



# Assessment of pathology trainees' satisfaction: results of a survey from Sudan

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**Background:** Assessment of students, trainees and graduate's satisfaction in medical education and clinical training is an important guide for the improvement of educational and training programs. The objective of this study is to assess the satisfaction of histopathology graduates with the training in the MD pathology program, Medical and Health Studies Board (MHSB) University of Khartoum (UofK).

**Methods:** This is a cross-sectional study conducted at the University of Khartoum Graduate College/MHSB/MD pathology program, within the period from September to December 2017. Fifteen graduates were surveyed using a closed-ended unipolar 5 grade Likert's scale, through a self-administered questionnaire covering 15 areas and 33 items of pathology training. Areas covered were: program entry examination, part one two years course, induction, the content of learning, learning methods, duration of the rotation, organization and management of learning activities, laboratory management, research experience, educational and clinical supervision, hand over, communication, professionalism, assessment, and overall satisfaction.

**Results:** Results of assessment of satisfaction with the 15 areas can be grouped into three groups: the first group composes of areas with good satisfaction (five areas): Handover 93.7 %, entry examination 86.75%, research experience 80%, learning methods 73.3%, and assessment 70.8%. The second group with moderate satisfaction (five areas) each scored 66.7%: Organization, laboratory management, supervision, communication, and overall satisfaction. The third group reflecting areas of dissatisfaction and scores was less than 50% (areas were induction, part one course, duration of training, teaching about professionalism and learning content).

**Conclusions:** Overall, the graduates have a good level of satisfaction with postgraduate pathology training. Future reform of the histopathology curriculum will help to increase graduate's satisfaction and will consequently result in improving pathology training and services.

**Keywords:** Pathology; histopathology; training; assessment; satisfaction

Received: 02 October 2018; Accepted: 18 October 2018; Published: 07 November 2018.

doi: 10.21037/jphe.2018.10.01

View this article at: <http://dx.doi.org/10.21037/jphe.2018.10.01>

## Introduction

Students' satisfaction reflects what they expect from their educational institution (1). Until the 1980s, feedback from students about their experience in higher education was an uncommon practice (2). The 2000s witnessed great concerns about quality and student satisfaction and feedback has become an important element of the higher education quality process (2). Feedback from students has two main functions: internal information to guide improvement and external information for potential students and other stakeholders, including accountability compliance requirements (2,3). Medical schools and training bodies are highly concerned with students and trainee's satisfaction because of its strong association with future professional attitudes, carrier commitment and retention (4). Different aspects of medical students' satisfaction have been studied: The overall satisfaction, satisfaction with specific programs (5), evaluation of learned skills (6) and learning methods (7). Data on postgraduate students' satisfaction can be gathered through trainees and graduates' surveys (8). Such data form constructive feedback for improving the quality of medical education and clinical training (9-14). The practice of graduates and trainees' surveys is global; many postgraduate training boards and medical councils undertake comprehensive surveys of doctors in training for their views about the training they are receiving. Different aspects of training have been included in the trainees and graduates surveys: educational supervision, clinical supervision, research, feedback, hand over, assessment, cost, mentoring, professionalism, communication, environment, enrolment requirements, clinical experience, and others (10-15).

Formal medical education in Sudan started by the establishment of the Faculty of Medicine at the University of Khartoum (UofK) in 1924. National postgraduate medical training started in 1976 at the UofK. By the year 2002, the Sudan Medical Specialization Board (SMSB) was established as a new postgraduate training body (16). Pathology training started at the UofK in the year 1980. Trainees study the four subjects of pathology during the first two years. For the final two years, trainees choose two subjects to specialize in. Another pathology training program was established in the year 1993 at The University of Gezira. Gezira University program is almost similar to that of the (UofK). Graduates from both programs are eligible for the specialist registration in the Sudan Medical Council (17). SMSB established a new program for histopathology training in March 2018. The assessment

of pathology graduate's satisfaction is expected to improve pathology training and services and result in providing good patient care. The aim of this study is to assess the satisfaction of histopathology graduates concerning the training program in MD pathology degree at the Graduate College, University of Khartoum.

## Methods

### *Study design*

This is a cross-sectional descriptive study. The study population includes 15 graduates of the MD pathology program who specialized in histopathology at the University of Khartoum after the year 2015. The study duration was three months (from 1<sup>st</sup> September to 31<sup>st</sup> December 2017).

### *The data collection tool*

The data was collected using a structured questionnaire. The following steps were followed to develop the questionnaire. Initially, a review of the literature was conducted to ensure that the construct definition aligns with relevant prior research and theory and to identify existing survey scales and items that may be used or adapted. Consequently, similar questionnaire forms in studies and surveys on assessment of satisfaction of medical students, trainees and graduates were reviewed (10-14). Other learning aspects peculiar to histopathology training were also included (18,19). Interviews and focus group discussions were conducted with histopathology trainers, senior and junior graduates to identify how the study population conceptualizes and describes the construct of interest. The last step in the survey design process was the pilot study which was intended to check for adequate item variance, reliability and convergent /discriminant validity with respect to other measures (20,21). As a result, a self-administered, closed-ended unipolar 5 grade Likert's scale was developed and validated to assess the degree of satisfaction of histopathology graduates concerning 15 areas of the training program.

### *Study variables*

The outcome variable was the degree of satisfaction and was graded as follows: 1, not at all satisfied; 2, slightly satisfied; 3, moderately satisfied; 4, quite satisfied; 5, extremely satisfied. Graduates who responded with 3, 4 and 5 are considered as satisfied, those who respond with 1 and 2 are considered as

**Table 1** Alpha and Spearman-Brown reliability coefficients

Equation	Reliability coefficient
Cronbach's Alpha	0.901
Spearman-Brown	0.904

unsatisfied.

The independent variables are 15 areas of the training program: Program entry examination, Part one two years course, Induction, Content of learning, Learning methods, Duration of the rotation, Organization and management of learning activities, laboratory management, Research experience, Educational and clinical supervision, Handover training Communication skills, Professionalism Assessment methods and Overall satisfaction.

#### *Questionnaire reliability coefficients and statistical analysis*

Cronbach's Alpha and Spearman-Brown reliability Coefficient for questionnaire scores were computed. Both Cronbach's Alpha & Spearman-Brown equations show high reliability (Table 1). Data obtained from the questionnaire were analyzed using SPSS version 28. Descriptive data were presented in percentages, means, and standard deviation.

#### *Ethical considerations*

The study was approved by the Ethical Committee at the University of Khartoum, Medical Campus. Informed consent was attached in the first page of the questionnaire. Filling the questionnaire indicates agreement to participate in the study.

## **Results**

Fifteen out of the seventeen MD graduates in histopathology responded to the questionnaire. The response rate was 88.2%. Among them were 5 males (33.3%) and 10 females (66.7%). The group age ranged from 32 to 40 years old. We have divided the response rate into high, moderate and low satisfaction. Assessment is vital for the progress of any program, and this was presented as a separated heading (Table 2).

#### *High satisfaction rate*

Overall, trainees expressed significant satisfaction with

many training areas (86.7%) were satisfied with the entry examination as a good tool for enrolment. Concerning the learning content, 80% were satisfied with their theoretical knowledge in surgical pathology, while 86% were satisfied with surgical pathology skills, 73.3% were satisfied with the cytology knowledge, Satisfaction with most of the learning methods is high: Trainees expressed (100%) satisfaction with reading from textbooks, peer learning, and the weekly teaching sessions. Surveyed trainees show 93.3% satisfaction with routine work was reported. 80% were satisfied with the E-learning resources, 73.3% were satisfied with working in private clinics and laboratories as a learning method. The overall satisfaction with learning methods was 73%. Other areas of the program that achieved high respondents' satisfaction were Handover achieved and Research experiences that scored 93.7% and 80% respectively. Trainees are also highly satisfied with the summative assessment methods; they reported 86.7%, 86.7%, 93.7% 86.7% with MCQs, EMQs, Practical examination and the oral examination respectively. Overall satisfaction with the summative assessment methods was 88.5% (Table 2).

#### *Moderate satisfaction rate*

Interestingly 66.7% satisfaction were recorded for both teaching slides and local training courses as training methods. Organization of the program, laboratory management training, educational and clinical supervision, and communication all these areas scored 66.7% of the surveyed trainees' satisfaction. 53.3% were satisfied with the regional and international courses they attended (Table 2).

#### *Low satisfaction rate*

Score of less than 50% was classified as low satisfaction rate. This can be seen in relation to part one course (27.7%), induction into training (27.7%). Concerning the learning content, cytology skills scored (40%) of the trainee's satisfaction. Only 13.3% of the respondents were satisfied with the duration of the clinical rotation. Importantly, 40% of the graduates were satisfied with the professionalism content of the program (Table 2).

#### *Assessment methods*

86.7% of respondents were satisfied with the written MCQs examination, 86.7% were satisfied with EMQs. 93.7% were satisfied with the practical examination. 86.7% were

**Table 2** Score & percentages of satisfaction for the surveyed training areas

Questionnaire items	Frequencies of satisfaction scores					Mean	SD	Percent of satisfaction (%)
	1	2	3	4	5			
1/Entry exam	1	1	9	4	–	3.07	0.799	86.75
2/Part one course	3	8	2	1	1	2.27	1.10	27.7
3/Induction	7	4	4	–	–	1.80	0.862	27.7
4/1/1 Sur. Path. knowledge	–	3	6	6		3.20	0.775	80
4/1/2 Sur. Path. skills	–	2	8	4	1	3.27	0.799	86.7
4/2/1 Cytology knowledge	1	3	10	1	–	2.73	0.704	73.3
4/2/2 Cytology skills	–	9	6	–	–	2.40	0.507	40
5/1 Routine work	–	1	5	9	–	3.53	0.640	93.3
5/2 Textbooks	–	–	4	11	–	3.73	0.458	100
5/3 Teaching slides	1	4	6	3	1	2.93	1.03	66.7
5/4 Local training courses	2	3	4	5	1	3.00	1.20	66.7
5/5 Regional and international courses	6	1	5	2	1	2.40	1.35	53.3
5/6 E-learning	1	2	3	9	–	3.33	0.976	80
5/7 Peer learning	–	–	3	10	2	3.93	0.594	100
5/8 Private labs& clinics	2	1	7	4	1	3.07	1.10	73.3
5/9 Weekly sessions	–	–	–	1	14	4.93	0.258	100
6/Duration of rotation	2	11	2	–	–	2.00	0.535	13
7/Organization	–	5	6	4	–	2.93	0.704	66.7
8/Laboratory management	2	3	10	–	–	2.53	0.743	66.7
9/Research experience	–	3	8	4	–	3.07	0.704	80
10/Supervision	1	4	7	3	–	2.80	0.862	66.7
11/Hand over		1	5	7	2	3.67	0.816	93.7
12/Communication	–	5	6	4	–	2.93	0.799	66.7
13/ Professionalism	2	7	4	2	–	2.40	0.910	40
14/Assessment	–	–	–	–	–	–	–	70.8
15/Overall satisfaction	–	5	6	2	2	3.07	1.03	66.7

satisfied with the oral examination, Overall satisfaction with assessment methods was 70.8% (Table 2).

## Discussion

Worldwide histopathology training is demanding and challenging concerning infrastructures, machines, reagents, trained personals, competent trainers with sub-penalties, a variety of surgical and cytology specimens, functioning

in a setting of a multidisciplinary team, and keeping up to date with the latest trends in diagnostic tools and advanced technologies. Training is even more demanding and challenging in settings with limited resources as in Sudan. Despite all challenges and constraints, The MD pathology program at the UofK persisted for more than 30 years in training and graduating competent histopathologists who provide excellent pathology services inside and outside the country.

Trainees in histopathology in Sudan expressed a high level of satisfaction in many areas of the questionnaire. Despite the small number of participants in this study the response rate in this study was good (88.2%), and almost comparable to other studies which ranged between 92–100% (14). For example, graduates reported 86.7% satisfaction with the entry examination which is the main requirement for enrolment in the program; similar surveys reported satisfaction of 74% and 69% for the selection process (12). Satisfaction with the learning content of the program mainly surgical pathology knowledge and skills was 80% and 86% respectively. Satisfaction with cytology knowledge was 73.3% which is quite acceptable. Trainees' satisfaction with ten learning methods was investigated, the overall satisfaction with learning methods was 73.3%, this is in agreement study that reported 75% of satisfaction with pathology training and educational activities in the UK (12). Graduates were highly satisfied with 6 out of the ten learning methods: all graduates were satisfied with learning through reading textbooks (100%) which is the historical method for learning. All trainees were satisfied with (100%) Peer learning (PL) which is an important part of the teaching and learning environment. PL can take place in either formal, structured settings, i.e., Peer-assisted learning (PAL) or in informal settings (22,23). PL is beneficial especially in addressing gaps within the curriculum and in providing student support in preparation for assessment (24). The weekly session is a learning activity organized at the Histopathology and Cytology Department of the National Health Laboratory, Khartoum. Trainees' present talks in selected histopathology topics, related histopathology slides are also discussed. Histopathologists from other hospitals bring slides of their difficult and interesting cases. These sessions are supervised by senior professors of pathology. All (100%) investigated trainees were satisfied with the weekly sessions. Graduates reported 93.7% satisfaction with routine work, while other studies reported satisfaction rate between 75% to 92% (10-14). Therefore, it is possible to suggest that the study showed a high level of satisfaction with the clinical experience. The 80% satisfaction with E-learning reflects how much online learning can fill the gaps of the real training environment, a wealth of materials and virtual microscopy is available on histopathology, cytology websites (25,26). Interestingly, the study showed a high rate of clinical satisfaction with training in private sectors (73.3%) in comparison with 40% in another study (13). Sending trainees for the clinical rotation in private laboratories and clinics is a

sort of filling the gaps of training in the public hospitals and governmental laboratories. Our survey reported 80% satisfaction with research experience; this is a good result despite the constraints of scientific research in our country. Supervision is the main indicator of medical training. This study reported satisfaction of 66.7% with supervision; other similar surveys reported 95% (10), 84.48% (12) and 89.82% (14) respectively. Handover is defined as the transfer of professional responsibilities and accountability for some or all aspects of patient care, to another person or professional group on a temporary or permanent basis (27). Handover is a learned skill; handover skills of trainees improve as they gain seniority (28,29). Our study reported graduates satisfaction of 93.7% with the handover, this is a strong point and may reflect smooth transmission of skills within the training program, other studies reported, 70–90% satisfaction with handover in training (10,14).

Moderate satisfaction was also reported in the use of teaching slides, local courses, regional and international courses and this also similar to other studies (10,30). Graduates in this survey reported 66.7% satisfaction with laboratory management skills learned during the program. Worldwide there is a deficiency of training in laboratory management within pathology postgraduates' programs; some researchers reported 0% time rotation for management activities (31).

One area for future reform of curriculum of histopathology may address the issue of spending two years in learning the four subjects of pathology, which can be seen as the cause of dissatisfaction with a multidisciplinary practice in pathology training and favors the international trend in specialization and sub-specialization in medicine (18,32-34). The international trend for postgraduate pathology training is four to five years for a single subject including histopathology (19,28,35,36). The new histopathology training program established at the (SMSB) 2018 may express the global trend in medical specialization. Other areas suggested for improvement in the curriculum is the induction of trainees at the start of the training program, as induction is a strong enhancer of the learning process. Other studies showed 74% (10) and 85% (14) satisfaction rate with induction into training. Areas of the training that showed dissatisfaction of the graduates is the cytology skills (40%) which may be explained by the limited cytology training facilities within the country. Part of the reform of the curriculum should also address applying MTDs sessions which reflect integration in patient care and focus on pathologists are essential members of patient

management team and the need to increase the number of courses for professionalism.

### Limitations

The study is not without limitations. The numbers included in the study is small, this can be explained by the small number of pathology graduates as worldwide few trainees are recruited into pathology training, we included only trainees after the year 2015 because this year has witnessed major change in the summative final written assessment from long essays, to MCQs, EMQ & short questions, we believe that having study participants assessed by the same method will make the study sample more homogenous. A study with a bigger sample and including graduates from the Gezira training would have better assessed the satisfaction of trainees. Despite these limitations, we believe this study to be novel and can be one of the first of its kind in Sudan.

### Conclusions

Overall the graduates and trainees have a good level of satisfaction with postgraduate training in histopathology in Sudan. This study may serve as a preliminary guide for future reform of histopathology training in Sudan. Reform will result in better training and improvement in better services.

### Acknowledgments

The authors would like to acknowledge the contribution of senior pathology trainers and pathology trainees for their support in preparing this study.

*Funding:* None.

### Footnote

*Provenance and Peer Review:* This article was commissioned by the Guest Editor (Mohamed H. Ahmed, Heitham Awadalla and Ahmed O. Almobarak) for the series “The Role of Sudanese Diaspora and NGO in Health System in Sudan” published in *Journal of Public Health and Emergency*. The article has undergone external peer review.

*Conflicts of Interest:* All authors have completed the ICMJE uniform disclosure form (available at <http://dx.doi.org/10.21037/jphe.2018.10.01>). The series “The Role of Sudanese Diaspora and NGO in Health System in Sudan”

was commissioned by the editorial office without any funding or sponsorship. HA served as the unpaid Guest Editor of the series. MHA serves as an unpaid editorial board member of *Journal of Public Health and Emergency* from August 2017 to July 2019 and served as the unpaid Guest Editor of the series. The authors have no other conflicts of interest to declare.

*Ethical Statement:* The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). The study was approved by the Ethical Committee at the University of Khartoum, Medical Campus. Informed consent was attached in the first page of the questionnaire. Filling the questionnaire indicates agreement to participate in the study.

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doi: 10.21037/jphe.2018.10.01

**Cite this article as:** Zulfu AA, Abass SK, Awadalla H, Babiker SA, Ahmed MH. Assessment of pathology trainees' satisfaction: results of a survey from Sudan. *J Public Health Emerg* 2018;2:29.