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Emergency medical services (EMS) training in Kenya: Findings and recommendations from an educational assessment

Benjamin Nicholson
One Boston Medical Center Place

Chelsea McCollough
Denver Health Residency in Emergency Medicine

Benjamin Wachira
Aga Khan University, benjamin.wachira@aku.edu

Nee-Kofi Mould-Millman
University of Colorado

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Benjamin Nicholson a, Chelsea McCollough b, Benjamin Wachira c, Nee-Kofi Mould-Millman d,*

a Boston Medical Center, Department of Emergency Medicine, One Boston Medical Center Place, Dowling 1 South, Room 1322, Boston, MA 02118, USA
b Denver Health Residency in Emergency Medicine, 777 Bannock Street, MC #0108, Denver, CO 80204, USA
c Accident & Emergency Department, The Aga Khan University, Nairobi, 3rd Parklands Avenue, Nairobi, Kenya
d Department of Emergency Medicine, University of Colorado, School of Medicine, 12401 E. 17th Ave, Leprino Room 752, Aurora, CO 80045, USA

ABSTRACT

Background: Over the past twenty years, Kenya has been developing many important components of a prehospital emergency medical services (EMS) system. This is due to the ever-increasing demand for emergency medical care across the country. To better inform the next phase of this development, we undertook an assessment of the current state of EMS training in Kenya.

Methods: A group of international and Kenyan experts with relevant EMS and educational expertise conducted an observational qualitative assessment of Kenyan EMS training institutions in 2016. Three assessment techniques were utilised: semi-structured interviews, document review, and structured observations. Recommendations were reached through a consensus process amongst the assessment team.

Results: Key findings include: (i) No national or state-level policy exists that establishes levels of EMS providers or expected fund of knowledge and skills; (ii) Training institutions have independently created their own individual training standards; (iii) Training materials are not adapted for the local context; (iv) The foundation of basic anatomy and physiology education is weak; (v) Training does not focus on symptom- or syndrome-based complaints; (vi) Students had difficulty applying foundational classroom knowledge in simulations and clinical encounters; (vii) There is limited emphasis on complex critical thinking.

Discussion: Standardisation of training is needed in Kenya, including clearly defined levels of providers and expected learning outcomes. A nationally standardised EMS provider scope of practice may also help focus EMS education. Instructors must reinforce basic anatomy and physiology amongst all trainees to establish a robust foundation, then layer on field experience before trainees receive advanced training. Training graduates should be EMS providers who approach patient care with high-order symptom- or syndrome-based critical thinking. While these recommendations are specific to the Kenyan EMS environment, they may have wider applicability to other developing EMS systems in resource-limited settings.

African relevance

- Prehospital care systems are in multiple phases of development across the African continent.
- Little is known about the strengths and weaknesses of Kenyan emergency medical services (EMS).
- The education of Kenyan EMS providers has not previously been systematically evaluated.

Introduction

Kenya has an undisputed and strong need for robust prehospital emergency care. The high prevalence of acute medical events, natural and man-made disasters, and mass casualty incidents has created an increasingly large demand for a reliable, integrated, and safe emergency medical services (EMS) system [1,2].

Over the past twenty years, EMS systems have developed in Kenya, as have institutions to train EMS providers [3]. Currently, two separate EMS training programmes are offered in Kenya: the Kenya Red Cross Training School and the Kenya Council of Emergency Medical Technicians [4,5]. Two levels of EMS providers exist in Kenya: Emergency Medical Technician-Intermediate and Paramedic. Their level of training varies based on their educational...
background. Effective training is critical to producing quality pro-
viders who can provide quality services and advance the profes-
sion. A robust evaluation of existing EMS training programmes in
Kenya may augment the quality, effectiveness, and efficiency of
these programmes.

The objective of this assessment was to appraise Kenyan EMS
training programmes in the context of the local burden of acute
disease, the healthcare system, existing resources, and anticipated
national EMS expansion. Our aim was to provide recommendations
to optimise EMS training in Kenya.

Methods

A qualitative assessment of Kenyan EMS education was con-
ducted in July and August 2016 by external assessors with expertise
in African and international EMS systems and education. The
assessment was primarily of Kenya’s main EMS training institu-
tions and EMS agencies. Study investigators developed a stan-
dardised form and interview guides a priori through discussion and
consensus. Main domains in interview guides included providers’
perceived strengths and weaknesses of their prehospital training and
clinical care. Key categories in observation forms included
strengths and weaknesses of practical, classroom, and clinical
instruction, and adequacy of providers’ prehospital management.

Data were directly collected by study investigators using three
techniques: key personnel interviews, direct observations, and
document review. Semi-structured one-on-one interviews were
conducted with 20 total trainees, instructors, and senior staff
within three EMS training institutions. Approximately 60 h of total
standardised observations were conducted in clinical and class-
room training environments and in ambulances during live clinical
care. Training organisations provided relevant training and testing
documentation for review, and several EMS agencies provided
equipment checklists. Combined, these approaches allowed a
detailed understanding of context, rationale, structure, function,
and outputs of the EMS training institutions. All agencies, respond-
ents, and data were de-identified.

Final recommendations were made through discussion, ranking,
and consensus-building amongst the study investigators using a
modified Delphi approach. Two internationally-accepted standard
educational theories were incorporated to help contextualise the
findings: Kirkpatrick’s Four-Level Training Evaluation Model (to
assess educational impact) and Bloom’s Taxonomy of Educational
Objectives (to categorise complexity of educational goals) [6,7].

This study received ethical approval from Boston Medical
Center (USA) and all participating organisations in Kenya.

Results

Per stakeholder interviews, the EMS scope of practice in Kenya
is defined at the individual ambulance agency level. No national-
or state-level policy exists to establish or standardise levels of EMS
providers, nor the repertoire of knowledge and skills within exist-
ing emergency medical technician or paramedic levels.

Per stakeholders and from document review, Kenyan EMS train-
ings institutions have individually defined the breadth and depth of
training content, and employed their own training standards.

Per document review, training materials and content, including
slides, books, and practical simulations, are from non-Kenyan
sources. Testing materials cover non-Kenyan EMS system facts
and issues. This subtly degrades the quality of EMS training, is
inappropriate for EMS learners in Kenya, and wastes training
resources.

Per individual interviews, EMS students consistently reported
discomfort with developing care plans for medical chief com-
plaints, largely due to difficulty in formulating simple symptom-
or syndrome-based differential diagnoses. Conversely, EMS trai-
nees overestimated their knowledge and confidence in trauma
care, compared to reports on knowledge and proficiency described
by EMS leaders and trainers.

Per review of examinations and from individual interviews, stu-
dents struggled with understanding basic anatomy and physiology
(Bloom lower-order). This results in difficulty in applying this con-
tent clinically (Bloom middle- and high-order).

Per observation and according to EMS trainers interviewed, stu-
dents had difficulty applying foundational classroom knowledge to
patient simulations and practical stations (Bloom middle-order).
Learning and behaviour changes during the ambulance and hospi-
tal clinical experiences are not assessed (Kirkpatrick levels 2 and
3).

Per observation, and from interviews with emergency physi-
cians and leaders, there is limited emphasis on complex critical
thinking skills beyond reciting facts and understanding basic con-
cepts (Kirkpatrick levels 1 and 2). Consequently, students struggle
with applying classroom knowledge to practical clinical stations
(Bloom middle- and high-order).

Discussion

Primary recommendations

Standardising the Kenyan EMS scope of practice: A standard
Kenyan EMS scope of practice (document and policy) is needed
that clearly defines standard levels of EMS providers, and deline-
ates all knowledge, skills, and competencies required to practice
at a given level. This document should explicitly define: (i) the vari-
ous levels of EMS providers; (ii) training and qualifications
required to attain those levels; (iii) standardised minimum and
maximum expected knowledge, skills, and core competencies for
each level.

Creating a national standard for EMS training in Kenya: A standard
for EMS training should be developed and implemented to help
ensure high quality, uniform EMS training across institutions that
aligns with the Kenyan EMS scope of practice. Standards for EMS
training in Kenya can establish the minimum and maximum con-
tent of training for each tier of EMS provider. Aligning EMS training
curricula and content to scopes of practice will likely minimise
costly over-training, or dangerous under-training.

Adapting foreign training content to Kenya: There should be a
transition from over-reliance on non-Kenyan curricula and training
content, to Kenya-specific materials that are relevant to the local
burden of disease, healthcare system, and available resources.
Kenyan EMS educators have requisite qualifications and expertise
to adapt content.

Focus on symptom- or syndrome-based training: Instructors
should increase the time spent on the general approach to medical
symptoms and decrease emphasis on distinct diseases (Bloom
middle- and high-order). We suggest a shift in Kenyan EMS train-
ing culture away from diagnosis-based training to syndrome- and/
or symptom-based training.

Improve foundational didactic/classroom-based education: EMS
trainees will likely benefit from stronger foundational didactic
classroom-based education with a specific focus on clinically rele-
vant basic anatomy and physiology aligned to the Kenyan burden
of disease (Bloom lower-order). Further, as EMS students come
from a wide spectrum of prior education, it is important to ensure
that basic knowledge and skills are equilibrated amongst all learn-
ers in a given tier.

Improve foundational clinical thinking: We recommend trainees
first achieve competencies and attain adequate field clinical expe-
rience at a basic level, before receiving additional training to higher
qualifications (e.g. ILS or ALS). Hence, a basic course should be established as the initial course for all providers. Additionally, middle- and high-order thinking should be robust and formally assessed during clinical experiences.

*Improve (Bloom) high-order and critical thinking skills:* Higher-order and critical thinking skills need to be developed, by integrating basic knowledge and skills into real-world clinical scenarios that are included in all aspects of EMS training and evaluation programs. Kenyan instructors should continue to use mixed methods (qualitative and quantitative) to assess learners’ higher-order thinking and more integrated thought processes (Kirkpatrick 3 and 4).

**Secondary recommendations**

Primary course instructors (i.e. those who instruct at least fifty percent of the course) must be experienced and currently licensed as an instructor and above the qualification level of instruction.

EMS training institutions should maintain a written clinical training agreement with a licensed medical facility, ambulance service, and physician medical director (with requisite knowledge of emergency medicine or EMS).

Upon completion of training, EMS providers should be certified as ready-for-independent-practice through a standardised process that includes a certificate of graduation from an EMS training institution and passing a standardised external exam. EMS service agencies should internally prepare certified EMS providers to enter their workforce through a credentialing process. This should include certificate verification, an on-boarding process, and a supervised assessment period by a medical director or field-training officer.

Since critical knowledge and skills are known to decay rapidly, it is imperative that EMS agencies provide ongoing training opportunities to improve knowledge and skills retention [8].

The local Kenyan prehospital burden of disease needs to be better established to aid in tailoring of training towards the Kenyan environment.

**Conclusions**

Several recommendations are offered to assist improving quality of Kenyan EMS training, including developing a national EMS scope of practice document, tailoring training to Kenyan epidemiology, improving critical thinking skills, and focusing on symptom- and syndrome-based patient care. We recommend that EMS agencies introduce more structured continuous medical education/professional development and processes for credentialing and recertifying providers. Overall, the EMS environment in Kenya is thriving and expanding. Sustained high-quality training of EMS providers will be critical to the continued growth and professionalisation of EMS in Kenya.

**Conflict of interest**

Ben Wachira is an editor of AfJEM. He was not involved in editing or peer review for this paper. The authors have no further conflicts of interest to declare.

**Dissemination of results**

Results from this assessment have been summarised in a white paper and presented to relevant members of the prehospital community in Kenya including prehospital agencies and the primary organisations that have developed Kenyan EMS training programmes.

**Author contributions**

BN and CM carried out the assessment in the field and contributed to the manuscript. BW was involved in the study idea and design and provided introductions to members of the organisations. NM conceived the idea, developed the assessment framework and methodology, contributed to the manuscript, and served as the senior advisor to the project. All authors approved the final version for submission.

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