

**SENSITIZING STUDENTS TO PRESCRIPTION WRITING  
BY CLINICAL CASE SCENARIO****ARUL AMUTHA ELIZABETH.L<sup>\*1</sup>, S.V.MYTHILI<sup>2</sup> AND N.S.MUTHIAH<sup>3</sup>**<sup>1</sup>*Professor of Pharmacology, Sree Balaji Medical College & Hospital, Tamil Nadu, India*<sup>2</sup>*Professor of Biochemistry, Sree Balaji Medical College & Hospital, Tamil Nadu, India*<sup>3</sup>*Prof & HOD of Pharmacology, Sree Balaji Medical College & Hospital, Tamil Nadu, India***ABSTRACT**

Prescription writing is a core competency of a medical professional and it is the cornerstone for treatment. There is a worldwide concern regarding the lack of safe and rational prescribing skills and knowledge among the new medical graduates. This study is taken up in assessing the effectiveness of the prescription writing through clinical case scenario over the traditional tutorial based teaching. 85 students of 2nd M.B.B.S were exposed to the traditional teaching of prescription writing for myocardial infarction. Pre-test was conducted. Post-test was conducted after 3 weeks of small group discussion using paper cases of bronchial asthma to assess the effectiveness of case based teaching of prescription writing. The prescription was assessed using a checklist and scored accordingly (Physician component-2.5marks, Drug component-7.5 marks, total-10marks). The results obtained were statistically assessed using paired student 't' test. 85 students were evaluated in the prescription writing, and the scores in both pre-test and post-test was compared by paired students "t" test. And it was found that there was significant difference ( $p < 0.001$ ) in the prescription pattern in the students after teaching with clinical case scenario. The prescription skills and confidence of future doctors can be improved by teaching prescription using clinical case scenario rather than traditional tutorial method.

**KEY WORDS:** Prescription writing, clinical case based teaching, Traditional teaching, Assessment.**ARUL AMUTHA ELIZABETH.L**

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## INTRODUCTION

“Pharmacology is more than a distinct discipline in medicine, it conceals itself and institutes itself into many interdisciplinary areas of basic clinical science.<sup>1</sup> Pharmacology is usually considered as a paraclinical discipline which connects basic science to clinical science, it provides the scientific basis of therapeutics (i.e.) the scientific foundation for safe and rational prescribing of drugs.<sup>2</sup> Prescribing is a complex and challenging duty that requires diagnostic skills, knowledge of medicines, communication skills and understanding of the principles of clinical pharmacology.<sup>3</sup> It is a written order which include detailed instructions of what medicine should be given to whom, in what formulation and dose, by what route when, how frequently and for how long.<sup>4</sup> Proper prescription writing, which is an essential skill for doctors in medical specialties, is the primary intervention that doctor's offer to the suffering humanity.<sup>5</sup> so prescribing is one aspect of patient care where it is possible to do considerable harm if not done judiciously. Most junior doctors are unaware of the fact that prescribing errors may contribute to a significant rise in reported hospital adverse events and subsequent medico-legal problems. Each prescriber must be able to prescribe drugs safely and effectively to the designated patients in order to prevent medical errors. In spite of its complexity and great significance very little importance is given to the learning of prescribing in the medical curriculum. The time devoted to its learning during the undergraduate clinical pharmacology practical exercises is barely sufficient. The clinical postings teach the students about how to arrive at a diagnosis and what drugs are to be prescribed. How to prescribe receives very little attention. Deficiencies in undergraduate prescribing education has been closely linked to the high frequency of medication errors, especially by the junior doctors<sup>6</sup> which can result in serious health risks to the patient and adverse economic outcomes<sup>7</sup>. The quality of undergraduate pharmacology teaching has been reported as one of the main stakeholder. Most often prescribing is thought of as a simple act of writing a prescription and failure to realize the seriousness of the prescribing task at hand has culminated in prescription errors. The importance of writing proper prescription should be emphasized during the students' undergraduate training. The skills, knowledge, and attitudes needed to make good prescribing decisions should be inculcated.<sup>8-9</sup> Contradictory to this the undergraduate training at many places makes the task of prescribing to appear as a casual exercise which only requires the students to memorize the names of certain medications. The practical aspects of selecting a drug appropriate to a clinical condition, based on patient characteristics and available evidence is rarely conveyed to the students.<sup>10</sup> Clinical orientation of MBBS teaching in pharmacology is essential as it has relevance on their further training in final professional and internship training program. A good training in pharmacology necessitates the acquiring of the skill of rational prescribing. However, this goal is not adequately met with by the existing curricula. Urrutia-Aguilar et al. in 2012 conducted a study to measure the effectiveness of pharmacology teaching in

undergraduate medical students and found that there was an urgent need to review undergraduate training in pharmacology.<sup>11</sup> A lot of priority has been laid on adapting interactive student-centered approaches to learning including problem based learning (PBL) and case based learning (CBL). In active learning, the focus is on the students rather than the teacher. Hence, the student is responsible for their own learning. Both PBL and CBL use a clinical situation that trigger interest in the students on the basis of knowledge that they already have and discover knowledge gaps that will be addressed during the learning process.<sup>12</sup> The aim of CBL is to teach basic medical sciences in a meaningful manner closely related to topics in clinical sciences and invigorate the reasoning, collaborative and communication skills of the students.<sup>13-15</sup> Keeping in mind the current medical curriculum, we assessed the effectiveness of case based teaching prescription writing which was feasible in our set-up. These sessions have been planned with an aim to help the students empower the habit of treating the patient as a whole rather than the disease or symptoms. This way they get trained in individualization of drug therapy. Such sessions have been conducted for topics which are important as per the health care needs of the community.

## MATERIALS AND METHODS

This study was conducted in the department of Pharmacology at Sree Balaji Medical College, Chrompet, and Chennai. After obtaining permission from Institutional Ethics Committee (IEC).002/SBMC/IHEC/2014-114. A waiver for written informed consent was also taken from IEC. The study participants include 2nd MBBS students (batch of 84 students) Preparation Before each session, a departmental meeting was held to choose the topic and plan the session. After a didactic theory lecture and a standardized tutorial were conducted on prescription writing on myocardial infarction, pre-test was conducted. We prepared a factual case scenario of acute bronchial asthma clinical disease condition. The prepared case scenario was discussed with the clinician and his suggestions were incorporated before the presentation was actually carried out. Students were informed beforehand and were required to come prepared with the topic, hence that they could participate actively. Relevant points of history, general physical examination, investigations and diagnosis were included. Group discussion was conducted by splitting the students into 8 groups (each group has either 10 or 11 students). Each group was guided by a faculty or post-graduate. The group discussion was conducted in 2 sessions. During the group discussion prescription writing for management of acute bronchial asthma was taught with in coherent with the clinical case. The importance of rational prescription was stressed to the students. Post test was conducted after 3 weeks of small group discussion using paper cases of bronchial asthma. The prescription was assessed using a checklist and scored accordingly (Physician component-2.5marks, Drug component-7.5 marks, total-10marks)<sup>16</sup>.

The physician related component is comprised of

- Prescriber's identity
- Professional degree and registration no.
- Prescriber's address with telephone no.
- Date of prescription
- Patient's Identity
- Patient's address
- symbol (Rx), "Take Thou"
- Diagnosis of the disease e.g. Bronchial asthma
- Refill information
- Prescriber's signature

The drug related component is comprised of

- Appropriateness of drug selected
- Strength of drugs
- Dosage form
- Quantity to be dispensed
- Direction for use

The results obtained were statistically assessed using paired student's t test.

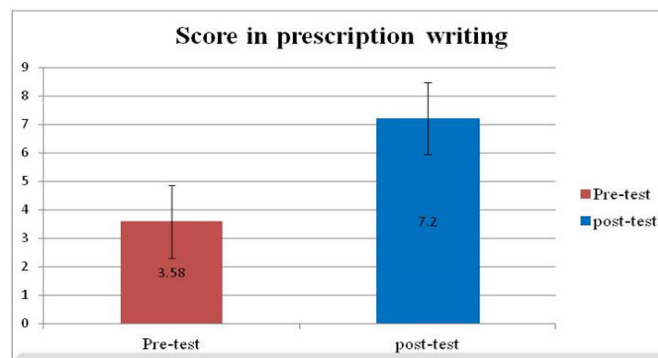
## RESULTS

- The pre-test and post-test prescription writing was analyzed by a standardized checklist and scored accordingly. Physician component-2.5marks, Drug component-7.5 marks, total-10 marks. From the results it is evident that (Myocardial infarction  $3.58 \pm 0.17$  Bronchial asthma  $7.2 \pm 1.04$ ) the student's performance increased in the case based teaching of prescription writing.
- The data are expressed in mean  $\pm$  SD. This difference is statistically assessed using paired student's t test and was found to be statistically significant ( $p < 0.001$ ).

**Table 1**  
**Comparison of pre-test prescription scores with post-test**

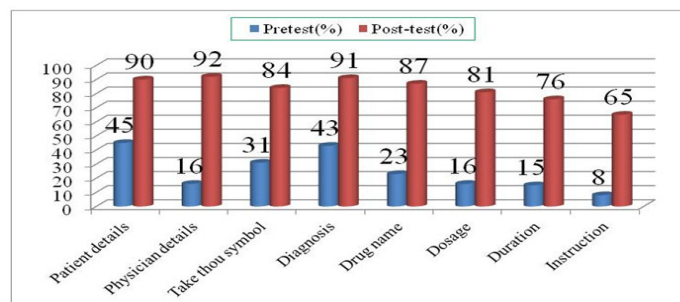
Topics	Myocardial Infarction (Pre test)	Bronchial asthma (Post-test)
Score (Mean $\pm$ SD)	$3.58 \pm 2.17$	$7.2 \pm 3.04^*$

**Figure 1**



**Figure 2**

**% Comparison of prescription parameters between pretest & post-test**



## DISCUSSION

For an effective undergraduate teaching, it should essentially be horizontally and vertically integrated. As per the Vision 2015 document of Medical Council of India (MCI), emphasis should be on the introduction of

case scenarios for classroom discussion/ case-based learning.<sup>17</sup> In future, this might become an essential part of the medical curriculum. A survey by Vasundara et al. to assess the clinical application of pharmacology knowledge in patient care found that pharmacology teaching needs radical changes.<sup>18</sup> A number of

methods and new techniques have been tried by various academicians elsewhere. Rao and Kate introduced problem solving interactive clinical seminars for undergraduates to make the learning process more effective<sup>19</sup>. A number of researchers have also tried to integrate two or more subjects in UG curriculum and found encouraging results<sup>12-13</sup>. No method of teaching and learning in medicine is ideal since each method is associated with its own benefits and flaws. Didactic lecture format is used most commonly but, it being a passive form of learning, fails to motivate the students to learn more. In an active learning environment, teachers facilitate students' learning. CBL is an interactive student centered instructor led learning approach<sup>14</sup>. Several researchers compared CBL with didactic form of teaching<sup>15-17</sup>. Pearson et al. found CBL to be an effective adjunct to the traditional lecture format<sup>15</sup>. Kassebaum et al. in their study showed that CBL made the learning more enjoyable and improved the interactive ability of the students<sup>16</sup>. Another comparative study conducted by Kamat et al. assessed the impact of case based teaching on learning rational prescribing when compared with the traditional method of teaching and found them to be better in facilitating the learning process.<sup>18</sup> A literature review of CBL was done by Williams and its role in basic sciences teaching was explored<sup>12</sup>. The article concluded that CBL is an exciting educational prospect which allows students to develop a collaborative, team based approach to their education. Rodríguez-Barbero and López-Novoa had a positive experience in using CBL in physiology<sup>20</sup>. A study from Manipal indicated that CBL sessions enhanced active learning in microbiology<sup>21</sup>. The opinion of the students is also highly valuable. They are the best ones to judge if a new methodology is of any benefit to them or not. Hence, student evaluation on the impact of CBL was done by a number of researchers<sup>22-23</sup>. They summarized that the students enjoyed the sessions and felt that it enhanced their understanding. However, the feedback from faculty taken in another study<sup>23</sup> showed that the faculty favoured didactic lectures over these sessions, keeping in mind the attentiveness of the students. In our setup, a formal written feedback from the faculty was not taken, but as per the verbal feedback, the faculty found the students to be more involved, engaged and interested in the sessions. But the importance of didactic lectures could not be undermined. Tayem concluded that CBL led to a significant improvement in students' self-reported analytical and communication skills, confidence, satisfaction, motivation and engagement<sup>24</sup>. CBL is an excellent method for integrating pharmacology with clinical subjects. It enhances the ability of students to understand the concepts and assimilate the knowledge in an effective manner. As the faculty of both the departments will be present, it is an excellent opportunity for students to clarify their doubts, if any. They understand that whatever is being taught in pharmacology is actually being practiced in clinical departments and hence pharmacology is not merely a theoretical subject. This would be one of the important ways to integrate basic and clinical subjects. In a way, it is like bringing the patient bedside to classroom. As with any other teaching methodology, this method is also not flawless. This method requires a lot of planning,

co-ordination and organization in advance, not only at the departmental, but also inter-departmental level. Hence, feasibility may be an issue in conducting such sessions. Furthermore, it is difficult to discuss all the aspects of the therapy in this format; for example, pharmacokinetics and pharmacodynamics of the drugs may be missed out. It is not wise to cover the entire syllabus in the form of case scenarios as it is not an exam oriented activity. Also, the time consumed for three sessions in a sequence on a particular topic, i.e. lecture followed by tutorial and then a case discussion, may be too much as per the number of teaching hours available according to MCI guidelines. However, this may be justified by the fact that the practicals in pharmacology (pharmacy and animal experiments) have been reduced to a great extent as per MCI guidelines. These practicals can be replaced by the case discussions. Moreover, the entire syllabus need not be covered in this manner. Only the important topics can be included initially and later on, if found suitable by the departmental faculty, either of the didactic lecture or tutorial for a particular topic may be replaced by a case discussion. Hence, the aspect of time consumption is manageable to a great extent. Another aspect is that we are looking only at short-term impact of the intervention. To look at the long-term effects, i.e., whether this knowledge translates into better prescribing skills, we need to take another feedback when these students become interns. We need to look not only toward the students' attitudes but also any difference in their knowledge levels. For this, we plan to introduce pre- and post-session questionnaires based upon the content of the topic. This will help us to evaluate whether these sessions have led to any improvement in score and better understanding of the students. Then, we can establish CBL as an alternative method of teaching pharmacology and make it an essential part of the curriculum. Recently, MCI has proposed to introduce some reforms in the MBBS curriculum including a decrease in the number of teaching hours in pharmacology. In these settings, these sessions can be very useful as they can reduce a number of theory lectures to be taken on a particular subject, although this may require a great deal of preparation on the part of teachers as well as the students. However, the positive aspect is that such an exercise can be introduced in any institution without any administrative hassles. Such exercises require close co-ordination between the two departments. On the basis of our experience, we can say that CBL has good acceptance and recognition by students and a high level of satisfaction on the part of teachers. It is a good addition to the armamentarium of pharmacology teaching tools. But whether it can replace the conventional methods requires further studies.

## CONCLUSION

The current study conclude that the prescription writing skills of future doctors can be improved by teaching prescription writing using clinical case scenarios, so the students understand the importance of prescription writing. CBL also integrates pharmacology with clinical subjects. It enhances the ability of students to understand the concepts and assimilate the knowledge in an effective manner.

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**CONFLICT OF INTEREST**

Authors in the manuscript have declared no conflict of interest.

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