

# Introduction of 'patient safety' module to undergraduate medical students through an interactive workshop

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## Abstract

**Background:** The World Health Organization (WHO) had developed a curriculum guide designed to shape foundation knowledge and skills of medical students to sensitise them regarding 'Patient Safety'. 'Patient Safety' is not emphasised in the current undergraduate (UG) medical curriculum. This study is an attempt to know the effectiveness of introducing a 'Patient Safety' Module based on the WHO's proposed curriculum, through an interactive workshop for UG medical students.

**Methods:** This cross-sectional study was conducted with 77 students of 2<sup>nd</sup> year Bachelor of Medicine, Bachelor of Surgery (MBBS). Three topics of the WHO's 'Patient Safety Curriculum' were taught through an 'Interactive workshop' and a study tool, comprising of multiple-choice question and Likert scale. A questionnaire was also administered pre- and post-workshop, followed by a 'field activity' which allowed students to apply their newly learnt knowledge in a real hospital setting. Feedback was taken and qualitatively analysed.

**Results:** The mean score of first section of the study tool was 9.2 (45.9%) in pre-test and 14.6 (73.2%) in post-test, with a positive difference of 5.5 (27.4%) marks. The analysis of section 2 showed a significant positive change in the knowledge level, but a non-significant change was noted for the level of agreement, own ability to influence, personal attitudes with regard to patient safety and expectations about patient care. Overall analysis of the second section revealed a significant change to the positive side.

**Conclusions:** 'Interactive Workshop' significantly increased the knowledge regarding patient safety, and therefore, it is an effective method to teach 'patient Safety' to UG medical students.

**Keywords:** Curriculum development, interactive workshop, patient safety, undergraduate medical students

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## INTRODUCTION

Medical science has evolved at a rapid pace over the recent years and enabled effective diagnosis and treatment of many diseases, thus making the world a relatively healthier place. It is ideally assumed by the patients and laymen that the 'Doctor' is an expert

who can never be wrong in his judgement during the diagnosis and treatment. However, in reality, it has been recorded that there are a significant number of incidents, where a patient has to suffer from temporary or permanent harm due to some act of omission or commission of the doctor or by any member of the

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medical team. The desired goal of 'patient safety' is to reduce the risk of unnecessary or preventable harm to patients, to the minimum.

'Patient Harm' is the 14<sup>th</sup> leading cause of global burden of diseases, even in high-income countries, 1 out of 10 hospitalised patients suffers from unnecessary or preventable harm and 1 million patients die annually due to surgical complications,<sup>[1]</sup> 5.2 million medical errors are occurring in India annually.<sup>[2]</sup> It is established that adverse events generally do not occur because doctors intentionally hurt patients, or he/she is incompetent, but are primarily due to the complexity of medical care systems where diagnosis and treatment depends on innumerable factors. These events are often deliberately not reported by the doctor, due to fear of repercussions by the hospital administration, public aggression and litigation by the patient or their relatives. On many occasions, such events are even not realised by the doctor, and he attributes the harm caused to the patient to unknown or other reasons, not under his control. In this era of information revolution, the patients are increasingly becoming aware of their safety issues and there are often reports in the media about allegations of negligence and flouting safety protocols on doctors and hospitals that lead to undesired complications. There is a rising trend of consumer forum cases against doctors and hospitals. It is impractical to think about 'no risk' approach in medical practice, and doctors and their team, being humans can make mistakes, after all 'to err is human'. There has been a realisation regarding this in recent years and increased efforts are now being made globally for patient safety; however, they are mostly concentrated to developed countries. The question that naturally arises is that *Is the Indian Medical Graduate, Adequately Sensitised and Trained regarding Patient Safety?*

Conventionally, training of bachelor of medicine and bachelor of surgery bachelor of medicine, bachelor of surgery (MBBS) undergraduate (UG) students has focused on developing pure clinical skills, such as diagnosis and treatment of illnesses and their medical follow-up. The sensitisation about 'Patient Safety' and the skills that are vital to ensure safety such as root cause analysis of all adverse events, communication skills and teamwork have been largely ignored in the curriculum. It is important that all UG medical students should have the necessary competencies to minimise any harm to patients. Patient safety is a new discipline in few developed countries but worldwide, many clinicians and faculty staff are unfamiliar with many of the concepts and principles. The World Health Organization (WHO) has developed a curriculum guide in 2009<sup>[3]</sup> which is designed to shape foundation

knowledge and skills for medical students to prepare them for clinical practice in a range of settings. A joint report was published by the General Medical Council and the Medical Schools Council of the United Kingdom<sup>[4]</sup> titled 'First, do no harm - Enhancing patient safety teaching in UG medical education', which describes the initiatives taken by the British medical schools in patient safety teaching for medical students. There have been attempts to include the patient safety in the medical curriculum,<sup>[5,6]</sup> however, much needs to be done as a serious attempt to include 'patient safety' as an essential part of the UG curricula in India.

The aim of this study was to conduct interactive workshop among 2<sup>nd</sup> year MBBS students on patient safety and assess its outcome. The objective of the study is to assess the improvement in knowledge on basics of patient safety before and after attending the interactive workshop and to create an environment of 'Patient Safety' by encouraging, sensitising and training the medical students.

## MATERIAL AND METHODS

A cross-sectional study was conducted among the 2<sup>nd</sup> year MBBS students of a tertiary care teaching hospital between September and October 2018. The study was approved by the Institutional Ethics Committee (CUSMC/IEC(HR)/PROVISIONAL APPROVAL-01/2018/3186 Dt 23-8-2018).

The patient safety module used was adopted from the 'WHO patient safety curriculums guide for medical schools 2009.'<sup>[3]</sup> Out of the 11 topics in the curriculum guide, three topics were selected for the present project for implementation convenience: (i) what is patient safety? (ii) infection control practices and (iii) medication safety. The Additional Medical Superintendent, a Professor of Microbiology Department and an Assistant Professor of Pharmacology Department were sensitised and included in the faculty team for the interactive workshop. Together, the faculty team tailored the curriculum content to suit the requirements of the 2<sup>nd</sup> year medical students and the teaching hospital where it would be implemented.

The team had a meeting to plan the interactive workshop and a 'Questionnaire' was developed with 30 questions (10 items for each topic), adopted directly from the WHO curriculum guide's relevant topic section. The first section of the questionnaire was of 20 close-ended questions with four multiple choices for each. 1–10 questions were from topic of infection control practices and the next 11–20 questions were based on the topic of medication safety. The last 21 to 30 questions were of a 5-point Likert scale response type, directly adopted from the WHO questionnaire.<sup>[7]</sup>

At the beginning, sensitisation regarding the workshop was given to the 2<sup>nd</sup> year MBBS students. All the UG students who were present on the particular day of study and who gave pre-written informed consent were included in the study. Seventy-seven students voluntarily expressed their willingness to participate in the study while 21 students elected not to. The venue and time regarding this were clearly informed well in advance to all the students.

The venue was an air-conditioned lecture hall, of 300 seating capacity, with large space and audio-visual aids. The students were initially allowed to sit randomly as per their choice and later grouped for interactive activity.

The workshop was divided into three sessions, each followed by a group activity. There was an initial 'ice breaking' session of introductions, creating a relaxed atmosphere, providing information to participants about the aims of the study, explaining the anonymity of their responses, allotting a temporary roll number and administering the 'pre-Test' of the study tool.

Session 1 was a PowerPoint (Microsoft Corporation, Redmond, USA) presentation on the basics of 'Patient Safety', there was video clips shown relating to use of helmets and seatbelt, lessons learnt from other industry such as space exploration and nuclear reactors, the 'Swiss cheese model', root cause analysis and discussing the commonly used patient safety terminology. This was followed by group activity, where five groups of 15–16 students each were formed, and a tasks for doing 'Root Cause Analysis' of a case and an exercise for 'Identifying Hazards' on a photo of a simulated intensive care unit was performed, followed by open discussion.

Session 2 was about hospital infection control, and the faculty began with real-life stories of patients treated at the hospital, discussed the importance of universal precautions, demonstrated the methods to use the personal-protective equipment and a 'Drill and Practice' session of the seven steps of handwashing technique was performed.

Session 3 was for 'Medication Safety'. The faculty started with a PowerPoint presentation to explain the terms and followed up with a discussion on 'Cases' with the groups. There was enthusiastic participation, especially because the subjects of microbiology and pharmacology were also being taught to them regularly.

The interaction was especially ensured during the workshop - with a lot of group activity, discussions, asking questions and keeping eye contact with all participants.

After the end of the workshop, the 30-item questionnaire was repeated with the same temporary roll number as identity. There were additional open-ended questions for 'feed-back' in the post-workshop questionnaire to assess students' overall perceptions of the quality of the workshop.

A 'Field Activity' was given to all the participants at the end of the workshop. A 'Hospital Visit Format' was provided and students visited the hospital's patient care areas, observed the procedures being carried out in the hospital, and recorded 5 observations that were jeopardising patient safety and suggested what could be the safety measures or solutions to prevent the hazards. The qualitative analysis of these formats was done and important points noted.

### Statistical analysis

The collected data were entered into the Microsoft Excel (Microsoft Corporation, Redmond, WA). For testing the normality of data, Kolmogorov–Smirnov and Shapiro–Wilk test were used. The non-parametric Wilcoxon signed-rank test statistics were used for further analysis. The responses on the Likert scale were analysed using the weighted average method. A *P* value <0.05 was considered statistically significant. Data were analysed using the Statistical Package for Social Sciences 17 version statistical package (IBM SPSS Statistics, Chicago, IL, USA).

## RESULTS

A total of 77 students participated in the study. All students were from the 2<sup>nd</sup> year MBBS (5<sup>th</sup> semester). The response of the students before and after the workshop is shown in Table 1. The first 20 questions of the pre-test questionnaire were analysed with 0 awarded for a wrong answer and 1 given for a correct answer, and the mean score was 9.2. The same analysis for the post-test questions delivered the mean score as 14.6. There was a difference of 5.5 marks observed (*P* = 0.0001). The range of marks in the pre-test was from 5 to 15 and post-test was from 5 to 19 (Table 1). These results suggest that the 'Interactive Workshop' has been successful in increasing the 'Knowledge level' of the students.

**Table 1: Comparison of knowledge score among study participants before and after the workshop\***

Questionnaire	Mean knowledge score (%)
Pre-test	9.2 ± 45.9
Post-test	14.6 ± 73.2
Difference	5.5 ± 27.4

\*Data are presented as mean ± standard deviation

The response of the students before and after the workshop for the statements 21–30 was analysed using the 'weighted average' method (Table 2). The analysis of

**Table 2: The response of the students before and after the workshop for the statements 21-30**

Statement	Mean score before test	Mean score after test	Difference in mean scores	P-value
Different types of human error?	2.7	3.5	0.8	<0.0001
Factors influencing patient safety?	2.9	3.6	0.8	<0.0001
Most healthcare workers make errors	3.1	3.5	0.4	0.001
In my country there is a safe system of healthcare for patients	2.8	2.9	0.1	0.325
Telling others about an error I made would be easy	3.1	3.4	0.3	0.021
I am confident about speaking to someone who is showing a lack of concern for a patient's safety	3.5	3.5	-0.0	0.801
If I keep learning from my mistakes, I can prevent incidents	4.1	4.1	-0.1	0.658
By concentrating on the causes of incidents I can contribute to patient safety	4.1	4.1	-0.0	0.846
Being open and honest about the mistakes I make will be acceptable at my workplace	3.4	3.6	0.2	0.061
The nurses will not criticise me for making mistakes	2.9	3.3	0.4	0.011

WHO=World Health Organization

the questions 21 and 22 showed that there was a positive change in the knowledge level regarding patient safety. This is also important because the shift is from the 'Disagree' segment towards the 'agree' with a difference in scores of 0.77 and 0.75. This indicates a definite improvement in knowledge level. Response to question number 23 is significant while number 24 is not significant, which shows that there was a minimal or no level of agreement. The weighted average score difference is 0.39 and 0.13, respectively suggesting that that this workshop has not greatly influenced the level of agreement about patient safety.

The next set of questions 25 and 26 deal with the responder's ability to influence patient safety measures, and there was significance noted in question 25 and not significant obtained in 26<sup>th</sup> response. The weighted average of 0.31 and -0.05 show a very less effect of the workshop on influencing ability and the responses remain around the neutral segment before and after the workshop.

The questions 27 and 28 are about one's attitude towards patient safety; there was no significant change in attitude. However, it was noted that the 'Attitude' weighted average pre-test score was quite good (4.13 and 4.08, respectively) and the post-test scores were nearly the same at 4.08 and 4.05, indicating an already agreeable sound attitude and inability of the workshop to increase it further.

The 29<sup>th</sup> and 30<sup>th</sup> statements were for 'expectations' on patient care and weighted average score of 3.36 and 2.88 were recorded in pre-test while the post-test response was 3.57 and 3.29, which was indicative of no significant improvement in the 29<sup>th</sup> statement while a significant change was detected in the 30<sup>th</sup> statement matter. We had observed a significant change in the overall responses to the questionnaire ( $P = 0.015$ ).

The feedback was an open-ended response type of questionnaire and after qualitative analysis, the important statements are provided in Table 3. The analysis shows that there was an overall positive feedback, from students regarding the workshop, indicating that 'Interactive Workshop' was acceptable method to teach 'Patient Safety'. The suggestions were important for the improvement of future workshops. Fifty-six students out of 77 that attended workshop submitted their 'field activity' reports. The information gathered during the field activity was highly variable in the content and the findings of the content's analysis were not relevant to the project at hand. However, the objective of the field activity was effectively achieved which was to stimulate the medical students on developing the important skills of observation, situation awareness, conscientiousness and predictive thinking, which are important for patient safety. The 21 students who had not submitted the field activity report could not be followed up because of the anonymity condition.

**Table 3: Summary of feedback statements**

Question	Statements
Question 1	What was 'good' about the 'interactive workshop on patient safety'
1	A new view point given to students
2	Increased their awareness regarding patient safety
3	More interesting than regular lectures
4	Changing teachers and methods of teaching in short intervals kept interest alive
5	Easy to remember as applicability was very clear
6	The group activities were very enjoyable
Question 2	What was 'not good' about the 'interactive workshop on patient safety'
1	It was very long in total duration
2	It was monotonous
3	Field activity will be difficult to carry out- fear of getting scolded
4	Not possible to implement the teachings in Indian hospitals
Question 3	What are your suggestions for improving 'interactive workshop on patient safety?'
1	Keep only one topic in a workshop
2	Keep it maximum of 1 hour duration only
3	Real cases and events should be discussed
4	Teaching 'patient safety' in real ward environment will be better



## DISCUSSION

The importance of the focus on patient safety and reasons why this topic should be part of the UG Medical Education Curriculum is well established. The WHO Curriculum Guide<sup>[1]</sup> comprises of two parts. Part A is a teacher's guide, which has been designed to assist teachers to implement the Curriculum Guide. Part B provides a comprehensive, ready-to-teach, topic-based patient safety programme that can be implemented either as a whole or on a per-topic basis. Considering the meticulous work already done by international experts chosen by the WHO, there was not much confusion as to the content (Part B) but given the fact that this had not been implemented in India as yet, and only in Medical Schools of few developed countries like the United Kingdom,<sup>[5]</sup> it was decided to experiment with the 'Workshop' method to implement the module. 'Workshop' literally means a small group that meets to explore some subject that develops a skill or a technique or carries out a creative project. It was established to be one of the teaching-learning methods which follow principle of active learning for adults. It was noted that the 11 topics of patient safety were being taught in a disintegrated manner in the present system, for example, the Hospital Infection Control was partially covered in Microbiology and Community Medicine, while 'Medication Safety' was partially taught in pharmacology and medicine. This piecemeal approach combined with the long duration of medical education and intervening board examinations was diluting the effectiveness of teaching concepts on 'Patient Safety'.

The workshop method<sup>[8]</sup> has been used to teach research methodology and concluded that workshop with group activities could be used as a powerful tool in medical education for improvement of knowledge among medical students. Problem-based learning case discussions have also been used for the same WHO topics.<sup>[5]</sup> The authors<sup>[5]</sup> recorded similar results as the present study with a significant increase ( $P < 0.05$ ) in the students' mean multiple choice question (MCQ) scores. A valuable conclusion of his study that was not suggested by the present study participants was 'patient safety education in clinical settings should focus on emergencies, where students perceive most errors'. In a similar study<sup>[9]</sup> dedicated surgical workshops were introduced into the pre-clinical component of the MBBS program. These workshops encompassed training in the clinical skills needed in the perioperative and wider hospital setting. The authors<sup>[9]</sup> concluded that the workshop was useful in improving the knowledge of the medical students and it was perceived by the students as beneficial in

enhancing their preparation for the off-campus surgical rotation and wider hospital experience. Peer-facilitated workshops enhanced interactivity which led to the student engagement and learning.<sup>[10]</sup> The same study<sup>[10]</sup> also showed that the workshops had improved student performance, retention of the subject, quality of student learning and increase in a higher level of thinking from pre-workshop to post-workshop. All these studies show that along with the regular lectures, the adjunct workshops for the students had shown greater impacts on student learning.

The limitations of the study were as follows: only one intervention is analysed. More number of workshops required on each of 11 topics to effectively cover the entire curriculum and establish the effectiveness of this teaching learning method and the participants have less clinical experience and the same interactive workshop with interns and 1<sup>st</sup> year resident doctors would have been more effective.

It was possible to significantly increase the knowledge regarding patient safety by conducting 'Interactive Workshop', and therefore, it is an effective method to teach 'Patient Safety' to UG Medical Students. However, to bring positive change in the student's level of agreement, develop own ability to influence patient safety, improve personal attitude towards patient safety and make accurate expectations about patient care; repeated interactive workshops on each of the 11 topics suggested by the WHO Curriculum and 'field activities', will be required.

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## Conflicts of interest

There are no conflicts of interest.

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