A Review of Small Group Discussion and Case-based Learning as a Learning Strategy in Pharmacology

Godofreda V. Dalmacion[1] and Erlyn A. Sana[2]

[1]Department of Pharmacology and Toxicology, College of Medicine and Philippine General Hospital, University of the Philippines Manila
[2]National Teacher Training Center for Health Professions, University of the Philippines Manila

ABSTRACT

In response to the increasing amount of drug information, the teaching strategy of Pharmacotherapeutics was changed from Teacher-based Classroom Lecture to Small Group Discussion (SGD) revolving around ten to twelve of the most prevalent diseases in the country.

Objectives: To investigate the effect of small group discussion on the performance of Pharmacology students by 1) Comparing the drug choices of students during Medical Internship with those of Pharmacology teachers for five selected clinical conditions 2) Describing the attitudes of Medical Students while in Medical Clerkship towards SGD 3) Determining areas of disagreements in prescribing choices between Clinical Consultants and Pharmacologists.

Methods: Medical Interns and their pharmacology teachers were concurrently administered the same questionnaire testing their drug choices for five clinical conditions. Attitudes of Medical Interns during their Clinical clerkship towards SGD was determined using their reflection papers. A survey was also conducted among interns to determine which diseases showed more frequent disagreements in prescribing between clinical consultants and pharmacologists.

Results: Ninety one medical interns participated in the study. Agreement on the choice of drugs was generally low (23%-44%) except for Exercise-induced Asthma (89%). Majority of 147 reflection papers by clinical clerks expressed positive attitude towards SGD as a learning tool for Pharmacotherapeutics. Medical interns also perceived that drug choices of their clinical consultants/residents agree with what they were taught in Pharmacology 70% of the time. But it was actually 43% low when they were given five clinical cases to virtually treat. It is presumed that their drug choices only reflected their actual prescribing practice while under the supervision of their Residents/ Consultants. Most disagreements were observed in the treatment of Hypertension and UTI.

Conclusions: There was poor retention of knowledge about drug choices from undergraduate Pharmacology especially for eradication of H. pylori and recurrent UTI at 23% and 28%, respectively. Forty six percent of medical interns concur that Small Group Discussion is an acceptable strategy for case –based learning. It likewise positively influenced their prescribing decisions as Medical Interns.

Key Words: Small group discussion, Pharmacotherapeutics, case-based learning, education, medical curriculum, reflection papers.

Corresponding author: Godofreda V. Dalmacion, MD, MSc, MHPEd
Department of Clinical Epidemiology
College of Medicine
University of the Philippines Manila
547 Pedro Gil St., Ermita Manila 1000, Philippines
Telephone: +632 5254098
Email: jrvd2003@yahoo.com

Introduction

Medical education is a life long process that has undergone a dramatic pedagogic shift from the traditional teacher- centered approach to one that is student- centered.[1] Innovations are continuously being explored to make medical students more competent in solving problems. A study showed that students taught within the lecture- based disciplinary system typically are not able to solve problems that would require connecting between concepts and content.[2] In contrast, interdisciplinary teaching that utilizes a topic, problem or project galvanizes active participation of students enabling them to reach a resolution.[3] Naturally, this growing uncertainty about the applicability of purely lecture-based education to address today's current problems, has given impetus to the adoption of more critical thinking using clinical problems and interdisciplinary education.

Consequently, with the increasing amount of drug information and growing number of computer- savvy students, the Department of Pharmacology of the University of the Philippines- College of Medicine applies two learning strategies to teach Undergraduate Pharmacology. These are classroom lectures to teach Pharmacodynamics to medical undergraduates and Small Group Discussion (SGD) on the treatment of different diseases using clinical cases for Pharmacotherapeutics to Clinical Clerks. While multiple choice test questions tested students' performances in Basic Pharmacology, virtual prescriptions for disease problems was used to assess performances by clinical clerks in Therapeutics. Two years have since passed from the implementation of this strategy and an opportune time to assess its effect on the prescribing pattern of the same students taught SGD now that they are Medical Interns.

Objectives: This study was conducted a.) To compare the drug choices for five clinical conditions of medical interns with the drug therapy taught to them in Pharmacotherapeutics 2.) To describe the attitude of students towards SGD when they were Clinical Clerks 3.) To determine the perception of interns on the degree of agreements in prescribing between Pharmacologist and Clinical Consultants.

Study design: A cross sectional survey on the attitude of Medical Interns toward SGD was done. A questionnaire testing their choices of drug treatment for five clinical scenarios were administered. These diseases were mild

Hypertension, recurrent Urinary Tract Infection (UTI), H. pylori infection, Salmonella in pregnant patients and Exercise- induced asthma. Their choices were compared with the drugs chosen by randomly selected Pharmacology teachers. Their answers to the same questionnaire served as benchmark.

The attitudes of Medical Interns when they were Clinical Clerks towards SGD as a learning strategy for Pharmacotherpeutics was determined using their reflections papers. Finally, agreement on drug therapy was determined using a self-administered questionnaire.(Table 1).

medical curriculum.

Attendance to the course was also observed to have significantly improved. Sleeping in class occurred less frequently and the number of students coming in late for the sessions decreased. In addition, the plenary meetings where the learning activities were synthesized were well attended andthere was more active participation. Table 2 and Table 3 summarize the varied insights of the students towards SGD for the clinical cases.

Despite the varied responses, a general feeling of satisfaction towards SGD was evident. Most students expressed their preference for active participation by the

Table 1. Comparison of Drug Choice Between Faculty and Medical Interns

Disease	Drug choice by faculty (gold standard)	Medical Interns who agreed	Remarks
Mild Hypertension	Diuretic	46/91 or 30%	Medical Interns chose metoprolol over diuretics
Recurrent UTI	Fluoroquinolone-Norfloxacin	20/87 or 23%	Most medical interns were less specific and chose quinolone as the drug of choice. Norfloxacin would have been a better answer.
H. pylori eradication	Clarithromycin plus *PPI + Amoxicillin	234/86 or 28%	Most students chose metronidazole instead of the more expensive clarithromycin .Many medical interns picked H2 blocker eg. Ranitidine rather than a proton pump inhibitor
Salmonella in a pregnant patient	Ceftriaxone/ Amoxicillin	36/82 or 44%	No significant difference observed
Exercise induced asthma	Salbutamol/beclomethasone	75/84 or 89%	No significant difference observed

*PPI proton pump inhibitor

Results: There were 91 Medical Interns who responded to the survey although not all answered all items in the questionnaire. Table 1 below shows the difference **in drug choices** between Faculty and Medical Interns. Arbitrarily, an agreement of 70% to 80% was considered satisfactory, 80% to 90% was very good agreement and more than 90% was excellent agreement. Agreement of 50 to 69.9% was considered unacceptable and less than 50% was considered very poor agreement.

Clearly, agreement on the choice of drugs between faculty and Medical Interns was generally poor except for Exercise--induced Asthma (89%). Agreement was poorest for H. pylori infection and Recurrent UTI at 28% and 23% respectively. Interestingly, test scores for these diseases were also lowest for the medical interns during their undergraduate course. There was no prescribing disagreement among the selected Pharmacology teachers for drug treatment of all five diseases.

Attitude of medical students towards the SGD and case-based learning : Entries from 147 reflection papers out of the original 152 were retrieved. Attitude and reaction to SGD as a tool for learning were mostly favorable and encouraging. Clinical clerks felt that these strategies were sound although more difficult to carry out. They also concurred that curricular change occurred at the right moment when the University was already pushing for innovation of the facilitator in the discussion instead of being mere observers. But it was also observed that some facilitators tended to over do it and steered the discussion towards their biases. It was also suggested that the study guide should be distributed earlier and a structure be imposed on the discussion of the cases.

Perceived effect of SGD on prescribing habits in Medical Internship: A total of 93 medical interns participated in the survey of which 45 (48.39%) were females and 48 (51.61%) were males. A total of 17 respondents were direct entrants of the Integrated Arts and Medicine (Intarmed)[1], the 6-year Medical Curriculum, while 76 (81.72%) came from lateral courses and other admission slots such as the Regionalization Program. (Table 4).

Forty six percent of medical interns believed that SGD effectively contributed to their prescribing decisions but almost the same percentage of interns were non-committal (45%). Only 4 (4.3%) respondents replied in the negative. In the end, about 53% of medical interns were more likely to agree with clinical consultants than with pharmacologists in the choice of drug therapy. They also think that knowledge of drug therapy for Hypertension and UTI obtained in the undergraduate program do not approximate the choices made by their clinical consultants. Surprisingly, prescribing agreement for other diseases was perceived by interns to be quite good at 70%. Disagreements in prescribing decisions

Table 2. General Comments on the Small Group Discussion using Reflection Papers of Medical Interns when they were Undergraduates

Positive Perceptions	**Negative or equivocal Perceptions**
Good, pertinent, lively and interesting discussion.	We had problem choosing drug
Presented us with a challenge in selecting drug.	Relied on textbook and rotation in the hospital
Helped to think independently	Topic this time more difficult but
Everyone came prepared	I know a person who has this illness
All participated.	Generally unaware how to conduct (the SGD);
Holistic approach	Made a mistake of doing case conference
I learned more than reading on my own	Confused. Getting the hang of it
No one was late, informative	Tiring
Dynamic and comprehensive	Some were more talkative than the others
Intellectually stimulating highly interactive	We are not used to this, did not know where to start.
Enjoyed it, reinforced previous learning	More direction, not ready , more comfortable with traditional method
Learned to write formulary.	Hope can give learning
Better understanding of the concept of treatment	objectives a week before
Now I find myself with my colleague, discussing a topic as mature doctors. If that isn't something to be proud of, I don't know what it is	Subgroup, just answered
Honestly, I did not fall asleep. Had we been in the classroom setting then that is what I would be doing now in the middle of the lecture	question, in a hurry
I realized how cost of drug affects its effectiveness	Less structured although we were able to address the problem but circuitously (sic)
	Group too big, break it up into smaller groups

Table 3. Comments towards SGD for specific concerns

I. Comments on Methods	Better way of analyzing problem. We exhausted all resources
	Systematic way of analyzing. Practical
	Group consensus. Interaction was nice. Good interaction; not groping anymore since second time (sic) all participated
	I learned from the others
	Many insights opinions and contradictions
	Logical and productive interaction
	Group members came with reference. Improving thru time
	Complete attendance and orderly discussion
	Process was helpful
	Fervent discussion but agreed without violence
II. Comments on Faculty and Student Facilitator	Too long. Preceptor should have read ahead of time
	Productive good discussion despite tutor
	Better this time with preceptor directing the discussion
	Preceptor guided us.
	Intellectually stimulating but better if tutor guides
	Effective with facilitator who helped clarified issues; Facilitator also related personal experiences and clinical pearls
	No volunteer for facilitator
	I am glad facilitator gave input. They should not only listen
	Tutor redirected discussion
	Despite the absence of a tutor, the discussion came out well
	Tutor very helpful, relaxed and teaching materials helped
	Starting was hard. Facilitator was good, it became lively and we got carried away and drifted
	We had problem choosing drug
	Relied on textbook and rotation in the hospital
	Topic this time more difficult but I know a person who has this (sic) illness
	Generally unaware how to conduct (the SGD);
	made a mistake of doing case conference
	Confused. Getting the hang of it
	Tiring
	Some were talkative than the other
III. Criticisms	We are not used to this, did not know where to start.
	More direction, not ready ,comfortable with traditional
	Hope can give learning objectives a week before
	Subgroup, just answered question, in a hurry
	Less structured although we were able to address the problem but circuitously (sic)
	Too big for group/broke up in smaller group

Table 4. Medical Interns perception on actual prescribing in the clinics

Question 1 n=93 (%)	**Outstanding**	**Very much**	**Just enough**	**No difference**	**Worse**	**Comments**
How much did the SGD help you in your current prescribing ?	4 (4.3%)	**43 (46.24%)**	42 (45.16%)	4 (4.3%)	0	Good exposure for selecting drugs. Reading materials and guidelines helped a lot
Question 2	**Less than 50%**	**51-60%**	**61-70%**	**71-80%**	**81-90%**	**More than 91%**
How much disagreement was there between prescribing in the clinics versus what you learned from Pharmacology?	8 (8.60%)	8(8.60%)	18 (19.35%)	24 (25.81%)	**29 (31.18%)**	6 (6.45%)
Question 3						
List five diseases which you perceive have the most disagreements in drug prescribing.	**A. Hypertension**	**44 (47.3%)**				
	B. UTI	**28 (30.1%)**				
	C. DM	**14 (15%)**				
	D. Pneumonia	**12 (12.9%)**				
	E. Ulcer	**11 (11.83%)**				
Question 4	**Pharmacologist**	**Clinician**	**None**	***EBM**	**No reply**	
With whom would you agree during disagreements in drug choice?	**22 (34.41%)**	**49 (52.69%)**	1	1	10 (10.75%)	

[1]INTARMED refers to the Integrated Arts and Medicine medical curriculum of the University of the Philippines College of Medicine. The program follows Organ-System Integration (OSI) track and recruits 40 medical students directly from high school upon landing in the top 40 slots of the University's admission examination. Lateral entrants complete the medical degree in 6 years.

+DM=Diabetes mellitus
* EBM- Evidence –Based Medicine

Table 5. Areas of Prescribing Disagreements between Clinical Consultants and Pharmacologists based on the Perception of Medical Interns.

Areas of disagreement	**Frequency of Occurrence**
Choice of the drug	74 (79%)
Cost of drug	31 (33 %)
Choice of Intervention (non pharmacologic versus drug)	28 (30 %)
Duration of Therapy	22 (24 %)
Dosing of drug	16 (17 %)
Contraindication	10 (11 %)
Diagnosis	8 (9 %)
Instruction to patient	8 (9 %)

were felt to occur in the areas listed in Table 5.

In the study, clinical consultants were observed to prescribe more expensive and newer drugs even to mildly hypertensive patients. But only 33% disagreed on cost which is promising for the successful implementation of the Generic Act. About 30 % also disagreed on type of therapeutic modality. Understandably, real life situations in a tertiary hospital urge clinical consultants to respond more aggressively by choosing drug therapy over non-drug treatment. In contrast, classroom case-based scenarios are sterile, ideal and less explicit about detail such as age, nutritional status, co-morbidities or psychological state. These confounding factors are often not evident in clinical scenarios which in the interest of brevity are restricted to the essentials of the case. It is precisely this simplistic depiction of clinical scenarios which hinders correct assessment of the true prescribing skill of medical students using case scenarios.

Conclusions:

Generally, there was good acceptance of Small Group Discussion as a learning strategy for Pharmacotherapeutics except for brief periods of uneasiness and uncertainties during the initial meetings. Although when tested on their drug choices for five clinical cases (also taught in undergraduate Pharmacology), prescribing agreement with Pharmacology Teachers' choices was poor especially for eradication of H. pylori and recurrent UTI at 23% and 28%, respectively. Forty six percent of Medical interns feel that SGD learning exerted positive influence on their prescribing practices during internship while about the same percentage (45%) were non committal. On the average, the drug prescribed by students in their internship was not the same as those in the undergraduate course with an agreement ranging from 23% for recurrent UTI to a high 89% for exercise-induced asthma. More than half or 53% tend to agree more with their clinical consultants than their Pharmacology teachers in selecting drug treatment. This was not attributed to lack of credibility of the teacher-pharmacologist but rather due to a difference in the appreciation and interpretation of the same signs and symptoms between virtual and real

patients. It can be surmised that these cases are "sterile" depictions of actual diseases while real patients exhibit other characteristics aside from the disease which can influence prescribing decisions. Prescribing is a behavior after all while drugs are mere inanimate objects. In 30% of disagreements, the choice of drugs (79%), cost of the drugs (33%), and the decision to choose between non-pharmacologic and pharmacologic intervention (28%) were the most frequent areas of prescribing conflict.

Although SGD is an acceptable tool for both students and teachers to teach rational prescribing, it is not enough to ensure "appropriate" drug choices when confronted with real patients except for exercise-induced asthma in this study. More work should be invested in creating "virtual cases" that can capture the real world of therapy and closely approximate the actual patients in the hospitals. Moreover, more education researches must be undertaken to link performance outcome with the various learning strategies that teachers in the College of Medicine administer to their medical students. Changing curriculum poses a challenge that should transcend the temptation to change for the sake of change.

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