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Evaluation of an Internal Medicine Residency Curriculum from Trainees' Perspective: A Qualitative Study from a Developing Country

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Abstract

Objectives: This study aimed to identify the areas of strength and areas needing improvement in the internal medicine residency curriculum in a developing country - Sudan. **Materials and Methods:** This qualitative study was conducted at six major teaching hospitals in Sudan. Purposive sampling was used to select 48 residents who participated in six focus group discussions (FGDs). All FGDs were audio taped and lasted between 60 and 90 min. Data collection continued until theoretical saturation took place. The transcribed data were analyzed using the content analysis technique, and codes were generated and categorized into subthemes. Three emerging themes were identified: training curriculum, training in research, and assessment of residents. **Results:** The residents were generally satisfied with the curriculum at the planning level. They reported that the structure of the program is suitable and the duration of the curriculum appropriate; the number of patients and theoretical training in the research were considered optimum. They suggested that training in research should begin earlier in the curriculum, with time reserved for conducting research, and that assessment needs improvement. **Conclusion:** This study highlighted the utility of the qualitative approach in identifying residents' perspectives of their educational programs. However, the residents provided suggestions for improvement in the following areas: training curriculum, research training, and assessment. The practical recommendations from this study could be used to improve the quality of postgraduate medical training in Sudan and elsewhere.

Key words: Curriculum, internal medicine, postgraduate medical education, residency, resident training

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INTRODUCTION

Postgraduate medical education (PGME) in Sudan dates back to 1953 and was started in the University of Khartoum with the postgraduate diploma in obstetrics. However, the first formal residency program was established in 1976 by the Postgraduate Medical Board under the umbrella of the University of Khartoum. Since then, the PGME has evolved with various changes and developments.

The internal medicine residency training curriculum was established in 2004 by the Sudan Medical Specialization Board (SMSB). The curriculum consists of 4 years of training (R1, R2, R3, and R4), including general internal medicine and specialized rotations, two elective rotations, and a research dissertation to be completed before the final examination in the 4th-year R4.^[1]

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The training is divided into five major rotations of 4 months in general internal medicine, and rotations of 4-month duration on cardiology, respiratory medicine, gastroenterology, neurology, nephrology (20-month duration), and two minor elective rotations of 2 months. The major rotations are conducted in 15 accredited training centers in all the states of Sudan, while the minor and elective rotations are conducted in tertiary (specialized) hospitals and training centers.

Besides a good structure for any training curricula, there are many factors that affect the successful implementation of the training in the residency curriculum, one of which is the satisfaction of both the trainers and trainees with the design, delivery, and assessment of the curriculum.^[2] Previous studies have reported that residents' satisfaction with the training curriculum was a significant factor in their performance, learning process, and the quality of care given to patients.^[3,4] Residents' satisfaction with the training curriculum significantly impacts the future maintenance and robustness of that curriculum.^[5]

A few studies in Sudan have assessed the satisfaction of residents with the training curricula and pinpointed the areas needing improvement.^[5,6] Therefore, this study aimed to identify the areas of strength and those needing improvement in the internal medicine residency curriculum in Sudan.

MATERIALS AND METHODS

This qualitative study, which was the second phase of quantitative study,^[5-7] was conducted in six major teaching hospitals in Sudan over 6-month period. The purposive sampling technique was used to select participants who were particularly vocal about the curriculum, and familiar with issues related to the curriculum, research, training, and assessment methods.

Forty-eight residents took part in the study, and a total of six focus group discussions (FGDs) were held. The focus groups involved eight participants in each group (two from each residency year - R1, R2, R3, and R4). None of the residents participated in more than one session.

The list of research questions and the interview guide were developed by the researchers and modified slightly on the basis of the first two interviews. The following discussion areas were agreed upon by the authors, on the basis of a review of the existing literature:^[8-10] the curriculum design, the learning and working environments, mode of delivery, training in research, and student assessment. Table 1 provides the examples of areas and the questions relating to each.

Participation in the study was voluntary, and written informed consent was obtained prior to the focus groups, and trainees were asked to sign consent upon their agreement to participate in this study. Confidentiality, anonymity, and the right to withdraw were emphasized at the start of each session. To maintain participants' confidentiality, a pseudonym was assigned to each one.

All FGDs were audio taped, conducted in Arabic on hospital premises, and lasted between 60 and 90 min. Data collection continued until theoretical saturation was reached. The FGDs were translated into English, and the accuracy of translation was checked by another translator who is conversant in both languages using back translation, to enhance the validity of the translation. All interviews were conducted by one of the research team members.

Transcribed data were analyzed using the content analysis technique. Codes were generated by reading the transcripts one word at a time, and they were categorized into subthemes. A list of codes was developed and reviewed by two authors (MH and YA) until consensus was reached. To limit possible bias and enhance interpretative credibility, the final categories/

Table 1: Example of areas and related points for discussion

Area	Points for discussion
Curriculum design	Curriculum structure principles Major rotations, subspecialties Availability of clinical cases and other learning resources Delivery of the curriculum, e.g., bedside teaching, morning meetings, major weekly rounds, and training in referral clinics Supervision
Learning and working environments	Learning environment Working environment: Wards, clinics, and lounges Electronic libraries
Mode of delivery, research training	Formal training on research Activities to build research skills (journal clubs) Opportunities to conduct research
Student assessment	Entrance to the program Logbook Assessment for learning (formative assessment) SPACES

SPACES: Sudan Practical Assessment of Clinical Examination Skills

themes were generated by combining similar codes (inductive approach). Consensus was achieved after discussion among all the authors of the final data. All authors examined the transcripts separately to determine whether new themes had emerged, and to ensure the accuracy, completeness, and readability of the data.

Permission to conduct the study was obtained from SMSB, and ethical approval was granted by the Sudanese National Technical Ethical Committee.

RESULTS

Forty-eight residents participated in six rounds of FGDs, 36 males and 12 females. Table 2 shows the characteristics of the participants. Thematic analysis of the FGD data revealed three themes: the training curriculum (design, educational climate, and delivery), training in research, and assessment of the residents. Table 3 lists the examples of the themes, categories, and codes.

The first theme: Training program

Participants reported that the structure of the training curriculum is suitable regarding the number of rotations and the duration of training (major rotations, subspecialties, and elective rotations). Nonetheless, the respondents reported some areas of difficulty with the entry route to this program.

There were no reading materials for the first part of the entrance exam for this programme; we read literature based on the experiences of our senior colleagues and the materials found in the question banks of the royal colleges.

FGD R (3)

They also pointed out some difficulties that they faced before joining the program, including unclear outlines in the first part of the curriculum and the lack of feedback and grade distribution in their results, stating that passing the first part is a matter of luck.

We did not know about the pass degree and did not receive feedback after failing the exam, in contrast to other international exams; sometimes you sit several times for an exam without knowing your weaknesses.

FGD R (2)

The respondents further expressed that the number of patients and clinical cases they reviewed during their residency

training is suitable for learning. They also expressed that lack of diagnostic investigations in some hospitals and patients' financial problems jeopardize the training process.

The number of patients is very adequate in this training programme; they are very cooperative. This enabled us to get maximum benefits from the training.

FGD R (1)

Another strength of this programme is access to patients and the variability of cases in all conditions.

FGD R (3)

Participants also described that they needed introductory training before the residency training to inform them about their job description and duties, the training tracks, and an outline of the curriculum, in addition to the essential skills required for medical practice (e.g., basic life support skills and emergency procedures).

It is better to add to the selection criteria that residents should have at least 2 years' experience in the speciality before sitting the first part exam. Moreover, preparatory training is required before training in the rotations.

FGD R (5)

Regarding the delivery of training, the residents' opinions varied. Some stated that training activities on the unit - bedside teaching, morning meetings, major weekly rounds, and training in referred clinics - are appropriate, while others said that some activities - journal clubs and interdepartmental meetings - were not beneficial. They further expressed that the way clinical rounds are conducted needs to be improved by the faculty to direct the trainers in the supervision of skills.

Clinical rounds are valuable training methods used in this programme but depend on the trainers and vary from one trainer to another.

FGD R (6)

With respect to learning and working environments, participants stated that the working environment in the hospital wards, clinics, and lounges was not poor. They further reflected that the learning environment, such as electronic libraries, needs improvement.

We feel that great efforts are exerted at the national level and by programme directors at the central level in SMSB, particularly regarding the library, including digital libraries, regularising the fundamental courses and the ease of paperwork, and the most important thing availability of exam centres inside and outside Sudan.

FGD R (2)

On the other hand, at the training sites, we suffer from a lack of privacy while examining or treating patients at outpatient clinics; this is a major problem in the working environment.

FGD R (4)

Table 2: Characteristics of participants

Variables	No (%)
Gender (%)	
Male	36 (75)
Female	12 (25)
Year of training (%)	
1 st year	8 (16.67)
2 nd year	15 (31.25)
3 rd year	15 (31.25)
4 th year	10 (20.83)

Table 3: Examples of themes, categories, and codes

Theme	Category	Code
Clinical training	Preparation before the program	Orientation, training for emergencies, such as BLS, ALS
	Structure and duration	Major rotations, subspecialties, and elective rotations, areas of training, courses, number of patients and cases, duties, bedside teaching, morning meetings, major weekly rounds and training in referred clinics, journal clubs, and interdepartmental meetings
	Learning and working environment	Hospital/working environment (wards, clinics, and lounges), electronic libraries, working hours
Training in research	Courses in research methods	Stand-alone course in research methodology, digital research skills, references management, searching the literature, and evidence-based medicine, a fixed calendar for these courses
	Timing of research methods courses	Calendar of courses on research methods, timing of the courses during training years (R1, R2, R3, and R4)
	Practice of research	Time to practice research, journal clubs, participation in conferences, symposia, annual research day, poster day
Assessment of residents	Assessment for entering the program	Unclear outlines in the first part of the curriculum, lack of feedback and grade distribution, introducing a computer-based examination
	Formative assessment (for learning)	Introduction of continuous assessment, communicating the blueprint to the residents, and introduction of a stop examination (progress test) at the end of each training year, with timely feedback, logbooks, and feedback
	Final assessment	SPACES, oral examination, long cases, feedback after the examinations

SPACES: Sudan Practical Assessment of Clinical Examination Skills, BLS: Basic life support, ALS: Advanced life support

The residents called for urgent interventions from program directors to improve these hospitals' learning and working environments.

One problem is the lack of investigation in some hospitals and the financial conditions of the patients; these issues affect the learning in this programme.

FGD R (2)

The second theme: Training in research

The residents expressed the usefulness of training courses on research methodology but believed that a stand-alone course in research methodology is not enough to acquaint them with the research skills needed. They stated:

The research methodology course is useful; however, we felt that it is not adequate to support us in conducting our research and writing our theses.

FGD R (4)

We suggest that this course should be early in the programme, and every attendee should come with a research topic before the start of the course. The certification for the course should be awarded after submitting a written proposal.

FGD R (3)

Other longitudinal courses in the area of research would be useful, including digital research skills, management of references, searching the literature, and evidence-based medicine.

FGD R (5)

They pointed out that these courses should be continued throughout the 4 years of training in all training centers. They further suggested a fixed calendar for these courses.

The residents were interested in opportunities to participate in conferences, symposia, or research that would help them learn more about research.

Another point raised was that research priorities and a list of research that has been done should be available on the SMSB website.

The third theme: Assessment of residents

The participants recommended introducing a computer-based examination for the first part with immediate feedback on their performance in each domain. Moreover, the participants suggested improvement of the assessment system by introducing continuous assessment, communicating a blueprint of the first and final examinations, and introducing a stop examination (progress test) at the end of each training year.

We did not know about the pass degree and did not receive feedback after success or failure, to identify our areas of strength and weakness for further learning.

FGD R (1)

They also urged better tracking of their learning progress by introducing an annual examination.

We would prefer to have a stop exam at the end of each of the four academic years (R1, R2, R3, and R4), to identify and rectify our areas of weakness.

FGD R (6)

The second part (final exam) is not clear to us. We did not know anything about the second part.

FGD R (5)

Participants considered the logbook well-prepared and well-structured, but they raised some issues concerning how the logbook is filled in, stating that it is filled in at the end of the shift so they could not benefit from their supervisors' feedback. They recommended that this be done in a timely manner.

Regarding the Sudan Practical Assessment of Clinical Examination Skills (SPACES), the examination held at the end of the training program, respondents expressed great satisfaction with this examination compared to the long case examination in the past; they reported that this examination is fair for assessing their clinical competency. Nevertheless, they had recommendations to improve the SPACES regarding the number of evaluators - they indicated that two evaluators would be better than only one, as well as being given detailed comments after the examination.

DISCUSSION

The present study aimed to identify areas of strength and areas needing improvement in the internal medicine residency curriculum in Sudan. Several studies have demonstrated that assessments of both faculty and residents' satisfaction could refine future assessment processes, and improve medical care delivery.^[10,11]

To the best of our knowledge, this is the first qualitative study from the Eastern Mediterranean region to assess the satisfaction of residents with their training curriculum, and to explore the areas needing improvement. Studies have shown that residents' satisfaction with their program considerably influences the future maintenance and strength of that program.^[12,13] Numerous factors have been recognized in the literature that might affect medical residents' satisfaction, including how well-organized the residency program is, and whether there is a balance between education and service.^[14]

In this study, residents described their satisfaction with the courses in research and scientific writing, but said they have no opportunity to conduct research apart from what was required for graduation; they recommended starting research training earlier, that is, during the 1st-year residency, and making some part of the course longitudinal. This finding is in line with previous studies on internal medicine residency programs that revealed that research training was appreciated.^[14,15]

Other studies have shown that residents who receive proper research training have a greater appreciation for evidence-based medicine and higher clinical competence scores.^[16] Furthermore, research training may encourage interest in pursuing a clinician-scientist career.^[17]

Several other studies have shown that early research training is associated with continued scholarly work, possibly informing residents' career choices, and should therefore be conducted early.^[18] In some countries in the region, research and publication are an entry requirement for the programs.^[19]

Lack of time was considered a significant barrier to research during residency. A tenable approach might be to reserve a

specific time for research, but it may be more beneficial to use that time for a research curriculum instead.^[20]

This finding is a challenge worldwide; several studies have delineated the barriers to performing research activities, which include the lack of time, mentorship, faculty support, an organized research curriculum or network, knowledge and skills, incentives and rewards, research funding, and personal interest in research.^[20,21]

The learning environment was the area of greatest dissatisfaction, as reported by the residents in this study. This finding is similar to a study conducted in Sudan in 2019.^[6] A recent study found a significant negative correlation between the educational environment and burnout among resident doctors, according to the Postgraduate Hospital Educational Environment Measurement and the Maslach Burnout Inventory questionnaires.^[22]

In the current study, participants articulated their dissatisfaction with the assessment tools used. They recommended the introduction of continuous assessment, with timely and relevant feedback from the trainers. Studies have shown that residents must become comfortable seeking formative assessment/feedback, and that trainers must offer it frequently.^[23,24]

The typical end-of-rotation examination after 4 years of training is not carried out near enough to the actual educational experience, and thus cannot provide immediate, direct feedback to the learner.

Participants also suggested that introduction of a progress test at the end of each training year would be very useful. Research has shown that the value of progress testing for PGME assessment is promising and should be used for residency programs.^[25]

Regarding assessment in the current curriculum, logbooks were used to document the mastery of competencies acquired in training. Participants were dissatisfied with the logbook as a tool for measuring such progress.^[26,27] Recent trends in assessment and evaluation in PGME involve the use of portfolios instead of logbooks. Studies have demonstrated that portfolios are well suited to assessment of the competence of doctors in training.^[28,29]

This study has a few notable limitations. It was conducted with a small group that included only residents in the internal medicine program and not all programs provided in Sudan. Moreover, the sampling methodology and gender imbalance in the sample are other limitations. However, the study methodology, of course, may be generalizable – and of great value to other educators in the demonstration of how to conduct such a qualitative internal program assessment.

Suggestions

This study sheds light on the significant topic of PGME in a developing country. The practical recommendations from this study could be used to improve the quality of training along with conducting further studies involving the stakeholder in PGME such as senior doctors, residents, patients, allied

health-care professionals, and health-care managers. It can be utilized by other postgraduate medical specialties program directors and medical faculties who design and develop medical curricula, and resident training and assessment in Sudan and the wider region.

CONCLUSION

In the current study, the residents were generally satisfied with the curriculum at the planning level. However, they provided suggestions for improvement in the following areas: training curriculum, research training, particularly the practical part of research training and opportunities to conduct research, and assessment methods and timing. The practical recommendations from this study could be used to improve the quality of postgraduate medical training in Sudan and elsewhere. This study highlighted the utility of the qualitative approach in identifying resident perspectives on their educational programs.

Research quality and ethics statement

All authors of this manuscript declare that this scientific study is in compliance with standard reporting guidelines set forth by the EQUATOR Network. The authors ratify that this study required Institutional Review Board/Ethics Committee review, and hence prior approval was obtained by the Sudanese National Technical Ethical Committee (Certificate No. 2-12-2016). We also declare that we did not plagiarize the contents of this manuscript and have performed a Plagiarism Check.

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Conflicts of interest

There are no conflicts of interest.

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