

Introduction of Suturing Skills Acquisition into Undergraduate Surgical Education: Early Experience from Ile-Ife, Nigeria

Adewale Abdulwasii Aderounmu¹, Funmilola Olanike Wuraola¹, Olalekan Olasehinde^{1,2}, Oludayo A Sowande^{1,2}, Adewale Oluseye Adisa^{1,2}

¹Department of Surgery, Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife, Nigeria, ²Department of Surgery, Obafemi Awolowo University, Ile-Ife, Nigeria

ABSTRACT

Background: Undergraduate medical students of the Obafemi Awolowo University, Ile-Ife, Nigeria, had over the years acquired various skills informally without structured training in basic skills in wound closure. The Department of Surgery introduced suturing skills acquisition workshop into the curriculum of the Final-Year Medical Students in 2016. This study describes the preliminary experience and the perception of the participants. **Methods:** All students undergoing the senior rotations in surgery and surgical specialties were taken through a day suturing skills workshop at the surgical skills laboratory. Skills were demonstrated using validated narrative videos followed by practical sessions supervised by senior registrars and consultant surgeons. All participants were requested to complete a feedback form after the workshop. **Results:** One hundred and eighty students were trained in six workshop sessions per year over two academic sessions. There were 128 (71.1%) male and 52 (28.9%) female students trained by 9 consultants and 13 senior registrars with 15–17 students in each session. Self-assessment feedback after the workshop revealed that all but 3 (1.7%) students felt very confident in handling basic instruments, 102 (56.7%) were confident of their proficiency in basic suturing, 68 (37.8) were less confident, whereas 10 (5.6%) were not confident looking ahead and 82 students (46.1%) wanted additional skills to attain proficiency in some common surgical procedures prior to graduation. **Conclusion:** The department achieved the aim of introducing suturing skills acquisition into undergraduate surgical education. In the future, other surgical skills acquisition workshops may be considered as desired by the students.

KEYWORDS: *Surgical education, suturing skills, undergraduates*

INTRODUCTION

Formal basic surgical skills acquisition programs are not part of the undergraduate medical curriculum in many medical schools in Nigeria with attention usually focused on these skills during postgraduate surgical residency training.^[1] In most instances, undergraduate surgical education involves didactic lectures, tutorials, bedside teaching, and attendance in outpatient clinic and operating theater sessions. One of the challenges of this age-long approach is that only few undergraduate students are exposed to hands-on training during theater sessions, while the ethical question of training beginners on live patients is an increasing concern in modern

practice. One of the older generation medical schools in Nigeria conducted an audit of basic skills acquisition of final-year students, which revealed the deficiency of this training model.^[2] The vast majority of students were deficient in basic skills including urethral catheterization and nasogastric intubation. This inadequate exposure and poor skill set have been shown to translate to

Address for correspondence: Dr. Adewale Oluseye Adisa, Department of Surgery, Obafemi Awolowo University, Ile-Ife 220005, Nigeria. E-mail: wadisc@yahoo.com

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low confidence of fresh medical graduates while also contributing to low interest in surgery and surgical specialties as a career choice compared to other aspects of medicine.^[3-5] Conversely, previous studies have shown that training undergraduates in basic surgical and procedural skills can, in turn, produce safe and confident junior doctors who can safely take care of patients in emergency situations, thus making the acquisition of this skill important for all doctors irrespective of future specialty.^[6,7] The training, however, demands commitment from trainers as well as availability of resources, given the high cost of setting up and sustaining an effective skills laboratory.

The Department of Surgery, Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC), Ile-Ife, created a Surgical Skills Laboratory in 2012 for the training of postgraduate surgical trainees and has consistently provided scheduled training in basic and advanced surgical skills to them. The aim of this study was to determine the feasibility of introducing formal basic surgical skills training into the undergraduate medical training at the Obafemi Awolowo University, Ile-Ife.

METHODS

Final-year (Clinical Year III) medical students undergoing the senior rotations in surgery and surgical specialties in the 2015/2016 and 2016/2017 academic sessions were taken through suturing skills workshops at the Surgical Skills Laboratory of the OAUTHC. For each set of 90–100 students, six training sessions were delivered and spread over their 10-month final-year rotations, with each session accommodating 15–18 students. The workshop covered the principles of handling of surgical instruments, using a needle holder, making an incision, using basic suturing methods, suture removal, as well as using basic knot tying techniques.

Each skill was demonstrated using validated narrative videos adopted with permission from the online surgical education facilities of the American College of Surgeons, followed by practical demonstration and supervised hands-on sessions. Synthetic foams and animal tissues (pig skin) were used to simulate skin for the practice sessions on suturing techniques. Sutures and instruments, including needle holders, and different types of tissue-holding forceps as well as scissors, were provided by the laboratory. The practical sessions were supervised by senior registrars and consultant surgeons in a student–tutor ratio of 3:1 or 4:1. A 20-min lunch break was provided midway into the 5-h workshop.

All participants were requested to complete a Likert-scaled feedback form at the end of each workshop

exploring the relevance of the workshop and their proficiency in basic suturing techniques. They were also asked to make suggestions on how the workshop can be improved. The information was collected anonymously and analyzed with IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY, USA: IBM Corp.

RESULTS

One hundred and eighty students were trained over a 2-year period in six workshop sessions per year. There were 128 (71.1%) male and 52 (28.9%) female students. Nine consultant surgeons and 13 senior registrars participated in the training. Each session had 15–17 medical students supervised by a minimum of six senior registrars and at least two consultant surgeons in attendance giving a trainer–trainee ratio of between 1:3 and 1:4 [Figure 1]. All students completed instrument handling techniques, basic suturing skills including instrument tying, one-hand and two-hand tying techniques, as well as suture removing techniques.

Feedback forms were returned by all students. They all rated the course as very good, adjudged the content as very useful, and expressed satisfaction with the demonstration and practical sessions. All students agreed that the facilitators adequately aided their learning during the course.

In self-assessment report after the workshop, all but 3 (1.7%) students felt very confident in handling basic instruments, 102 (56.7%) were confident of their proficiency in basic suturing, 68 (37.8) were less confident, whereas 10 (5.6%) were not confident. On a Likert scale rating, 53.1% of the participants agreed that the time allotted was adequate for their skills acquisition, 15.6% disagreed, whereas 31.3% were neutral. Overall, 160 (88.9%) adjudged the environment of the skills laboratory conducive to skills acquisition.



Figure 1: Undergraduate suturing skills training session in Ile-Ife, Nigeria

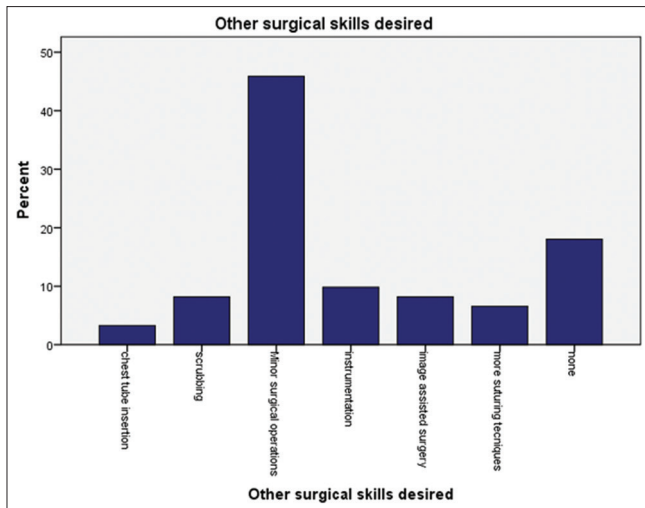


Figure 2: Procedures of interest to undergraduate students after suturing workshop

Participants suggested ways of improving the workshop. These included allocation of more time, increasing the number of sessions, and use of models similar to those displayed in the videos. Some participants wanted more surgical instruments displayed and 82 (46.1%) wanted to acquire additional skills to perform common surgical procedures such as chest tube insertion, hernia repair, and others [Figure 2].

DISCUSSION

This study demonstrates the feasibility of training undergraduate students in some basic surgical skills in a Nigerian medical school. We believe that this will serve as a very much-needed adjunct to the exposure they have in their current clerkship and provide them with the much-needed skills to confidently perform their duties as house officers not only in surgery but also in other subspecialties. This is particularly important in the current Nigerian medical practice where a very large number of medical graduates are not absorbed in the tertiary hospitals and must undergo their internship rotations in secondary-level care hospitals where many of them have more responsibilities and less supervision than their colleagues in the teaching hospital setting. Many studies overseas have demonstrated the benefit of this early exposure of medical students to surgical skills acquisition.^[7-12] Antiel *et al.* introduced basic surgical skills to preclinical medical students and opined that the earlier, the better.^[13] With the success of our own feasibility study, our department has now formally incorporated basic skills acquisition into the 1st week of the rotations of final-year medical undergraduates.

We attained this success with a low budget as we are unable to secure funding or sponsorship at this preliminary phase. The models and mannequins used

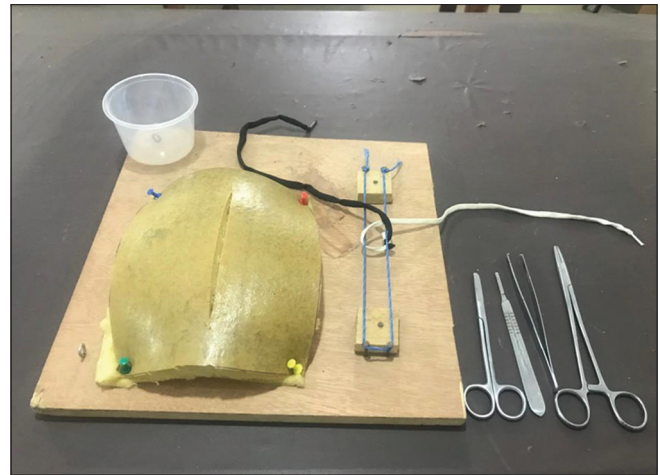


Figure 3: Locally assembled basic suturing kit

for the skills training abroad are quite expensive and unaffordable. Our department created a skills laboratory that provides the basic facilities including a room for video demonstration and teaching adjoining the other rooms for dry and wet laboratory processes [Figure 1]. This facility was adjudged conducive to learning by nearly 90% of the participants. Our improvisation with readily available and less expensive materials such as synthetic foams and locally sourced strings and twines as well as leftover sutures from our theaters contributed to reducing the running cost of the program for undergraduates [Figure 3]. Such cost-effective approach has been shown to lead to substantial savings in surgical skills laboratory setup and maintenance.^[14,15] We advocate the adoption of a similar approach for institutions in Nigeria aiming to establish clinical skills laboratories.

Organizing the training requires a major commitment from the trainers. In the present study, we were able to sustain a trainer–trainee ratio of 1:3–4 throughout by incorporating senior registrars in general surgery, pediatric surgery, urology, and neurosurgery as trainers from the onset. This ratio is essential and has been described as optimal in previous studies.^[16] On the other hand, incorporating residents is advantageous in that it not only improves their teaching skills but also models them for such future roles in their career, but studies have also shown that medical students may be more inclined to learning basic skills from residents than the consultants.^[17,18] Over time, our residents including the first and second authors of this manuscript led the organization of the workshop sessions.

Overall, only half of the participants in our workshops felt that the 5 h was adequate, whereas a number of students requested for more visits to the laboratory. The duration of skills acquisition workshops for both medical

students and postgraduate surgical trainees is variable. For undergraduates, such training ranges from few-hour workshops to whole-day surgical boot camps.^[19,20] While this variation exists, it is imperative to provide adequate time for participants to acquire the skills at their different speeds and attain similar proficiency.

Being a feasibility study, we observed some limitations in the course of time. We administered a self-assessment questionnaire at the end of the workshop which we could have equally administered before the workshop to assess the impact of the workshop on the participants. We will begin this with the next set of students and perhaps evolve into adopting some Objective Structured Assessment of Technical Skills-based technical proficiency scoring for assessing the students' proficiency in the near future.

CONCLUSION

This study assessed the newly introduced basic suturing skill in our undergraduate surgical training and was able to show that the workshop was successful in being sustained over two academic sessions adopting affordable improvisations in training techniques and cost-effective models for teaching the practical skills. In the future, we will consider the inclusion of more skills acquisition workshops for the benefit of the students.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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