International Journal of Medical Science and Education

www.ijmse.com

*Original Research Article*

pISSN- 2348 4438 | eISSN-2349- 3208

# EXPLORING FACTORS AFFECTING THE QUALITY OF POSTGRADUATE MEDICAL EDUCATION IN SUDAN: RESIDENTS PERSPECTIVE

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***Received: 02/06/2019*** ***Revised:10/06/2019*** ***Accepted: 17/06/2019***

## ABSTRACT

**Background:** Postgraduate Medical Education (PGME) in Sudan dated back to 1953 in the last century. Despite the extended period of the delivery of training, there are limited published studies that measure the quality of the training and satisfaction of the residents with provided training. The objectives of this study were 1) to assess the satisfaction of the internal medicine residents with the quality of their training; 2) to identify the areas of strengths and challenges; 3) to explore the factors affecting the quality of internal medicine residency program from residents' perspectives. **Materials and Methods:** Cross-sectional study was conducted for the Internal Medicine Residency Program of Sudan Medical Specialization Board (SMSB) during the period June 2017 – January 2018, using anonymous, validated, Self-administered questionnaire (n=189). The SPSS version 22.0 was used for quantitative data analysis. Descriptive statistics were used to calculate frequencies, means, and SD. **Results:** Out of 189 residents, 181 (95.76%) responded to the questionnaire. Cronbach alpha coefficient was 0.897 for all questionnaire items and ranged from 0.891 to 0.900 for each item, suggesting a high degree of internal consistency. The study revealed that some areas were positive in this program included the duration of training, development of communication skills and life-long learning. While the residents recommended some improvement in the following areas; the implemented curriculum, learning environment, mentoring and supervision, assessment, and training in research. **Conclusion:** This study revealed overall average satisfaction with the training by the residents. However, some areas need improvement particularly; the training curriculum, learning environment, assessment, supervision and feedback.

**Keywords:** Postgraduate Medical Education; Residency Training; Residents Satisfaction; Training Program SMSB; Quality in Postgraduate Medical Education

## INTRODUCTION

Postgraduate Medical Education (PGME) is highly dynamic and involves a complex interaction among the working environment, formal training activities, workload, careful supervision, and feedback from teachers.**(1)** Previous studies have shown a gap between residents' expectations and experiences during residency that gives rise to dissatisfaction.**(2)** This gap must be closed to improve the quality of

training, residents' satisfaction, and the delivery of quality health services to the community.**(3)** Several reports identified residents' satisfaction as a significant factor in their performance, learning process, and quality of care given to patients.**(4,5)** These studies also demonstrated that assessments of both the faculty and the residents' satisfaction would refine the future assessment process and improve medical care delivery.**(6,7)**

PGME was started in 1953 at the University of Khartoum with a postgraduate diploma in obstetrics. **(8)** The first formal residency program in Sudan was established in 1976 through the Post-Graduate Medical Board of the University of Khartoum. Since then, PGME in Sudan has evolved. **(9)** However, the literature describing medical residents' satisfaction in developing countries, including Sudan, is scarce. This creates difficulty in developing a quality residency training program that meets the needs and expectations of physicians. **(10)** Additionally, Sudan and other developing countries have little contribution in the international debate for developing and setting standards for training residents. **(11–15)**

This study was planned to 1) to assess the satisfaction of internal medicine residents with their training, 2) to identify the areas of strengths and challenges, and 3) to explore the factors affecting the quality of the residency program from the residents' perspective.

## MATERIALS AND METHODS

We conducted cross-sectional study during June 2017–January 2018 (n=189) using an anonymous, self-administered questionnaire. The questionnaire was developed in the following four stages: **(1)** a comprehensive literature review, **(2)** an consideration of face and content validity, **(3)** an scrutiny of construct validity by factor analysis, and **(4)** a reliability test by internal consistency and stability assessments. The questions included socio-demographic data and residents' views on the curriculum, learning resources, trainers, training methods, and assessment tools. The questionnaire was administered to 35 residents from other programs in the Sudan Medical Specialization Board (SMSB) to assess the clarity of the questions. The questions were then rephrased accordingly.

In addition, the reliability and validity of the 32-item questionnaire was statistically evaluated. The internal consistency of the questionnaire was measured using Cronbach alpha coefficient and it was ($\alpha$=0.89).

Various descriptive statistics were employed to calculate frequencies, means, and SD. We started the data collection following the permission, from SMSB, to conduct the study. Moreover, the study was approved by the Sudanese National Technical Ethical Committee (Certificate No. 2-12-2016).

The questionnaire was distributed to 189 Sudanese residents in the internal medicine program. The sample size was calculated using the following formula: **(16)**

$n= Z2\ P\ (1-P)/d2$

Where:

n= Sample size,

Z= Z statistics for a level of confidence,

P= Expected prevalence or proportion (if expected prevalence is 20%, then P=0.2), and

d= Precision (if the precision is 5%, then d=0.05).

## RESULTS

Out of 189 residents, 181 (95.76%) responded to the questionnaire's closed-ended questions; 104 (57.4%) were male, and 77 were female (42.6%).Most of the respondents were between 20–30 years (49.2%), and 77.4% of them were in their third or fourth year of training (Table1).

### Views of training curriculum

The vast majority of the residents (80.1%, n=145) stated that they did not understand the curriculum outline and that they prepared for exams by studying previous exams with their senior colleagues' support. After enrollment in the program, 55.4% (n=92) of the respondents stated that they became aware of the program, but 83.1% (n=151) reported that they did not receive the curriculum. Regarding the orientation before the start of training, 58.4% (n=97) reported that they attended the formal session for orientation before starting their training. However, 85.1% (n=154) reported that they did not receive a copy of the training or assessment regulations.

The residents were generally satisfied with their courses, including research methodology, communication skills, and professionalism; their rates of satisfactory responses were 78.0%, 71.9%, and 79.9%, respectively. However, 82.5% (n=150) were not satisfied with the structured training provided for theoretical knowledge (like lectures, presentations, tutorials, PBL sessions, case discussions, and seminars).

**Satisfaction with teachers**

Figure 1 shows that 63.5% (n=115) of the residents were satisfied with the excellent communication skills of their teachers and with the encouragement of their teachers to become independent learners (80.1%, n=145). The vast majority of residents were not satisfied with the time provided for learning (70.7%, n=128); they were also not satisfied with the accessibility of their teachers (70.2%, n=127). Other areas that showed dissatisfaction included getting feedback from teachers (76.24%, n=138) and attending educational activities (70.16%, n=127).

**Satisfaction with research training**

One-third (33.1%, n=60) of the residents were not satisfied with the opportunity to conduct research, although they reported satisfaction with their research methodology and scientific writing courses. They suggested making these courses longitudinal throughout the training, as well as training teachers in areas related to research and supervision.

**Overall satisfaction with the residency program**

With regard to workload, 79.56% (n=144) of the residents reported that their working hours were more than 80 hours per week, including one day working for a full 24 hours. However, they spent no fewer than 16 hours in private centers as well. The residents' overall satisfaction with their residency program was average (Figure 2); the most reported area of dissatisfaction was the learning environment. The areas of highest dissatisfaction included the working environment in the hospital and training centers, hospital accommodations, digital libraries, and internet services.

**Strengths, challenges, and suggestions for improvements**

Of the respondents, 112 residents (61.9%) responded to the open-ended questions. They provided 82 responses to "List the main strengths of this program," from which three themes emerged through content analysis. They provided 335 suggestions for improvement, under five emerging themes. The statements in italics shown in Tables 3 and 4 are some of the residents' unedited comments. The residents expressed some areas of strength in this program (Table 3), including training duration, number of patients, and good communication with patients in the Sudanese context. However, they gave recommendations for further improvement in the curriculum including training activities, training in research, assessment and feedback, and recommendations for the teachers (Table 4).

## DISCUSSION

Little research has evaluated the quality of PGME in Sudan. This study showed that the respondents did not understand the curriculum outline and prepared for exams by studying previous exams with their colleagues' support. In his pivotal article from 1986 on the ten questions to ask when planning a curriculum, Harden recommended that the curriculum should be communicated early with the trainees and teachers. **(17)**

In the current study, half of the respondents reported they didn't attend the formal session for orientation before starting training. Similar findings have also been reported by residents in a developing country in Africa. **(18)** Additionally, most residents were not satisfied with the structured training for theoretical knowledge provided. This finding is in agreement with other studies in developed and developing countries, including Japan, Turkey, Saudi Arabia, and Pakistan. **(19–22)**

In 2000, Wall and McAleer conducted a comprehensive study involving consultants and junior hospital doctors in England that identified the top five themes for teaching hospital consultants how to teach. The top-ranked themes, both for consultants and junior doctors, were **(1)** giving feedback constructively, **(2)** keeping up-to-date as a teacher, **(3)** building the right educational climate, **(4)** assessing the trainees, and **(5)** discovering the trainees' learning needs. **(23)**

The present study showed that residents were not satisfied with the internet services and digital libraries in the training hospitals. Other studies, reported the significance of web-based resources in PGME is growing internationally as it becomes one of the recent trends in training. **(24–26)**

E-learning has become a major trend in PGME and brings with it new approaches to content development appropriate for PGME. **(11)**

Despite the residents' satisfaction with the courses in research and scientific writing, they had no opportunity to conduct research apart from the research required for graduation. They recommended starting training in research early (during the first year of their residency) and making some part of this course longitudinal. Several other studies also showed that early research training has been associated with continued scholarly work, may inform residents' career choices, and should, therefore, be conducted early. **(19, 27–31)** In some countries in the region, research and publications are an entry requirement for the program. **(32)**

The residents were satisfied with the number of patients, which they reported as a strength of the training in Sudan. In other programs, the residents considered it a high workload. **(33)**

This finding was similar to other studies conducted in Pakistan, **(15)** and much higher than in studies conducted in western countries, which reported an average workload of 60 hours per week. **(34)** However, the finding was not in agreement with some standards regulating working hours for residents. In the US, the maximum working hours for residents include an 80-hour work week, with one day off per week, a maximum of 24 hours per shift, at least 10 hours off between shifts, and overnight on-call duty no more than once every third night. **(35)** Moreover, studies have shown that long working hours for postgraduate trainees lead to fatigue, sleep deprivation, poor performance, compromised judgment, impaired manual dexterity, and errors in management**. (36–38)**

The findings of the current study regarding the involvement of residents in non-clinical work were similar to findings reported in a study conducted in Pakistan that showed that residents spent a significant time on non-clinical work, such as arranging beds, drawing blood, and examining patients.**(15)** Since residency training depends on learning to provide clinical services to patients, the working pattern in Sudanese hospitals needs to be redesigned in such a way that all residents have a reasonable chance of partaking in their educational events.

The recent trends in assessment and evaluation in PGME as highlighted by Harden **(11)** involve the use of portfolios instead of logbooks. The portfolio, which contains work collected over a longer period, is a collection of evidence prepared by the trainee to demonstrate that learning has taken place. It documents not only the resident's learning experiences but also how these have contributed to the resident's mastery of the required competency. **(39)** In the coming years, opportunities for self-assessment will be a an essential feature of the postgraduate learning environment, and residents will be able to plan their progress toward the achievement of the exit learning outcomes.**(40)** Furthermore, as reported in another study, an electronic portfolio will contribute effectively to residents formal assessment. **(41)**

Finally, residents' overall satisfaction with their residency program was average, as the most reported areas for dissatisfaction involved the learning environment. Numerous factors have been recognized in the literature that might affect residents' satisfaction with training. These factors included how well-established the residency program was and whether there was a balance between education and service.**(42)**

## CONCLUSION

This study explored the complex factors that impacted residents' satisfaction of PGME. It revealed overall average satisfaction with the training by the residents. However, some areas needed improvement, particularly the training curriculum, learning environment, assessment, supervision, and feedback. Understanding these complex factors is essential to strengthening PGME in developing countries like Sudan.

A limitation of this study was that it included only residents undertaking their training in the internal medicine residency program, and not all programs

provided in Sudan. Moreover, the present study had a cross-sectional design, which prevented determining causality. Further work with a large sample size and in-depth qualitative studies is required to provide an in-depth exploration of the current findings. Future researches should examine which factors are essential for the quality of PGME in Sudan and should hence be prioritized.

**Conflict of interest:**

None

**Funding:**

The authors report no external funding source for this study

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**Table1. Residents' socio-demographic characteristics**

| General characteristic | | Frequency | Percent |
|---|---|---|---|
| **Gender** | **Male** | 104 | 57.4% |
| | **Female** | 77 | 42.6% |
| **Age** | 20–30 | 89 | 49.2% |
| | 31–40 | 75 | 41.4% |
| | 41–50 | 17 | 9.4% |
| | 51–60 | 0 | 0.0% |
| | Above 60 | 0 | 0.0% |
| **year of training program** | 1st year | 15 | 8.3% |
| | 2nd year | 26 | 14.4% |
| | 3rd year | 91 | 50.3% |
| | 4th year | 49 | 27.1% |

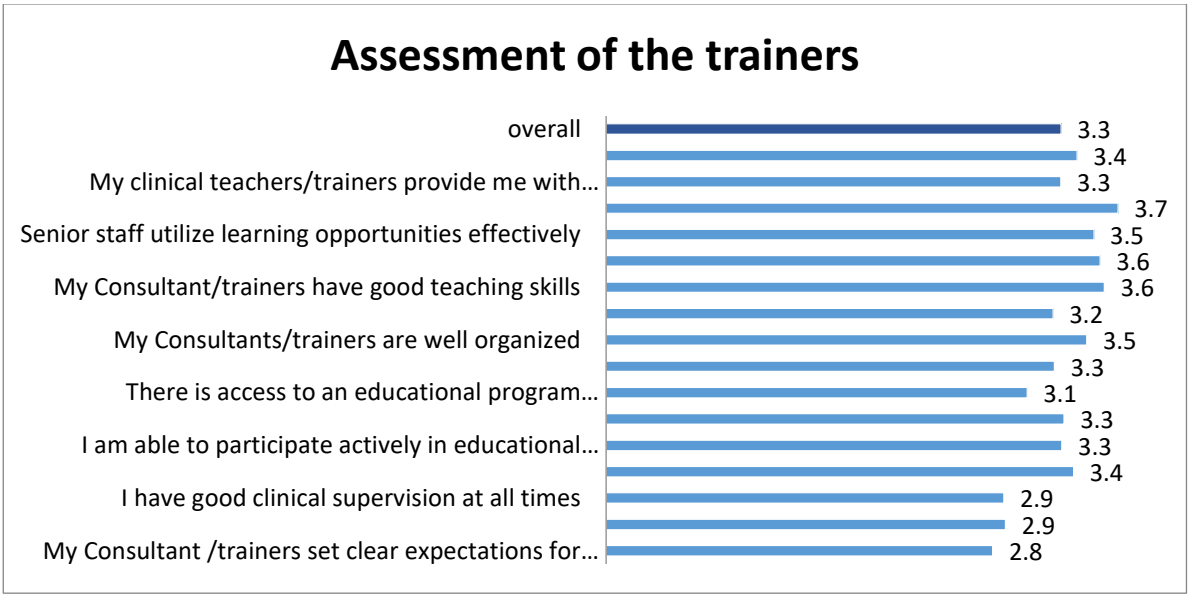


**Figure 1 Assessment of the trainers by the residents**

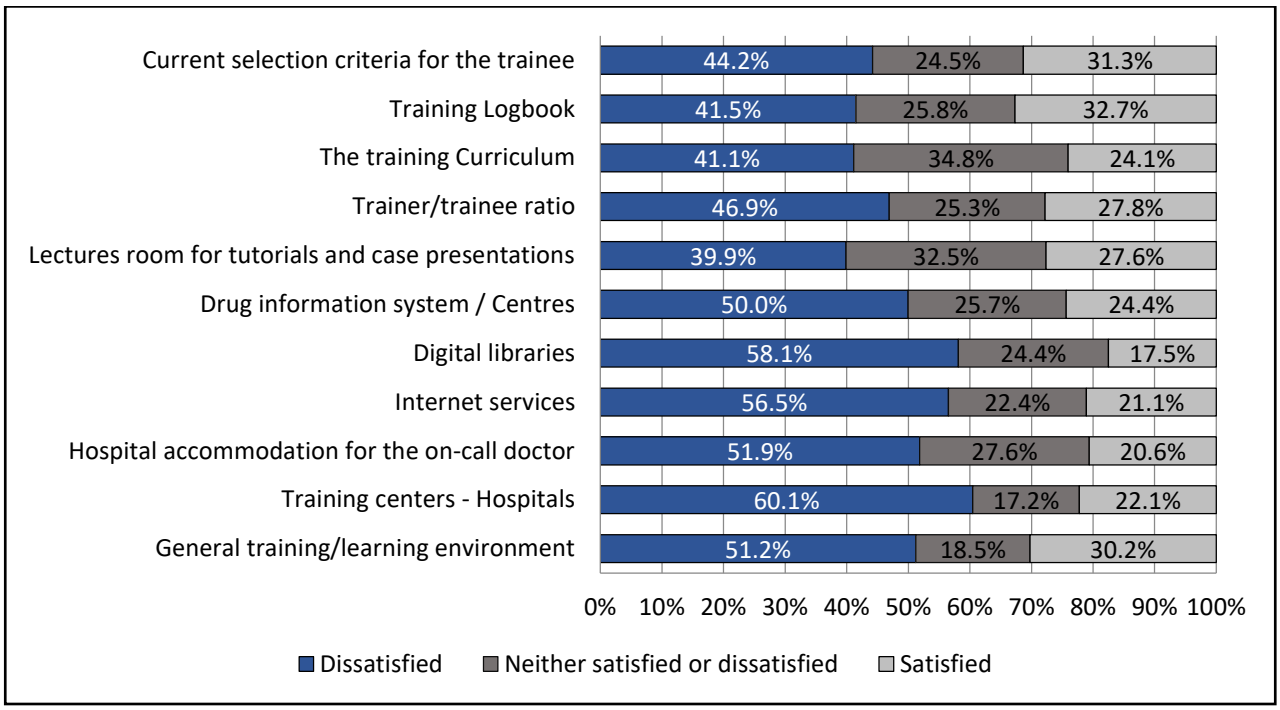


**Figure 2 Overall satisfaction of the trainees with the design of the program**

**Table 3. Content analysis of students' responses to open-ended questions: Strengths of this residency program**

| | *n* | % |
|---|---|---|
| Duration of the training: the duration of the training is adequate, and the shifts (rotations) are well divided | 43 | 52.4 |
| Number of Patients: there is a considerable number of patients, so that we can be exposed to all of the cases that we should learn about during the training. | 25 | 30.5 |
| Developing Communication Skills: It is effortless to communicate with our patients, no languages barrier, amiable atmosphere with my colleagues | 7 | 12.2 |
| *'This training programme helped me to build up my self-confidence by providing space for me to learn by doing and to learn from my senior colleagues. Moreover, there is a good opportunity for self learning.'* | 3 | 3.7 |
| *'Our trainer is very enthusiastic, well-organised, has good teaching skills, and deals with us respectfully.'* | 3 | 1.2 |
| Total | 82 | 100 |

**Table 4. Content analysis of students' responses to open-ended questions: Suggestions for improvement**

| | *n* | % |
|---|---|---|
| The Training Curriculum: | 49 | 14.6 |
| The curriculum should be communicated to the residents from the first day of the training; orientation before the distribution to the training centres is very crucial | | |
| Training activities: | | |
| We suggest a full one-week training workshop before the start of the training, as a tool of orientation in addition to essential courses such as BLS and Professionalism | 27 | 8.1 |
| *'It is nice that the programme provides us with courses in research methodology and essential biostatistics, but it would be better to offer these courses yearly, so we can start the research yearly and understand the process of conducting research properly.'* | | |
| *'It is a good thing that the SMBS provides courses such as BLS, ALS, and Professionalism; I would prefer that they be conducted before the start of the training.'* | | |
| It is suggested that a course on evidence-based medicine and critical appraisal be added | 7 | 2.1 |
| Training Environment: | 76 | 22.7 |
| Improving the work environment, adherence to the accreditation standards developed by the SMSB. Moreover, we spent a significant time on non-clinical work such as arranging beds, drawing blood, and examining patients | | |
| Involve us in the evaluation of the trainers | 33 | 9.9 |
| The obligation of the training centres to conduct teaching/learning activities like lectures and journal clubs, seminars, tutorials, and case-based learning | 19 | 5.7 |
| The Trainers: | 25 | 7.5 |
| Training of the trainers in training methods, thesis supervision | | |
| Providing the trainers and the units with guidelines and protocols for management in collaboration with related sectors | 9 | 2.7 |
| Good follow up of the trainers by the SMSB, involvement of students in evaluating the training skills of the trainers. | 27 | 8.1 |
| The motivation of the trainers to be available in the hospital | 36 | 10.7 |
| Development of the Continuing Medical Education (CME) Unit in the teaching hospital and training centres | 13 | 3.9 |
| Assessment and Feedback: | 8 | 2.4 |
| Suggestions to introduce annual exam to assess our progress | | |
| Developing a robust mechanism of feedback to apprise us of our progress and mistakes | 6 | 1.8 |
| Total | 335 | 100.0 |

**How to cite this article**: Taha M.D., Ahmed Y, Abdalla M.E., Gaffar A.M, Exploring Factors Affecting The Quality Of Postgraduate Medical Education In Sudan: Residents Perspective. Int.J.Med.Sci.Educ 2019; 6(2): 7-15