



Original article

Emergency medicine as a career: Knowledge, attitudes and predictors in Nigerian medical students

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ARTICLE INFO

Keywords:

Emergency medicine residency
Medical student
Nigeria

ABSTRACT

Introduction: Despite the high burden of deaths from emergency conditions in Nigeria, there are no formal emergency medicine (EM) residency programs in the country. Due to the absence of training programs in the country, we hypothesised that there may be a lack of awareness of these benefits of specialised emergency care among medical students and also a lack of interest in it. In this study, we assessed the knowledge and attitude of Nigerian medical students towards EM specialty and their willingness to undergo EM training.

Methods: Online surveys were shared among medical students in six selected medical schools, one in each of the six geo-political zones in Nigeria. The surveys were designed to assess the knowledge of, attitude towards, and interest in EM residency programs. A total of 439 responses were received and analysed using Epi Info 7 analytical software.

Results: Among the 439 respondents, the average knowledge score was 27.5%. Thirty-three percent (CI 28%-37%) of all the respondents had good knowledge about the availability of and opportunities in EM. Good knowledge was determined by a score of >50% on the knowledge portion of the survey, 97% (CI 96%-99%) of the respondents felt that EM training program should be established in Nigeria and 20.5% (CI 17%-25%) of the respondents were interested in pursuing EM as a specialty of choice.

Conclusion: Our research showed that there is a low level of knowledge about EM residency training programs among Nigerian medical students. This is likely secondary to the current absence of these programs in Nigeria. Almost all of the respondents felt that an EM training program should be established and a substantial number of medical students indicated an interest in pursuing the specialty.

African relevance

- As the future of the medical profession depends on medical students, an assessment of this population is a key indicator of the current recognition of the specialty and a predictor of its growth in the coming years.
- Assessing the interest of medical students in the specialty and its predictors provides us with pertinent information to focus our limited resources on the most effective courses of action.

- This study highlights the urgent need to raise more awareness about the specialty and advocate for the development of emergency medicine residency programs in Nigeria and other African countries.

Introduction

Emergency conditions make up a large part of the global burden of disease with about 90% of deaths and 84% of Disability Adjusted Life Years (DALYs) around the world being due to emergency conditions. This is driven in nearly equal part by conditions that must be addressed within hours to days of onset and chronic conditions with common acute

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de-compensations [1,2].

The burden of acute illness is particularly overwhelming in low- and middle-income African countries. Low-income countries carry more than three times the burden of disease for emergency conditions in disability-adjusted life years (DALYs) than in high-income countries [3]. This is due in part to the fact that many lower-middle-income countries have underdeveloped emergency care systems. The World Health Assembly Resolutions 60.22, 68.15, and 72.16 all highlight the significant gap between the need for and the provision of emergency care that currently exists globally and especially in lower-middle-income countries [2,4,5].

While acute care systems can substantially lower the morbidity and mortality associated with a wide range of medical and surgical conditions in adults and children, few healthcare facilities in Sub-Saharan Africa adopt an integrated approach to resuscitation and stabilisation [6]. World Health Organization (WHO) recommends providing emergency specialty training programs in member states to strengthen emergency care systems and increase efficiency and effectiveness across the health system [4]. In November 2011, the African Federation of Emergency Medicine held a series of conferences on acute care in Africa and identified emergency medicine (EM) specialist training as one of the key components of effective acute care [6].

Although frontline health workers of all cadres provide care for the acutely ill and injured, this is often without the benefit of dedicated training in the management of emergency conditions. Effective expansion of emergency care services requires educational and planning initiatives for emergency health care providers [4].

EM is a unique specialty involving rapid diagnosis, medical care, and discharge for patients who need immediate medical attention [7]. It is a fairly new specialty, which started to receive recognition about 50 years ago as a distinct specialty, out of the need to care for the growing population of unscheduled and undifferentiated patients who needed immediate medical care [8,9].

In Africa, it is in different stages of development. It is highly developed in some parts yet remains rudimentary and virtually non-existent in other parts. As of 2017, there were 15 EM residency programs across twelve countries in Africa and only one in West Africa [8].

Nigeria is ranked second highest in the rate of road accidents and other emergencies (deaths, disabilities) among 193 countries of the world [10]. There is, therefore, an urgent need to reorganise emergency services in Nigeria [8]. The clinical practice of EM and the acceptance and recognition of EM as a medical specialty are valuable and efficacious for emergency care development worldwide [9]. Fortunately, the National Postgraduate Medical College of Nigeria recognized EM as a specialty in 2019, established a faculty and has opened up applications for an EM residency to start later this year, 2021 [11].

The government and leadership of the postgraduate colleges need to work hand-in-hand to develop legislature and policies that would enable the commencement of EM training [8].

An essential goal of undergraduate medical education is to train doctors who would become specialists in the various medical fields. This training depends on the availability of training opportunities and, more importantly, on the candidates' willingness to choose the specialty and accept the opportunities [12]. To our knowledge, no studies have been done to assess the awareness and interest levels of Nigerian medical students about specialty training in EM.

The aim of the study was to determine the knowledge and attitude towards EM residency and willingness to pursue EM as a specialty among medical students in Nigeria.

Methods

This study is a descriptive, cross-sectional, online survey of medical students across Nigeria. With a large and diverse population of over 195 million people, 250 ethnic groups, and about 450 languages in 36 states [13], modern Nigeria is divided into six geopolitical zones based on

similar ethnic groups, geographical location, and common political history [14].

The geopolitical zones are: North-East zone (Yobe, Borno, Bauchi, Gombe, Adamawa & Taraba States); North Central zone (Niger, Nasarawa, Kwara, Kogi, Benue, Plateau & FCT); northwest zone (Sokoto, Katsina, Jigawa, Kano, Zamfara, Kaduna & Kebbi States); southeast zone (Anambra, Abia, Enugu, Ebonyi, & Imo States); South-South zone (Edo, Delta, Cross River, Akwa Ibom, Rivers & Bayelsa States); and southwest zones (Oyo, Osun, Ekiti, Ogun, Ondo & Lagos States) [14].

There are 27 fully accredited medical schools in Nigeria and four partly accredited medical schools [15]. The medical schools are distributed geographically as follows; nine in the south-south zone, six in the south-east zone, six in the south-west zone, two in the north-central zone, three in the north-west zone, and only one in the north-east zone [15].

This study was carried out among medical students in six selected medical schools, across the six geo-political zones in Nigeria. Federally-funded universities were chosen purposively for this study as these schools are noted to utilise several quota systems to ensure a representative student population in aspects of ethnicity, gender, religion, and socio-economic status.

Simple random sampling was done to select one federal university from each geo-political zone. The selected medical schools were:

- College of Medicine, University of Lagos, South-west zone
- College of Medicine, University of Nigeria, South-east zone
- College of Medicine, University of Ilorin, North-central zone
- College of Medical Sciences, University of Benin, South-south zone
- Faculty of Medicine, Ahmadu Bello University, North-west zone
- College of Medical Sciences, University of Maiduguri, North-east zone.

In each school, an invitation containing the title, aims of the project, and link to the questionnaire was sent to the student body platforms and all responses were recorded till the target allocation for that school was reached.

Responses were collected from second to sixth-year students so as to give an insight into the preclinical school knowledge of EM and also to compare if clinical students were more knowledgeable and aware of EM than preclinical students. First year is not traditionally considered a part of medical school in Nigeria.

The inclusion criteria for participants' selection were:

- Medical students currently enrolled in the selected schools of the study.
- Those that give consent to participate in the study.

The exclusion criteria for participants' selection were

- Students in other allied medical courses e.g. Dentistry, Nursing, Physiotherapy.
- Exchange students or those on electives in the selected Nigerian universities
- Subjects who are unwilling to participate.

The sample size was determined using Cochran's formula, $n = z^2pq / d^2$, where n = sample size when target population is over 10,000, p is the proportion of respondents who were considering EM as a career choice [16]. This was gotten from a study on "Emergency medicine as a career choice: a descriptive study of Canadian medical students." [7] = 58.9% (0.59).

However, the target population in this study is estimated to be 4100, calculated from the Medical and Dental Council of Nigeria approved quota of students per school which ranges between 100 and 150 maximum per class depending on the school and hence our sample size was corrected with the formula $nf = n / 1 + (n / N)$ and the minimum

sample size was calculated as 424 respondents.

Data was collected using an online form containing a structured, self-administered questionnaire. The questionnaire was created from a base of previous similar studies made up of sections A-D [17–19].

Section A: The first section was comprised of the demographic data of respondents. This included age, gender, university attended, and current level of study.

Section B: The second section determined their awareness of EM as a specialty. It also comprises 13 questions on further knowledge of EM as a specialty including its availability in Nigeria, length of training, and sub-specialties. Options given were ‘Yes’, ‘No’, and ‘I don’t know’. Each correct answer was scored as one point, and incorrect answers scored nil. It was graded as good knowledge for scores between seven to 13, poor knowledge as scores between one and six, and no knowledge for respondents who reported a lack of awareness of the specialty.

Section C: The third section comprised 15 questions to explore student attitudes towards the EM specialty. These included questions regarding the importance of EM in the healthcare system as a whole, relative importance and prestige compared to other specialties, and to what degree students consider EM fascinating/interesting. The questions were answered using a five-point Likert scale graded as Strongly Agree, Agree, Neutral, Disagree, and Strongly disagree. Strong agreement and agreement with a positive statement on EM or strong disagreement or disagreement with a negative statement on EM was scored 1 point. Any other response did not earn any points.

Section D: The fourth section comprises questions on choices of specialty. Participants were asked if they were willing to practice EM and also to select, as many as apply, from a list of factors influencing the choice of specialty.

Participants were grouped according to different universities and levels for comparison. The questionnaire was made into an online Google form, and a cover letter indicating the purpose of the study was attached. Respondents were invited to complete the online questionnaire via messages sent to each class group page on WhatsApp, a social media platform.

Collected data was cleaned, coded, and entered into the Statistical Package for Social Sciences (SPSS) version 23 Software. Socio-demographic variables, as well as questions on knowledge, attitude and awareness of EM, were analysed using descriptive statistics and presented in the form of frequencies and percentages. Tests of association were done using the chi-square test. Statistical significance was set at ≤ 0.05 .

Approval was obtained from the Research and Ethics Committee of the Lagos University Teaching Hospital. Informed consent (online) was obtained from the participants before the commencement of the study.

Results

A total of 439 responses were received. Each medical school surveyed made up 10–18% of the total responses. All forms were assessed for completeness and analysed. **Table 1** shows the demographic characteristics of the respondents.

258 respondents (58.8%) responded yes to the question, ‘Is Emergency Medicine a residency specialty?’ Of those who answered yes (58.8%), further questions were asked to assess knowledge of the specialty (**Table 2**). The rest were moved to section C.

Scoring of the knowledge was carried out and only 32.6% of the respondents had a good level of knowledge (50% and above).

Table 3 demonstrates the perceptions of the respondents towards the practice of EM. When scoring of their attitudes was carried out, 97.7% of the respondents had a positive attitude towards EM specialty.

Of all the responses received, about 20.3% of all respondents answered ‘yes’ when asked if they would choose EM as their career while

Table 1
Socio-demographic data of respondents.

Variable	Frequency (n = 439)	Percentage
Respondent's age (years)		
16–20	114	26.0
21–25	271	61.7
>25	54	12.3
Mean age	22.3 ± 2.7	
Sex		
Male	198	45.1
Female	239	54.4
Prefer not to say	2	0.5
University attended		
ABU	82	18.7
UNIBEN	81	18.5
UNILAG	78	17.8
UNILORIN	71	16.2
UNIMAID	82	18.7
UNN	45	10.3
Level of study		
Preclinical	142	32.4
Clinical	296	67.6

ABU, Ahmadu Bello University; UNIBEN, University of Benin; UNILAG, University of Lagos; UNILORIN, University of Ilorin; UNIMAID, University of Maiduguri; UNN, University of Nigeria.

Table 2
Knowledge of emergency medicine.

Variable (n = 258)	Yes	No	Don't know
Is it available in Nigeria?	99 (38.4)	42 (16.3)	117 (45.3)
Is it available in your training hospital?	72 (27.9)	97 (37.6)	89 (34.5)
The following are subspecialties of emergency medicine (n = 258)			
Aerospace medicine	88 (34.1)	41 (15.9)	114 (44.1)
Disaster medicine	191 (74.0)	9 (3.5)	50 (19.4)
Wilderness medicine	56 (21.7)	36 (14.0)	144 (55.8)
Critical care	191 (74.0)	21 (8.1)	34 (13.2)
Addiction medicine	65 (25.2)	67 (30.0)	106 (41.1)
Population health and social emergency medicine	151 (58.5)	25 (9.7)	68 (26.4)
Sports medicine	154 (60.0)	41 (15.9)	52 (20.2)
Forensics emergency medicine	46 (17.8)	103 (40.0)	88 (34.1)

52.8% of the respondents answered ‘maybe’ (**Table 4**). There were no associations between either the school or level of study (preclinical versus clinical) and knowledge, attitude, or willingness to specialise in EM. Furthermore, having a good knowledge of the specialty did not significantly influence attitude and willingness to specialise in EM. However, when the data was interrogated more closely, those who had a knowledge score of 75% or more, actually were more likely to be interested in specialising in EM (42.3% vs. 18.9%; $X^2 = 8.666$, $p = 0.034$, 95% CI).

The three major factors influencing the choice of specialty cited by the respondents were: interest in the specialty (95.2%), work-life balance (90.2%), high-income potential (82.5%) (**Table 5**).

Discussion

Despite the growth and recognition of EM as a specialty worldwide, our study revealed that a large number of medical students in Nigeria are

Table 3
Attitude towards emergency medicine.

Variable (n = 439)	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Emergency medicine is a valid discipline like internal medicine or surgery	237 (54.0)	146 (33.0)	35 (8.0)	16 (3.6)	2 (0.5)
Having an emergency medicine rotation is valuable to future physicians regardless of their eventual specialty choice.	279 (63.6)	132 (30.1)	19 (4.3)	4 (0.9)	1 (0.2)
Emergency medicine doctors are particularly capable of providing comprehensive care.	153 (34.9)	177 (40.3)	74 (16.9)	28 (6.4)	0 (0.0)
The work of a hospital specialist is intellectually more stimulating than that of an emergency physician.	48 (10.9)	81 (18.5)	141 (32.1)	111 (25.3)	52 (11.8)
A specialist (e.g., a Cardiologist) should earn more money than an emergency physician.	46 (10.5)	54 (12.3)	166 (37.8)	106 (24.1)	62 (14.1)
I would feel frustrated if I could not practice in a field other than emergency medicine	49 (11.2)	72 (16.4)	108 (24.6)	136 (31.0)	69 (15.7)
Treating acute diseases is more interesting than counselling/caring for chronically ill patients.	97 (22.1)	104 (23.7)	139 (31.7)	59 (13.4)	30 (6.8)
If I were asked to include the three most fascinating medical specialties, I would include emergency medicine	100 (22.8)	140 (31.9)	114 (26.0)	55 (12.5)	23 (5.2)
Working as a specialist is more attractive than being an emergency physician	84 (19.1)	95 (21.6)	145 (33.0)	82 (18.7)	25 (5.7)
A wide variety of problems encompassing all age groups is interesting	126 (28.7)	194 (44.2)	88 (20.0)	22 (5.0)	2 (0.5)
Emergency medicine physicians are not as competent as internists	26 (5.9)	43 (9.8)	87 (19.8)	167 (38.0)	105 (23.9)
An emergency medicine physician should always consult a specialist for managing critically ill patients	88 (20.0)	144 (32.8)	104 (23.7)	74 (16.9)	20 (4.6)
The Nigerian health system would work better when emergency medicine physicians	228 (51.9)	162 (36.9)	24 (5.5)	11 (2.5)	4 (0.9)

Table 3 (continued)

Variable (n = 439)	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
are an integral part of the system					
An emergency medicine physician should enjoy as much as prestige as specialists, e.g., Neurosurgeons	184 (41.9)	165 (37.6)	54 (12.3)	21 (4.8)	7 (1.6)
Emergency medicine specialty should be established in Nigeria.	271 (61.7)	128 (29.2)	24 (5.5)	5 (1.1)	2 (0.5)

Table 4
Willingness to practice.

Variable	Frequency (n = 439)	Percentage
Maybe	232	52.8
No	113	25.7
Yes	89	20.3

Table 5
Factors influencing choice of specialty.

Factors influencing choice of specialty	Frequency (n = 439)	Percentage (%)
Interest	418	95.2
Work-life balance	396	90.2
Long term relationship with patients	130	29.6
High-income potential	362	82.5
Prestige among colleagues	156	35.5
Influence from mentors/family members	165	37.6
Length of training	277	63.1
Competitiveness of specialty	198	45.1
Variety of patient presentations	186	42.4

unaware of the specialty. There was poor overall knowledge of the specialty, training, and scope. Exposure to clinical activities and rotations did not make a difference as no correlation was found between the level of study (preclinical versus clinical) and knowledge of EM. Most emergency rooms in Nigeria are manned by doctors with no postgraduate training in EM; medical officers (doctors with no postgraduate training at all) and in the big centres are supervised by consultants of other specialties [20]. However, there seems to be an assumption that the doctors practicing in the emergency centres in Nigeria are trained emergency physicians as only a small proportion correctly identified the lack of EM residency training in any Nigerian teaching institution. The poor knowledge identified in our study is in contrast to almost universal knowledge of the specialty in developed countries and is rather more consistent with layman knowledge of the specialty in the United States two decades ago and Lebanon in 2014 [21,22]. The lack of recognition of EM as a specialty in Nigeria could explain the poor overall knowledge among participants.

Congruent with national trends, our medical students selected interest in the specialty, work-life balance, and high-income potential as the three principal determinants of their career specialty [12,23–25]. An overwhelming 95% of students rated personal interest as highly influential when making their choice of career. Thus, the role of adequate information and exposure to the specialty cannot be overemphasized as this is required to cultivate an interest in any given specialty [12]. Other factors noted such as work-life balance (90%), a variety of clinical presentations (42%), length of training (63.1%) have been highlighted as top motivations for a career in EM by EM physicians [26–29]. Proper orientation and interaction with senior EM physicians will likely improve interest in the specialty.

It was heartening to see that the overwhelming majority of the students had a positive attitude towards EM. About 88% agreed that the Nigerian health care system would work better with emergency physicians as an integral part of the system, and about 90% would like EM specialty to be established in Nigeria. About 80% of the students felt that EM should enjoy as much prestige as other specialties, although the respondents rated prestige as the least influential factor for choosing a specialty. Medical students interested in EM in Saudi Arabia were also less likely to cite prestige as an influencing factor and were most influenced by EM lifestyle and hospital orientation [28].

Overall, 20.3% of students expressed a willingness to pursue EM as a career. This is similar to a study carried out in 2012 among medical students in Singapore, which showed a 21% interest in EM. The study was carried out two years after the recognition of the specialty in 2010, which could account for the similarity of results with our study in Nigeria, where EM specialty does not exist yet. In a study in Canada, 20 years after the establishment of the specialty in the country, 43.8% of medical students expressed an interest in the specialty [12,29]. In the United States, these figures are lower, with 10% of graduating medical students in America expressing interest in EM in the 2005 and 2006 Association of American Medical Colleges graduation questionnaires [27]. However, this was the fourth most common specialty choice and most likely reflects top specialty choices rather than interest because the questionnaires were administered to the graduating class. When asked for their top specialty choice in our study, only eleven respondents (0.02%) indicated EM as their first choice. This is in keeping with several studies in Nigeria demonstrating a preference for Surgery, Obstetrics and Gynaecology, Internal medicine, and Paediatrics as top specialty choices. The poor willingness to choose EM as a top career choice can be attributed to the current absence of EM training programs in the country. The presence of an EM program affiliated with a medical school was associated with a 70% increase in the proportion of students choosing EM as a career in the American National Resident Matching Program [30].

An association was found between knowledge and willingness to practice as those with the highest knowledge scores (>75%) were more likely to pursue a career in EM (42.3% vs. 18.9%; $X^2 = 8.666$, $p = 0.034$, 95% CI). This further underscores the importance of awareness and adequate information. As noted in earlier studies, medical students often have negative perceptions about the EM specialty, lifestyle, and benefits [31]. If given the definition and characteristics of an EM career, a significant proportion of students would likely consider it a career choice.

This is the only study to our knowledge to evaluate medical student awareness, knowledge, attitudes, and interest in the specialty of EM. The urgent need for postgraduate EM training programs to be instituted in Nigeria was highlighted by DaCosta et al. which is the massive first step that needs to be taken [8]. However, interest in the specialty is crucial to its development and promotion in Nigeria. Much work needs to be done to educate and prepare our medical students for a career in EM.

Conclusion

The future of EM in Nigeria is dependent on the training of specialists in the vast and dynamic field. We should focus on the development of EM residency programs around the country alongside new initiatives to increase the positive exposure of medical students to these programs. As more medical students are aware of EM and its advantages as a career choice, more students would be likely to choose it as a career.

Dissemination of results

Results of this research were disseminated to medical school representatives of participating schools via an informal presentation highlighting the gaps identified while proffering recommendations.

Artuthorship contribution statement

Authors contributed as follow to the conception or design of the work; the acquisition, analysis, or interpretation of data for the work; and drafting the work or revising it critically for important intellectual content: AA contributed 30%; IF 30%; and OU, AE, OA, and RA contributed 10% each. All authors approved the version to be published and agreed to be accountable for all aspects of the work.

Declaration of competing interest

The authors declared no conflicts of interest.

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