

# Factors Affecting the Acquisition of Basic Surgical Skills among Surgery Interns in Teaching Hospitals in Southeast, Nigeria

## Abstract

**Background:** Upon graduation from medical school, doctors in Nigeria undergo a compulsory internship program which includes rotation through four core specialties: Internal medicine, Obstetrics and Gynaecology, Paediatrics and Surgery. Interns are expected to acquire basic surgical skills during their rotation in surgery. **Objectives:** To identify the factors that affect the acquisition of basic surgical skills by surgery interns (house officers) during their one-year internship program in teaching hospitals in Southeast Nigeria. **Materials and Methods:** A total of 73 surgery interns were sampled using a descriptive cross-sectional, epidemiological survey that employed self-administered Google forms. The semi-structured questionnaire was electronically distributed to interns currently in surgery rotations in their internship program in South-east, Nigeria. The data was analyzed using IBM's Statistical Package for Social Sciences (SPSS) version 22 and presented in tables and charts. Consent was obtained from all respondents and measures were put in place to limit different forms of bias. **Results:** The most important factors that negatively affected the acquisition of surgical skills by interns were fatigue from overwork (55.4%), poor mentorship (47.3%) and inadequate skill training courses (44.6%).

There were no statistically significant correlations amongst the factors that affected the acquisition of basic surgical skills by house officers. **Conclusion:** Some of the major limitations to acquisition of surgical skills by house officers that have undergone the surgery rotation were identified to be the workload, poor mentorship and inadequate structured skill training courses. **Recommendation:** Provision of better work conditions to limit work fatigue and improve learning. The training of house officers undergoing their surgery rotation should be supplemented by periodic assessment and mentorship programs by senior doctor to improve the acquisition of basic surgical skills by house officers.

**Keywords:** House officers, Nigeria, South-east, surgeons, surgery interns, surgical skills

## Introduction

The possession of basic surgical skills is one of the assessments of the competency of medical doctors.<sup>[1,2]</sup> The training of medical doctors includes a mandatory one-year housemanship programme during which they rotate through the fore core departments of medicine: Internal medicine, Obstetrics and Gynaecology; Paediatrics and Surgery, spending at least three months in each department.<sup>[3]</sup> In Nigeria, over a hundred tertiary hospitals are accredited by the Medical and Dental Council of Nigeria to offer this training programme to fresh medical graduates.<sup>[4]</sup>

During the period of their surgical posting, house officers are expected to learn basic surgical skills in addition to consolidating

their abilities to offer professional care to patients under the supervision of more experienced doctors. It has however been noted that a good number medical graduates have little exposure to practical surgical skills during their undergraduate studies and therefore enter the housemanship period with little disposition to engaging in hands-on learning during their surgical rotation with the consequence that a number of doctors complete this training with less than optimal acquisition of these lifesaving skills.<sup>[5-7]</sup> This therefore has necessitated efforts to remedy the situation. In Nigeria, the use of logbooks, provision of skill laboratories and use of mannequins have been recommended for training institutions.<sup>[8-10]</sup> The effectiveness of these remedies have been limited by a number of factors. As house officers, long

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**Kelechi Uzodinma Imediegwu, Angelica Chinecherem Uwaezuoke<sup>1</sup>, Chiamaka Q. Onyebuchukwu<sup>1</sup>, Chinonso J. Dimson<sup>1</sup>, Jude C. Abor<sup>1</sup>, Amarachi Ngwu<sup>1</sup>, Owhiri Oorerome, Udo E. Anyaehie**

*Department of Orthopaedic Surgery, National Orthopaedic Hospital, Enugu, Nigeria, <sup>1</sup>College of Medicine, University of Nigeria (UNN), Nsukka, Enugu, Nigeria*

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### Address for correspondence:

Dr. Kelechi Uzodinma Imediegwu, Department of Orthopaedic Surgery, National Orthopaedic Hospital, Enugu, Nigeria.  
E-mail: drkelsresearch@gmail.com

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and exhausting work schedule has been noted to negatively affect learning<sup>[11,12]</sup> while attention and close supervision by more experienced doctors was seen to notably improve the learning experience of the house officers.<sup>[11-13]</sup> Also infrastructural insufficiency in hospitals has also been fingered as a limitation to professional development by young medical graduates, in low-income countries like Nigeria which causes a resultant deficit in knowledge and skills levels.<sup>[14,15]</sup>

The aim of this study is to identify factors that currently affect the acquisition of basic surgical skills among house officers in the south-eastern Nigeria.

## Materials and Methods

### Study area

This was a Multi-Centre study involving surgery interns in 7 teaching hospitals in the six states South-east Nigeria. The teaching hospitals are Abia State University Teaching Hospital (ABSUTH), Aba; Nnamdi Azikiwe Teaching Hospital (NAUTH), Nnewi; Ebonyi State University Teaching Hospital (EBSUTH), Abakiliki; University of Nigeria Teaching Hospital (UNTH), Ituku-Ozalla; Imo State University Teaching Hospital (IMSUTH), Orlu; Enugu State University Teaching Hospital (ESUTH), Enugu and Chukwemeka Odumegwu Ojukwu Teaching Hospital (COOUTH), Awka.

### Sampling method

Multistage sampling, a probability sampling method, was used to recruit an estimated number of 102 interns currently in surgery rotation from seven teaching hospitals in South-east Nigeria with a response rate of 71.6% as 73 interns filled the and submitted the form. The study was simultaneously conducted among these hospitals over a three (3) month period.

### Study design

An online questionnaire (Appendix I) was developed by the researchers and the link to the survey was shared with surgery interns through WhatsApp and Telegram channels. Access to these forums were granted by the representatives of the house officers in the different participating hospitals. Questions comprise two sections: socio-demographic factors and factors that influence their acquisition of basic surgical skills such as unavailable theatre slots, limited surgical procedures, work fatigue, slow learning curve of interns, poor mentorship, etc. These factors were assessed using a four-point Likert scale with options of very significant, significant, not sure and insignificant respectively.

### Data analysis

Data analysis was entered and analyzed using the Statistical Package for Social Sciences (SPSS) version 26 Inc. Chicago, Illinois, USA. Descriptive and inferential analysis was done. The result of the study was presented in tables and figures.

## Ethical consideration

Ethical approval was obtained from the Health Research Ethics committee of the University of Nigeria Teaching Hospital Ituku-Ozalla, (UNTH) Enugu, Nigeria. Participants were informed of the purpose of the study and notified that participation was voluntary and written, informed consent was subsequently obtained. Anonymity of information provided, and confidentiality were ensured.

### Measures to limit bias

A pilot study was done with 20 participants. There was randomization of options in the questionnaire (this limited answer order bias) with validity and accuracy confirmation of the questionnaire by the authors and increased callbacks to improve response rate and limit non-response bias. Two independent analysts were employed to reduce systematic errors.

## Results

### Socio-demographic characteristics

Out of the 73 respondents, majority were males (41, 56%) and aged between 26 – 30 years (43, 58%). Most were single (65, 88%) and were of Igbo ethnicity (60, 81%).

As seen Table 1, above, the most important factor contributing to poor acquisition of basic surgical skills was fatigue from work. Other contributing factors include poor mentorship, and poorly developed skill programmes for house officers. These three ranked topmost among the factors identified.

There were no statistically significant correlations amongst the factors that affected the acquisition of basic surgical skills by house officers.

## Discussion

We assessed the factors that affect the acquisition of basic surgical skills by house officers during their surgery posting. Heavy workload and high stress levels is the bane of medical practitioners<sup>[11,12,16,17]</sup> including house officers who are at the lowest level of the medical hierarchy and therefore bear the brunt.<sup>[18]</sup> In line with this, most of the participants of this study identified work fatigue as the major impediment to acquiring basic surgical skills. This factor is noteworthy in the light of the current healthcare situation of the country. With many healthcare practitioners migrating to other climes, the pressure on the remaining workforce is at best unhealthy. Thus a vicious cycle ensues whereby overworked and fatigued doctors are unable to devote the necessary time to acquisition of additional skills which in the case of house officers are basic and lifesaving skills. The poor attention of the more experienced surgeons through mentorship or tutorial sessions were also identified as major reasons for the poor outcome of house officers that have done their surgery rotations. This is in line with the findings in a similar

**Table 1: Factors that affect the acquisition of basic surgical skills by house officers**

Factors	Very significant	Significant	Not sure	Insignificant	Chi-square	p-value
1. Work fatigue	41 (55.4%)	26 (35.1%)	6 (8.1%)	0	3.35	0.34
2. Poor mentorship	35 (47.3%)	28 (37.8%)	9 (12.2%)	1 (1.4%)	6.74	0.15
3. Inadequate skill courses	33 (44.6%)	26 (35.1%)	9 (12.2%)	4 (5.4%)	2.97	0.57
4. Limited exposure to surgical procedures	33 (46.5%)	31 (43.7%)	6 (8.5%)	1 (1.4%)	1.05	0.90
5. Limited theatre slots	31 (41.9%)	29 (39.2%)	12 (16.2%)	1 (1.4%)	4.28	0.37
6. Paucity of departmental programs for house officers	26 (35.1%)	25 (33.8%)	18 (24.3%)	4 (5.4%)	5.55	0.24
7. Short rotation time	26 (35.1%)	25 (33.8%)	17 (23.0%)	5 (6.8%)	0.76	0.94
8. Harassment by seniors	26 (35.1%)	26 (35.1%)	17 (23.0%)	4 (5.4%)	5.37	0.25
9. Little or no finance to procure the materials needed	25 (33.8%)	27 (36.5%)	15 (20.3%)	5 (6.8%)	9.68	0.50
10. Limited time to study the theoretical basis	23 (31.1%)	27 (36.5%)	20 (27.0%)	0	4.63	0.31
11. Slow learning curve of the interns	21 (28.4%)	19 (25.7%)	29 (39.2%)	3 (4.1%)	5.96	0.31
12. Lack of interest	15 (20.3%)	31 (41.9%)	21 (28.4%)	6 (8.1%)	6.40	0.17

study by Adeolu *et al.*<sup>[19]</sup> Senior doctors are expected to be role models and facilitators of the learning process of the younger doctors, providing opportunities for interaction and practice.<sup>[20-22]</sup> The house officers also can in turn be assigned medical students to tutor, in order to help them retain their knowledge and master their skill.<sup>[23,24]</sup>

Unavailability of structured courses on basic surgical skills for house officers was also listed among the limitations to acquisition of basic surgical skills.<sup>[25]</sup> This points to a deficiency of the programme of training of house officers in the different training institutions especially in the face of overwhelming healthcare demands in the country. This highlights the importance of the move by the World Health Organization to develop virtual reality-based models that could be adapted to common cases found in different environments in order to breach the learning gap across countries.<sup>[8-10,26]</sup>

Limited theatre slots available slots in the teaching hospitals could be attributed to the nature of the teaching hospitals. These institutions which are major referral centres compete for a few available theatre slots in their facilities. This is further compounded by the numerous delays from equipment malfunction to delays from patient related factors.<sup>[27]</sup> These challenges therefore reduce the intra-operative learning opportunities for the house officers.

Poor remuneration of doctors with respect to needs also contributed as lack of funds to procure personal materials or supplemental training on basic surgical skills was among the inhibiting factors identified in this work. This factor echoes that of a previous study among medical doctors that showed that poor salaries and salary cuts are prevalent in Nigeria, and therefore limit the ability to afford extra trainings required for proficiency in different skill sets.<sup>[28]</sup>

## Conclusion

This study identified factors responsible for poor acquisition of basic surgical skills by house officers that have undergone their surgery rotation in the teaching hospitals in Southeast Nigeria. Work fatigue, poor mentorship and lack of structured skill programmes for house officers emerged the

most important factors. In the face of declining healthcare practitioners due to emigration, this situation portends a loss of achieved milestones in the country's health sector as available practitioners may be ill-equipped to minister to the ever growing healthcare needs.

## Recommendation

There is a need for better planning of the work schedules of house officers. Better working conditions including well managed work hours, employment of required number of workforce and provisions for rest will enable these doctors to learn optimally during this period of training. The medical and dental council of Nigeria should design and enforce training objectives for house officers. The use of logbooks for procedures and periodic seminars and workshops during the period of training will go help enhance the attention to skill acquisition. Also development of mentor-mentee programmes which will include interested surgeons may help house officers get more out of this training period. Finally, house officers could be electively posted to primary health care facilities to allow them more hands-on experience under the supervision of seniors.

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Nil.

## Conflict of interest

There are no conflicts of interest.

## Ethical approval

Ethical clearance was obtained from the Health, Research Ethics Committee of the University of Nigeria Teaching Hospital Ituku-Ozalla (UNTH), Enugu, Nigeria.

## Consent for publication

Participation was voluntary, and the purpose of the research was explained to each respondent. Informed consent

was obtained before inclusion into the study. However, anonymity of participants was ensured, and no personal information was collected during the survey.

### Author's contribution

Dr. Kelechi U. Imediegwu was the lead author, he conceived the idea of the research work, designed the questionnaire and analysis, wrote the paper and did the editing and initial review of the manuscript and also with the correspondence.

The other authors (*Angelica C. Uwaezuoke, Chinonso J. Dimson, Jude C. Abor, Amarachi Ngwu, Chiamaka Q. Onyebuchi, Orerome Owhiri, and Udo Anyaehie*) assisted with the collection of data, modifying the questionnaire, the analysis of the work from the data and editing of the write-up.

### Availability of data and material

Additional data from the research project can be made available by the author on request.

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## APPENDIX I

### AN ONLINE SURVEY QUESTIONNAIRE TO ASSESS THE FACTORS AFFECTING THE ACQUISITION OF BASIC SURGICAL SKILLS AMONG SURGERY INTERNS IN TEACHING HOSPITALS IN SOUTHEAST, NIGERIA

#### SECTION 1- INFORMED CONSENT

##### ▪ Introduction

You have been selected to participate in a research titled “factors affecting the acquisition of basic surgical skills amongst surgery interns in teaching hospitals in Southeastern Nigeria”.

The research assumes that the findings will help to determine the important factors and help improve the acquisition of basic surgical skills for interns in future and for better curriculum and programme restructuring.

##### ▪ Voluntary nature of participation

Participation in this research is voluntary. Although you have been selected, you are free to decide to participate or otherwise. If you decide not to participate, you are free to withdraw from the research.

##### ▪ Study procedure

This will involve filling a questionnaire which will be giving to you to the best of your knowledge. No clinical examination will be performed on you.

##### ▪ Risk

There is no known risk associated with this research and it does not affect or influence any established treatment methods in general.

##### ▪ Confidentiality

Information obtained from you will be treated as confidential and will not be used against you in any form. In addition, data analysis and presentation from this research will not in any way reveal your identity.

Thank you.

Do you wish to continue?

Yes, No. (Please click to proceed)

#### SECTION 2- SOCIO-DEMOGRAPHICS

1. Sex- Male, Female
2. Age Range- Click the option appropriate for age
3. Marital status- Single, Married
4. Ethnicity- Click the option as appropriate

#### SECTION 3- FACTORS THAT CAN AFFECT ACQUISITION OF SURGICAL SKILLS

Please, rate the effect of the following factors on how it affects your basic surgical skills acquisition in your internship programme based on a four-point Likert scale options of - very significant, significant, not sure and insignificant for each of the twelve (12) tested factors below.

1. Limited theatre slots/exposure –
    - Do you think that limited theatre slots for interns in your Centre is a major factor in acquisition of basic surgical skills?
    - Very significant, significant, not sure and insignificant
  2. Work fatigue-
    - Has the demands of your work (work fatigue) perhaps based on reduced number of fellow interns and senior doctors, affected your acquisition of basic surgical skills?
    - Very significant, significant, not sure and insignificant
  3. Slow learning curve-
    - Is a general slow learning curve for interns a major factor affecting acquisition of basic surgical skills acquisition?
    - Very significant, significant, not sure and insignificant
  4. Limited time to study the theoretical basis-
    - Is time a key to study your surgical basics and revise your undergraduate teachings a major factor affecting your acquisition of basic surgical skills?
    - Very significant, significant, not sure and insignificant
  5. Poor mentorship-
    - Is lack of active surgery senior mentors in your Centre a major factor affecting your acquisition of basic surgical skills?
    - Very significant, significant, not sure and insignificant
- Very significant, significant, not sure and insignificant
6. Lack of interest-
    - Is lack of interest in acquiring basic surgical skills a major factor affecting your acquisition of basic surgical skills?
    - Very significant, significant, not sure and insignificant
  7. Inadequate skill courses-
    - Will you consider inadequacy in available number of skill courses a major factor affecting your acquisition of basic surgical skills?
    - Very significant, significant, not sure and insignificant
  8. Poor departmental programme-
    - Is a poor surgery departmental programme in your Centre, a major factor affecting your acquisition of basic surgical skills?
    - Not sure, insignificant, very significant, significant

9. Short rotations-

- Do you think that short rotations in surgery in your Centre is a major factor affecting your acquisition of basic surgical skills?
- Very significant, significant, not sure and insignificant

10. Harassment-

- Do you get harassed at work and feel that it is a major factor affecting your acquisition of basic surgical skills?
- Significant, Very significant, not sure and insignificant

11. Low finance to procure gadgets/materials required-

- Do you think your low finance to procure useful gadgets and materials during your programme is a major factor affecting your acquisition of basic surgical skills?
  - Not sure, insignificant, very significant and significant
12. Impact of limited surgical procedures-
- Do you think that a general low number of surgery cases done in your centre is a major factor affecting your acquisition of basic surgical skills?
  - Not sure, insignificant, very significant and significant

Thank you filling this questionnaire.