

Self-reported, House-Officer's Competency and Knowledge

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Abstract This study was conducted to assess the competency of fresh medical graduates in dealing with common emergency conditions. Graduates who received structured training in Emergency Medicine (EM) as part of their medical school curriculum (stratified group) were compared to those who did not (pooled group). Curricula of medical schools were reviewed. Structured questionnaire was used to collect data which included self-reported competencies and demographics among the medical graduates. The study population were 162 freshly graduated doctors, among them 35 received structured training in EM. Lack of competency in clinical skills ranged from 2.9% - 40% and 11.4% - 53% among stratified and pooled groups respectively. We found a statistically significant difference in skills related to assessment of acutely ill patient, use of ABCDE approach, valve mask ventilation, dysphagia screening, management of diabetic emergencies, and management of convulsions. A relatively higher level of competency was reported in those who received structured training in emergency medicine. Incorporation of emergency medicine in the curricula might improve the competency of junior doctors.

Keywords: *clinical competence, simulation, emergency medicine, medical student*

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1. Introduction

Medical school curriculum is supposed to provide a set of educational experiences designed to support students' mastery of the core knowledge, skills, and attitudes needed to achieve their goals as physicians, researchers, teachers, and public servants. Accreditation Council for Graduate Medical Education (ACGME) expects residents to obtain competency in six areas [1]. These areas include; patient care, medical knowledge, practice-based learning & improvement, interpersonal & communication skills, professionalism and systems-based practice.

Medical students as future healthcare providers are supposed to cover a spectrum of knowledge and skills comparable to the residents in term of content and topics. The depth and expected competency are the main difference. One of the important roles of a physician, as described in CanMEDS, is the role of the medical expert. Physicians possess a defined body of knowledge, clinical

skills, procedural skills and professional attitudes, which are directed to effective patient-centered care [2].

Cantor et al reported that eighty percent of young physicians reported that their formal medical training did an excellent or good job of preparing them for medical practice. In spite of this more than one third would prefer to have received more training in settings outside of hospitals. This might highlight deficiencies related to system based learning. The same study by Cantor reported variation in preparedness in different training programs [3]. Emergency Medicine (EM), despite being a fairly new specialty, is experiencing significant growth in graduate medical education with the expansion of residency training programs [4]. Undergraduate programs are incorporating EM experiences in their curricula, but the addition of mandatory, structured EM clerkships still remains an area of slow growth [5]. Medical schools may offer EM experiences, but these may have wide variability in goals, settings, focus, and learning methods. Lyss-Leman et al reported that there are growing concerns regarding the variability in skills and lack of preparedness

of incoming residents [6]. In emergency rooms, residents and front - liners should be prepared with sets of competencies enabling them to manage acutely and critically ill patients. EM - related competencies in medical school curricula may lack uniformity and standardization [7]. As such, it may not be surprising to see significant variability in the basic knowledge and skills of incoming residents. The resulting gap in expected competencies is of concern to educators, supervising clinicians, regulatory bodies and the public.

Sudan is an economically disadvantaged country. There is a significant shortage in qualified healthcare providers, add to this the efflux of providers seeking career advancement and economic stability. It is expected from fresh graduate to deal with common medical problems and handle a variety of medical emergencies with variable degrees of supervision and delegation. Emergency used to be handled by the relevant disciplines. EM is a fairly new specialty in the country. The first postgraduate training in EM was started in 2010 at Sudan Medical specialization Board.

There is an ongoing discussion and concern in the medical community in Sudan regarding the competency of the fresh medical graduates in dealing with medical emergencies. Because of this we designed this survey to assess the competency of Sudanese fresh medical graduate (house officers) in dealing with common emergency conditions.

2. Methods

This study was started by reviewing the curricula of medical schools in Sudan Medical Council records in September 2015. Documents were screened to identify written courses of Emergency Medicine (EM). Curricula with EM courses were identified and students from these schools were interviewed to assess the learning methods.

Then medical graduates were surveyed by structured questionnaire. The graduates were divided into two groups. Group 1 (stratified group) represented graduates who received structured training in EM in medical school. Group 2 was the (pooled group) that consisted of graduate of different medical schools who did not receive structured training in EM.

The survey included demographic data and self-reported competencies. We included competencies for generic skills needed to manage acutely and critically ill patients (8 items), and skills needed for specific disease or a common presentations (16 items).

3. Results

At the time of conducting this study there were 37 licensed medical schools. Curricula of 32 medical schools were available at Sudan Medical council. Reviewing these curricula revealed that only 6 schools have an EM course written into the curriculum documents. Three of these schools were excluded because they were fairly new and their students were at the preclinical phase. Two schools teach EM as lectures and tutorials with no structured clinical encounters. There was only one school that

teaches EM as a structured course. This course is hosted by four departments including; internal medicine, surgery, obstetrics and pediatrics.

In Sudan the cumulative number of medical graduates from all medical schools is 3100 according to the data from Sudan medical council. The school that teach structured course of EM graduated 295 doctors. In this study 162 (they represent 5.2% of all graduates) doctors were surveyed before starting internship, of them 35 (out of 295) received structured training in EM in medical school (they represent 11.9%). From all doctors 106 (43.1%) were males, and 95.1% were below age of 30. Majority of them graduated in 2014 and 2015(80%). The pooled group was graduated from 17 medical schools.

The reported competencies are illustrated in (Table 1). Significant number of house officers reported a lack of competency in generic and disease-specific skills. In this report the majority of the participant scored poorly in most of the 24 items. In only 5 (20.8%) and 2 (8.3%) items more than 50% of the pooled and stratified groups reported competency. Lack of competency in generic skills ranged from 2.9% - 31.4% and 11.4% - 53% among stratified and pooled groups respectively. In disease-specific skills it ranged from 5.7% - 40% and 13.5% - 54.5% in the stratified and pooled groups respectively.

Comparing those who had structured training in EM with those who did not, we found a statistically significant difference mainly in six skills namely the assessment of acutely ill patient, use of ABCDE approach, valve mask ventilation, dysphagia screening, management of diabetes and its complications, and management of convulsions.

4. Discussion

In this report the majority of the participant scored poorly in most of the 24 items with very few reporting competency. It is interesting to see that in the pooled group 50% of the participant reported competency in 5 items compared to 2 items in the stratified group. Poor competency was seen much more in the pooled group. The stratified group showed statistically significant difference in 6 items. The discrepancy in acquiring competency could be related to the method of teaching and instruction. Since EM is a new specialty and the country graduated only 14 ER physician with few trained in other countries, it will be expected teaching of EM to medical student is delivered by heterogeneous group of providers. We wonder if these items with statistical significance were taught by experience instructors or had well-designed learning methods.

Lack of competencies limit doctors abilities to deal with emergency situations. This might have devastating consequences, especially if they are not supported and supervised in health care setting. As we know physician will avoid treating problems in which they are not competent. Lack of experience and a lower level of self-perceived competency appear to be affecting future practice patterns. Powel et al reported that among obstetrics residents 85% of those who do not feel competent to perform forceps deliveries will predominately use vacuum extraction [8]. It was reported that 22%, 25%

and 38% of family practice residents were somewhat unprepared to deal with pain management, critically ill and HIV patient respectively [9].

Teaching emergency medicine varies from country to country. In the same country there is a variation from one school to the other. In 1994 only 20% of allopathic medical schools in USA had a required EM rotation [10]. In this report we found only 6 out of 32 (18.8%) medical schools teach EM. Exposure to EM medicine varies in

these schools from tutorial based teaching, part of other disciplines. It was noted none of the school teach EM in ER setting. In many medical schools' curricula, EM exist as an elective, selective, or mandatory rotation. Wald et al reported only 36% of institutions reported having a mandatory clinical experience for medical students [11]. Lacking quantitative and qualitative training in EM is alarming since basic skills of emergency management is crucial for patient safety.

Table 1. Comparing Competencies between those taking Structured Course in Emergency Medicine before Internship and those who did not

	Received structured course			Not received structured course			P value
	Not competent	average	Competent	Not competent	average	Competent	
Assessing acutely ill patient	1 (2.9%)	19 (54.3%)	15 (42.9%)	29 (19.9%)	45 (30.8%)	72 (49.3%)	0.008
basic airway management	7 (20.6%)	13 (38.2%)	14 (41.2%)	43 (29.5%)	45 (30.8%)	58 (39.4%)	0.531
Use of ABCDE approach	2 (5.7%)	19 (54.3%)	14 (40%)	24 (16.3%)	46 (31.3%)	77 (52.4%)	0.026
Use of different methods of oxygenations	11 (31.4%)	13 (37.1%)	11 (31.4%)	60 (40%)	44 (29.3%)	46 (30.7%)	0.574
know method of bladder care including urinary catheterization	4 (11.4%)	13 (37.1%)	18 (51.4%)	41 (11.4%)	32 (21.5%)	76 (51%)	0.054
Use of valve mask ventilation	2 (5.7%)	14 (40%)	19 (54.3%)	41 (28.7%)	28 (18.2%)	76 (53.1%)	0.002
know dysphagia screen	9 (26.5%)	12 (35.3%)	13 (38.2%)	79 (53%)	39 (26.2%)	31 (20.8%)	0.015
NG tube caring	11 (31.4%)	13 (37.1%)	11 (31.4%)	52 (34.9%)	30 (20%)	67 (45%)	0.089
Advanced skills							
Handling chest pain	7 (20%)	14 (40%)	14 (40%)	35 (24%)	56 (38.4%)	55 (37.7%)	0.882
Handing shortness of breath	4 (11.8%)	16 (47.1%)	14 (41.2%)	25 (16.9%)	66 (44.6%)	57 (38.5%)	0.762
Managing acute MI	8 (22.9%)	14 (40%)	13 (37.1%)	39 (26%)	52 (34.7%)	59 (39.3%)	0.830
Managing asthma	3 (8.6%)	15 (42.9%)	17 (48.6%)	20 (13.5%)	41 (27.7%)	87 (38.8%)	0.203
Managing acute kidney injury	13 (37.1%)	16 (45.7%)	6 (17.1%)	73 (49.7%)	40 (27.2%)	34 (23.1%)	0.103
Managing acute liver failure	14 (40%)	13 (37.1%)	8 (22.9%)	79 (54.5%)	38 (26.2%)	28 (19.3%)	0.285
Managing sepsis	8 (22.9%)	14 (40%)	13 (37.1%)	50 (35%)	40 (28%)	53 (37.1%)	0.272
Managing life threatening electrolyte disturbance	10 (28.6%)	15 (42.9%)	10 (28.6%)	61 (41.2%)	37 (25%)	50 (33.8%)	0.101
Managing comatose patient	11 (31.4%)	18 (51.4%)	6 (17.1%)	59 (39.6%)	49 (32.9%)	41 (27.5%)	0.113
Managing stroke	11 (31.4%)	14 (40%)	10 (28.6%)	41 (27.7%)	57 (38.5%)	50 (33.8%)	0.823
Managing acute deterioration of level of consciousness	13 (37.1%)	13 (37.1%)	9 (25.7%)	72 (48.3%)	44 (29.5%)	33 (22.1%)	0.483
Managing bleeding patient	8 (22.9%)	11 (31.4%)	16 (45.7%)	35 (24.3%)	42 (29.2%)	67 (46.5%)	0.962
Managing and utilizing blood products	8 (23.5%)	11 (32.4%)	15 (44.1%)	60 (41.1%)	41 (28.1%)	45 (30.8%)	0.143
Recognizing and managing shock	5 (14.3%)	11 (31.9%)	19 (54.3%)	44 (30.6%)	45 (31.2%)	55 (38.2%)	0.106
Managing diabetic emergencies	2 (5.7%)	19 (54.3%)	14 (40%)	38 (23.8%)	31 (20.8%)	88 (59.1%)	0.000
Managing convulsions	2 (5.7%)	18 (51.4%)	15 (42.9%)	36 (23.8%)	37 (24.5%)	78 (51.7%)	0.003

The ultimate goal of medical education is prepare competent future healthcare providers. The pathways to meet medical school mission varies from country to another. In some countries it enable graduates to enter postgraduate training and work in supervised environment. In some resources limited area, the medical graduates are supposed to handle patients with different complexity with a variable degree of supervision. Nada A-Rahman, an emergency medicine physician at Omdurman hospital (the second largest hospitals in Sudan), reported both urgent and non-urgent patients were seen by house-officers (the very junior doctors) in the emergency room [12]. The presence of junior doctors in emergency room requires training them with the needed skills and supporting them with a viable system. John Henry, stated that “every medical school graduate should possess at least a rudimentary competence in the management of medical and surgical emergencies.” [13]. Faculty and trainers of prospective physicians, need to consider what graduating medical students should know about the management of acutely sick and injured patients [14]. This should be provided through an education experience supervised by appropriately qualified physicians [15]. Learning objectives and evaluation methods must be set when the curriculum is developed. Effective learning strategy and faculty development should be implemented. Well-structured clerkship sessions in real environment and system for feedback are essential in the development of student learners.

The current model of medical education has been accused of producing physicians who are ill-equipped to deal with a very complex healthcare system [16]. This call for alternative models of education such as competency-based models of medical education [17]. Lack of competency in a significant number of skills among our junior doctors is alarming and calls for an immediate short term plan. In addition to this, a long-term strategic plan and review of educational strategy might need to be considered. Observing and addressing the context of healthcare delivery system is crucial to synchronize the educational goals with the service delivery.

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