REFLECTIONS ON PRACTICE

Redesigning the Teaching of Medication Management and Counselling Skills for Pharmacy Students: A Reflection on Experiences and Teaching Practices

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ABSTRACT

Pharmacy graduates need to demonstrate competency in medication management and counseling (MMC) skills such as dispensing, counseling, communication, and documentation for registration as a pharmacist. Undergraduate Pharmacy students at the National University of Singapore (NUS) develop these skills in a sequence of three Pharmacy Professional Skills Development (PPSD) modules. PPSD III traditionally conducts two rounds of MMC practical sessions using one-on-one role play between a student and a faculty member or clinical tutor. The manpower and resources required to conduct these sessions are significant and challenging to sustain for a large undergraduate class averaging 180 students per year. In Academic Year (AY) 2018/19, the first round of MMC practical was redesigned into a tutorial format to capitalise on the strengths of tutorials in facilitating interactions between students and faculty, and engaging students in problem-solving. This report describes our experiences in implementing the MMC tutorial and our students' perceptions. We also reflect on our experiences and share learning points for future improvements. Our students believed that the MMC tutorial facilitated their learning of MMC skills (77.4%). They preferred hands-on activities such as documentation and generation of labels (85.8%), and interactions with faculty such as discussions and role plays (86.9% and 75.9% respectively). Significant improvement in students' self-reported confidence was observed for all MMC skills taught during the tutorial. To further improve students' learning experiences, tutorial activities should strive to mimic similar conditions as what would be expected of students in graded assessments, such as independent problem-solving under time constraints.

Keywords: Pharmacy skills, tutorial, role play, undergraduate pharmacy education

INTRODUCTION

A competent pharmacist possesses many skills, such as taking history, assessing information, identifying as well as resolving legal issues and drug-related problems (DRPs), and communicating with patients, caregivers and prescribers. Regulatory authorities such as the Singapore Pharmacy Council (SPC) require competency in these skills prior to registration (SPC, 2011).

The National University of Singapore (NUS) offers a four-year Bachelor of Science (Pharmacy) degree that is recognised by the SPC for registration as a pharmacist. The programme includes three years of didactic courses in biomedical, pharmaceutical and clinical sciences, followed by a final year which includes research and experiential learning. The Pharmacy Professional Skills Development (PPSD) sequence at NUS Pharmacy includes three required modules, each in Years One to Three, and allows pharmacy students to develop medication management and counseling (MMC) skills (e.g. dispensing, counseling, communication, and documentation) in a classroom setting.

PPSD III is a required module for third-year undergraduate pharmacy students. This module typically conducts four-hour MMC practical sessions where students are presented with a patient case and a prescription. Students review patient information, assess appropriateness of a prescription, identify, communicate and document interventions, and counsel on dispensed medications, which mimic steps in dispensing at a pharmacy. These skills are taught and assessed by faculty members or clinical tutors with pharmacy practice experience, who role play as either the patient or prescriber where necessary.

While students appreciate the active learning accorded by one-on-one role play, conducting these sessions has numerous challenges. Firstly, the time, manpower and resources needed to conduct one-on-one role plays are significant for an undergraduate class averaging 180 students per year. Secondly, it is challenging to balance faculty workload and identify appropriate clinical tutors. Lastly, there is limited time during each practical session to debrief students, elicit their reflection, and provide individualised feedback.

Tutorial is a group teaching format centered on interactive discussion (Jagzape et al., 2012). It is frequently employed in higher education to engage students in problem-solving and to promote autonomous student-centered learning (Ferris, 2015). Tutorials have been used in medical and pharmacy education for teaching skills such as drug information and business management (Lapidus et al., 2009; Singleton & Nissen, 2014). A tutorial format was chosen in the redesign of MMC teaching activities because tutorials can overcome several challenges of one-on-one role play. Specifically, extensive interactions between faculty and students during a tutorial allow faculty to observe how students approach patient cases and solve problems. Non-graded tutorials provide a safe environment for students to practice their MMC skills. Using a tutorial format, the manpower needs can also be reduced. Other approaches for teaching or assessing MMC skills had been reported in the literature and included one-on-one role play, small group role play (four to five students per group) and objective structured clinical examination (Luiz Adrian et al., 2015; Jin et al., 2019; Urteaga et al., 2015). The use of these approaches in PPSD III were limited by resource and manpower constraints and were not in-line with the aim of creating a safe and low-stress environment for students to practice before they are evaluated through one-on-one role play.

The MMC tutorial session was designed based on two pedagogical approaches—reciprocal peer learning and role play. Reciprocal peer learning allows students in the same class to learn together and contribute to the learning of their peers (Boud et al., 2001). This approach is well-suited in PPSD III because all the students in this module were third-year undergraduate pharmacy students with comparable background knowledge. This meant that students were able to engage in and contribute equally to group discussions. Role play is a pedagogical approach used extensively in healthcare and pharmacy education literature for

enhancing communication and medication management skills, and also challenges pharmacy students to apply their skills in a simulated environment (Luiz Adrian et al., 2015; Bond et al., 2017).

There is no published literature on the use of tutorials for teaching MMC skills in pharmacy education. This pilot study was conducted to explore the feasibility of implementing tutorials for teaching MMC skills to undergraduate pharmacy students. This report discusses students' perceptions of the MMC tutorial. We also reflect on our experiences and share learning points for future improvement.

CONTEXT AND LEARNING ACTIVITIES

Traditionally, two rounds of MMC practical sessions would be conducted in PPSD III. The first round would be for practice, and the second round was a graded assessment. In AY2018/19, the first round of MMC practical session was redesigned as an MMC tutorial, following which students were assessed on their MMC skills in a practical session using the traditional format of one-on-one role play.

A one-hour lecture was first conducted during Week One of the semester to review MMC skills that students previously learned in PPSD II, and to explain the tutorial format, expectations and pre-tutorial assignment. The learning outcomes of the MMC tutorial were communicated to students as follows:

1. Identify and resolve legality issues and DRPs in prescriptions.
2. Document interventions on prescriptions to fulfill legal requirements and reflect best practices.
3. Dispense medications accurately.
4. Demonstrate effective communication skills with patients and healthcare professionals.
5. Demonstrate legal, ethical and professional conduct in pharmacy practice.

To accommodate a class of 178 students, a three-hour MMC tutorial was conducted four times (i.e. 44 to 45 students per tutorial session) during weeks two and three of the semester. Students completed a pre-tutorial assignment in groups of five to six students. A pre-tutorial worksheet was developed to guide students on assessing patient information, identifying legality issues and DRPs, and listing patient counseling points. Groups uploaded their worksheet onto the University's learning management system (LMS) before the first tutorial session. One mark was awarded to all members of a group who uploaded the worksheet on-time.

During each tutorial, two faculty members ran parallel sessions in an identical format in separate rooms for four groups of five to six students per group. All sessions were conducted using the same patient case that students evaluated in their pre-tutorial assignment. The faculty member role played with one student representative per group on history taking, communicating interventions, and counseling a patient. Other students assessed the interaction using a standardised grading rubric, following which they were encouraged to critique their peer's performance. A grading rubric and scripted responses for role plays were developed and harmonised among both faculty members to ensure consistency of the tutorial sessions. Learning activities during each session are shown in Table 1.

Table 1
Learning activities during MMC tutorial

Time Allocated	Description of Learning Activity
10 minutes	Faculty-led briefing of tutorial activities
10 minutes	One student representative from group one to role play patient history taking with faculty
20 minutes	Faculty-led discussion to critique and provide feedback on history taking; students were encouraged to provide feedback to their peers
20 minutes	Student group discussion to identify and resolve DRP
10 minutes	One student representative from group two to role play with faculty on communicating interventions to a prescriber to resolve DRP
20 minutes	Faculty-led discussion on identifying and resolving DRP; students were encouraged to provide comments for their peers
10 minutes	Students individually to document intervention on prescription and prepare label for dispensing, then one student representative from group three shared his or her documentation and label with the class
10 minutes	Faculty-led discussion to provide feedback on documentation and labeling
20 minutes	Student group discussion to prepare counseling points
10 minutes	One student representative from group four to role play counseling with faculty
20 minutes	Faculty-led discussion to critique and provide feedback on counseling; students were encouraged to provide feedback to their peers
20 minutes	Questions and answer; end of tutorial

STUDY DESIGN

This was a cross-sectional study conducted in AY 2018/19 which included a convenience sample of 178 third-year undergraduate pharmacy students in PPSD III. Objectives of the study were to assess students' perceptions of the MMC tutorial and to determine effectiveness of the tutorial based on students' self-reported confidence in various MMC skills.

Data were collected using an anonymous hardcopy self-administered survey, administered at the end of a lecture three weeks following the completion of all MMC-related activities in the module. The survey (refer to the Appendix for a sample) consisted of 33 items in three sections: (i) baseline confidence in MMC skills, (ii) perceptions of MMC tutorial, and (iii) post-tutorial confidence in MMC skills. Statements were adapted from a previous study (Bond & Cone, 2012) to reflect PPSD III's learning activities. Responses were measured using five-point Likert scale except for the last item, which was an open-ended question to gather qualitative comments. This study was approved by the University's Institutional Review Board (approval number: S-18-059E).

Survey responses were transcribed to Microsoft Excel® for analysis. Data from incomplete surveys were retained for analysis if at least 80% of questions were answered. Qualitative comments were reviewed to identify themes and representative quotes. Descriptive statistics were used to summarise students' perceptions, and the Wilcoxon signed-rank test was used to compare students' self-reported levels of confidence. Statistical analysis was performed using STATA® version 14.0 for Mac (College Station, Texas, USA).

FINDINGS

All groups submitted the pre-tutorial assignment on time and all students attended the MMC tutorial. A total of 137 students completed the survey, all of which were retained for analysis (response rate: 77.0%).

Students' perceptions of MMC tutorial

Most students believed that the MMC tutorial was effective in facilitating their learning of MMC skills (77.4%) and enhanced their abilities in dispensing prescriptions (73.7%), answering drug-related inquires (70.1%), and communication (69.3%) (Table 2). Comparatively, fewer students believed that the tutorial prepared them for independent work (61.3%) and was as effective as the MMC practical, which used one-on-one role play (54.7%).

Table 2
Students' perceptions of MMC tutorial

Statement	Agreement[a] N (%)	Neutral N (%)	Disagreement[b] N (%)
I believe the MMC tutorial enhanced my skills in processing and dispensing prescription	101 (73.7)	28 (20.4)	8 (5.8)
I believe the MMC tutorial enhanced my communication skills in obtaining patient history, communicating interventions and counseling patients	95 (69.3)	30 (21.9)	12 (8.8)
I believe the MMC tutorial enhanced my skills in answering drug-related inquiries	96 (70.1)	32 (23.4)	9 (6.6)
I believe the MMC tutorial is effective in facilitating my learning of medication management and counseling skills	106 (77.4)	25 (18.2)	6 (4.4)
I believe the amount of preparatory work required before MMC tutorial was about right[c]	76 (55.9)	41 (30.1)	19 (14.0)
I believe that the MMC tutorial helped me prepare for independent work during the MMC practical	84 (61.3)	32 (23.4)	21 (15.3)
I believe the MMC tutorial is as effective as the MMC practical in facilitating my learning of medication management and counseling skills	75 (54.7)	37 (27.0)	25 (18.2)

[a]Agreement = strongly agree + agree

[b]Disagreement = strongly disagree + disagree

[c]One missing response; based on N = 136 responses

Of all tutorial activities, students preferred hands-on activities such as documentation and generation of labels for dispensing (85.8%), and activities involving interactions with the faculty member such as discussion and role play (86.9% and 75.9% respectively) (Table 3). In contrast, discussions within student groups before and during the tutorial were perceived less favorably (58.1% versus 68.6%, respectively).

Table 3
Students' perceptions of various activities of the MMC tutorial

I believe the following activity in the MMC tutorial is effective for my learning:	**Agreement[a] N (%)**	**Neutral N (%)**	**Disagreement[b] N (%)**
Group work before coming for MMC tutorial[c]	79 (58.1)	41 (30.1)	16 (11.8)
Role play with faculty member	104 (75.9)	28 (20.4)	5 (3.6)
Group work during MMC tutorial	94 (68.6)	34 (24.8)	9 (6.6)
Practice documenting on prescription and generating labels[d]	115 (85.8)	16 (11.9)	3 (2.2)
Discussion with faculty member during MMC tutorial	119 (86.9)	16 (11.7)	2 (1.5)

[a]Agreement = strongly agree + agree
[b]Disagreement = strongly disagree + disagree
[c]One missing response; based on N = 136 responses
[d]Three missing responses; based on N = 134 responses

Effectiveness of MMC tutorial

Significant improvement in students' self-reported confidence was observed for all MMC skills taught during the tutorial (Table 4).

Table 4.
Pharmacy students' self-reported confidence in various MMC skills

MMC Skill	**Before MMC Tutorial (Mean ± SD)**	**After MMC Tutorial (Mean ± SD)**	***p*-value**
Obtain patient history	3.6 ± 0.7	3.8 ± 0.7	< 0.01
Identify and resolve legal issue(s) in a prescription	3.7 ± 0.8	4.1 ± 0.7	< 0.01
Identify and resolve drug-related problems (DRPs)	2.9 ± 0.8	3.3 ± 0.8	< 0.01
Communicate intervention(s) to prescriber	3.5 ± 0.8	3.9 ± 0.7	< 0.01
Document intervention(s) appropriately on a prescription	3.8 ± 0.7	4.2 ± 0.6	< 0.01
Label medications appropriately for dispensing	3.6 ± 0.8	3.9 ± 0.7	< 0.01
Counsel patient on medications	3.2 ± 0.8	3.6 ± 0.6	< 0.01
Select appropriate medications for dispensing	3.4 ± 0.9	3.8 ± 0.7	< 0.01
Identify appropriate reference(s) to address drug inquires	3.0 ± 0.9	3.7 ± 0.7	< 0.01
Address drug enquiries from patients or prescribers	2.6 ± 0.8	3.5 ± 0.8	< 0.01

REFLECTIONS AND ACTION PLAN

Reflections

Two faculty members contributed a total of 32 teaching hours in conducting the MMC tutorial in AY 2018/19. This was a significant reduction compared to a typical MMC practical session which would have required a total of 144 teaching hours from eight faculty members or clinical tutors.

More importantly, the MMC tutorial capitalised on interactive discussions to enhance students' learning experience. Such opportunities for close interaction were well-received by our students who considered discussions with the faculty member as being the most useful activity during the tutorial (86.9%). We observed that most students were engaged during these discussions, evidenced by them taking notes, contributing answers and asking questions. While the MMC practical session included one-on-one role play, the actual time allowed for discussion between each student and faculty member was typically less than 10 minutes. Similarly, a previous study also demonstrated a positive relationship between faculty-student interaction and students' learning (Lambert et al., 2012).

Furthermore, the MMC tutorial facilitated peer interaction before and during the tutorial which many students also found beneficial (58.1% and 68.6%, respectively). Although only one student representative from each group got to role play, other students were encouraged to evaluate their peer's performance. Our students are capable of doing so, given their prior exposure to MMC skills. This was also done to increase students' familiarity with the evaluation criteria and to foster learning through peer evaluation, which had been demonstrated as one of the strongest facilitators of positive learning outcomes in higher education (Schneider & Preckel, 2017).

While most students perceived the tutorial as effective for learning MMC skills (77.4%), fewer students believed that the tutorial was as effective as one-on-one role play (54.7%) and prepared them for performing MMC skills independently (61.3%). This latter finding is of concern because the intent of the tutorial was to prepare students for performing these core pharmacy skills independently.

Qualitative comments in Table 5 offer plausible explanations for these perceptions. Firstly, only one student from each group got to role play. This student was self-nominated and therefore, it was possible that the more confident student would have either volunteered or be nominated to role play, and students who are less confident and needed practice would not have gotten the opportunity. Although the intent was for remaining students to observe and evaluate their peer's performance, some students tended to focus on the content of the role play rather than evaluate their peer's skills. Students who did not role play might feel that they did not receive comparable learning experience and hence might not have fully appreciated the learning value of peer evaluation.

Table 5.
Qualitative comments on students' perceptions of MMC tutorial

Theme	**Representative Quotes**
Did not allow for all students to practice MMC skills individually	"There is no individual component so I feel that I didn't really benefit from the tutorial"
	"Not all students got to role-play with the faculty, so the tutorial might not benefit everyone"
	"Can try to involve everyone in the tutorial"
	"Better to allow all students to role play"
Did not train students on time management in completing various MMC activities	"Could make the MMC tutorial like a practical so that we can practice time management"
	"The tutorial did not prepare us adequately for the stress and time constraints of the actual practical session"
	"Tutorial has not time limit as the actual practical, should also impose time limit for us to prepare for the practical"
Inadequate practice	"Needs more practice in identifying drug-related problems"
	"Needs more hands on practice"
	"More tutorials can be given for MMC as practice"

Secondly, students also commented that the MMC tutorial did not train them on time management. To mimic real-life conditions of working in a pharmacy, students were allowed 10 minutes to prepare for history taking and to formulate interventions. However, these activities were completed as a pre-tutorial take-home group assignment with no time limit imposed. We postulate that most students took longer than 10 minutes and had the support of their group members. As such, many found it stressful to perform these activities independently under time pressure during the subsequent practical session.

The pre-tutorial assignment was not graded and thus, we could not ascertain the extent and quality of the group's work. During the tutorial, we observed that some students were not prepared to share their answers on certain questions while another group member was. We surmised that some groups might have divided the work among group members rather than to engage in meaningful discussions as intended. This was also evident from our findings, that pre-tutorial group work was perceived to be less useful compared to group work during the tutorial that was mediated by a faculty member and actual face-to-face discussions took place (58.1% versus 68.6%, respectively).

Solutions and action plan

Moving forward, we propose several changes to the existing MMC tutorial in order to improve students' learning experiences (Table 6). We hope to develop more patient cases so that groups may be assigned to work on different cases which can then be discussed in class to provide students with broader exposure. Cases being worked on by other groups may serve as additional practice cases for students to review at their own pace outside of class.

Table 6.
Proposed changes to MMC tutorial learning activities

Issue Identified	Proposed Change	Rationale
Did not allow for all students to practice MMC skills individually	In addition to role play with faculty member, allow students to role play with and provide feedback to one another	Create practice opportunities, encourage peer interaction and evaluation
	Students to work on tutorial worksheet independently before coming to tutorial	Encourage students to think and work independently
Did not train time management	Create tutorial worksheet as E-assignment on the University's LMS and impose time limit for completion that mimics the expectations during MMC practical session	Create opportunities for students to work under time constraint which is a required skill for the subsequent practical and their future practice
Extent and quality of student group discussions before tutorial were uncertain	Students to work on tutorial worksheet independently before coming to tutorial and then discuss in class	Facilitate meaningful in class discussion when all students are prepared

LMS=learning management system

Critique

Limitations of this pilot study included the fact that all students were from the same cohort. We also received limited qualitative comments and therefore, were unable to gain a more thorough understanding of the rationale for our students' perceptions. While both faculty observed an improvement in students' performance from the MMC tutorial to the MMC practical session, we did not explicitly measure and compare students' MMC skills to demonstrate improvement. The survey instrument used in this study was self-developed and did not undergo rigorous validation. Administering the survey at the end of a lecture helped to improve the response rate since most students were in class. However, students might have completed the survey in a hurry in order to leave class, thereby introducing procedural bias. Additionally, the study might also be limited by measurement biases, where students tended to provide socially acceptable responses such as reporting higher levels of confidence or improved levels of confidence after MMC tutorial.

Nonetheless, our study is valuable in describing the pedagogical approaches and teaching activities to teach MMC skills to a large class of undergraduate students in a sustainable and resource-conscious manner. We offered a critical reflection of aspects that worked well for students' learning, challenges encountered and

potential solutions. Our experiences would be useful to other educators involved in skills-based teaching in the classroom setting, particularly for large classes.

CONCLUSION

The implementation of MMC tutorial is a positive change that encouraged faculty and student interaction and supported teaching MMC skills in a large undergraduate class in a more sustainable and resource-conscious manner. Learning activities in the tutorial should strive to mimic similar conditions as what would be expected of students in graded assessments. Moving forward, changes to increase the level of independent problem-solving and to impose time constraints will be implemented to further enhance students' learning experiences.

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APPENDIX. SAMPLE OF SELF-ADMINISTERED SURVEY