นิพนธ์ต้นฉบับ

Effectiveness of conventional training program and model training program for Thai medical students

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Objective : *To study the effectiveness of conventional training program and model training program for Thai medical students.*

Study Design : *Retrospective analytic study.*

Setting : *Faculty of Medicine, Chulalongkorn University.*

Methods : *Review literature by electronic internet search.*

Materials : *All reports about comparative study of the effectivenessof model training program and conventional training program for medical students in Thailand.*

Results : *There were only 2 reports included in this study. The overall effectiveness score of each training program was high. Effectiveness score of conventional training program was higher. There was a significant difference between effectiveness of these two training programs ($P < 0.05$).*

Conclusion : *Overall effectiveness scores of model training program and conventional training program in this study were statistically different. But there were only a few reports about this topic so further study was recommended. Some suggestions about clinical training program for medical students were discussed.*

Key words : *Model training program, Conventional training program, Medical student, Effectiveness score.*

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วิโรจน์ ไววานิชกิจ, สิทธิพร แอกทอง. ประสิทธิภาพของการฝึกหัดโดยวิธีการใช้หุ่นจำลองและวิธีแบบปกติสำหรับนิสิตแพทย์ไทย. จุฬาลงกรณ์เวชสาร 2542 พ.ย; 43(11): 791-6

วัตถุประสงค์ : *เพื่อศึกษาประสิทธิภาพของการฝึกหัดโดยวิธีการใช้หุ่นจำลองและวิธีแบบปกติสำหรับนิสิตแพทย์ไทย*

รูปแบบ : *การศึกษาเชิงวิเคราะห์ชนิดย้อนหลัง*

สถานที่ทำการศึกษา : *คณะแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย*

วิธีการ : *การทบทวนวรรณกรรมโดยการใช้การค้นหาด้วยวิธีทางโครงข่ายคอมพิวเตอร์*

วัสดุอุปกรณ์ : *รายงานการศึกษาทั้งหมดที่เกี่ยวกับการศึกษาเปรียบเทียบประสิทธิภาพของการฝึกหัดโดยวิธีการใช้หุ่นจำลองและวิธีแบบปกติสำหรับนิสิตแพทย์ไทย*

ผลการศึกษา : *มีเพียง 2 รายงานการศึกษาที่อยู่ในขอบเขตการศึกษาครั้งนี้ แต้มประเมินความสำเร็จโดยรวมของทั้งสองวิธีการอยู่ในระดับสูง แต้มประเมินความสำเร็จโดยรวมของการฝึกโดยวิธีการใช้หุ่นจำลองมีค่าสูงกว่า พบความแตกต่างอย่างมีนัยสำคัญระหว่างวิธีการฝึกทั้งสองแบบ*

บทสรุป : *จากการศึกษานี้ พบว่ามีความแตกต่างอย่างมีนัยสำคัญทางสถิติระหว่างวิธีการฝึกโดยวิธีการใช้หุ่นจำลองและวิธีแบบปกติ แต่พบว่ามีรายงานการศึกษาน้อยมากเกี่ยวกับประเด็นนี้ดังนั้นจึงควรมีการศึกษาด้านนี้เพิ่มเติมต่อไป ได้แสดงข้อแนะนำบางประการเกี่ยวกับการฝึกหัดทักษะทางคลินิกสำหรับนิสิตแพทย์ไว้ในบทความนี้*

คำสำคัญ : *การฝึกหัดโดยวิธีการใช้หุ่นจำลอง, การฝึกหัดโดยวิธีแบบปกติ, นิสิตแพทย์, แต้มประเมินความสำเร็จ*

There are many medical procedures practiced in medicine. The major usage of them is using for diagnosis and follow-up of diseases. In Thailand, the newly graduated medical students are required to be able to practice these procedures.[1] The role of university hospital in training medical education is very important. Conventional training program is comprised of lectures and actual humanistic training. While model clinical skill training make use of artificial manikin as additive source of knowledge for medical students in inquiry study. Both techniques have been used for years in Thailand.

Due to the concept that good medical education gave to medical students can result in a high quality physicians in the future. Therefore, this study was done in order to obtain the data about the effectiveness of both clinical training programs. The results or this study can help medical staffs in the university hospital select the appropriate method of training for their medical students.

Materials and Methods

Review literature by electronic internet search[2-3] (Medline and Thaimed) was done in order to find the reports about experiments of both clinical skill training programs for medical students in Thailand. Due to the failure of electronic internet search to collect all relevant references, examination of the publish reference lists of detected reports was done. Data from all articles were collected. The final effectiveness score evaluated after complete training from each program was adjusted using total score as 100 points then recorded. Overall effectiveness score of each type of training was calculated and compared to each other. $P < 0.05$ was accepted to be a statistical significant difference. The passing-evaluation rate was calculated by using the number of students passing the evaluation as the numerator and the number of total students in the program as the denominator. Passing-evaluation (first evaluation after experiment) rate odd ratio of each experiment was calculated.

Results

There were only 2 documents about clinical skill training program for medical students found.[4-5] The details about these documents were shown in Table 1. All were from Chulalongkorn Hospital. No report from other university hospitals was found. We found that the overall effectiveness score of

Table 1. Characteristics of the experiments included in this study.

Author	Study design	Setting	Procedure	Number of students (conventional/model)
Bunyavejchevin S et al. 1996	Before - after experiment with one control group	Chulalongkorn University	Subdermal contraception	30/30
Mikasen R et al. 1998	After only experiment with one control group	Chulalongkorn University	Lumbar puncture	22/20

conventional training program was 78.3 ± 10.8 and the overall effectiveness score of model training program was 86.3 ± 7.5 (Table 2). When the overall effectiveness scores were graded by comparing to the Ministry of Education evaluation criteria for knowledge (high 75%, fair 50 - 74% and low 0 - 49%), the scores of both programs were high. We found that there was a statistical significant difference between conventional training program and model training program. Passing evaluation-rate odd ratio of each experiment was shown in Table 3.

Discussion

Although model training has been introduced into Thailand for years. From Medline and Thaimed internet search which are effective tools in the present day, there have been only a few reports of experiments about effectiveness of this new technique comparing to conventional technique. And all reports came from only one university. This may imply to the fact that there are not much university hospitals where model training was used. Or medical staffs in Thailand believe the quality of this training program so they think it is no need to check its effectiveness. Although there were many studies in other countries confirm the effectiveness of model training program. [6-7] But from the study of Gould SM et al [8], the difference in Thai and other countries medical education was found due to many factors. Therefore, further evaluations of model training method for Thai medical students should be performed.

Although the comparisons of effectiveness results in the two reviewed papers were different but there was no criteria set to determine level of effectiveness in both papers. From this study, the overall effectiveness score of model training program was higher than conventional training program. But both overall effectiveness scores were high by Ministry of

Table 2. Effectiveness score of training program.

Author	Conventional training program	Model training program
Bunyavejchevin S et al. 1996 *	73.3 ± 12.5	87.3 ± 8.2
Mikasen R et al. 1998 *	85.2 ± 8.0	84.7 ± 6.2
Overall*	78.3 ± 8.2	86.3 ± 7.5

*There was a significant difference between two programs.

Table 3. Passing evaluation-rate odd ratio of each experiment.

Author	Passing evaluation-rate		Passing evaluation odd ratio
	Model	Conventional	
Bunyavejchevin S et al. 1996 *	90 %	67 %	4.43
Mikasen R et al. 1998	No data	No data	Cannot calculate

* Odd ratio of higher than one indicate higher passing evaluation-rate of model training program.

Education criteria. This can imply that both training programs are good in quality. And using additive media in model training program can improve the quality of medical study.[9]

This study was a retrospective study so there might be some reports not registered in the internet tool did not included. But this study design can decrease bias in paper selection. From this study, there was only one report that supported sufficient data for calculating passing evaluation-rate odd ratio. Therefore, complete meta-analysis could not be done. Additional experiments about comparison of effectiveness of the both techniques are suggested.

Model training program is an alternative training program that should be used in medical education. In the present day, "Patient's Rights" [10] is widely discussed. To practice any medical procedures must get permission from the patients.[11-12] Untrained medical personnel should not perform any procedures to the patients. Due to the ethics, there must be the least danger to the patient if medical staffs let their students practice procedures. Many models were constructed in order to serve the need of medical education [13] such as rubber arm, pelvis manikin, etc. Therefore, medical staffs should consider the appropriate model for training their students.

Although the quality of conventional training program is high, the model training should be considered as addition due to the ethics. Training in models before performing in actual humans should be done so as to reduce the risks to the patients.[4-5] And when medical staffs plan to train their students the actual humanistic procedure, they should ask for the permission from the patients before.[14] Informed consent is important in any medical practice. [12] Practice without informed consent is considered illegal.

Model training program can help medical staffs train a large group of medical students. Although model is artificial not realistic but it is better than no experience. It is impossible that medical staff can teach and train every student to practice procedure due to the improper ratio of medical staffs and students.

Sufficient models should be provided for the students. Some easy available and inexpensive materials should be used as model in training. For the example, chicken can be a good model in Norplant insertion training.[15] Model training should be continuously emphasized, monitored and properly adjusted.

Not only model training program but also other programs using new media should be supporter Computer-based training program is an interesting method that should be used although there is a problem that using computer is not a real type of learning by doing.[16] Another interesting method is cadaver-based training.[17] This method can provide actual humanistic training experience although not alive.

Conclusion

The data from review literature about experiments about effectiveness of model training and conventional training program for medical students in Thailand were collected and analysis. We found that there had been only a few reports about this topic. From those reports, we found that there was significant different between the two methods. Some recommendations about clinical skill training programs for medical students were discussed.

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