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Original contribution

Evaluating sepsis training for medical students and nonphysicians in Malawi☆

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Abstract

Study objective: This study aimed to evaluate whether (regarding the Surviving Sepsis Campaign [SSC] guidelines) the training of Malawis scarce medical staff is adequate. Hospitals in Malawi have a severe shortage of human resources and therefore rely heavily on junior staff. Sepsis is a leading cause of admission to hospitals particularly in resource poor countries. It is associated with a high mortality rate. The SSC guidelines have been developed to help frontline staff diagnose and treat patients with sepsis.

Design: A questionnaire consisting of 10 multiple choice questions, which was to be completed before and after a teaching module.

Setting: Anesthesia courses at the University of Malawi.

Intervention: Participants had to answer the questionnaire before and after their teaching block on anesthetics and critical care. The medical students have a 2-week teaching block, and the nonmedical staff have an intensive 3-day training course. MBBS 1 was asked only once as a baseline.

Participants: 168 medical students and 31 nonphysician staff returned 345 questionnaires (return rate, 97.1%).

Measurements: A total of 345 anonymous multiple choice questionnaires were completed. The same questionnaire was then repeated after their teaching block on anesthesia and critical care (not MBBS 1). The aim was for us to assess the knowledge the students had of sepsis.

Overall 67% of the questions were answered correctly (2299 correct answers of 3450). The MBBS IV students had an average score of 68% to 72%, and the MBBS I students had a score of 42%. The highest score was achieved by the nonphysician clinical staff after their teaching as they improved by 11% (65%-76%).

Conclusions: Medical students and health care workers have a lack of knowledge regarding the SSC guidelines which needs to be addressed via training. The medical student teaching was not as effective as the nonphysician clinical staff course, and therefore, we need to think about restructuring their teaching block by having an intensive "Sepsis Day" that focuses on the SSC guidelines.

1. Introduction

Most patients worldwide admitted to a hospital with sepsis live in developing countries [1,2]. It is a leading cause of mortality in sub-Saharan Africa [3]. In Africa, fever is one of the main presentations leading to admission to hospital and it

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has a close association with HIV which has a high prevalence throughout sub-Saharan Africa [4,5]. In Malawi, the prevalence of HIV/AIDS is 10.6% in 15- to 49-year-olds [6]. If sepsis is not diagnosed and treated early, it can progress to severe sepsis, organ dysfunction, and death, with a mortality rate of up to 45% [7]. In addition, sepsis has a severe impact on several of the millennium development goals [8].

The Surviving Sepsis Campaign (SSC) was developed to improve the diagnosis and treatment of septic patients. The guidelines include early goal-directed therapy (EGDT) and care bundle management. EGDT includes intensive monitoring and aggressive early therapy in patients with sepsis to help reduce morbidity and mortality [4]. It has been shown to increase survival [9]. However, in a lot of resource-depleted countries in Africa, these measures cannot be fully implemented [10]. Furthermore, the World Federation of Paediatric Intensive Care and Critical Care Societies do not recommend the SSC guidelines for children in resource-poor settings, and instead, they recommend the Paediatric Global Sepsis Initiative guidelines [11].

Malawi is among one of the poorest countries in the world. Life expectancy was just 54 years in 2011 and gross national income per capita was $320 in 2012 [12]. There is a huge human resource issue particularly in the health sector with only 2 doctors and 38 nurses per 100,000 population [7]. The College of Medicine was established in 1991; prior to that, doctors had been trained abroad and many did not return to work in Malawi. The College of Medicine program is a 5-year program, and after graduation, there is an 18-month internship where the newly qualified doctors are often alone when diagnosing and treating new admissions [13].

Initial care of the patient is by interns, but due to a lack of human resources, nonphysician clinical staff are recruited and these are medical assistants (3 years of training) and clinical officers (4 years of training). A 3-day high-dependency, obstetrics and trauma management (HOT) course has been developed to help give them the skills and knowledge to provide care as frontline staff [14]. This study aimed to look at the general knowledge of sepsis of medical students and compare it with nonphysician clinical staff in Malawi.

2. Methodology

An anonymous questionnaire was distributed to medical students at the College of Medicine, Malawi. We collected 345 completed questionnaires. It was also given to nonphysician clinical staff on the HOT course, as we see in Table 1. The questionnaire had 10 multiple choice questions, which can be seen in Table 2, about the recognition, diagnosis, and treatment of sepsis based on the SSC guidelines. The groups included in the study were first-year medical students (MBBS I); 2 groups of fourth-year medical students (MBBS IV), one from 2012 and the other from 2013; and nonphysician clinical staff on the HOT course.

Table 1 Study sample

Participants	Group o.	No.
2012 MBBS I	G1	45
2013 HOT-pre	G2	30
2013 HOT-post	G3	31
2012 MBBS IV-pre	G4	48
2012 MBBS IV-post	G5	48
2013 MBBS IV-pre	G6	68
2013 MBBS IV-post	G7	75
Total		345

Number of participants in each group.
MBBS I = first-year medical students; HOT = high-dependency, obstetrics and trauma management; MBBS IV = fourth-year medical students.

The questionnaire was completed twice by both groups of fourth-year medical students and the HOT course participants, firstly before and then after their teaching block on anesthetics and critical care (pre and post). The fourth-year medical students have a 2-week anesthetics and critical care teaching block that involved 4 lectures and 4 practical sessions a day with an examination at the end of the block. The HOT course involved an intensive 3-day training course. The teaching that they received was not directly related to the questionnaire but was part of their curriculum, and the lecturers were unaware that the students were to receive a questionnaire to test their knowledge of sepsis.

3. Results

In total, the groups averaged a score of 67%, 2299 correct responses of 3450 completed questions (2299/3450). The MBBS IV groups had average scores of 69% to 72% preteaching and 68% to 72% postteaching on their questionnaires. The MBBS 1 group had the lowest score with an average score of 42%. The HOT course students achieved the highest score after their teaching session, with an average score of 76% (G1: 42%, G2: 65%, G3: 76%, G4: 72%, G5: 68%, G6: 69%, G7: 72%). These scores are shown in Fig. 1.

3.1. Definition

The first question concerning the definition of sepsis asked to the participants was question 2, "Which of the following is not a Systemic Inflammatory Response Syndrome (SIRS) criteria?" Overall 64% (221/345) of the participants gave the correct answer to the question (G1: 49%, G2: 37%, G3: 71%, G4: 69%, G5: 73%, G6: 63%, G7: 73%).

The second question was question 3 (which can be seen in Fig. 2): "Severe sepsis is defined as:" 62% (213/345) of participants correctly identified that SIRS plus infection with organ dysfunction was needed to make this definition (G1: 40%, G2: 43%, G3: 74%, G4: 75%, G5: 65%, G6: 66%, G7: 63%).