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An international standard fetal ultrasound training programme organized in a low resource setting: The ISUOG-benin city experience

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ABSTRACT

Objectives: To organise an indigenous, cost-effective, short, intensive fetal ultrasound training programme in a low-resource setting, in order to improve the quality and quantity of skilled professionals in the field of obstetric sonography in a low-income country.

Methods: The course was implemented in two stages namely the pre-workshop preparations and workshop proper. The former stage involved achieving international accreditation, publicising the programme as well as participant registration. The latter stage was focused on the workshop training activities which included lectures, practical sessions, discussions and hands-on sessions.

Results: A high level of satisfaction with the programme was demonstrated by participants following a questionnaire assessment. Registration process and communication before the workshop were mostly rated as excellent and good. Other parameters such as lectures, practical sessions, coverage of objectives, knowledge improvement and others, followed the same pattern.

Conclusion: Short, indigenous, cost-effective training programmes can be successfully carried out in a low-resource setting and the simple model allows for easy imitation at other relevant locations.


Key words: Obstetric ultrasound; ultrasound training; low-resource.

Introduction

Obstetric scans constitute the majority of ultrasound scans performed by sonologists. It permits assessment of fetal and maternal morphology including indicators of fetal well-being or otherwise^[1] and has the advantages of being portable, quick,^[2] and relatively safe. It has also been shown to improve maternofetal attachment.^[3] These advantages facilitate highly detailed monitoring of pregnancy, thereby improving preparedness for complications and other undesirable occurrences in pregnancy.

There exists a need for formal training of healthcare practitioners before they use ultrasound machines for medical diagnosis and treatment. This expertise is scarce in Africa as statistics have shown that less than one-fifth of obstetric sonographers have attended a formal practical training and less than 5% in a hospital environment.^[4] These figures are worrisome, considering the critical role of ultrasound in

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maternal health the fight to reduce maternal and perinatal mortality. Ultrasound scanning is a skill that improves with practice and requires constant updates because it is highly reliant on technology; hence, there is a need for continuous professional development courses even for professionals who have previously received formal training. A study conducted in Senegal^[1] showed that 93.8% of obstetric ultrasound providers, who participated in the study believed that continuous medical education in obstetric ultrasound would be beneficial in improving the quality of services provided. Tennant *et al.*^[5] emphasized this by stating that a continuous programme of training is an indispensable tool for improved work performance and high quality output.

Difficulties such as high cost of such training, frequent location in high income countries, scarcity of training spaces and sometimes accreditation issues, have made the provision of standardized training, in highly technical areas of fetal medicine and advanced obstetric sonography, a challenge for low income countries. These obstacles have necessitated a provision for home grown training to address the dearth of these important yet lacking skills.

Various proposals including the establishment of regional centres of excellence where the training needs will be addressed have been put up. Another is the provision of short intensive programmes domiciled in the regions of interest in collaboration with established international organizations, which will also involve accredited international experts in these rare fields.^[6] The latter option has the advantage of indigenization, reduced cost, and better accessibility for providers. A possible drawback, if not monitored however, is the creation of a wrong impression that the participants can be experts after such short programmes.

The second option was recently explored and implemented in Benin City, Nigeria. It was a training programme in obstetric ultrasound approved by the International Society of Ultrasound in Obstetrics and Gynaecology (ISUOG). The initiative was led by the lead author of this article under the cover of the Maternal-Fetal Unit of the Obstetrics and Gynaecology Department, University of Benin Teaching Hospital, Benin City, Nigeria.

Materials and Methods

Pre-workshop preparations

A trial basic obstetric ultrasound training workshop had been successfully hosted previously in May 2014. The details are available at www.beninfetaldiagnostics.org/workshop. Following the successful trial, a move was made to develop the training into a truly international standard training

programme. After successfully meeting requirements, ISUOG conferred their endorsement, allowing the workshop to be held as an ISUOG approved course in June 2015.

Next, with a very effective website, the total package including the tentative programme of events was disseminated to enhance global publicity in a bid to encourage prospective participants and facilitators. Hundreds of flyers and posters were disseminated to various hospitals and training centres in the country, targeting specific departments. Phone texts and e-mails were sent to available addresses. Journeys were also made to some centres within and outside the country to try and garner support of notable facilitators. Social media was also harnessed, with the creation of a Facebook page (www.facebook.com/workshop2015), twitter handle (@beninfetal), and LinkedIn accounts.

To meet international standards, the website was made interactive with encouragement for early registrations and regular updates on workshop preparations for registered participants. Accredited participants, who had completed their registration and payment formalities, were given password access to relevant papers such as ISUOG and NICE GUIDELINES, which had been put on the website. Reading these materials prepared them for the pretest which was highly encouraged to be taken before the workshop. Special rebates were obtained by the organizers on accommodation with guest houses close to the workshop venue, and payment for this could also be made online.

The workshop proper

The training was held in June 2015 on the 8th to 12th for the basic course and 13th to 18th for the advanced course at the Golf Course Conference Hall within the premises of the University of Benin Teaching Hospital, Benin City, Nigeria. The basic course was open to interested practitioners, but to qualify for the advanced course, at least prior basic ultrasound experience was required or the intending participant was required to have attended the basic course previously.

A private conference organizing firm was contracted with the logistics of the workshop. Physical accreditation was electronic as participants who had arrived with their printed online verification were able to promptly have their barcodes scanned and their attendance badges printed out automatically by the system. Every day, the codes on these badges were scanned twice as verification of attendance, and on the last day, scanning the badge automatically led to the printing of individualized certificates.

The daily programme included didactic lectures, practical demonstrations, general discussions, and hands-on sessions. There were video sessions during which well-selected relevant videos were shown. Audio-visual arrangements were also made such that the participants could follow the events from anywhere in the hall. Interactive sessions were held at the end of each day. During the hands-on sessions, participants were divided into groups and each group assigned an instructor who performed a brief introductory demonstration; then each group member had a turn at scanning with verbal guidance and feedback provided by the instructor when necessary. A similar method of hands-on training was used in a study in Denmark, where simulation-based ultrasound training was done for new Ob-Gyn residents.^[7]

Three key elements of ultrasound proficiency were identified, namely technical performance, image assessment, and medical decision-making for patient management.^[8] The workshop structure was largely focused on technical performance and image assessment in a bid to improve behavior and attitude of participants towards fetal ultrasound scanning. Although many participants already had prior experience in ultrasound scanning, the initiative behind the hands-on training was to enable inexperienced participants acquire personal skills for structure location and pattern recognition while experienced participants could identify and correct erroneous habits or practices during fetal ultrasound scanning. Coles^[9] considers this method of training to be effective as it affords the trainee an opportunity to practice what they have learnt theoretically in a real-time environment, which improves efficacy and memory retention.

Mann and Robertson^[10] have asserted that evaluation of the training outcomes is a critical aspect of the training process. To this effect, a printed semi-structured questionnaire was used to anonymously assess the participants' evaluation of the various aspects of the programme on the last day of training. All questionnaires were correctly filled and returned. Data analysis was done using Microsoft Office Excel 2007 (version number 12.0.6425.1000). No ethical approval or informed consent was sought for the study as it did not involve patients or require access to sensitive information.

The participants' satisfaction at various stages was assessed using a Likert scale scoring system of excellent, very good, good, indifferent, bad, and very bad.

Results

There were 67 participants at the basic course and 51 participants in the advanced course. Among these participants, 28 attended both courses. The obstetricians

made up 71% with the remaining 29% being private practitioners, radiologists, sonographers, and two nurse practitioners. There were two participants from Ghana and the others were from Nigeria (the lone registrant from Switzerland eventually could not make it to the programme). With a response rate of 100%, 90 questionnaires were appropriately filled and returned.

In response to the preworkshop activities, 51 participants (57%) rated the registration process as excellent and only 4 (4%) gave ratings of less than good. Regarding communication with participants prior to the workshop, cumulatively 81 participants (90%) gave ratings above average [Figure 1].

More than half of the participants assigned ratings of good on all the four aspects of workshop activities graded [Figure 2], namely communication (64%), coverage of objectives (64%), lectures rating (63%), and practical sessions (56%).

In the postworkshop evaluation [Figure 3], the individual aspects graded, namely participation, ultrasound knowledge improvement, basic ultrasound evaluation competency, and overall workshop rating were similarly rated by more than half of the participants as good or excellent. Only 1 (1%) participant assigned ratings of less than average in some aspects of this category.

Participants' rating of other miscellaneous aspects of the workshop [Figure 4] such as feeding, venue choice, accommodation, and general enjoyment of oneself showed ratings of average or higher by majority of participants (89%, 98%, 74%, and 96%, respectively) in each case.

Discussion

This report shows that a high level of participant satisfaction can be achieved by organizing a well-structured training programme endorsed by relevant international agencies, board, or professional association (in this case ISUOG), that has verified that such can be conducted as advertised

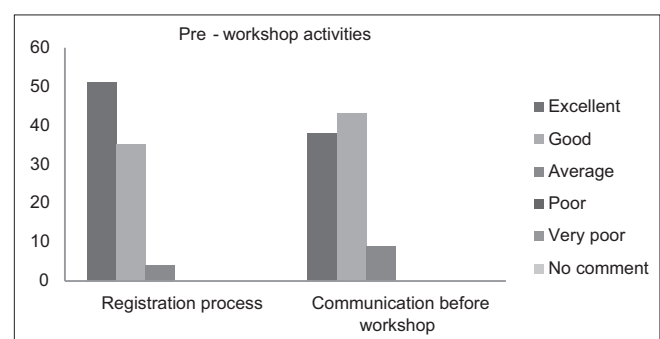


Figure 1: Participants' evaluation of pre-workshop activities

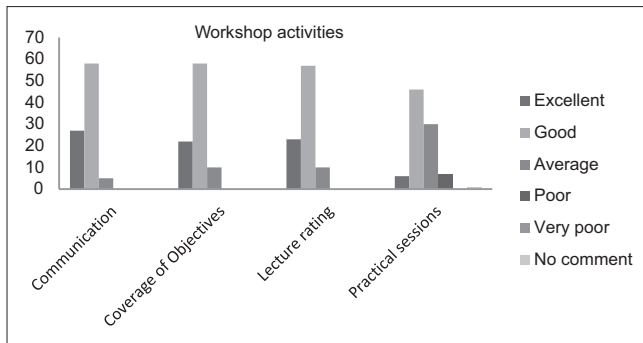


Figure 2: Participants' evaluation of activities during the workshop

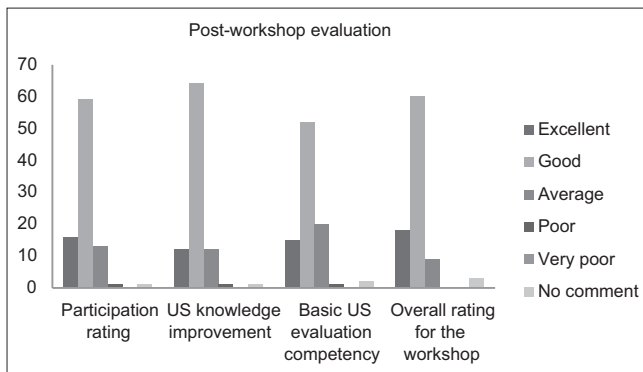


Figure 3: Participants' rating of the workshop at the end of the workshop^[11]

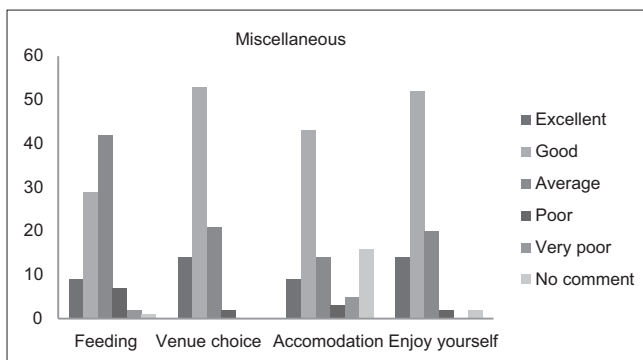


Figure 4: Participants' rating of workshop-related parameters

and planned. It further buttresses the fact that training programmes in relevant but apparently rare fields can be done in a low resource environment (in this case, in Benin City, Nigeria) and that this can achieve a high level of acceptability. Essential accompaniments of such will be their affordability and accessibility. The preworkshop preparation here seemed to have achieved the highest level of satisfaction, as adjudged by the respondents [Figure 1]. The registration process was an innovation in this environment being electronic and devoid of use of papers, as is the norm. These electronic processes are being promoted worldwide as a means of environmental conservation. Communication before the workshop also followed the same pattern.

International standard ultrasound training programmes are quite feasible in low resource countries using available manpower augmented by foreign manpower. These programmes are accessible, affordable, and acceptable and help to provide much needed skills, and participants show a high level of satisfaction towards them [Figure 2]. In their grading of workshop activities, fewer participants, compared to other aspects, rated lectures and practical sessions as good. This could be attributed to issues which arose on some occasions as a result of power failure. As a result of time spent resolving these power supply issues, time assigned for lectures and practical sessions on some occasions had to be reduced. The problem was eventually fully resolved with the acquisition of efficient standby generators and uninterrupted power supply (UPS) units. Other minor challenges faced, which briefly interrupted smooth running of the program, were availability of subjects for scanning and suitable space. However, after a few minor initial hiccups, these problems were resolved.

In terms of ability to perform basic scans, the participants had a self-assessment rating of being good [Figure 3], which is an encouraging assessment for the organizers. Improvement in participants' technical performance and image assessment abilities were quite obvious in some cases. For some who had no idea about ultrasound probe orientation or structure identification at the beginning of the course, towards the end of the course, they were more adept at handling the probe and locating and identifying various anatomical structures. Others had become better at identifying patterns and associating them with known pathological conditions. Participants generally demonstrated greater confidence in scanning as the training progressed. However, this does not give a reliable assessment of practical ultrasound ability. The nonreliability of self-assessment of clinical skills when compared with actual clinical competence has been previously reported.^[12-14] It ought to be followed up by objective assessment of such competence.

Many researchers and trainers have surmised that ultrasound competence requires a long period of training and continual hands-on practice.^[7] This is a potential drawback of short programmes like this, as some may have a wrong conviction of proficiency, which may not be the case. It has previously been reported in a study of recently graduated medical practitioners that there is often gross overestimation of ability and performance, mainly due to deficits in metacognitive skills. It was, however, found that improving skills through training programmes like this, actually helped many discerning practitioners to better recognize the limitations of their ability by increasing their metacognitive competence.^[13] Programmes should therefore be encouraged.

The feeding incidentally, though still adjudged as good scored the lowest [Figure 4]. The food was contracted to a renowned caterer and it is quite difficult to give the optimum in terms of meals to all participants. However, the fact that participants generally showed good satisfaction is encouraging.

Power supply was the biggest challenge during this programme, however, as earlier mentioned, suitable solutions were promptly found.

Although the results of the study may be subjective, this model has been shown to be both attainable and successful and provides a basis for skill transfer using its model as outlined.

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Conflicts of interest

There are no conflicts of interest.

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