

Formative assessment of the communication skills related to drug delivery systems on standardized patients through group objective structured clinical encounters in second year medical students

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ABSTRACT

Background: Choosing an appropriate Drug Delivery System (DDS) influences the acceptability, adherence and better outcome of the therapy in the patients. The present study was planned to evaluate the second year MBBS students on standardized patients (SP) using Group Objective Structured Clinical Encounters (GOSCE) after content delivery by traditional power point class versus experiential teaching methodology.

Methods: DDS practical class was held in two larger groups after adding two odd sub-groups (1+3) as 'A' (64 students) and even sub-groups (2+4) as 'B' (66 students). The formative GOSCE evaluation was done 2 weeks after the classes by the trained physician examiners as per the Medical Council of Canada pre-determined scoring instruments.

Results: The average magnitude of change in GOSCE scoring is extremely statistical significant on t-test ($P < 0.0001$) in favour of experiential teaching methodology for all the skills. The statistical significant percentage of students were able to extract the treatment history in respect of eliciting problem, reasons for non-compliance, methods of intake, explain the technique and showed the courteous professional behaviours.

Conclusions: The clinical cases as SP in pharmacology teaching for developing competency based communication skills and GOSCE are the appropriate methodology for evaluation of large student group for experiential DDS training.

Keywords: Drug delivery system, Early clinical exposure, MBBS students, Group objective structured clinical encounters, Pharmacological treatment history, Standardized patients

INTRODUCTION

Contemporary medical education objectives are achieved through competency-based teaching-learning methodologies.¹ The clinical competencies of the medical graduates are assessed by the Objective Structured Clinical Examination (OSCE) strategy. The OSCE evaluates the training of the graduates related to the communication with the patients, extracting history, monitoring compliance to therapy, drug-food interactions and solving problems.^{2,3}

The standardized patient (SP) is central to the OSCE assessments of the students in healthcare especially in teaching the pharmacy practice or pharmacology.⁴⁻⁷

The studies have shown the growing trends of trained standardized patients in pharmacy related communication skills, taking patient history for adherence to the treatment, decision making and physical assessment of the patients.⁸⁻¹⁰

OSCE has some evaluation components and ratings for students' assessment. One such rating scale guidelines have been published by the Medical Council of Canada (MCC) containing OSCE case template, Patient Encounter Probe (PEP) and examiner's rating scales.¹¹ The traditional OSCE assessment of each candidate in the batch is very exhaustive and time consuming.^{12,13} Some pilot studies have found Group Objective Structured Clinical Encounters/Examinations (GOSCE) to be cost, resource and time effective tool for teaching communication skills particularly for the formative assessment.¹⁴ However, this variation of traditional OSCE has not been reported much in the literature.^{15,16} The present study was planned to evaluate the desired outcomes of students as per the rating scales of MCC on standardized patients after training in Drug Delivery Systems (DDS) through traditional power point (PPT) presentation and hand on experience Ingredient tray (I-Tray) methodology via GOSCE.

METHODS

Institutional Ethics Committee approval was obtained before framing the specific learning Objectives outcomes based on DDS on SPs.

The second year MBBS students were taught the applied aspects of Drug Delivery Systems through traditional PPT presentations to one group (Gr A) and through experiential teaching tool developed in the department for various practical classes called 'I-Tray' (Ingredient Tray) to the other group (Gr B). Both the groups were exposed to the OSCE rating scales of MCC with the expected levels and corresponding scores during their class.

The study was designed at A tertiary care University Teaching Medical College.

The 64 students attended the GOSCE evaluation from Gr A and 66 from Gr B.

Sampling methods

A total of 150 students were divided into four subgroups 1, 2, 3 and 4. Each subgroup has 37 to 38 students. A simple randomization was used to make two larger groups where odds subgroups (1 and 3) were combined to form a broader group 'A' (Gr A) and two even subgroups (2 and 4) to group 'B' (Gr B).

Study protocol

The five OSCE stations with SPs related to the DDS in the subject of pharmacology as per the guidelines of Medical Council of India curriculum were set up.⁷ The taught content was evaluated based on the DDS stations (Table 1) prepared by the collaborative efforts of all faculty members. The non-teaching staffs were made SPs after their proper training. The evaluation was done 2 weeks after the completion of the classes. The faculty members evaluated each student by sitting alongside the SP. The

case history that was to be elicited and expected explanation to the patients were prepared beforehand and assessed on the patients as per the rating scales of MCC (Table 2).

Table 1: Standardized clinical cases set up and the expected extraction of treatment history or training by the candidate.

Clinical Cases	Drug history to be elicited/ technique to be explained to the standardized patient/ guardian
A 35 years old female patient diagnosed as a case of seasonal bronchial asthma. She was advised 2 puffs of salbutamol twice a day. She is taking medication for last two weeks but there was hardly any response.	The patient was taking the 2 puffs of salbutamol twice a day in the manner a deodorant is applied in the armpit thus there was no response
Explain the technique for proper intake of medication to make the patients compliant to therapy through Metered Dose Inhaler (MDI)	Students were expected of explaining the inhalation technique through MDI for retention of medication in the lungs
Explain the use of the spacer to the guardian of an asthmatic pediatric patient who is 10 years old.	Students were expected of explaining the inhalation technique through the use of spacer to an illiterate mother for her child
Explain to the parents of a pediatric patient regarding the application of enema in case of frequent constipation.	Students were expected to explain the insertion of enema pouch tube per rectum in seemingly embarrassing vernacular language to a father
Demonstrate the technique for taking insulin from a pre-filled insulin pen.	Student were expected to explain the patients how to take subcutaneous insulin injection

Five SPs were from departmental and non-departmental supporting staffs. Three males and two females SPs were trained for facing the students and a modified response checklist was also prepared to score the students on the basis of the broad outcomes achieved related to the DDS (Table 3).

The PPT presentation was conducted for Gr A followed up by the class of Gr B by our own developed and validated experiential 'I-Tray' methodology for training the MBBS students regarding various DDS. A tray containing the DDS devices and formulations were shown to the students along with their functioning in the I-Tray methodology. Both the methodologies were assessed on the SPs.

Table 2: Expected skills and rating scales awarded as per the students’ performance.

Skill	Rating Scale					
	0	1	2	3	4	5
Listening Skill	Interrupts inappropriately, ignores patient’s answers	impatient	Borderline unsatisfactory, Somewhat attentive	Borderline satisfactory, Somewhat attentive	Attentive to patients’ answers	Consistently attentive to answers and Concerns
Questioning skills	Awkward, exclusive use of leading or closed ended questions, jargon	Somewhat awkward, inappropriate terms, minimal use of open-ended questions	Borderline unsatisfactory, moderately at ease, appropriate language uses of different types of questions	Borderline satisfactory, moderately at ease, appropriate language, uses of different types of questions	At ease, clear questions, appropriate use of open and closed ended questions	Confident and skillful questioning
Organization of interview	Scattered, short-gun approach	Minimally organized	Borderline unsatisfactory, flow is somewhat logical	Borderline satisfactory, logical flow	logical flow with sense of purpose	Purposeful, integrated handling of encounter
Organization of physical examination	Scattered, patient moved unnecessarily	Minimally organized	Borderline unsatisfactory, flow is somewhat logical	Borderline satisfactory, logical flow	logical flow with sense of purpose	Purposeful, integrated handling of examination
Demonstration of technical skills	No Skills manoeuvres, cannot provide reliable/ useful information	Manoeuvres too rushed or clumsy, unlikely to provide reliable/ useful information	Borderline unsatisfactory: some skill but likelihood of reliable/useful findings minimal	Borderline satisfactory: Some skill some reliable/useful findings likely	Consistent skills, manoeuvres likely to provide reliable/ Useful information	Consistent skills, manoeuvres performed will elicit reliable/ useful information
Rapport with person	Condescending, offensive judgmental	Minimal courtesies only	Borderline unsatisfactory	Borderline satisfactory	Polite and interested	Warm, polite, empathic
Information giving	No attempt or inappropriate attempt to give information: e.g. not truthful	Awkward and/ or incomplete attempts to give information	Borderline unsatisfactory, somewhat at ease, attempts to give information	Borderline satisfactory, somewhat at ease, attempts to give information	Gives information easily, somewhat attentive to patient understanding	Confident and skillful at giving information, attentive to patient understanding, truthful

All the 130 students were divided into 26 teams each containing 5 students. There were 5 stations. Every team has to choose a new leader interviewer at each station. All the five students were given a chance to communicate with the SP. They were given 5 minutes for each station followed by the 5 minutes for discussion among themselves as well as any extra points that is to be asked from the SP. A total of 10 minutes was given to each team per SP. All the teams entered one by one with the ringing of the bell and left the hall after completing 5 stations. The students who were waiting to appear were quarantined till their turn to enter the hall. It was an open ended unidirectional flow of teams. The activity started 9:00 am

in the morning and completed at 4:00 PM in the evening with an hour of intermission for lunch.

Outcome measures

The faculty positioned at each GOSCE station rated the individual interviewer candidate as per the checklist of MCC (Table 1, Table 2 and Table 3).

Data analysis

Data was analysed using Graphpad software and figures were prepared using Microsoft excel program.

Table 3: Broad outcomes achieved by the students.

Response	Yes	No
Elicits Problem history		
Elicits reason of non-compliance		
Elicits methods of intake		
Explain technique to the patient		
Courteous Professional behaviors		

RESULTS

The average GOSCE score obtained for interviewers in each skill in the Gr B were extremely statistically significant as compared to Gr A with p value less than 0.0001 on unpaired t-test in each category of Skills (Figure 1).

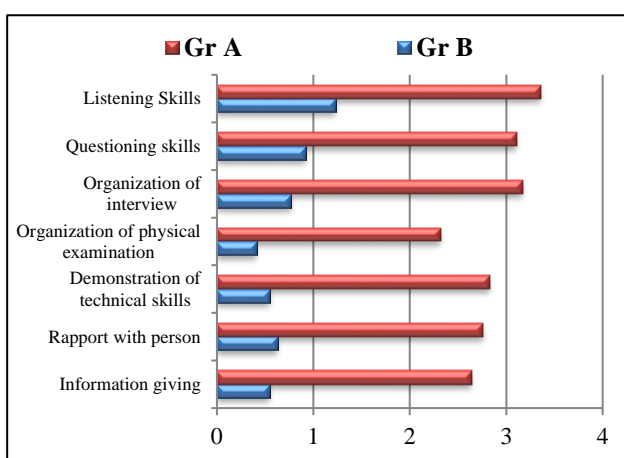


Figure 1: The average score out of 5 of each skill obtained by power point presentation (Gr A) versus hand on experiential training (Gr B).

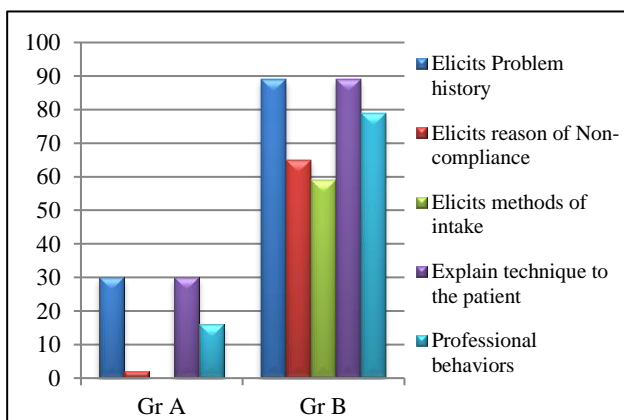


Figure 2: Percentages of broad outcome achieved during GOSCE assessments.

The highest magnitude of change in group average score was obtained in “Organisation of Interview” followed up by ‘Demonstration of technical skills, ‘Questioning skills’ and ‘Listening skills’ in the respective order. The lowest

change was seen in ‘Organisation of physical examinations’.

Figure 2 shows the broad objectives achieved. The 89% (n=66) of Gr B students were able to elicits problem history and explain the technique to the patients as compared to 30% (n=64) in case of Gr A. While the 65% (n=66) of Gr ‘B’ students were able to extract the reasons for non-compliance as comparison to the meagre 2% (n=64) in case of Gr ‘A’. Surprisingly no one from the Gr A could locate the method of drug intake by the patients as comparison to the 59% (n=66) in Gr B. The most importantly the experiential learning group outperformed the students in communicating with the patients with the Courteous Professional behaviours in 79% (n=66) in Gr B as compared to 16% in Gr A (n=64).

DISCUSSION

The shared decision making is a fundamental part of clinical practice of a physician.¹⁷ All medical colleges should impart these skills to communicate with the patients and colleagues throughout their curriculum. Therefore, many medical councils including MCI recommend starting the early clinical exposure to the undergraduate medical students even from the first year of their studies.¹⁸ Once acquired the assessment of clinical skills needs proper design to understand their attainment and performance.¹⁹ Hence each department develops their own specific learning objective (SLO) based on competency based training. One such department which teaches the science of drugs to the future physicians has gradually evolved into Pharmacy practice in developed nations and remained traditionally as pharmacology in countries such as India.²⁰ The exposure to objective structured clinical encounters to extract the treatment history by the medical students is limited in the subject dealing with science of drugs irrespective of their departmental nomenclature.

However, the literature review on the related topic has found the increasing trends of use of SPs in Pharmacy Practice for gaining knowledge, developing skills for individual as well as for interpersonal communications.²¹ A need of training of the students on a relevant content by experiential learning was felt before we could evaluate the students on GOSCE. Thus, a topic of ‘Drug Delivery System’ was taught by the traditional PPT presentation and experiential learning tool called the I-Tray (Ingredient Tray). Subsequently five encounters based on the taught content were stationed as the SPs. The GOSCE was used as an evaluation methodology instead of the traditional Objective Structured Clinical Examinations (OSCE) for patient encounters. The GOSCE provides students the opportunity to observe, evaluate and learn from their peer group.²² It is also a cost effective, time effective and manpower effective strategy for the formative assessment of the students as compared to the traditional OSCE.¹⁴⁻¹⁶ The present study was planned to prepare such GOSCE stations on SP to tackle the treatment history of the patients for better therapeutic outcomes to the patients.

However, there were limitations to incorporate GOSCE for formative assessments of the students. First and the most important were to develop the clinical cases involving DDS which could have been extracted through the treatment history. Second was the recruitment of teaching faculty for the whole day divided into two sessions. Third was the large class size for which all the students were grouped as five students per team and fourth was the assessment of each student as lead interviewer only at one station and rest of the students acted as lead feedback students. The scoring of lead feedback student was not done in this study. However, it is a potential tool to evaluate the team work in the clinical settings.

CONCLUSION

Our study has re-established that experiential learning (EL) by developing customized teaching tool as per the content is far more evidence-based education for competency-based training as compared to the traditional didactic teaching. In addition to that prior exposure to OSCE rating scales leads to the conscious training of the students' mind to look for the broad objectives of physicians training. Furthermore, GOSCE are best suited for the communication skills needed for treatment history taking in a large student's group for their formative assessments. Thus, GOSCE along with the SP as an evaluation tool and experiential learning as a teaching tool are the need of the curriculum enhancement for competency and communication-based pharmacology teaching in the medical colleges for extracting treatment history. Moreover, it has relevance in the art of history taking by the pharmacologists throughout the world as well as the future licensing examination proposed for extensive medical education reforms to get the MBBS degree in India by National Medical Commission (NMC) which will replace MCI.

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