diagnosis, and management of the acutely ill patient after completion of their EM rotation, and specifically reported increased confidence in procedural skills [18]. Similar to these other studies, the results of our study showed the perceived need for more practical skills sessions focused on procedural competencies.

There are learning objectives from IFEM which are designed to allow easy modification to the local needs and are written such that objective measures of performance and competency can be designed to measure attainment of the learning objective. Those objectives are modified precisely for our set up into four major areas (Table 3) and the respective findings from this study are summarised as;

First more than 50% of medical students agreed that they are expected to understand emergency medical problems, and this is the main objective when it comes to undergraduate Emergency Medicine training. Second more than 50% responded that they will be able to manage emergency medical problems. Around 70% of them believed they will be able to develop competency on life saving techniques. Fourth, when it comes to knowledge and skills on emergency medical services organization and leadership, only 40% agreed that they have a sufficiently developed skillset. The majority feel they didn't acquire this by the end of the training. This is an area to be looked into by the Department and the school, since it is a vital part of the management of emergency medical conditions including mass casualty.

We feel that the results of this section outline that it is very important to have adequate undergraduate training in order to further develop the next generation of health care professionals that will manage acute and emergency care. These specific objectives are also mentioned in the IFEM core curriculum under objectives for educational outcomes. We feel that this can serve as a model for EM faculty and staff to teach and model effective team approaches to health delivery, as well as demonstrate administrative and leadership skills in a clinical setting.

Some of the outlined difficulties with the setting in Addis Ababa include the paucity of trained Emergency Medicine faculty; the challenges of practicing in a resource limited clinical environment; and the poor access to emergency protocols, equipment and medications. Some of the respondents also noted that there needs to be improved cooperation between health care professionals and hospital administrative staff to improve communication regarding

clinical care leading to optimal emergency care. Similarly, many of the respondents feel that triage in the emergency centre needs physician supervision so that patient care can be optimised and begun from the initial clinical encounter.

EM is a relatively new speciality and EM specialists are particularly interested in promoting their specialty and encouraging medical students to pursue future training. Many EM rotation feedback surveys in the US have not demonstrated a correlation with choice of EM as a career after medical school with increasing EM undergraduate exposure [18,19]. This survey revealed an increased interest (60% agreed or strongly agreed) regarding its importance for future career in post-graduate training, an encouraging finding since postgraduate EM training is continuing to grow and develop in Ethiopia.

There are a number of limitations to this study. This is a single institution survey done in a single year, and it was qualitative in nature. Similarly, we recognise that the specialty itself is in its initial stages of development and the educational, clinical and administrative Emergency Medicine programs are still being developed. Having no pre-training survey to compare the findings was another limitation. The training was only successfully implemented in Addis Ababa University School of Medicine during the time of the study. Finally, the study only involved interns who have the training during their fourth year and practicing internship (their fifth year practice under supervision).

Conclusion

We believe that there is a general consensus of the relevance of having undergraduate Emergency Medicine training and the further integration of emergency care into other clinical rotations. We feel that EM training should be started in the pre-clinical years to meet other international standards. We feel that it should also include skills focused on clinical care, communication, maintaining good medical practice, professionalism, leadership, ethics and education. The implementation of a multicentre case-control study on the medical interns (undergraduates) who either attended an EM training course or not; estimating the impact of different teaching methods (such as bedside practice, problem-oriented sessions, etc.); and comparing the medical interns' clinical skills; further focusing on the leadership aspect of EM are recommendations of this study.

Conflict of interest

The study was part-supported through the Fogarty Medical Education Partnership Initiative. The authors declare no further conflicts of interest.

Dissemination of results

Results from this study (research/trail/etc.) were shared with staff members at Addis Ababa University School of Medicine, Department of Emergency Medicine through an informal presentation. It was formally presented at the Ethiopian Medical Association's annual conference, as well as the 2016 International Conference on Emergency Medicine (poster presentation).

Author contributions

TB conceived the original idea. TB and AA designed the survey. TB carried out analysis of data. TB and AA prepared the manuscript. JT critically revised the entire manuscript. All authors approved the final draft.

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Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.afjem.2017.04.008>.

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