## EVALUATION OF A HYBRID UNDERGRADUATE DERMATOLOGY TRAINING WORKSHOP DURING FAMILY MEDICINE CLERKSHIP

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## ABSTRACT

#### Introduction

Dermatological conditions constitute 5 percent of primary care consultations. Effective undergraduate medical training in skin diseases inducts students to this important field of general practice.

## Aim:

This study determined the acceptability and perceived effectiveness of the Hybrid Model of dermatology training during Family Medicine (FM) clerkship in a Singapore primary care institution.

#### Method:

This is a retrospective study based on the feedback responses of NUS third year medical undergraduates after attending a Hybrid dermatology workshop conducted during their FM clerkship. The 4-hour Hybrid Model covered description of cutaneous morphologies, photo illustrations of common diseases by the faculty, student presentations and a slide quiz. This new teaching model was conducted by a unique faculty. The students gauged the acceptability (how well it was received) and perceived effectiveness using Likert-scale scores in de-identified questionnaires.

#### **Results:**

The feedback responses from 994 medical students from 2010 to 2016 were analysed. Comprising of multi-ethnic Asian groups, slightly over half of them were females. The response rates ranged from 84 percent to 98 percent. Students' ratings on its usefulness had risen from 85.8 percent in 2010 to 94.0 percent in 2016.

### **Conclusion:**

The Hybrid dermatological training model was well accepted and has been integrated into the clerkship program since 2013.

SFP2018; 44(1): 39-45

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## INTRODUCTION

Dermatological conditions cover about 5 percent of new attendances at public primary-care clinics (polyclinics) in Singapore.<sup>1</sup> It thus becomes imperative to impart some basic knowledge of dermatology to our medical students during their FM clerkship. Also, such conditions are easily managed at the primary-care level, avoiding unnecessary referrals to specialist clinics.

Various methods of teaching dermatology have been tried around the world.<sup>2,3,4,5</sup> Skin diseases are usually taught in specialist clinics in many countries. These cases tend to be quite different from that in primary care. The case mix in the former setting often includes rare and complex presentations, and patients are referred chiefly for investigations and specialised forms of treatment. The conditions and management in primary care are different. Teaching should therefore focus on rapid recognition of signs, quick diagnosis, and outpatient management of common dermatological conditions in the community. As there is a need for such knowledge and skills, dermatology teaching has been a part of the undergraduate training curriculum from 2004, comprising of a 4-hour model during the FM clerkship. The Conventional Model of teaching dermatology comprised a didactic lecture with multiple photo slides covering 20 common dermatological conditions, with outpatient investigations and treatments available in SingHealth Polyclinics (SHP). This method of conventional teaching was not well received by the medical undergraduates, commonly resulting in adverse feedback.

Hence, a new Hybrid Model of training has been developed, which combines interactive pedagogy and self-directed learning by the undergraduates. Adapted in 2013, the 4-hour model encompasses pre-workshop reading of assigned topics, self-assessment quizes, flipped classroom peer teaching, and slides-based learning to cover the same 20 conditions as before. This new teaching model was conducted by a dedicated faculty member to reduce variations in the teaching style.

This study aims to evaluate acceptability (defined as how well it was received) and perceived effectiveness of the Hybrid Model of teaching dermatology by medical undergraduates in comparison to the Conventional Model.

## METHOD

This is a retrospective study based on the feedback responses of NUS third-year medical undergraduates after attending a hybrid dermatology teaching session conducted during their SHP FM posting.

## Site

SingHealth Polyclinics (SHP) is one of three Singapore Family Medicine (FM) training centres accredited with the

Accreditation Council for Graduate Medical Education (ACGME).<sup>6</sup> As such, training of undergraduate and postgraduate students is regularly evaluated. SHP is the training ground for half of the medical undergraduates from the Yong Loo Lin School of Medicine (YLLSOM) in the National University of Singapore. Family physicians are appointed as FM faculty to coach YLLSOM students. Each year, 5 cohorts of students go through their 2 weeks of FM clerkship in SHP clinics. Each cohort consists of 5 groups of 6 to 7 medical students. They are posted to the 5 appointed polyclinics within SHP. FM faculty are assigned to each group of undergraduates to induct them on the principles and practices of FM in the public primary-care setting. For dermatology teaching, the students get together at a designated training centre in SHP.

# **Dedicated Faculty**

This new teaching model was conducted by a dedicated faculty to reduce variations in the teaching style, which can influence the feedback collected. The tutor selected has vast experience in teaching primary-care dermatology and holds a Masters in Medicine (Family Medicine) with a Graduate Diploma in Family Practice Dermatology. He is also involved in teaching dermatology to new doctors, FM residents, and resident physicians.

# **Study Population**

At the end of each cohort's posting, the 5 groups of medical students in each cohort filled an anonymous feedback form comprising close- and open-ended questions to evaluate the effectiveness of the new model of teaching. The questionnaires were administered at the end of each clerkship. The questionnaires were collated from each cohort of students posted to SHP clinics for their FM clerkship annually from June 2010 to Dec 2016. There was no exclusion criteria as all students who attended the sessions were handed a questionnaire to fill up.

# Hybrid Dermatology Training Model (adapted in 2013)

All students are given some pre-reading for dermatology. This includes basic information about approach to dermatological conditions and the use of topical steroids. Each group of medical students is assigned a disease condition in dermatology at the start of their FM clerkship. The disease conditions assigned are the most common conditions seen by a primary-care practitioner. The rationale is for the students to be very familiar with the diagnoses, differential diagnoses, and management of these 5 most common dermatological conditions. **Table 1** shows the key differences between the two models.

A list of resources (websites, dermatology atlas) is given to the students. The group needs to prepare word and picture slides, which will be used to present to their peers on the actual day. Each group is given 10 minutes to present, which is followed by clarifications by the faculty. The groups are given the topics Acne vulgaris, Atopic dermatitis, Psoriasis vulgaris, Scabies, and Herpes infections. They are told to present the clinical features,

 Table I: Key Differences between Conventional Model

 and Hybrid Model

Learning Objective	Conventional Model	<u>Time</u> allocation	Hybrid Model	<u>Time</u> allocation	
To be familiar with symptoms, signs, investigations and treatments in dermatology	Lecture	20 min	Lecture	20 min	
To be familiar with various dermatological morphologies	Lecture	30 min	Short lecture, quiz on morphologies	20 min	
To be able to diagnose and treat the 5 most common dermatological conditions in primary care	Lecture with slide show	80 min (includes 20 min break)	Group presentations (peer teaching)	120 min (includes 20 min break)	
To be able to diagnose & manage other common dermatological conditions in primary care	Lecture with slide show	110 min	Lecture with slide show	80 min	

non-pharmaceutical and pharmaceutical management of the condition, and the advice they would give to the patient in terms of managing their skin. The breadth of topics covered by the faculty remains the same, as those topics not presented by the groups are taught by the faculty for completeness.

## **Outcome Measured**

Data was collected at the end of each teaching session (Annex A) and after the posting (Annex B). The data included the usefulness of the session, the content covered, the teaching methodology, and the duration of the session. Likert-scales ranging from 1 to 10 were used in the questionnaires to determine the subjects' responses to each of the questions. The responses were regrouped and analysed in 3 broad groups, with ratings of 1 to 4 (defined as "poor"), 5 to 6 (defined as "equivocal"), and 7 to 10 (defined as "good") respectively.

# RESULTS

Although dermatology teaching has been in the curriculum for many years, the author decided to analyse data from student feedback dating back 3 years before the implementation of the Hybrid Model. There were a total of 994 medical students from 2010 to 2016, with 52 percent female. 90 percent were Chinese, 6 percent Indian, 2 percent Malay and 1 percent Others.

Ninety percent found the hybrid dermatology model very useful in achieving the learning goals in dermatology and rated it as one of the top 3 learning programmes during the clerkship. **Figure 1** shows that 94.0 percent of students rated the teaching as very useful in 2016, as opposed to 85.8 percent in 2010.

Most students (66.7% to 81.6%) found the duration of the teaching of 4 hours to be "just right". This was regardless of which teaching method was used. (Figure 2)

Majority of the students found the content appropriate, and methodology effective, as can be seen in **Table 2**. Subjective feedback was also received as shown in **Table 3**.

# Figure 1: Perception of Effectiveness of Conventional Model (2010–2012) vs Hybrid Model (2013–2016)



# Figure 2: Rating on the Length of the Dermatology Teaching Activity



# Table 2: Feedback on the Content and Quality of the Hybrid Model

Year / Score	2013	2014	2015	2016				
The content was appropriate								
Agree	99.3%	98.2%	100.0%	98.8%				
Neutral	0.7%	1.8%	0.0%	1.2%				
Disagree	0.0%	0.0%	0.0%	0.0%				
The methodology and tools used in teaching were effective								
Agree	99.3%	96.5%	96.5% 100.0%					
Neutral	0.7%	3.5%	0.0%	2.4%				
Disagree	0.0%	0.0%	0.0%	0.0%				
The faculty was well prepared								
Agree	100.0%	100.0%	100.0%	100.0%				
Neutral	0.0%	0.0%	0.0%	0.0%				
Disagree	0.0%	0.0%	0.0%	0.0%				

Domain of	Comments			
feedback	Connicitta			
Overall feedback	"Very interesting and useful."			
	"Very interactive." "Was very impressed by the balance of			
	foundational knowledge and application - good progression			
	along the learning process which made learning easier."			
	"Very good session with a lot of interaction and pictorial			
	teaching."			
	"Good in giving us a basic and general understanding of the			
	conditions."			
	"Good and insightful summary of dermatology conditions."			
Method of	"Method of presentation/ discussion was excellent."			
presentation	"Very good idea to have groups present as knowledge is better			
	retained that way as well."			
	"The presentation of different groups encouraged participation			
	and made it more interesting."			
	"Very good and I liked the need to prepare topics before the			
	teaching. Although it is more work to be done, there was good			
	takeaway with the topic prepared."			
	"Idea of getting students to prepare and present is very good.			
	Forces us to be prepared and 'expert' in the allocated topics."			
	Having a topic to present on as a team is a good idea to get us			
	Involved.			
	Nice to have student participation."			
Self-directed	"Good opportunity for self-directed learning."			
learning	"This was also useful because dermatological conditions are all			
	very similar and confusing, especially to students. So it was			
	good that we had to do the presentations and research			
	ourselves, so that we could learn by reading up and teaching it,			
	rather than just being lectured on it."			

# Table 3: Qualitative Feedback from Students (2013 to 2016)

# DISCUSSION

The Hybrid Model has its strengths. It introduces students to the "dermatology language", focusing on the description of cutaneous morphologies. The aim is to help them describe various rashes in a standardised way. A self-marked quiz is then given to test their retention of recent knowledge. The flipped classroom model is used in between lecture topics where the commonest conditions are presented by individual medical student groups to their peers. This helps them learn how to source for appropriate information and present relevant material in a concise and easy-to-learn way. The lecture and slide show given by the faculty helps consolidate learning on the remaining common conditions. The use of a dedicated tutor helps reduce variation in the teaching style. This benefits all students equally in terms of a positive learning experience.

The duration of the model has been maintained at 4 hours to retain the undergraduates' attention span and to avoid mental exhaustion. An average of 74.7 percent (66.7% to 81.6%) of students surveyed felt the timing was "just right". Within a short workshop, the curriculum is focused on the diagnosis and management of the 5 most common dermatological conditions in primary care to avoid information overload on the students. The other dermatological conditions are briefly covered by the faculty.

In SHP, the faculty meets the Education Department upon completion of clerkship for each cohort. There is a regular review of medical curriculum by the faculty based on students' feedback. In view of the favourable feedback from the students, the Hybrid Model has been integrated into the regular teaching curriculum since 2013.

The Hybrid Model has its limitations. The short duration limits in-depth coverage of each of the five stipulated dermatological conditions. The intent was to equip the medical students with a fundamental understanding of the dermatological condition, so they can make an accurate diagnosis, and move on to management of the condition in primary care.

There was a lack of comparator for these students because the Conventional Model and Hybrid Model were applied to different cohorts of students. The students were all in Phase 3, but they may not have been at the same level of dermatological knowledge. As the data was analysed over 6 years, this will average out.

Potential coercion to give unfavourable results in the responses was minimised with the anonymity of the questionnaire. Nonetheless, further study will be needed to assess the long-term retention of these dermatological diagnostic and management skills amongst these students after they graduate from medical school.

The capacity of faculty to teach the Hybrid Model should be expanded with structured training and certification. This will allow de-centralisation in the implementation of this model to reduce travel time by medical students. Video conferencing with real-life patients and tele-dermatology are potential features which can be incorporated into the next edition of this hybrid training model.

# CONCLUSION

The Hybrid Model for teaching dermatology was well received, as evidenced by the high levels of compliments and feedback. Understandably, the data available was limited by the study's retrospective nature, and based on such encouraging results a prospective study may further validate the authors' findings.

This Hybrid Model has since been assimilated in routine undergraduate primary-care dermatology education in the institution.

## Acknowledgements:

The authors would like to thank Dr Ruth Lim, Serena Loh, and other staff from the Department of Education in SingHealth Polyclinics for the collation and retrieval of the data set. They are grateful to the medical students for providing feedback for the hybrid dermatology training model over the years.

## Contributorship

MS designed and developed the hybrid teaching module. MS, EK and TNC analysed the data and interpreted the results. MS drafted the manuscript. EK and TNC reviewed and revised the manuscript before it was finalised by MS for submission to this journal.

## **Declaration of Conflicts of Interest**

There are no conflicts of interest in writing up this article.

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# <u>Annex A</u>

# MEDICAL STUDENTS Combined teaching - Derm Dr Shah Mitesh



Na Da	ame (optional) ate	:						
TE	ACHING		1 - Strongly Disagree 2 - Disag	Please cir gree 3 - Neutral 4 - /	cle y Igree	our 5-S	res trong	ponse lyAgree
1. 2. 3. 4.	The tutorial was use The content was ap The methodology ar The tutor was well p	ful propriate id tools used in teaching we repared	re effective	1 1 1	2 2 2 2	3333	4 4 4	5 5 5 5
LC	GISTICS		1 - Strongly Disagree 2 - Disag	Please ci gree 3 - Neutral 4 - /	rcle y Igree	your 5-S	r res trong	sponse ly <i>Ag</i> ree
1. 2.	The tutorial started a The location of the t	and ended on time utorial was appropriate (traw	el time/ facilities)	1 1	2 2	3 3	4 4	5 5
GI	ENERAL FEEDBACK							

What is one thing you like about the tutorial?

What is one thing about the tutorial that you would like to see improvement?

# OTHER FEEDBACK/SUGGESTIONS

Appreciate your valuable feedback to help us plan a better session in the future

Thank you!

# **YLLSOM MEDICAL STUDENTS POST POSTING FEEDBACK**

## (h) Dermatology teaching

On a scale of 1 to 10, how do you rate the following training activities in terms of usefulness?Not useful12345678910Very useful

In terms of duration, for the above teaching activities, how would you comment on the duration? a. Just right

- b. Too Short
- c. Too Long
- d. Should be replaced by another activity

Other Comments: \_\_\_\_\_