

ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCES
DEPARTMENT OF NURSING AND MIDWIFERY
GRADUATE STUDIES PROGRAM

**ASSESSMENT OF THE FEASIBILITY OF OBJECTIVE STRUCTURED
PRACTICAL EXAMINATION AMONG FINAL YEAR DIPLOMA NURSING
STUDENTS IN GOVERNMENT AND PRIVATE COLLEGES IN ADDIS ABABA,
ETHIOPIA.**

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ACRONYMS

A.A.U: Addis Ababa University

C.O.C: Center of Competency

DUCHS: Defense University College of Health Sciences

FGD: Focus Group Discussion

MSAT: Multiple Stations Assessment Test

OSCE: Objective Structured Clinical Examination

OSPE: Objective Structured Practical Examination

ABSTRACT

Background

The way clinical performance is assessed is one of the determinants affecting clinical skill training of nurses. The conventional method of clinical assessment is found to be subjective. Objective Structured Practical Examination (OSPE) has been introduced in many countries as a valid and reliable assessment tool. In Ethiopia, there is no experience in regard to the feasibility of OSPE and its use to assess clinical performance of students.

Objective

The main objective of this study was to assess the feasibility and the clinical performance of final year diploma nurse students using OSPE.

Methods and Materials

The study was done in Menlik II Health Science College and Central University located in Addis Ababa. The study populations were final year diploma nurse students. The design of study was descriptive cross-sectional. A total of 36 students 16 from Menilik II and 20 from Central University were enrolled. In Central out of 3 campuses, Lanchia Campus was selected randomly. Out of 35 students in Lanchia Campus 20 were chosen using simple random sampling. Data were collected through a structured questionnaire, checklist, focus group discussion and observation. The variables collected were age, clinical performance score, feasibility of OSPE, perception of study subjects and barriers to skill training.

Result

The mean age of the 36 students was 21.7 years. Out of 6 clinical competencies assessed managing 3rd stage of labor, clean wound dressing, managing airway obstruction and administering IM injection were poorly performed while that of measuring blood pressure was good. Of the expected 1872 tasks to be performed by the 36 students in the 6 clinical procedures 886(47.3%) were correctly performed. In addition, out of 52 steps expected to be performed by a

student in the 6 procedures, the maximum steps performed by a student correctly were

35(67.3%). Among major deficiencies observed in the management of 3rd stage of labor was inability to palpate the abdomen to rule out the presence of another baby 35 (97.2). In addition, 31(86.1%) and 27(75.0%) of the students were unable to read the growth monitoring chart and interpret temperature of a patient respectively.

Furthermore, instructors and students attitude towards OSPE was highly positive. Feasibility study showed in each demonstration room a maximum of 10 stations could be organized. The amount of time to conduct OSPE in each site was 290 minutes. OSPE was found feasible in a small set up with few numbers of students. The result also showed the main barriers to clinical training were instructors' competency, coaching process, close supervision and inadequate learning facilities.

Conclusion

Objective Structured Practical Examination is feasible in a small setup where the numbers of students to be assessed are few. When the numbers of students are many, additional resource is required. OSPE has demonstrated the clinical performance of the students to be weak.

Recommendation

Objective Structured Practical Examination was found feasible and should be introduced as an additional clinical assessment tool.

1. Background and Statement of the problem

1.1. Background

Currently there is great concern from government and the public sector over poor quality of education of health professionals (1, 2). This is reported in studies carried out by Health Sciences Colleges as part of their institutional reform designed to improve quality of education (3). Besides, low client satisfaction was reported in many health facilities and inadequate skill among health professionals was considered as a major factor (1). Quality education is becoming urgent as a result of increased public expectation for better health care and the changing trend in disease patterns and health technology (1, 3). In addition, market is becoming extremely competitive whereby only those who have acquired the essential skills, knowledge and attitude can compete for a job (4). Moreover, health expenditure is soaring at alarming rate and as the public spending on health care increases training institutions need to be accountable in producing capable health professionals who can respond to the health need of the population competently (4). Not only that, the graduate must be committed to serve, compassionate to those in need particularly to those who are vulnerable and at risk and above all they should be conscious of public responsibility. Being aware of the existing educational problems, the government is taking important steps to improve quality of education (1).

The nursing profession is currently in great need because of this nurses must be equipped with the necessary knowledge, skill and attitude in order to respond effectively to the health needs of individuals, families and communities. This means nurses are expected to be able to synthesize and critically analyze and learn new skills necessary to ensure clinical competence. The major challenge in nursing education today is the problem of information over-load. There is too much emphasis in class room teaching as a result there is no much

time left for acquiring practical skill (4). Nurses training needs to focus on learning by doing so that specific knowledge, skills and attitudes needed to carry out an activity are learned (5).

There are a number of problems that contribute to lowering quality of nursing education. Among many to mention few are large number of students and insufficient number of staff; limited opportunities for students to practice and master essential skills; inappropriate clinical practice sites which is not similar to the actual work place of the graduate; scarce resource and technology etc (3). Some of the problems seen in the nursing service are actually related to poor training. Effective training of nurses should offer more practical experiences to help the student develop the competency they need to enter professional practice (3).

Among determinants of quality of education besides other factors such as the teaching learning environment the way student is assessed during clinical nursing practice is an important one. Assessment is recognized as a driving force for learning and it is the motor that improves learning particularly in acquiring clinical skill. Students are motivated to learn when they know they are being assessed properly. Assessment assists the instructor to improve quality of learning as it identifies training deficiency, provides feedback, monitors progress, determines whether the learning outcome is met; decides whether the student should progress to the next higher of learning etc. In fact, changing the curriculum without changing the assessment methods achieves nothing (6). Thus, assessment is designed to find out whether a student has satisfied the minimum standards as required by the training program (6).

The starting point of this study was the growing awareness among nurse instructors that the clinical assessment tool currently in use has drawbacks. Experience shows that the assessment instrument is too subjective. There is discrepancy between scores achieved and

actual performance of students. The method has a problem to differentiate the weak from the strong student. Since students perceive they are not assessed properly they are less motivated to learn. Instructors were also observed to focus more on obtained grades rather than on the clinical competency. As the present assessment instrument has limitations it was necessary to study the feasibility of an additional clinical assessment tool called OSPE. Furthermore, although there is a feeling among educators that the clinical performance of nurse students is weak so far no study was done to determine their level of competency using OSPE.

1.2. Statement of the problem

Testing, measurement and evaluation play an important role in all educational institutions including nursing. Educators have the responsibility for development of testing devices or procedures that fairly evaluates students' achievements and yields accurate result. A good assessment tool has to be valid able to measure what is expected to measure; reliable repeated measurement giving the same result; objective i.e. if the same performance is scored equally by different observers and feasible in terms of cost and practicability (7,6).

One of the biggest problems in the teaching learning process is in the way students are evaluated while performing clinical nursing procedures. The traditional system of practical examination in nursing education consist of either assigning a procedure to a student or a patient to identify needs on priority basis for giving care and this depends on the student ability and availability of the patient for a particular procedure (8, 9) In spite of the innovations in the mode of evaluation of students` performance, the importance of conventional system of practical examination cannot be denied. It helps the instructor to observe and assess students for different professional and technical skills in real life situation and it enables to have an overall view of students` performance. However, the conventional system of practical examination has a number of drawbacks. Among these are, it is subjective

as the student score depends on the mood of the examiner; it is time consuming and there is lack of standardized conditions in bedside which affects student's score. Moreover, students are not examined in a similar way as each student is not given the chance to perform the same procedures and this affects the scoring. Besides, the current examination does not assess student performance in a systematic way such as demonstrate practical skill, make accurate observation, analyze and interpret data, identify patient problem and plan alternative nursing procedures. The conventional system of practical examination currently in use does not measure the student's competence in these areas systematically (8).

Realizing the magnitude of the problem prevailing in the assessment of students, some years back the All India Institute of Medical Sciences introduced a new pattern of practical examination called OSPE which has greater objectivity, reliability and validity. The OSPE is a new pattern of practical examination where by each component of clinical competence is tested uniformly and objectively for all students who are taking up a practical examination at a given place. In OSPE students rotate through a series of stations where they perform skills or answer questions orally or in writing while being observed. Students may perform skill, interpret diagnostic materials or respond to short questions or case studies. This type of examination is also known as a multiple station assessment test (8, 10). Currently OSPE is not included as an assessment tool in government and private colleges. It would be useful to study the feasibility of introducing OSPE in private as well as public training schools. Currently, no information is available on the feasibility of OSPE as a method of assessing clinical performance of nurse students in Ethiopia. During OSPE, the performance of the student on basic skills will be assessed as this will provide an overview of the competency of students. In conjunction with OSPE some of the determinants factors that affect skill development of students will be investigated. Among the factors to be studied are how

students are taught clinical skills and on whether the practical skill learning sites meet the needs of the students or not.

Few studies done in the past had primarily focused on the relevancy of the curriculum, availability of learning facilities such as demonstration rooms, classrooms, teaching learning process, student characteristics etc (2, 3). What makes this study different from previous studies is that it tries to assess the feasibility of a new practical assessment tool (OSPE) which will assist in fostering clinical competence among nurse students. OSPE is not meant to replace existing assessment methods but to provide an additional tool in assessing skill performance of students. It can be used during formative as well as summative assessment of the students. Nursing educators have indicated that the more different types of assessment tools are used the better students performance is measured and the more they are motivated to learn (4, 6).

1.3. Research questions

On the basis of the research problem addressed in the study the following research questions were formulated

Is OSPE feasible in terms of time, space, facilities and acceptability by staff and students as an assessment tool?

What is the level of clinical performance of final year diploma nurse students using OSPE?

What is the perception of staff and students on the advantages and disadvantages of OSPE?

What is the opinion of students on how clinical skills were taught in their respective institutions?

What are the main educational barriers to skill training?

1.4. Significance of the study

If OSPE is found to be feasible, it can be introduced as an additional tool to assess clinical performance and there by improve clinical skill training

In OSPE students will have a formative assessment tool to help them identify their skill deficiency and instructors will have a tool to identify students who need additional training

Training institutions can improve the teaching learning process by identifying barriers to skill development

Introducing OSPE as an additional clinical assessment tool assists decision makers in their effort to improve the quality of nurses' education particularly in the domain of practical training

It will contribute to the development of nursing research as it is related to improve the nursing practice.

II. Literature review

Objective Structured Practical Examination (OSPE) was introduced as an assessment stool in nursing in many countries particularly in South-east Asia. It is considered to be superior to traditional methods of examinations (6,8,11,12). Objective Structured Practical Examination is found to test uniformly and objectively all students who took up practical examination in a given place (6, 7, 8). Through OSPE one gets a reasonable idea of the extent of student achievement in every practical skill related to nursing (6,7).

It was also reported to assess a wide range of nursing competencies and skills in a short period of time (6,8,13). Since OSPE is based on checklist, it makes the assessment more objective (6,7,8). Besides, it is found to provide immediate feedback to students and help them in correcting teaching learning errors (6,8).

A United Kingdom study found out that OSPE allows self-evaluation in which the actual performance of students is reviewed through video- recording (14). Another similar study showed that video-recording to assess OSPE performance was seen as extremely relevant experience by nurse students, instructors and external examiners (15). Studies carried out on the feasibility of OSPE showed that it takes more time and requires more effort, and team work on part of teachers to prepare the examination (6,7). However, such disadvantage is minimized once it becomes a regular feature of the school in which OSPE banks can be created and revised (6, 16). Another reported drawback of OSPE was that there is compartmentalization of knowledge and holistic approach towards the patient is not tested (6, 7). Since OSPE is used in simulated condition it may not reflect real life experience (8, 17). Besides, some educators feel that OSPE focuses more on assessment of basic and technical skills rather than complex cognitive skills (15). However, despite such drawbacks, OSPE is

considered as a measuring tool which closely approximates an objective evaluation of clinical skills (6, 7, 8). And using OSPE as an additional tool to the already existing assessment tools enables examiners to assess the multiplicity of skills of students in a given situation (8).

Experience from nursing colleges in South-east Asia indicates since its introduction, OSPE was found a useful tool in evaluating clinical performance of nurse students during their entire period of training (8, 16). As it is routinely used as an assessment tool, it is being continuously refined and modified (8, 16). The Asian experience also showed that after each OSPE, the process of skill learning is investigated to identify problems in the teaching learning process and thus assist in improving quality of learning (16). Different training institutions have different experiences in using OSPE, but experience so far from Ethiopia is lacking as it is not being yet introduced as an assessment tool in nurse training institutions.

III. Objective of the study

3.1. General objective

To assess the feasibility and clinical performance of final year diploma nurse students using OSPE

3.2. Specific objectives

The specific objectives of the study were to:

1. Assess the feasibility of OSPE in terms of its practicability within the educational set up of the institution.
2. Assess the clinical performance of diploma students on basic nursing skills using OSPE.
3. Identify the specific deficiencies of students while performing the procedure based on the checklist
4. Identify educational barriers that affect the students in learning essential skills.

IV. Methods and Materials

4.1. Study area

The study sites were Menlik II Health Science College and Central University Health Science College Lanchia Campus. The former was a government institution while the later one was private. Both institutions were located in Addis Ababa and they train different types of health professionals including diploma nurse students. The two training institution were selected for the study because they were accessible and were willing to provide their facilities for the study. In addition, these were the institutions where there were final year diploma nurse students during the study period. The study was done from March to May 2011 G.C.

4.2. Study design

Since the study was done at a point in time, it was a descriptive cross-sectional. The study used quantitative and qualitative approaches to answer the underlined research questions.

4.3. Study Subjects

The source populations were all nursing students and staff working in the study sites. The study populations were final year diploma nursing students and staff who taught practical nursing procedures

4.4. Eligibility Criteria

4.4.1. Inclusion criteria

Final year diploma nursing students

Those enrolled in the regular program

Staff who were teaching or supervising practical clinical training

Staffs who were permanent employee of the institutions

4.4.2. Exclusion criteria

Nurse students who were not final year and upgrading

Those who attended extension programs at night or weekends

Nurse students who were previously health assistants

Staff who were teaching on a part time basis

4.5. Sample size

In Menilik all 16 final year students were included in the study. In Central based on the experience of Menilik taking into account the time it took to conduct OSPE and the size of the demonstration room a maximum of 20 students from Central University were taken

In the 2 sites a total of 36 students participated in the study and this number was considered enough to assess the feasibility of OSPE on the bases of availability of time and space of the demonstration room. In each study site there were 6 examiners, 1 time keeper and 1 supervisor.

4.6. Sampling Procedure

Among government and private health science colleges Menilik and Central were selected using convenience non probability sampling. Convenience sampling was used because during the study period, the study participants were available in the two institutions. In addition, the study sites were accessible and the study participants were willing to participate in the study. As indicated earlier all 16 students in Menilik were included in the study. In Central there were three campuses and Lanchia Campus was selected randomly. Out of the 35 students in Lanchia Campus 20 were chosen by simple random sampling.

4.7. Data collecting instruments and methods

4.7.1. Quantitative method

Socio-demographic variables, student response on skill development and on the teaching learning environment for clinical practice was collected using a structured questionnaire which was developed for this purpose. To assess the skill of the students an appropriate check list which contained a list of steps needed to perform the procedure in a correct sequence was already available. The checklist was prepared by the staff of the Department of Nursing at Defense University College of Health Sciences, as per standard nursing manual procedure (annex II). The check list indicated if each step was performed correctly or not but also assessed the quality of the performance using a rating score. A check list was also prepared to assess the demonstration rooms in meeting the practical training needs of the students.

The method of data collection for quantitative variables was self administered questionnaire and direct observation. Self administered questionnaire was preferred in order to minimize response and interviewer`s bias. After orientation the questionnaire was distributed before and after OSPE was conducted. In assessing skill performance, the examiner used the prepared checklist to observe the performance of the student. The adequacy of the demonstration centre for clinical training was assessed through observation.

4.7.2. Qualitative method

To find out the feasibility of OSPE information on lived experience of students and examiners in regard to time allocated for the examination, resource required, relevance, organization and process of the examination, appropriateness of the checklist and so on was collected through Focus Group discussion (FGD).

The numbers of FGDs were determined by the level of information saturation reached. Eight students participated in each FGD. In Menilik and Central two FGDs for students was organized in each site. In Central out of the 20 students those who were willing and able to provide rich information on the subject to be discussed were included. All examiners in each site formed one FGD. In each FGD there was a facilitator and a recorder. All information discussed was written on a note. Each FGD was carried out for half an hour and was held immediately after OSPE was completed.

The major theme in FGD with staff and students was on the feasibility of OSPE and their perception to OSPE. Feasibility was discussed in terms of organization of OSPE, administration of examination; time allocated for the examination, availability of resource, and acceptability of OSPE by staff. Perception of students was focused on the relevancy of the procedures and questions, time given to each station, on the use of checklist, on the number of procedures to be examined, on the role of the examiner and the way the examination was conducted.

4.8. Variables

4.8.1. Quantitative variables

Socio-demographic: age, sex, religion, type of training institutions, number of students and clinical instructors

Clinical performance assessment: number of tasks correctly performed and identified; mean score achieved in each competencies, specific deficiencies identified

Feasibility: time required for OSPE, maximum number of stations to be organized in each site; availability of space; adequacy of demonstration rooms and equipments, materials, anatomical models, other learning aids; and number of assessors

Response of students and instructors to OSPE: the relevancy of OSPE as an assessment tool; way of organization; attitude of students and instructors to OSPE; advantages and disadvantages of OSPE

Investigators observation: time required for each step in OSPE; space availability; layout of the examination, problems identified in OSPE organization and process

Student response on skill training: the way the coaching technique in skill training was conducted by the clinical instructor this includes whether the instructor demonstrated a new procedure being taught; whether the instructor explained while performing the procedure; whether instructor allowed the student to re-demonstrate and provide feedback or not; and barriers to skill training

Student response on practical learning sites: availability and type of patients to provide students adequate learning opportunities to practice; accessibility of teaching sites in terms of transport and time; regularity of supervision; availability of medical supplies, materials and equipments; support from the health facility where the students were attached.

4.8.2. Qualitative variables

Data on students and clinical examiners perception on the organization, process, and feasibility of OSPE in terms of resource such as the duration of the examination, availability of equipments, materials and appropriateness of the checklist was collected. In addition, the usefulness and problems of OSPE as an assessment tool and the reasons for less focus on skill training was discussed.

4.9. General procedures in the organization of Objective Structured Practical Examination

In order to organize an OSPE one has to spell out objectives of practical experiences in a given discipline related to particular subject such as practical examination in medical surgical. Each nurse student was supposed to demonstrate practical skill; make accurate observations; analyze and interpret data; identify patient problem and plan alternative nursing interventions. To describe the organization in detail some examples are given as follows:

Demonstrate practical skill

The student was assigned to monitor and record oral temperature

Make correct and accurate observations

The student was assigned to identify correctly common surgical instruments and different types of rubber tubes according to their use

Analyze and interpret data

The student was assigned to interpret the weight of a child in a growth monitoring chart

Identify patient problem

The nurse student was assigned to identify patient problem and set priority so as to cater to the immediate needs of the patient such as to identify dyspnoea on the basis of her observation

Plan alternative nursing intervention in a given situation

The nurse student was assigned to plan nursing intervention for example in case of air way obstruction keeps the patient in side lying position; do oropharyngeal suction; check and record vital signs and so on

4.9.1. Organization of Objective Structured Practical Examination in the study area

In this study 10 essential competencies that the diploma nurse must perform were identified by clinical instructors at the Defense College of Health Sciences (DCHS) Department of Nursing. The 10 competencies were selected because they were basic clinical skills that a final year diploma nurse must perform. The selected clinical skills were:

Checking and recording oral temperature

Identify different types of surgical instruments

Checking and recording blood pressure

Administering IM injection

Nursing intervention for air way obstruction

Managing 3rd stage of labor

Identifying different types of rubber tubes according to their use

Interpret the type of fever from a given chart.

Reading and interpret growth monitoring chart.

Clean wound dressing

Among 10 competencies assessed 6 were psychomotor and 4 were cognitive skills.

Types of stations

In order to have a comprehensive appraisal of the student performance during OSPE, different types of stations were planned and organized alternatively.

There were two types of stations and these were:

Procedural station

In this case it required a student to perform a task e.g. monitoring of oral temperature. When the student performed the task, simultaneously the student was being observed and marked against a checklist which was prepared in advance by a silent but vigilant instructor. Eventually a student got a score according to the skill demonstrated.

Question station

In this station the student answered the question being asked on an answer sheet provided and left the answer sheet in the specified place.

4.9.2. Procedures on how the examination was conducted

The stations were arranged in circles with a time keeper sitting at the centre. In this study the stations were arranged in the following way:

Station 1: Checking and monitoring oral temperature

Station 2: Identify different types of surgical instruments

Station 3: Checking and recording blood pressure

Station 4: Administering IM injection

Station 5: Manage the air way obstruction

Station 6: Managing 3rd stage of labor

Station 7: Identify different types of rubber tubes according to their use

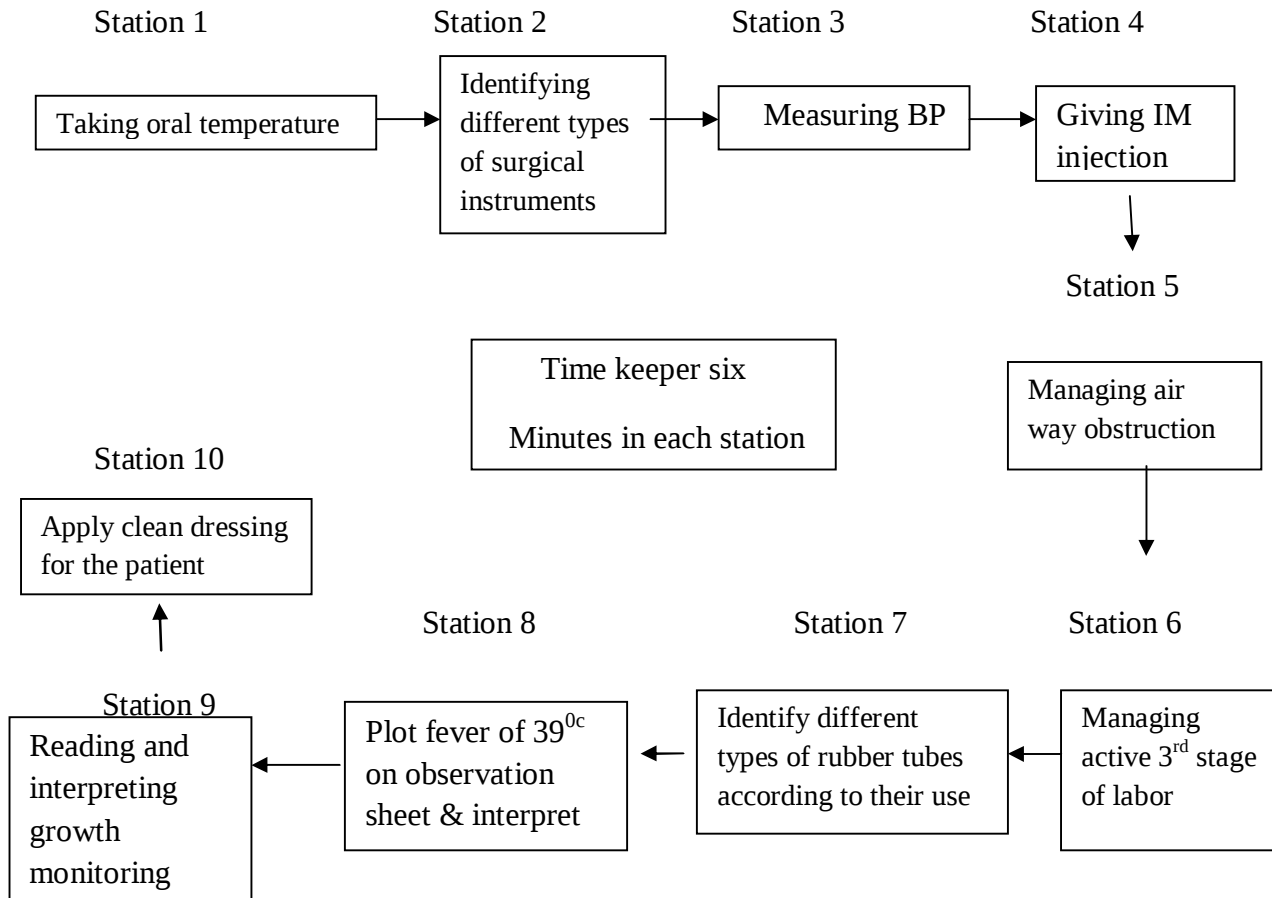
Station 8: Interpret type of fever from a given chart

Station 9: Read and interpret a growth monitoring chart

Station 10: Do clean wound dressing for the patient

In station 3 a student was used instead of a doll. In station 1, 4, 5, 6, and 10 dolls that closely simulate the human body were employed. In stations 2 and 7 different types of rubber tubes such as folly- catheter, N/G tube, endotracheal tube and rectal tube etc and surgical instruments were displayed on a table in front of the student. And in station 8 and 9 students were given to plot and interpret fever; read and interpret weight of a child.

Figure 1: Organizational arrangement of the stations



Examination procedure

The examination was performed in an orderly way. During the conduct of the examination the following steps were followed:

1. Students had their uniforms and were gathered in a hall
2. Each student was instructed to keep his/her code number carefully and clipped to the uniform throughout the examination
3. Orientation on the purpose, organization and process on how the examination was given in detail

4. The first 10 students who were seated in the front were assigned to each station while the rest remained in the hall until the group finishes the examination and left the place.
5. At each station each student will had 6 minutes to perform the procedure or answer the questions and as the bell rung the student moved to the next station.
6. At each procedural station an instructor silently but vigilantly observed the performance of the student using a checklist prepared for the purpose (annex). The instructor either stood or sat near to the student where a good view of what was being performed was observed.
7. The objectivity in assessment was achieved by getting each component tested at one particular station and had the students rotate through all the stations.

Scoring in OSPE

For each specific skill, a checklist was prepared by breaking the skill being tested into essential steps and score assigned to each step which was proportional to the importance of the step related to a particular procedure.

At the end of OSPE the checklist was filled by the examiners pertaining to a given candidate and the answer sheets were put together to give the final score. The 6 examiners and the supervisor sat at the end of the OSPE to discuss lessons learned and feedback was given at end.

4.10. Operational definition

Checklist: A list of steps needed to perform a skill correctly given in correct sequence.

Coaching: Is an essential element of competency based training which is learning by doing; it is the way in which the instructor follows to help the student learn the skill

Competency: Means the learner acquires essential skills and attitudinal concepts needed to perform a job

Feasibility: Applicability; practicability; capability of being accomplished; this includes time it takes to plan, prepare and organize OSPE; availability of resources; acceptability of OSPE by students and instructors; and ability of OSPE to assess clinical performance in the study areas.

Objectivity: A test is objective if the same performance is scored equally by different observers; it is the use of predetermined checklist

Objective structured practical examination: Is a method of assessing clinical skill and knowledge of students using a checklist. In OSPE students rotate through multiple stations and are assessed by examiner using direct observation in a similar way. The amount of time each student can remain in a station is limited and all students are assessed to the same standard and are tested on the same skill and knowledge.

Reliability: All students are tested on same or similar patients or procedures by the same examiners.

Skill: The ability of the student to perform a group of steps or tasks correctly

Validity: A test is valid if it measures what is intended to measure

Quality of nursing education: The provision of nursing education that helps the nurse to be

compatible with the health care system and respond to the health needs of the community

adequately

Assessment: A process to determine whether students have achieved the learning objectives

Clinical skill: Skill that involve the abilities to assess a patient's situation, decide what action is needed and design and implement strategy

Skill assessment: Determining the ability of students to perform essential skills

4.11. Data quality assurance

The prepared structured questionnaire was pre tested among diploma students at DUCHS and modified before being applied to the study participants. The OSPE including the checklists was already pretested among diploma students of the DUCHS. The checklist was constructed in such a way to help the examiner evaluate and record the performance of the student. It was developed taking into account the steps needed to perform the skill. Adequate time was given in the planning and implantation of OSPE. During the conduct of OSPE there was continuous supervision to make sure the examination was conducted properly. One instructor was assigned to supervise the organization and flow of the work. The required resources such as checklists, questionnaires, equipments, materials, dolls etc were prepared in advance. Orientation was given to students and examiners on how the examination was to proceed.

Information collected was processed manually to make sure that the data was accurate and ready for analysis.

4.12. Data processing and analysis

The data was entered and analyzed using SPSS 16 and manually. Proportions, percentages, means and standard deviations were calculated. Data were entered into appropriate relative frequency tables for analysis. The qualitative data was analyzed using techniques such as immersion, coding, exploring thematic areas and interpretation of data. Initially the information obtained during the FGDs was listed and each category was explored to identify subthemes. Variations and similarities in each subtheme were observed. Table was constructed in a form that permits analysis of the data in a meaningful way.

4.13. Ethical considerations

The study was conducted after getting ethical clearance from institutional review board (IRB), Addis Ababa University, College of Health Science Department of Nursing. Support letter was obtained from Addis Ababa University to respective health institutions for their cooperation during the conduct of the study. Informed written consent was obtained from the study participants after explaining the purpose and usefulness of the study including its benefits and risks. Authorization to use video camera was received from the study participants and the institution. Anonymity of study subjects during clinical performance was protected by assigning a code number. Information obtained from study participants to ensure confidentiality was kept in a locked place. At the end of the study, the result will be communicated to students, staff and respective institutions.

V. Result

Feasibility is a process. It starts with assessing clinical performance using OSPE, explores the experience of students and instructors, and investigates the practicability of OSPE in the study areas. Thus, the finding of the study is presented in a systematic way based on the underlined process. Among 36 students who participated in the study the majority 27(75.0%) were females. Their mean age was 21.7 years with SD 3.3 and a median of 21 years. The study subjects were predominantly Christians33 (91.7%).

5.1. Clinical performance of diploma students on basic nursing skills using OSPE

All 36 students were assessed using OSPE on 6 essential nursing procedures. The 6 core competencies were taking oral temperature, measuring blood pressure, administering IM injection; managing 3rd stage of labor after baby is delivered, managing airway obstruction and clean wound dressing.

Table 1 shows total tasks expected to be performed and those tasks correctly performed. The total tasks were calculated by multiplying the number of students with the number of tasks to be performed in each checklist. Of the expected 1872 tasks, 252 tasks were on taking oral temperature, 288 measuring blood pressure, 396 administering IM injection, 360 managing 3rd stage of labor, 216 managing airway obstruction and 360 on clean wound dressing. Out of the 1872 total tasks expected 886 (47.3%) of the tasks were carried out correctly. Regarding performance of specific procedures 129(51.2%) tasks on taking oral temperature, 217(75.3%) tasks on measuring blood pressure, and 193(48.7%) tasks on administering IM injection were performed correctly. In addition, 121(33.6%) tasks on managing 3rd stage of labor, 88(40.7%) tasks on managing air way obstruction and 138(38.3%) tasks on clean

wound dressing were correctly carried out. Moreover, each student in the 6 clinical procedures was expected to perform correctly 52 steps. The maximum steps correctly performed by a student were 35(67.3%) and the minimum were 9(17.3%). Of the 36 students the majority 24(66.7%) performed 25% to 49% of the total tasks correctly whereas 10 had a score from 50% to 75%.The rest 2 students had a score below 25% and there was no student who did all the tasks correctly (Please see Annex III for the detailed result of students on the 1872 tasks).

Table 1: Number of tasks correctly performed by diploma nursing students in schools of nursing in Addis Ababa, Ethiopia, 2011

Procedure	Number of Steps	Total tasks expected to be performed	Correctly performed			
			Yes		No	
			Number	%	Number	%
Taking oral temperature	7	252	129	51.2	123	48.8
Measuring blood pressure	8	288	217	75.3	71	24.7
Administering IM injection	11	396	193	48.7	203	51.3
Managing 3 rd stage of labor	10	360	121	33.6	239	66.4
Managing airway obstruction	6	216	88	40.7	128	59.3
Clean wound dressing	10	360	138	38.3	222	61.7
Total	52	1872	886	47.3	986	52.7

5.2. Specific deficiencies of students while performing the procedure

Table 2 shows specific deficiencies identified while the students were performing the clinical procedures based on the checklist. Major deficiencies observed in the management of 3rd stage of labor were palpating the abdomen to rule out the presence of another baby 35(97.2%) and inspecting placenta and membrane completely 34(94.4%). In clean wound dressing the major ones were recording the procedure 32(88.9%), assisting the patient on a convenient place 32(88.9%), wash hands 29(80.6%) and place patient on comfortable position 24(66.7%). In managing airway obstruction most common observed deficiencies were inform doctor 32 (88.9%), tilt patient to one side 31(86.1%) and checking vital signs 29(80.6%).

Table 2: Specific tasks not performed by diploma nursing students in schools of nursing in Addis Ababa, Ethiopia, 2011. (n=36)

Clinical procedures	Major specific deficiencies	
	No	%
Taking oral temperature		
Brings down the level of mercury near the bulb end	24	66.7
Removes and wipes to dry thermometer	21	58.3
Measuring blood pressure		
Reading, recording immediately date and time	27	75.0
Administering IM injection		
Record date, time, route and dosage	27	75.0
Techniques of aspirating blood before giving the drug	26	72.2
Message the site	25	69.4
Managing 3rd stage of labor		
Palpate abdomen to rule out presence of another baby	35	97.2
Inspect placenta and membrane & check for perineal tear	34	94.4
Guide the uterus with left hand & pull out with right hand gently	26	72.2
Hold cord clamp in one hand while pushing with other hand	24	66.7
Managing airway obstruction		
Inform doctor	32	88.9
Tilt patient to one side	31	86.1
Check and record vital signs	29	80.6
Clean wound dressing		
Record the procedure	32	88.9
Assist patient on a convenient place	32	88.9
Wash hands	29	80.6
Place patient on a comfortable position	24	66.7

5.3. Measuring performance score using Objective Structured Practical Examination

Table 3 indicates the mean performance score of the 36 students for the different clinical procedures. Students scored high in measuring blood pressure. Very low score was achieved in managing 3rd stage of labor, clean wound dressing, managing airway obstruction and administering IM injection. Although performance score was low for all competencies except for taking blood pressure, high individual variation was observed in some competencies such as in managing airway obstruction, administering IM injection and in clean wound dressing.

Table 3: Mean score achieved by the students while performing the specific procedures

Clinical procedures	Maximum achievable score	$\bar{x}$ score achieved	SD
Taking oral temperature	6	3.52	1.30
Measuring BP	8	6.74	1.28
Administering IM injection	12	7.30	2.30
Managing 3 rd stage of labor	12	5.09	1.55
Managing airway obstruction	8	4.13	2.80
Clean wound dressing	12	5.86	2.10

5.4. Assessing Cognitive skill using Objective Structured Practical Examination

Table 4 shows major deficiencies identified at the non observable stations. Among surgical instruments and rubber tubes that were unidentified by majority of students were clip applier and remover, blade holder, dressing forceps and rectal tube. In addition, not able to read growth monitoring chart and interpret temperature value were most identified deficiencies.

In cognitive skill each student was expected to identify 9 surgical instruments and 5 different types of rubber tubes. In addition, the student had to answer 4 questions, 2 on temperature and 2 on growth monitoring. Thus, each student was expected to answer 18 questions correctly. There was no student who answered all the questions. The maximum score achieved by 4 students was 61.1% and the rest 32 scored below 61.1%.

Table 4: Major cognitive skill deficiencies identified at the question stations(n=36)

Instruments/ materials and charts	Major cognitive deficiencies	
	No	%
Surgical instruments		
Clip applier and remover	33	91.7
Blade holder	29	80.6
Dressing forceps	28	77.8
Tissue/Thumb forceps	22	61.1
Types of rubber tubes		
Recta tube	26	72.2
Endotracheal tube	24	66.7
Folly (indwelling) catheter	19	52.8
Read interpret growth chart		
Read	31	86.1
Interpret	20	55.6
Plot and interpret temperature		
Interpret	27	75.0

5.5. Feasibility of Objective Structured Practical Examination

5.5.1. Quantitative findings on response of students on the importance of Objective Structured Practical Examination

After participating in OSPE students reported OSPE to have many advantages and one of them was its ability to prepare students for final practical examination. Most common reported disadvantage was inability of the student to communicate with examiner. In addition, in station one out of 16 students 15 and in station two 8 out of 20 reported shortage of time in performing management of 3rd stage of labor, clean wound dressing and management of airway obstruction.

Table 5: Response of students on advantages and disadvantages of OSPE based on their experience(n=36)

Response variable	No	%
Advantages of OSPE		
Prepares students for final practical examination	36	100.0
Assesses students performance correctly	32	88.9
Assesses students in a similar way	26	72.2
Feedback is given immediately	23	63.9
Assesses many skills at the same time	22	61.1
No teacher subjectivity	19	52.8
Uses checklist	17	47.2
Disadvantages		
No communication between student and examiner	22	61.1
No communication between student and patient	20	55.6
Uses simulation models instead of patients	13	36.1
It does not assess attitude	11	30.6

5.5.2. Qualitative findings on experience of students and instructors on Objective Structured Practical Examination

The finding in the qualitative study indicates that students and instructors experience in OSPE was positive. Both viewed OSPE as a useful clinical assessment tool.

Table 6: Theme, supporting themes and participants description on their experience on Objective Structured Practical Examination

Theme	Supporting theme	Participants description on their experience
Instructors and students reported OSPE as a useful assessment tool in practical clinical nursing	Instructors stated if OSPE is introduced it helps in the teaching learning process as it identifies skill deficiency immediately and feed back is given. It differentiates between strong and weak students and assesses the need for additional training. If introduced early it can change the attitude of our staff to focus on skill. Instructors also stated “OSPE is different from the present clinical examination method because student’s performance is assessed using checklist; all students are assessed similar skills; many skills are assessed at the same time”. Students reported that OSPE can assess the students’ skill much better and it helps us to learn by	The instructors experience in OSPE was reported by stating we have found it how OSPE is useful in assessing our students’ clinical skill performance. We have come to realize through OSPE how weak our students were in their ability to perform basic nursing procedures. In the conventional examination method it is difficult to assess them properly as grades are grossly inflated The students reflected their experience by stating if OSPE was introduced early our skill performance would be better by now and our instructors

	identifying our deficiencies. It can prepare us for our final qualification examination and helps us to focus on skill. Moreover, it helps us to get familiarized with surgical equipments and materials and the experience has helped us to build our confidence Main problem identified by students and assessors were students were not allowed to communicate with examiner or patients. This makes it difficult to assess communication skill and attitude and fragments the holistic approach in nursing	would have paid much attention to our skill training; currently we know our level of performance is not that much
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5.5.3. Practicability of Objective Structured Practical Examination

Instructors and students response

There were 16 instructors involved in the study. In each demonstration room there were 8 instructors; 6 were assessors 1 was a coordinator and 1 time keeper. All instructors stated that OSPE was well organized and coordinated and reported that the clinical problems distributed in the ten stations were relevant. Moreover, out of 36 students, 28(77.8%) stated OSPE was well organized and 32(88.9%) indicated that the competencies assessed were relevant. In addition, 34(94.4%) suggested OSPE be included as a formative and summative clinical assessment tool.

Result from the qualitative findings indicated the feasibility of OSPE in the study areas. However, in a small set up where the numbers of students are more than 20 OSPE is not feasible. In such a situation it needs additional resource in terms of number of instructors, facilities and space. During FGD instructors and managers indicated the constraints identified can be overcome with existing institutional resource.

Table 7: Theme, supporting theme and participant's description on feasibility of Objective Structured Practical Examination

Theme	Supporting theme	Participants' description
Instructors after their experience with OSPE came to a full understanding that OSPE is feasible and can be introduced as a formative assessment tool in clinical nursing	Instructors stated that: OSPE was well organized and the layout of the examination and the process was smooth. The necessary equipments, materials and models were available The space and time was adequate to examine the study subjects The checklist particularly the scoring system was new and did not pose any problem and the checklist can be done even by inexperienced instructor The competencies examined were relevant. On issue of introducing OSPE into their respective institutions it was stated commitment of staff, mobilizing additional resource, management follow-up and support would be crucial.	The instructors experience on feasibility of OSPE was described by stating since OSPE is a useful clinical assessment tool it has to be introduced immediately; if it is implemented we can refine and develop it to meet our institutional need and the constrains identified can be overcome as follows: In case there are many students halls or empty wards can be used to organize OSPE Additional instructors during OSPE from existing hospital staff or from other institutions could be available(sharing of resources)

	In addition, time availability for the staff to prepare OSPE and checklists is also an issue to be considered The students also indicated it was well organized. The equipments and materials were ready so we did not have to look around. Although we were not used to this type of examination the process went smoothly Time to do most of the competencies was adequate. The problems mentioned by instructors and students were: The instructors stated it would be difficult to conduct OSPE when the number of students are many and when there are inadequate equipments, materials and anatomical models The available space will not accommodate if many students are to be examined It took long time to examine few students so time would be a serious issue if there are many classes There was delay to start the examination as the layout of the stations had to be checked and checklists had to be distributed Inability to communicate with the examiner was observed as a problem	Staff motivation can be enhanced by organizing OSPE where all instructors participate and activities are videotaped Time could be more available by studying how much time is utilized by the instructor in teaching to make sure there is enough time to prepare and organize OSPE Additional resource could be available to buy equipments and materials from the available budget. The students experience in terms of organization and conduct of the examination was expressed by stating “it is our first time to see how OSPE is organized and conducted. The way the stations are arranged in a circle where each student has to move from station to station after the bell rings is exciting and practical. The examination was moving fast and smoothly, and within a short time we are able to demonstrate different types of procedures and all of us were
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	Students stated the time we had to wait in a closed space until the other batch finishes was long and boring They also stated since it was our first exposure to this type of examination we were somehow stressed	assessed for the same competency by the same instructor”.
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5.5.4. Researcher observation

Time usage

Objective Structured Practical Examination process took a total of 290 minutes (4 hours 50 minutes) in each demonstration site to examine the students. The time duration for examining 16 students and 20 students in the respective demonstration rooms was the same. As shown in the graph, 41.4% of the total time was used to perform clinical procedures and 15.5% for orientation and checking stations, formats and checklist

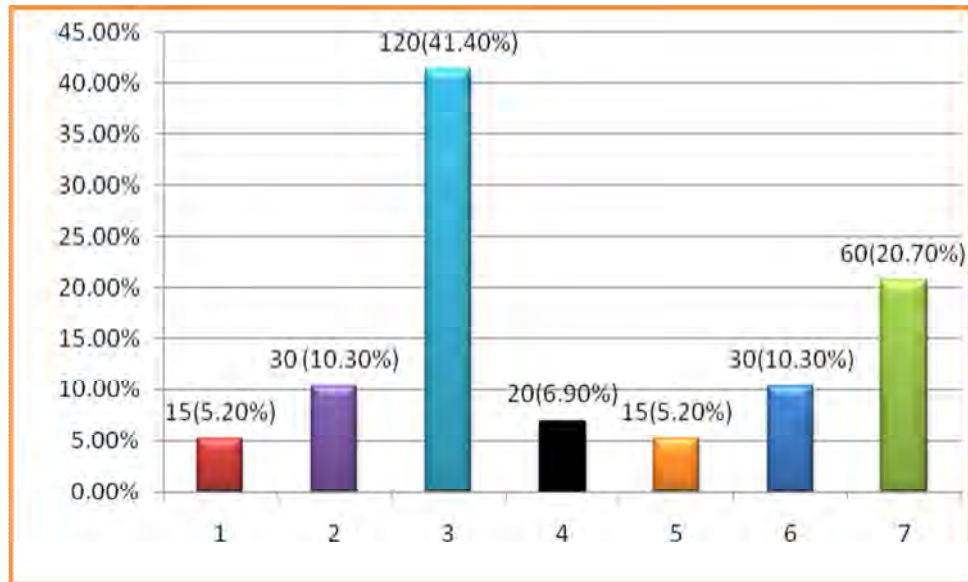


Figure 2 Graph showing the percentage of time spent at different stage of OSPE out of 290 minutes

KEY

- Checking stations, formats and checklist
- Orientation of instructors, students and time keeper
- Clinical procedures
- Time interval to move from one to another station
- Students entering and leaving OSPE room
- Grade analysis and identifying deficiencies
- Giving feed back to each student

Demonstration rooms

Both demonstration rooms were adequate to conduct OSPE how ever one was slightly bigger than the other. Each room was able to handle a maximum of 10 stations at one point. But if more than 10 stations were to be organized then much bigger rooms would be needed. Objective Structured Practical Examination requires a large room since it is organized in a circle so that there is a free movement of students from one station to another. The space, equipments and materials available in each demonstration room could only be used to examine a maximum of 20 students within the allocated time.

Organization

Objective Structured Practical Examination requires careful planning, coordination and team work. It was a formidable undertaking and it cannot be done by a single instructor. It was time consuming. The checklists had to be developed; the necessary equipments and materials had to be supplied; instructors and students had to be on time. Once the stations and assessment tools were prepared, conducting the examination and providing feedback to students was found less laborious.

Observed factors

During the process of OSPE certain factors were observed. Examiners felt fatigue as the examination had to be done uninterrupted for a long time. Since students had to stay in a room isolated until the other batch completes the examination, they were bored waiting. During the orientation students felt uneasy because they sought the assessment score would be included in their overall score. However, their anxiety subsided when they were informed by their program heads.

5.6. Identified barriers to skill training

Table 8 shows barriers in the teaching learning process. In the coaching technique the main problem reported was instructor did not always give the chance to students to re-demonstrate what they had learnt. In the practical teaching site problems related to regular supervision and support from health staff working in those facilities were mentioned.

In addition, the finding showed of the 36 students 24(66.7%) reported instructors' problem and 15(41.7%) inadequate facilities as main learning barriers in skill training.

Table 8: Types of learning barriers identified by final year diploma nursing students (n=36)

	Always	
Barriers to skill training	No	%
Coaching technique		
Does instructor explains procedure before demonstrating	22	61.1
Does instructor demonstrates procedure	14	38.9
Does instructor allows the student to re-demonstrate	15	41.7
Does the instructor corrects immediately	20	55.6
Does instructor gives feedback	17	47.2
Does the instructor provides checklist	16	44.4
Teaching practice site		
Do you arrive at practice site most of the time	19	52.8
Do you get enough patients to practice in most of time	22	61.1
Do you see a different type of cases in most of the time	16	44.4
Do health staffs at practical site provide support in most of time	13	36.1
Is supervision carried out regularly in most of time	12	33.3
Do you face shortage drugs/materials at practical training site	30	83.3

VI. Discussion

The present paper describes the implementation of a new method of assessment of basic nursing clinical skills among graduating diploma students. The fact that it was possible to assess clinical performance of students using OSPE demonstrated its feasibility. Instructors and students attitude towards OSPE in both training institutions was highly positive. They stated OSPE was well organized and coordinated. Besides, the competencies assessed were relevant and the tool used was appropriate.

In this study the overall clinical competency of the students was weak. All the basic clinical competencies except for measuring blood pressure were performed inadequately. Among the six clinical competencies assessed, managing 3rd stage of labor, clean wound dressing, managing airway obstruction and administering IM injection were poorly performed. In addition, 31(86.1%) and 27(75.0%) of the students were unable to read the growth monitoring chart and interpret patient temperature respectively. Moreover, 24 out of 36 students scored between 25% and 49 % in clinical performance. The findings indicated a serious gap in clinical skill training. What is most worrisome is that these competencies assessed were essential and life saving that the diploma student must perform competently. Some studies have shown clinical performance in OSPE could be affected by unrealistic time allocation to undertake tasks, noise distraction from other stations and fear of participants (18, 19, 20). However, in this study unrealistic time allocation and noise disturbance were not considered as possible factors. Although OSPE might have provoked fear it was unlikely that it would have prevented them from demonstrating their abilities. This is supported by the view of instructors who stated that the clinical performance of the students was weak. Besides, 32(88.9%) of the students said that OSPE had correctly assessed their clinical

performance. Moreover, in the FGD students had acknowledged that they were deficient in clinical performance.

Skill deficiencies among health professionals is widely reported in many institutions (2, 3) Unpublished report of COC showed problem of clinical performance among graduate nurses (21). In a study conduct at DUCHS to revise the curriculum, clinical skill deficiency was found a major problem among graduates (3). Training need analysis done among 700 doctors in 79 hospitals in Ethiopia indicated doctors perceived that their practical pre service training did not prepare them to perform live saving clinical procedures adequately (22). Acquiring clinical skills is essential for a nurse not only it maintains professional standard but also enables the nurse to provide the best possible patient care (23).

In the FGD instructors stated one of the advantages of OSPE was its ability to identify students who were weak and strong. The ability of OSPE to identify students who needed additional training was also observed in some studies (8, 23). Moreover, students perceived OSPE if introduced could prepare them for their final qualifying practical examination. These findings demonstrate the acceptability of OSPE by the study participants and reflect the confidence the students have in OSPE. It is known that confidence building is an essential element of learning (18). In many colleges of nursing OSPE is used as a valid and reliable assessment tool because it tests students what they can do objectively rather than what they know (6, 8, 16). Although this study does not aim to compare methods of assessment, instructors reported that OSPE was much better than the progressive clinical assessment currently in use. The reason given was that in the conventional system grades are over inflated. Grade inflation is a common phenomenon and was reported as a problem in assessment (2, 3). When grades are over inflated the learning process is jeopardized as the student is less motivated to acquire the relevant skills.

In the result among the advantages of OSPE reported was its ability to provide feedback at the end of clinical performance. Because of this, OSPE is regarded as a driving force for learning particularly when used during formative assessment (8, 16). In a study involving emergency nurse practitioners, performance improvement was observed significantly ($p < 0.01$) after receiving additional training based on the specific deficiencies identified in OSPE (19). A similar study also showed feedback received at the end of OSPE increased the confidence of students in performing clinical skills (19). This supports the view of the students who stated the relevancy of OSPE in improving clinical performance.

In the study instructors and students stated that OSPE had limitations. Those limitations were inability of OSPE to assess communication skill and attitude of the student while performing the task. In addition, OSPE fragments the holistic approach in nursing as it focuses on performance. Such drawbacks in OSPE were also reported in other studies (8, 16, and 19). There is no perfect assessment tool; each has its advantages and limitations. This is why multiple methods have to be used to assess students. Study done in India showed a combination of OSPE and the conventional system of practical examination were found to be effective in addressing the drawbacks in each of them (8, 20). When two or more tools are used it enables the examiner to assess the multiplicity of skills in a given situation (20). In our view although OSPE has limitations, how OSPE can be modified to address those stated drawbacks can be further investigated. OSPE as an assessment tool has great potential for improvement and provides an opportunity in educational research; therefore it needs to be adopted by all training institutions that train nurses.

The ability of OSPE to assess clinical performance and the positive lived experience of the study participants indicates the feasibility of OSPE. OSPE was feasible in the study sites because the number of students to be assessed were few. But when the number of students is

more than 20 in a small set up then the feasibility of OSPE is in question and this problem was observed in other studies (16, 17). The question that needs to be answered is how OSPE can be organized when student number is large and the set up is small. One solution is to generate additional resource but this takes time the other is to mobilize resource from nearby institutions during the conduct of OSPE. When resource is available OSPE can be organized in multiple or in a single site with many stations. The purpose is to assess many students within a short time. Experience in India showed that for 20 stations organized assuming 5 minutes per station the examining time for 40 students was 4 hours (23). In our study it was almost 5 hours for 20 students in a single site. This is because the number of stations that could be organized was 10. Studies indicated when the numbers of stations are less, the time it takes is more (17, 18). During OSPE students assigned at the unobservable stations took a maximum of 3 minutes to answer the questions. Each student had an extra 3 minutes unutilized. It would be interesting to study how this extra time could be used to increase the number of students assessed. One way that could be tried is to organize two OSPE one for procedural and the other for question stations

The finding also showed that 23 out of 36 students reported shortage of time while performing clinical procedures. However, as indicated in the result all the 23 students reported shortage of time while performing management of 3rd stage of labor, clean wound dressing and management of airway obstruction. This shows the problem is not with shortage of time but with the difficulty in performing the procedures. In this study 6 minutes was given to each station and this was more than 5 minutes allocated in many studies (8, 16, 18). Besides, time shortage was mostly reported in one study site while not in the other.

Difficulty in preparing a checklist every time students are to be assessed was mentioned as a problem by instructors. But experience in other countries indicated that once checklists are

prepared a data bank can be established so that one does not have to be prepare again and again (7,14). In our experience OSPE requires resource, teamwork, coordination and management support to function. Each training institution has to find out the most efficient way of organizing OSPE so that many students could be assessed within short time.

As indicated earlier the study showed that the clinical performance of the students was weak. Among educational barriers, the teaching learning process was identified as an important one. Clinical instructors competency was perceived as inadequate by 24(66.7%) of the students. In addition, the focus of training was on classroom teaching rather than skill. Moreover, there was also a problem in the way clinical skill was taught. Students were not always given the chance to re-demonstrate the skill they were taught and there was a problem in getting feedback regarding clinical performance. Moreover there was a problem in coaching process. Proper coaching is an essential element in skill acquisition and later in skill development as it enables the students how successful they are in meeting the learning objectives (5, 7).It is essential that clinical instructors not only are competent but are also are trained in the art of clinical coaching which is an essential element of competency based training where the emphasis is learning by doing (5). Another barrier affecting skill training was the size, adequacy and accessibility of the demonstration rooms. Students indicated that demonstration rooms were not accessible always as such they were unable to practice what they were taught. Working in demonstration room or skill laboratory is essential as it allows students to learn and practice new skills. It also reduces stress for learner, risk of injury and discomfort to the patient (5).

In the finding problems related to clinical practice site such as shortage of drugs/materials, irregular supervision, getting support from the health staff and availability of different types of patients were mentioned. These problems were also observed in other studies (2,3).

Nursing educators have indicated that clinical practice sites if properly organized provide an excellent environment for learning (5, 7). It ensures students exposure to a variety and relevant clinical experiences (5). Training institutions must address seriously the problems seen in clinical practice sites. It is not just enough to send students but they have to make sure the necessary drugs/ materials are available and the staff working at the clinical practice sites is receptive to students coming to practice. Otherwise unwelcoming attitude can create a negative learning environment. In addition, patients must be available both in number and type so that the learning objectives that were taught are met. Close supervision is necessary so that the learning experience of the students is consistent with what is taught.

Finally the study had shown important finding regarding the feasibility of OSPE, level of clinical performance of students and educational barriers in skill development. The limitations of the study were the study participants were not representative of all diploma nurse students. In addition, competencies such as communication skill and attitude were not assessed.

VII. Conclusion

The result in this study showed the feasibility of OSPE as an assessment tool. However, when the numbers of students are many additional resources is required. Even when these resources are available alternative strategies of organizing OSPE should be investigated so that many students are assessed simultaneously at the same time. The study also showed instructors and students' attitude towards OSPE to be positive. They found OSPE to be a valuable instrument in identifying individual skill deficiencies and competencies.

Objective Structured Practical Examination as an objective assessment tool had demonstrated that the clinical performance of the students was weak. Except for measuring blood pressure, very poor performance was observed in managing 3rd stage of labor, clean wound dressing and managing airway obstruction. In addition, most students were unable to plot and interpret weight of a child on a growth monitoring chart and interpret temperature of a patient. The result showed a serious problem in the teaching learning process. Among determinants affecting skill training, competency of the instructor, problem in the coaching process and at clinical practice sites were mentioned.

VIII. Recommendations

Since OSPE was found feasible it should be introduced as an assessment tool in evaluating clinical performance of diploma nurse students

In small set ups where there are many students additional resource should be mobilized to conduct Objective Structured Practical Examination

Additional practical clinical training should be given on all the competencies assessed so that the diploma nurse acquires the relevant skill

Sustainability of OSPE requires management support, team work, staff commitment and coordination

In service training which focuses on improving clinical skill competency of clinical instructor's including the technique of coaching should be organized from time to time

The size and number of demonstration rooms should be increased and strengthened in relation to the number of students

Demonstration rooms should be accessible to students so that they can practice on their own

The sites for clinical practice should be strengthened in terms of regular supervision and support so that they are conducive to learning

Research is needed to test the modified version of OSPE whereby attitude and communication skills are assessed together with clinical competencies.

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Annexes

I: Instructor guideline during Objective Structured Practical Examination

1. Make sure equipments, materials, formats are ready at each station
2. Make sure that each student has got his own code number
3. At the procedural stations the examiner will have the corresponding check
4. Examiner will stand at a convenient place where there is a good view to observe the performance of the student clearly
5. Examiner will not communicate with the student as clinical performance is being assessed
6. Score is given for each task being performed based on the checklist
7. For each task being performed the weighted score will be:
 - Task not performed, the score will be 0
 - Partially performed task, the score will be 25% of the allotted score for each task
 - Half performed task, the score will be 50% of the allotted score for each task
 - Three quarter performed task, the score will be 75% of the allotted as per checklist
8. Examiner gives feedback to each student based on the identified deficiencies
9. Examiner will sit with other examiners to assess the performance of the students

II: Checklists on performance assessment of students using Objective Structured Practical Examination

Checklist format 001: checking oral temperature

Sex: M..... F..... Code No..... Time allowed for each procedure 5minutes.

Ser.No.	List of tasks to be performed	Allotted Score	Achieved Score
1	Rinses the thermometer in cold water & dry before placing in the mouth	1.0	
2	Wipes the thermometer from the bulb to stem	0.5	
3	Bring down the level of mercury in the thermometer near the bulb end	1.0	
4	Keeps the thermometer in the mouth for 3 minutes	1.0	
5	Removes & wipes to dry from the stem to bulb	1.0	
6	Reads the thermometer at eye level against light accurately	1.0	
7	Replaces the equipment in appropriate place after cleansing	0.5	
	Total	6.0	

Examiner's name -----

Signature-----

Date of examination-----

Checklist format 002: Measuring blood pressure

Sex: M..... F..... Code No.....

Ser.No.	List of tasks to be performed	Allotted score	Achieved score
1	Give the patient a comfortable positioning (lying down with arm resting on bed or sitting with arm supported on table).	1.0	
2	Applied deflated cuff evenly with rubber bladder over brachial artery, above the cubital fossa	1.0	
3	Palpates the brachial artery with finger tips	1.0	
4	Places the bell of stethoscope on the brachial pulse	1.0	
5	Inflates the cuff, and notes the reading on the manometer while the sound first begins (systolic)	1.0	
6	Continues to release the pressure slowly, and notes the point on the manometer where the sound eases(diastolic)	1.0	
7	Allow the air to escape till the mercury level falls to zero	1.0	
8	Records the reading immediately with the data and time	1.0	
9	Total	8.0	

Examiner's name -----

signature-----

Date of examination-----

Checklist format 003: administering intra-muscular injection

Sex: M..... F..... Code No.

Ser,No .	List of tasks to be performed	Allotted score	Achieved score
1	Provide comfortable position	0.5	
2	Identifies site properly	2.0	
3	Prepares the site for injection (with alcohol swab)	1.0	
4	Expels the air from the syringe by holding the syringe with needle vertical at eye level	1.5	
5	Hold syringe in right hand and insert the needle at 90-degree angle	1.5	
6	With the right hand on the syringe, aspirate to see any blood by pulling back the piston	1.0	
7	Gives the medication slowly by pushing the piston further (if no blood comes after aspiration)	1.0	
8	Removes the needle quickly after all the medicines are injected	1.0	
9	Massages the site	0.5	
10	Disposes the used syringe and needle in a proper container	1.0	
11	Records the procedure with date, time, route & dosage given	1.0	
Total		12.0	

Examiner's name-----

Signature-----

Date of examination-----

Checklist format 004: Managing the 3rd stage of labor immediately after baby is delivered

Sex: M..... F..... Code No.

Ser. No.	List of tasks to be done	Allotted score	Achieved score
1	Palpate the woman's abdomen to rule out the presence of another baby	0.5	
2	Giving oxytocin 10 IU within 1 minute of child birth immediately	2.0	
3	Clamp cord close to perineum	1.0	
4	Hold the cord clamp in one hand, while positioning the other hand just above the pubic bone to stabilize uterus	1.5	
5	Wait for next contraction and guide the uterus with the left hand and pull out with the right hand gently	1.5	
6	As the placenta delivers, hold it with both hands	1.0	
7	Gently rotate for the removal of the placenta	1.0	
8	Slowly pull to complete delivery of the placenta	0.5	
9	Massage the uterus through the abdomen after delivery of the placenta	1.0	
10	Inspect placenta and membrane complete and check for the cervix and perineal tear	2.0	
Total		12.0	

Name of examiner's-----

Signature-----

Date of examination-----

Checklist format 005: Nursing intervention for Air Way Obstruction

Sex: M.....F..... Code No.....

Ser.No.	List of tasks to be performed	Allotted score	Achieved score
1	Keep the patient in side lying position (tilt to one side)	1.0	
2	Open mouth and assess the blockage	1.0	
3	Do Oropharyngeal suction	1.5	
4	Check and record vital signs(pulse and respiration	1.5	
5	Start O ₂ inhalation if required	1.5	
6	Inform doctor	1.5	
Total		8.0	

Name of examiner-----

Signature-----

Date of examination-----

Checklist format 006: Clean wound dressing

Sex: M.....F..... Code No.....

Ser.No.	List of tasks to be performed	Allotted score	Achieved score
1	Wash hands	1.0	
2	Prepare the dressing set	1.5	
3	Assist the patient a convenient position	1.0	
4	Remove and discard old dressing	1.0	
5	Wear sterile glove/picks the forceps	1.0	
6	Clean the wound from inner to outer part	1.5	
7	Covers the wound adequately & appropriately	1.5	
8	Place the patient in comfortable position	1.0	
9	Wash hands	1.0	
10	Recording & reporting of the procedure	1.5	
Total		12.0	

Name of examiner's-----

Signature-----

Date of examination-----

Checklist format 007: Identifying different types of surgical instruments

Sex: M.....F..... Code No.....

Item 1. _____

Item 2. _____

Item 3. _____

Item 4. _____

Item 5. _____

Item 6. _____

Item 7. _____

Item 8. _____

Item 9. _____

Grading:

Each item will have a score of 2 with a total of 18 points.

Checklist format 008: Identifying different type of rubber tubes based on their use

Sex: M..... F..... Code No.....

Item 1-----

Item 2-----

Item 3-----

Item 4-----

Item 5-----

Grading

Each item will have a score of 2 with a total of 10 points.

Format 009: Plot and interpret patients' temperature of 39 °c on the temperature chart.

Sex: M..... F..... Code No.....

	Correctly	Not correctly
Plot		
Interpret		

Grading:

Plot correctly will count 3 and not correctly will count 0.

Interpret correctly will count 3 and not correctly will count 0.

The total scores will be 6.

Format 010: Read and interpret a growth monitoring chart for a one year old child weighing 6.5 kg.

Sex: M.....F..... Code No.....

Ser.No.	Activities to be performed	Allocated score	Achieved score
1	Reading weight of child 6.5 kgm.	3	
2	Interpretation of the curve	3	
Total		6	

Annex III: Detailed result of students on the 1872 total tasks

Table 2: Number of tasks correctly performed by study participants for each procedure

Assessed in schools of nursing, in Addis Ababa, Ethiopia, 2011

Procedure	Total tasks	Menilik (n=16)	Total tasks	Central (n=20)
		Correctly performed		Correctly performed
Taking oral temperature	112	36(32.1%)	140	95(67.8%)
Measuring blood pressure	128	99(77.3%)	160	118(73.8%)
Administering IM injection	176	103(58.5%)	220	90(40.9%)
Managing 3 rd stage of labor	160	16(10.0%)	200	105(52.5%)
Managing airway obstruction	96	37(38.5%)	120	51(42.5%)
Clean wound dressing	160	86(53.8%)	200	44(22.0%)

Table 3: Final year diploma nurse students' performance in taking oral temperature

Steps	Type of tasks to be performed	Menilik II (n=16)	Central (n= 20)
		No. of students	No of students
		correctly perform	correctly perform
1.	Rinses the thermometer in cold water	4 (25.0%)	13(65.0%)
2.	Wipes the thermometer from bulb to stem	5 (31.2%)	15(75.0%)
3.	Brings down the level of mercury near the bulb end	4 (25.0 %)	8(40.0%)
4.	Keeps the thermometer in mouth for 3 minutes	7(43.8%)	16(80.0%)
5.	Removes and wipes thermometer	2(12.5%)	13(65.0%)
6.	Reads the thermometer at eye level against light	7(43.8%)	14(70.0%)
7.	Cleans bulb to stem & replaces it at appropriate place	7(43.8%)	14(70.0%)

Table 4: Final year diploma nurse students' performance in measuring blood pressure

Steps	Type of tasks to be performed	Menlik II (N=16)	Central (n= 20)
		No. of correctly performed	No. of correctly performed
1.	Give the patient comfortable position (Sitting with arm supported on table)	9(56.2%)	16(80.0%)
2.	Applies cuff 1 to 2 ``above antecubital area	15(93.8%)	14(70.0%)
3.	Palpate brachial artery with finger tips	8(50.0%)	16(80.0%)
4.	Place bell of stereoscopes on brachial pulse	15(93.8%)	20(100.0%)
5.	Inflates cuff, notes reading while sound first begins(systolic)	15(93.8%)	18(90.0%)
6.	Continues to release pressure slowly and notes point on manometer where the sound ceases	15(93.8%)	17(85%)
7.	Allows air to escape, mercury level falls zero	14(87.5%)	16(80.0%)
8.	Records reading immediately date and time	8(50.0%0	1(5.0%)

Table 5: Final year diploma nurse students' performance on administering IM injection

StepsType of tasks to be performed		Menlik II (N=16)	Central (n= 20)
		No. of correctly performed	No. of correctly performed
1	Provides comfortable position	8(50.0%)	13(65.0%)
2	Identifies site properly	8(50.0%)	6(30.0%)
3	Prepare site for injection with alcohol swab	14(87.5%)	13(65.0%)
4	Expels air from syringe by holding syringe with needle vertical at eye level	12(75.0%)	8(40.0%)
5	Insert needle at 90°- angle using a steady push	12(75%)	9(45.0%)
6	Aspirate to check for blood	5 (31.25)	5(25.0%)
7	Gives medication slowly if no blood comes	11(68.8%)	7(35.0%)
8	remove needle quickly after medicine injected	15(93.8%)	13(65.0%)
9	Message the site	5(31.2%)	6(30.0%)
10	Dispose needle properly	8(50.0%)	6(30.0%)
11	Record date, time, route, dosage	5(31.2%)	4(20.0%)

Table 6: Final year diploma nurse students' performance on managing 3rd stage of labor

Steps	Type of tasks to be performed	Menlik II (N=16)	Central (n=20)
		No. of correctly performed	No. of correctly performed
1	Palpate abdomen rule out presence of another baby	1(6.2%)	0 (0.0%)
2	Give oxytocin 10 IU immediately	7(43.8%)	16(80.0%)
3	Clamp cord close to perineum	1(6.2%)	19(95.0%)
4	Hold cord clamp in one hand while Positioning other hand just above pubic bone to stabilize uterus	2(12.5%)	10(50.0%)
5	Wait next contraction and guide uterus with left hand and pull out right hand gently	1(6.2%)	9(45.0%)
6	As placenta delivers hold it with both hands	1(6.2%)	12(60.0%)
7	Gently rotate for removal of placenta	1(6.2%)	13(65.0%)
8	Slowly pull to complete delivery of placenta	1(6.2%)	13(65.0%)
9	Massage uterus through abdomen after placenta delivery	1(6.2%)	11(55.0%)
10	Inspect placenta and membrane completely and check for cervix and perineal tear	0(0.0%)	2(10.0%)

Table 7: Final year diploma nurse students' performance on managing airway obstruction

Steps	Types of tasks to be performed	Menlik II (N=16)	Central (n=20)
		No. correctly performed	No. correctly performed
1	Tilt patient in one side	3(18.8%)	2(10.0%)
2	Open mouth and assess blockage	14(87.5%)	16(80.0%)
3	Do oropharyngeal suction	7(43.5%)	13(65.0%)
4	Check and record vital signs	4(25.0%)	3(15.0%)
5	Start oxygen inhalation if required	8(50.0%)	14(70.0%)
6	Inform doctor	1(6.2%)	3(15.0%)

Table 8: Final year nurse diploma performance in clean wound dressing

Steps	Type of tasks to be performed	Menlik II (n=16)	Central (n=20)
		No. correctly performed	No. correctly performed
1	Explains the procedure washes hands	9(56.2%)	8(40.0%)
2	Prepare the sterile dressing set	13(81.2%)	0(0.0%)
3	Assist the patient on a convenient place	1(6.2%)	3(15.0%)
4	Remove and observe old dressing	13(81.2%)	15(75.0%)
5	Wear sterile glove /picks forceps	13(81.2%)	12(60.0%)
6	Cleans the wound from inner to outer)	14(87.5%)	0(0.0%)
7	Covers the wound adequately	14(87.5%)	0(0.0%)
8	Place patient on comfortable position	4(25.0%)	8(40.0%)
9	Wash hands	1(6.2%)	6(30.0%)
10	Recording the procedure	4(25.0%)	0(0.0%)

Table 10: Percentage of students who answered correctly at each question stations

Response questions	Menlik II		Central University		Total	
	n=16		n= 20		n=36	
Surgical instruments	No.	%	No.	%	No.	%
Scissor	13	81.2	14	70.0	27	75.0
Sponge/pickup forceps	8	50.0	18	90.0	26	72.2
Tissue/thumb forceps	2	12.5	12	60.0	14	38.9
Vaginal speculum	11	68.8	17	85.0	28	77.8
Artery forceps	11	68.8	11	55.0	22	61.1
Dressing forceps	4	25.0	4	20.0	8	22.2
Clip applier and remover	3	18.8	0	0.0	3	8.3
Blade holder	5	31.2	2	10.0	7	19.4
Nasal speculum	4	25.0	12	60.0	16	44.4
Rubber tubes						
Nasogastric tube	11	68.8	14	70.0	25	69.4
Rectal tube	1	6.2	9	45.0	10	27.8
Endotracheal tube	4	25.0	8	40.0	12	33.3
Folly (indwelling catheter)	15	93.8	2	10.0	17	47.2
Urine bag	14	87.5	18	90.0	32	88.9
Read and interpret growth monitoring chart						
Read	2	12.5	3	15.0	5	13.9
Interpret	5	31.2	11	55.0	16	44.4
Plot and interpret temperature						
Plot	11	68.8	15	75.0	26	72.2
Interpret	5	31.2	4	20.0	9	25.0

IV. Information sheet

Questionnaire that shows the nursing skill of final year diploma nursing students

The questionnaire has two parts. Part I assesses the opinion of students on how clinical skill is being taught in their respective institutions. Part II looks on the perception of students related to their experience after participating in OSPE.

The objective of this questionnaire is that it helps each student to identify problems that prevent him/her from developing the required clinical nursing skill.

This study helps to facilitate the teaching learning process especially the development of skill. All questions should be answered after carefully reading the question. We hope that you will be able to give the right information after learning. You are not allowed to mention/write your name on this form. Confidentiality will be maintained. Write the right and honest answer because who writes the answer remains unknown.

Thank you for your co-operation!!