RESEARCH ARTICLE

Introduction of structured physical examination skills to second year undergraduate medical students [v1; ref status: indexed, http://f1000r.es/xi]

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Abstract

Introduction: Effective learning of physical examination skills (PES) requires suitable teaching and learning techniques and assessment methods. The Tribhuvan University (Nepal) curriculum recommends involving the departments of Medicine and Surgery in PES training (PEST) for second year students as a part of early clinical exposure. The project was developed to make teaching/learning of PES structured, involving eight clinical sciences departments and using appropriate methods for teaching and assessment in KIST Medical College, Nepal.

Methods: Irby's three stages of clinical teaching model (Preparation, Teaching, Reflection), was applied for teaching. Skill acquisition was based on Millers' learning pyramid at "show how level" and Dreyfus' competency model at "competent level". Teaching/learning was conducted in small groups. A tutorial, demonstration and practice (TDS) model was developed for teaching/learning techniques based on a simple five-step method for teaching clinical skills. Assessment of effectiveness of training was done at "reaction level" as per Kirkpatrick's model based on students' feedback, "shows how level" as per Miller's pyramid of learning by OSCE and "competent level" as per Dreyfus' model using retro-pre questionnaire.

Results: The analysis of retro-pre questionnaire based on the Dreyfus model found the average skill score (max score 184), before the introduction of the project module as 15.9 (median = 13.5) and after as 116.5 (median = 116). A paired t-test showed the difference to be statistically significant (100.5±23 and 95% CI 95.45 – 105.59). The average overall feedback score for the students on PES training based on seven items on a five point Likert scale was found to be 4.30. The mean total objective structured clinical examination (OSCE) score was 3.77 (SD+/- 0.33) out of 5; 80% of students scored more than 70%.

Conclusion: Students learned most of the skills with the implementation of the structured PES module and did well in the OSCE. Students and faculty were satisfied with the training and assessment.

Article Status Summary

Referee Responses

Referees	1	2	3
v1 published 16 Jan 2013	✓ report 1	? report 1	? report 1

1 **Ramesh K Adhikari**, Tribhuvan University Nepal

2 **Deborah Korenstein**, Mount Sinai School of Medicine USA

3 **Bruce Fisher**, University of Alberta Canada

Latest Comments

No Comments Yet

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Introduction

Learning physical examination skills (PES) is an important aspect of undergraduate medical students' training in the early clinical years[1]. Effective clinical teaching and learning of PES requires appropriate teaching and learning techniques and assessment methods[2]. KIST Medical College (KISTMC), Lalitpur, Nepal, is a newly established medical school in the private sector and admitted its first batch of students in November 2008. It follows the curriculum of Tribhuvan University Institute of Medicine (TU-IOM), Kathmandu, Nepal[3]. The curriculum stresses early clinical exposure with the first year being devoted to the acquisition of history taking and communication skills and the second year to physical examination skills. The curriculum recommends involvement of the departments of Medicine and Surgery in PES training (PEST) for second year students as part of early clinical exposure (ECE). The methods for teaching/learning and assessment are not well defined in the curriculum.

The project was developed to make teaching-learning of PES structured, and involved eight clinical departments using appropriate teaching, learning and assessment methods. Students are provided with an opportunity to learn basic physical examination skills in gynecology and obstetrics, orthopedics, ear, nose and throat (ENT), ophthalmology and pediatrics, as well as general medicine and surgery in their second year Bachelor of Medicine and Bachelor of Surgery degrees (MBSS) so that they get sufficient time to learn reasoning, diagnostic, procedural, therapeutic and counseling skills during their clinical years (third, fourth and final year). The objective of the project was that at the end of the second year, students should be able to initiate and perform a basic physical examination of an adult suffering from medical, surgical, gynecology and obstetric, orthopedic, ENT and eye diseases, as well as a basic physical examination of a child.

Methods

I. Development of the module

Faculty members of departments involved in the project identified basic PES to be learnt by students. A checklist for each selected PES was prepared based on Hutichson's Clinical Methods (22nd edition)[4] and was peer reviewed and finalized by a core project committee.

II. Orientation of faculty members

All faculty members involved in teaching received teacher training before commencement of the module. They were oriented with regards to the implementation of the project in a mini-workshop. The details regarding grouping of students, the posting schedule of various groups in different departments in rotation, the approach to teaching and learning, the teaching-learning strategy and the assessment modalities were also shared with them.

III. Approach to teaching

Physical examination skills involve psychomotor skills. For teaching physical examination skills, Irby's three stages of clinical teaching were applied[5]. These are: preparation (stage I), teaching (stage II) and reflection (stage III).

IV. Approach to learning

Skills acquisition was based on Millers' Learning Pyramid[6] at the "show how level" and Dreyfus' competency model[6] at the "competent level". Miller's four levels of learning are:

1) Whether the learner has *knowledge* of the skill;
2) Whether the learner *knows how* the skill is performed;
3) Whether the learner *shows how* to perform the skill in a controlled or simulated setting; and
4) Finally, whether the learner actually *does* the skill in clinical practice.

The basic principle of the Dreyfus model is that the student progresses through five stages of proficiency in this specific order: novice, advanced beginner, competent, proficient, and expert[6].

V. Teaching-learning strategies

Teaching-learning was conducted in small groups. The one hundred students were divided into seven groups of 14–15 students; each group was further divided into two subgroups of seven or eight students. Each group was posted for four weeks each in Medicine Units I and II, surgery, pediatrics, and gynecology and obstetrics, and each subgroup for two weeks in family medicine, ENT, ophthalmology and orthopedics in rotation. Students learned PES related to the cardiovascular system (CVS) and respiratory system (RSS) in Medicine Unit I, the peripheral nervous system (PNS) and central nervous system (CNS) in Medicine Unit II, the examination of the abdomen in Surgery, the musculoskeletal system (MS) in orthopedics, general PES in family medicine, obstetrics and gynecology examination in the obstetrics and gynecology department, ear, nose and throat examination in ENT and eye examination in ophthalmology. Structured PEST (S-PEST) sessions were held for four hours every Monday for 28 weeks between February and August 2011.

Based on the method used for teaching clinical skills in the American College of Surgeon's advanced trauma life support course, a tutorial, demonstration and practice (TDP) model was developed. Each S-PEST session had three sub-sessions: Tutorial (T), Demonstration (D) and Practice (P). The 'Tutorial' element covered the overview by the faculty preceptor on skills to be taught; 'Demonstration' involved actually demonstrating each of the skills taught with a stepwise description, while 'Practice' involved performance/practice of each demonstrated skill by the students using a sequential description to be observed by the preceptor. This model follows five (conceptualization, visualization, verbalization, practice and correction and reinforcement) of the seven psychomotor teaching principles based on the taxonomy of psychomotor domain (the other two being skill mastery and skill autonomy)[7].

In most sessions, demonstration and performance/practice were conducted on real patients either in the ward or outpatient department (OPD). Some sessions were conducted on simulated patients, while in a few sessions the students themselves consented to be simulated patients.

VI. Assessment

Assessment of PES training effectiveness was conducted at Kirkpatrick's level 1 - Reaction (see below for details) based on student feedback. Skill performance was assessed at Millers' level 3 (Show How) by an objective structured clinical examination (OSCE), and perceived competence at Dreyfus' level 3 (Competence) using the retro-pre questionnaire.

Donald Kirkpatrick developed a four-level model of evaluation:

1) Reactions: measures how participants have reacted to the training.
2) Learning: measures what participants have learned from the training.
3) Behavior: measures whether what was learned is being applied on the job.
4) Results: measures whether the application of training is achieving results[8–10].

The following instruments were used for assessment:

1. The retro-pre questionnaire for assessing learners' self-reported changes. The retrospective post-then-pre design is a popular way to assess learners' self-reported changes in knowledge, awareness, skills, confidence, attitudes or behaviors. It takes less time, is less intrusive and for self-reported change, avoids pre-test sensitivity and response shift bias that result from pre-test overestimation or underestimation[11].
2. A feedback questionnaire to assess the perception of teaching and learning sessions of S-PEST from students and faculty members.
3. The OSCE was used for the end of the posting assessment. Standardized patients (SP) were used in the OSCE. They were trained to follow students' commands for various aspects of the physical examination. SP were healthy individuals from our house keeping department who consented to be SP. They were given prior briefing regarding appropriate mannerisms and how to respond to students' commands during OSCEs. A faculty observer at each station used a checklist to rate each student's performance.

The following components were developed by the station authors for each OSCE station:

- An instruction sheet for the examinee.
- A checklist for the assessment of the skill being examined at that station.
- A detailed patient profile for the standardized patient.
- A list of the equipment, instruments etc required at the station.

VII. Data management and analysis

Data was analysed using SPSS version 18.0.

VIII. Ethical considerations

The institutional Research Committee of KIST Medical College approved the project.

Results

A. Students' self-reported changes in perceived skill levels using the retro-pre questionnaire

Forty-six skills, representing various systems in different departments during the training were included in the retro-pre questionnaire. Two to four skills from the 'must know' category from each subject/chapter were included in this questionnaire. Each skill was scored out of 4. Individual skill scores were added to get overall scores. A paired t-test was used to evaluate the difference in overall scores before and after the module. Scores were found to follow a normal distribution as confirmed by a Shapiro-Wilk test.

The average perceived skills score (the maximum score being 184) before the module was 15.9, which increased to 116.5 after the module. Students perceived that their level of skill improved after the module. The result from the paired t-test showed that the difference is highly statistically significant (mean 100.5 with SD+/- 23 and 95% confidence interval 95.45 – 105.59), which means that students did learn most of the skills after the Structured Physical Examination Skills Training (S-PEST) module and it did influence them.

Retro-pre questionnaire and scores

2 Data Files and a Questionnaire

http://dx.doi.org/10.6084/m9.figshare.98607

B. Feedback of students regarding S-PEST

Around 75% of students filled in the feedback questionnaire which used a five point Likert scale. The questions were on the objectives of the session, facilitator/preceptor role, satisfaction with learning activities in each sub-session, overall rating of session and there were two open ended questions ("Suggestion/s for improvement" and "Any other comment/s"). Respondents gave scores out of 5, the higher the score, the higher the satisfaction.

The average scores of the different questions and global scores (overall session ratings) were calculated. The average feedback score was found to be 4.30 (maximum score 5) and the overall global score was 8.34 (maximum score 10) (see Figure 1 for scores and average scores). The agreement between global (subjective) and overall items average (objective) scores were found to be 78% (Pearson's Correlation).

Almost all respondents recognized the importance of each sub-session (Tutorial, Demonstration and Practice). The most frequent remark obtained from the open-response category question was to "provide more time for practice".

SPEST questionnaires and student feedback scores for each section

3 Data Files and 2 Questionnaires

http://dx.doi.org/10.6084/m9.figshare.98606

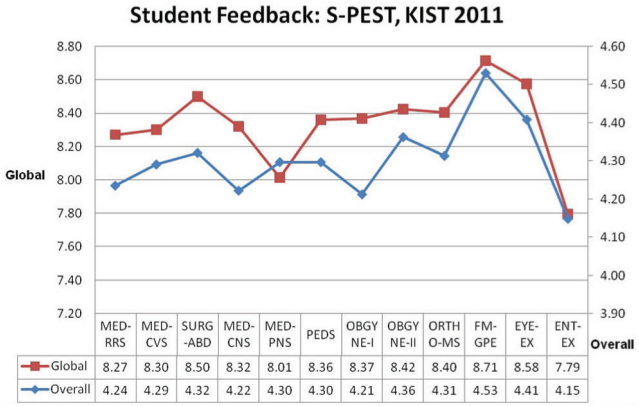

Figure 1. The graph shows the feedback of the students on Structured Physical Examination Skills Training (S-PEST) on skills imparted in various systems and delivered by different departments. Overall scores refer to the average student feedback scores (out of 5) in response to seven questions for each session. Global scores refer to the average student feedback scores (out of 10) for the importance of each session as a whole. Students agreed that they learned the skills of all the systems in various departments and they strongly agreed learning General Physical Examination skills in the Family Medicine department. Session abbreviations: MED-RRS – Medicine-Respiratory System; MED-CVS – Medicine-Cardiovascular System; SURG-ABD – Surgery-Abdomen; MED-CNS – Medicine-Central Nervous System; MED-PNS – Medicine-Peripheral Nervous; PEDS = Pediatrics; OBGYNE-I – Obstetrics; OBGYNE-II – Gynecology; ORTHO-MS – Orthopedics-Musculoskeletal System; FM-GPE – Family Medicine-General Physical Examination; EYE-EX – Eye Examination; ENT-EX – Ear Nose Throat Examination.

C. Feedback of faculty members on S-PEST

The feedback questions were on areas for improvement, how sessions could be improved, what could have been done differently and the faculty members' perceptions of the development of reasoning and diagnostic skills early on in the students' clinical years. Fifty-six feedback forms were received from faculty members. The frequency of each item scores on perception of teaching/learning sessions conducted as per protocol together with students' clinical reasoning and diagnostic skills developed early in clinical years was calculated. None of the faculty members strongly disagreed, one (1.8%) disagreed, 2 (3.6%) remained neutral, 33 (58.9%) agreed and 20 (35.7%) strongly agreed.

The most frequent comments obtained from the open response category questions were:

I. Areas for improvement:

1) Students require more time for practice.

2) Decrease group size.

3) Increase number of patients available for teaching-learning.

II. How sessions could be improved:

1) More time required for demonstration on patients.

2) Models may be used for demonstration and practice.

III. What could be done differently:

1) Using videos of PE.

2) Demonstration on manikins.

3) Teaching on models.

D. End of posting assessment using OSCE

Out of 100 students, 98 attended the OSCE. There were 14 OSCE stations; each representing a different system (CVS, RSS, PNS, CNS, Abdomen I & II, Obstetrics, Gynecology, Pediatrics I & II, MS, General PE, Eye, and ENT). The mean total OSCE score obtained by students in each station was 3.77 with a standard deviation (SD+/-) of 0.33 (the maximum score was 5). Eighty percent of the students scored more than 70% (26 students scored more than 80%, 55 students between 70 and 80%, and 15 students between 60% and 70%). A graph of the OSCE scores is shown in Figure 2.

OSCE results

1 Data File

http://dx.doi.org/10.6084/m9.figshare.98605

Discussion

Clinical skills acquisition is a major focus of education for health professionals extending from undergraduate to postgraduate and continuing to professional education[12].

The current trend in medical education is to introduce clinical teaching early, within the first two years of the curriculum, to help

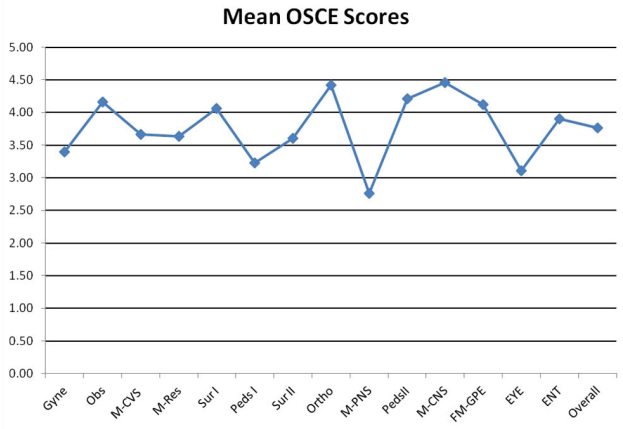

Figure 2. The mean total Objective Structure Clinical Examination OSCE score obtained by students for each session (out of 5). Session abbreviations: Gyne – Gynecology; Obs – Obstetrics; M-CVS – Medicine-Cardiovascular System; M-RES – Medicine-Respiratory System; Sur I – Surgery-Abdomen-liver; Peds I – Pediatrics I; Surgery II – Abdomen-kidney; Ortho – Orthopedics-Musculoskeletal System; M-PNS – Medicine-Peripheral Nervous System; Peds II – Pediatrics II; M-CNS – Medicine-Central Nervous System; FM-GPE – Family Medicine-General Physical Examination; EYE – Eye Examination; ENT – Ear Nose Throat Examination.

students understand the relevance of the basic sciences to clinical practice and to provide instruction in basic clinical skills in a standardized fashion[13].

Following these trends, Tribhuvan University (TU), Kathmandu, included early clinical exposure (ECE) in the curriculum, revised in 2008. The clinical examination, a required course for second year students, concentrates on the teaching of physical examination skills in two departments (Medicine and Surgery) with no defined method of teaching/learning and assessment[3].

The importance of structured clinical education has long been recognized. It provides equal learning opportunities and a suitable environment for everyone to acquire clinical skills and competencies. Modules are especially suitable for outcome-based adult learning programs and maximizing adult learning[14,15]. With this purpose in mind, a teaching/learning module was developed in this project at the KIST Medical College Nepal KISTMC (affiliated to TU) for teaching basic physical examination skills to second year students as part of early clinical exposure. KISTMC involved 8 clinical science departments and made teaching, learning and assessment structured.

Teaching-learning was conducted in small groups as small group teaching and learning is considered effective in clinical settings for tutorials and demonstrations[16].

Physical examination skills are largely psychomotor skills. For teaching physical examination skills, Irby's three stages of clinical teaching were applied (Preparation, Teaching and Reflection)[5,17]. Though faculty members and students reflected on experiences at the end of each session, these reflections could not be recorded[5].

All the faculty members involved in teaching received teacher-training before commencement of the course and were oriented about the implementation of the project[18].

Students were well informed about the project implementation but a limitation was that the students' stage of competency could not be assessed at the beginning of the project (this is why the retro-pre questionnaire was used).

Skill acquisition was based on Millers' Learning Pyramid at the 'Show how level' and Dreyfus' competency model at the 'Competent level' (i.e. consciously competent)[5,6].

Based on the method used for teaching clinical skills in the American College of Surgeon's advanced trauma life support course, a tutorial, demonstration and practice (TDP) model was developed because of the limited time allocated for demonstration and practice session.

Feedback both from faculty members and students was taken on teaching and learning. All students were satisfied with the S-PEST. Almost all recognized the importance of each sub-session (tutorial, demonstration and practice). Students agreed that they learned the skills of all the systems but suggested more time to be provided for practice. Sir William Osler (1849–1919) gave emphasis to practice. He said:

"*Observe, record, tabulate, communicate. Use your five senses… Learn to see, learn to hear, learn to feel, learn to smell, and know that by practice alone you can become expert*"[19].

Faculty members too were generally satisfied with the S-PEST. They commented that with the implementation of this module, students' clinical reasoning and diagnostic skills seemed to develop early on in the students' clinical years. Faculty members too felt that the students required more time for practice. They suggested that models, manikins and videos may be used for demonstration in addition to real and simulated patients.

Patsy Stark and F. Fortune had previously suggested that models may not be appropriate for teaching/learning skills but manikins and videos could be used instead[20]. They suggested that dedicated and structured clinical skills training is the most important factor, whether it takes place in a skills centre, in the ward or in the community[20]. A significant improvement in first-year medical student performance on the adult PE occurred after the use of a web-based instructional video at the University of Connecticut, School of Medicine, USA[21].

In this study, assessment of skills training effectiveness was done at level 1 (Reaction) as per Kirkpatrick's model from students through feedback and skill performance done at level 3 (Show How) as per Miller's pyramid model of demonstrated learning by OSCE and perceived competence at level 3 (competent) as per Dreyfus competency model of skill performance through the use of the retro-pre questionnaire[6,8–10,22].

Analysis of our retro-pre model in line with the Dreyfus model of skill acquisition suggests that students did learn most of the skills following the implementation of the S-PEST Module. One limitation is that although the retro-pre model may reveal valuable information, it is not a substitute tool for an objective measure or a gold standard, but can be used where a large number of skills are to be assessed at one point in time. Don W. Scott *et al.* from the University of Chicago Pritzker School of Medicine used retro-pre modelling for assessing teaching skills and they recommended this method for assessment[23].

The OSCE is a proven valid and reliable, formative and summative tool for assessing the clinical skills learned by health sciences students[24]. Standardized patients (healthy individuals trained to portray all the characteristics of an actual patient and to provide constructive feedback) were used in the OSCE. Students did well in the OSCE but one limitation was that only one skill from each system was assessed out of several skills taught in each system. Students and Faculty members also seemed to be satisfied with the OSCE process.

Conclusion

Students that were introduced to S-PEST acquired basic PES used to examine medical, surgical, gynecological and obstetric, orthopedic, ENT, and eye adult patients, as well as pediatric patients. It is expected that S-PEST will enhance medical students' performance during their clinical years. In this study, the students did well in OSCE and both students and Faculty members were satisfied with the training and assessment.

Limitations

The main limitations of this study were:

1. Limited time was allocated for each training session;
2. A pre-test for students' stage of competency could not be done;
3. Both real and simulated patients were used for demo and practice;
4. Reflection on experiences at the end of each session could not be documented; and
5. In OSCE, only one skill from each system was assessed out of several skills taught.

Author contributions

RMP conceptualized the project and developed the project proposal in consultation with PRS. RMP, PRS, TPT, BMK and RKK were all involved in designing and implementing the project. MPK also contributed to the implementation of the study. RMP, PRS and SB contributed to the data analysis and interpretation. RMP wrote the initial draft of the article. RMP, PRS, MPK and SB all reviewed the article. All authors approved the final manuscript.

Competing interests

No competing interests were disclosed.

Grant information

This study was supported by KIST Medical College.

The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

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Current Referee Status:

Referee Responses for Version 1

Bruce Fisher
Division of General Internal Medicine, University of Alberta, Edmonton, Alberta, Canada

Approved with reservations: 07 June 2013

Referee Report: 07 June 2013
Title and Abstract: The title is acceptable and clear.

Article content: The authors are to be applauded for their thoroughness and attention to accepted pedagogical models when designing and setting up their curriculum. However, there is little description of the actual content and emphasis of the curricular components, and the methods by which key knowledge and skills were actually assessed in the OSCEs. It is not clear if the OSCEs had been validated, or whether there was any comparison group for analysis of effect. There was no information to determine if the OSCE was used in any novel way.

Data: The methods used to introduce the curriculum were presented in some detail, but as stated above there were significant areas not described. The figures were unhelpful and the data could be better portrayed in table form.

Conclusions: The conclusions were substantiated by the data presented, but without information about any comparison or control group, it is difficult to gauge the impact of the curricular intervention (over that of secular trend etc). It is also not clear what these conclusions add to the existing literature.

I have read this submission. I believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Competing Interests: No competing interests were disclosed.

1 Comment

Author Response

Rano Mal Piryani, KIST Medical College Lalitpur Kathmandu Valley Nepal, Nepal
Posted: 08 Jun 2013

Dear Bruce Fisher

Thanks for reviewing article and providing suggestions for update.

Article content: Due to word limitation criteria, every detail of content cannot be included in the article; however, adequate information is provided in the introduction, methods and result section. Curricular components are mentioned briefly in the introduction. Contents are described briefly in method section under development of module, orientation of faculty members, approach to teaching, approach to learning, teaching/learning strategies and assessment section. OSCE was validated, the details of which are mentioned in the comments in response to Dr. Deborah Korenstein (See comments in response to referee 2).

OSCE was conducted in a novel way. The summary of practical arrangements for OSCE at KIST Medical College is as follows:

1. Prior to the OSCE session.

- Suitable venue was selected.
- Assessors/examiners were identified.
- Standardized Patients were selected.
- Running order of the stations in circuit was developed.
- List of equipments/instruments required was prepared.
- Tasks, checklists, feedback questionnaires etc printed

2. The day before the OSCE session

- Inspection of OSCE stations done
- Stations were clearly labeled
- Condition of required equipments/instruments was checked
- A pack of the documents for the OSCE examiners, students and patients were made available
- Signs were displayed at proper place

3. On the day of the OSCE session

- Reliable stop watch and loud manual bell were used
- Support staffs were placed to direct the candidates, examiners, and SPs
- Assessors explained SPs about their role once again
- Students were briefed
- Supervisors observed the session
- Feedback was taken from students, assessors and SPs

4. At the end of the OSCE session

- Feedback questionnaires were collected
- Checklists were collected
- Token money paid to SPs
- Contributions of everyone was appreciated

5. After the OSCE session

- Score was compiled and result declared
- Feedback questionnaires data compiled

Data: All the available data is included in data files of the article.

Conclusions: The conclusions are sensible, reasonable and rational.

Rano Mal Piryani
Principle Author

Competing Interests: No competing interests were disclosed

Deborah Korenstein
Division of General Medicine, Mount Sinai School of Medicine, New York, NY, USA

Approved with reservations: 29 May 2013

Referee Report: 29 May 2013
Title and Abstract: The title is OK, though I would describe it as a structured physical exam skills *educational program* (italicized words added by me). The abstract focuses largely on the theoretical models underpinning the approaches to evaluation. I think it would be clearer to focus concretely on concisely describing the evaluation performed. The theoretical rationale for that approach can be described in the paper itself.

Article content: Overall, the methods and design are adequately explained, though there are a few important exceptions. The authors go into great detail about the theoretical models underpinning their approach to evaluation. This is fine but is not really critical. The critical components of both the survey and the OSCE are whether these are validated instruments. I assume the authors created both for this project, but it is important for them to state that these tools have not been previously validated (unless of course they have). In addition, I did not find the Figures particularly helpful. They might be more clearly displayed in table format than as graphs.

Conclusions: The conclusions are reasonable, though I would add the caveat that because the measurement instruments were not validated it is difficult to be certain of their reliability. Also, the authors should emphasize that the meaning of the OSCE scores in particular is not clear since there is no comparison group and the OSCE has not been validated.

Data: The data is limited, but the curriculum design is presented in adequate detail.

I have read this submission. I believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Competing Interests: No competing interests were disclosed.

1 Comment

Author Response

Rano Mal Piryani, KIST Medical College Lalitpur Kathmandu Valley Nepal, Nepal
Posted: 08 Jun 2013

Dear Deborah Korenstein,

Thanks for reviewing article and providing suggestions for update.

Title and Abstract: As suggested evaluation performed is added in abstract concisely.

Article content: Both the survey and the OSCE were validated. Details of validation could not be included in article because of word limits. Validation of OSCE process was done in steps mentioned below.
Step I: OSCE academic team was formed. Preliminary workshop on OSCE was arranged in May 2010 for 3 hours for drafting OSCE stations (development of all three components of OSCE station--tasks, checklists and instruction/direction to simulated patients) utilizing standard book of clinical methods and evidence based literature. For drafting of tasks and checklists The Hutchison's Clinical Methods 22nd edition published in 2007 was chosen as standard book. Faculty members involved in teaching physical examination skills were instructed to draft two OSCE stations for each system within 8 weeks time.
Step II: Second workshop of OSCE academic team for two half days was organized in July 2010 to assess and finalize all three components of OSCE stations, develop instructions for examiner/assessor and scoring (marking) criteria. Editing of all three components of OSCE stations was done by experienced senior faculty members.
Step III: All the documents developed in second workshop printed in first week of August for conducting OSCE session in the end of August 2010 for first batch of undergraduate students.
Step IV: OSCE session conducted in the last week of August 2010 and the written feedback obtained from the examiners/assessors, faculty involved in teaching physical examination skills and students. This session was considered as piloting for OSCE session to be conducted for batch II in 2011 for proposed project.
Step V: Feedback taken from the examiners/assessors, faculty involved in teaching physical examination skills and students compiled, analyzed and shared with OSCE academic team in a meeting arranged in September 2010. Also score obtained on each station and total score by students shared in the same meeting. The team fully satisfied with the entire process and made some recommendations for conducting session for batch II in 2011 for proposed project.
Step VI OSCE academic team developed in 2010, reactivated in May 2011. Faculty members involved in teaching were assigned to review all three components of OSCE stations i.e. Tasks (stem), checklists and instruction/direction (training information) to simulated patients used in 2010 for assessment of first batch technically and as well as in the light of recommendation of OSCE academic team for conducting next session. OSCE Academic Team in depth reviewed all three components of OSCE stations in July 2011 in meeting cum workshop for two half days, edited & finalized. The documents printed in August 2011 and OSCE session held on September 27, 2011 for second batch (for project).

Conclusions: Validated tools were used for assessment**.** Mean of score obtained by students (98 students) on each OSCE station was calculated. Then overall mean was calculated. This data is included in article.

Data: All the available data is included in data files of the article.

Rano Mal Piryani
Principle author
Competing Interests: No competing interests were disclosed

Ramesh K Adhikari
Department of Child Health, Institute of Medicine, Tribhuvan University, Kathmandu, Nepal

Approved: 08 April 2013

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The title reads more like a description of an activity, suggesting that it reflects the article which reports on effectiveness of the TDP model in improving PES.

In regards to the content, I would suggest that the authors explain the 'retro- pre-questionnaire' in some detail. When did they administer this questionnaire and if there is any relationship between the responses to the questionnaire and OSCE?

The conclusions are sensible and balanced.

The data are satisfactory to justify the conclusions.

I have read this submission. I believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Competing Interests: No competing interests were disclosed.

1 Comment

Author Response

Rano Mal Piryani, KIST Medical College Lalitpur Kathmandu Valley Nepal, Nepal
Posted: 08 Jun 2013

Dear Ramesh Adhikari

Thanks for reviewing article and providing suggestions for update. The title of the article was finalized after consultation with all authors. A pre test was not done, so 'retro- pre-questionnaire' was used for assessing learners, i.e. self reported changes in acquiring physical examination skills. This was done at the end of project, before OSCE session. This is mentioned in the article. No correlation was done between response of retro-pre and OSCE score.

Rano Mal Piryani

Principle Author

Competing Interests: No competing interests were disclosed