



Original Research Article

Using Papaya as a simulation based training tool to develop competency in IUCD insertion & removal in interns - Perspective of teachers and students

W Jesi^{1,*}, V Dhanalakshmi², T Padmavathi³, P Rajavel Murugan⁴

¹Dept. of Physiology & Medical Education Unit, Govt. Thoothukudi Medical College, Thoothukudi, Tamil Nadu, India

²Dept. of Anatomy & Medical Education Unit, Govt. Thoothukudi Medical College, Thoothukudi, Tamil Nadu, India

³Dept. of Pharmacology & Medical Education Unit, Govt. Thoothukudi Medical College, Thoothukudi, Tamil Nadu, India

⁴Dept. of Emergency Medicine & Medical Education Unit, Govt. Thoothukudi Medical College, Thoothukudi, Tamil Nadu, India



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ABSTRACT

Introduction: As per MCI's new curriculum, insertion & removal of Intrauterine contraceptive device (IUCD) is a competency to be acquired by an Indian Medical Graduate. Only few students get the opportunity to learn this skill in a real patient. Simulation based teaching could improve the opportunity to learn. Hence we have done this study to use papaya as a cost effective simulation model for teaching IUCD insertion & removal.

Materials and Methods: Institutional ethical committee approval was obtained and a workshop was conducted to all the 158 interns of Government Thoothukudi Medical College in groups of ten. Briefing and demonstration was done with an IUCD simulator. Then the students were given an opportunity to practice the procedure in papaya individually. Feedback was obtained from interns and teachers by a structured questionnaire and analyzed.

Results: The feedback was analyzed to assess the reaction, knowledge, fidelity and transfer of the knowledge by students and teachers. Skill development by the students before and after the training showed a significant rise ($p < 0.05$)

Conclusion: This hands-on training on IUCD insertion & removal using papaya is found to have high fidelity and is very useful for the students to acquire knowledge and skill and is also approved and appreciated by the teaching faculty. Hence this can be included regularly in the teaching schedule for final year students and in Intern orientation programs.

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1. Introduction

Simulation based medical education allows acquisition of clinical skills through practice.¹⁻⁴ A student can make mistakes and learn from them without the fear of harming or distressing the patient.^{5,6} According to Medical Council of India's new curriculum based on CBME, insertion and removal of Intrauterine contraception device (IUCD) is a competency which an Indian Medical Graduate has to

acquire - 'OG35.15: Demonstrate the correct technique to insert and remove an IUD in a simulated/ supervised environment'.⁷

Learning IUCD insertion and removal through lectures and observation is not as effective as doing.⁸⁻¹¹ Performing in supervised environment is not possible for all the students. Only few students get the opportunity to learn in a patient under supervision. Training through simulators increases confidence and interest.¹¹⁻¹⁷ Hence we need a simulator to practice this skill. A simulator for learning and practicing IUCD insertion and removal can be bought and

* Corresponding author.

E-mail address: jesiwilson4@gmail.com (W. Jesi).

kept in skills lab of a college and used. But it is costly and is not affordable by all colleges and cannot be provided for individual students.

Hence there is need for a cost-effective way of learning this skill. The idea of using papaya as a simulation based model to learn intrauterine procedures has been introduced and done in few US based study.^{18–20} But still it has not been used in the colleges of our country and its pedagogical impact has not been fully evaluated yet. Hence we planned this study to use papaya as a simulation based model for teaching IUCD insertion and removal for the interns, and assess the perspective of teachers and students on the effectiveness of the new teaching method.

2. Aim

To assess the perspective of teachers and students on the usage of papaya as a model for learning IUCD insertion and removal.

3. Objectives

1. To use papaya as a cost effective model to simulate an uterus
2. To provide hands-on training to the interns in IUCD insertion & removal using papaya model.
3. To get feedback from the students and teachers to assess the reaction, knowledge & skill development and fidelity of the simulator.

4. Materials and Methods

The study population selected was the interns of Government Thoothukudi Medical College. Institutional ethical committee approval was obtained and a workshop was conducted to all the 158 interns of Government Thoothukudi Medical College. They were divided into 15 groups. In the workshop all the students were given a short introduction and demonstration of the IUCD insertion and removal using a IUD simulator by a faculty. Then the students were given an opportunity to practice the procedure in papaya individually. Feedback was obtained from the interns and also from the teachers by a structured questionnaire which had questions on its realism and questions to gauge the perception and acceptance of papaya as a simulation. Satisfaction of the students and faculty were also evaluated and analyzed.

4.1. Study setting

Government Thoothukudi Medical College, Tamil Nadu.

4.2. Study design

Observational study

4.3. Study population

Interns and Teaching faculty

4.4. Sample size

158 Interns and 20 Teachers.

4.5. Statistical analysis

Descriptive analysis and paired t-test.

Self-scored confidence level in skill acquisition before and after the training was collected. The change in the pre and post training scoring was assessed and analyzed using paired t-test. A p value of less than 0.05 was considered as significant.

5. Results and Discussion

The feedback was analyzed to assess the reaction, knowledge and skill development, fidelity and transfer of the knowledge by students and teachers.



Fig. 1: Papaya with IUCD inserted

The reaction of the students and the teachers were analysed by a question in the structured feedback as ‘ How much did you enjoy this training?’ and they were asked to give a score of 0-5. 84% of students and 100% of teachers gave a score of 4 and 5 respectively. Thus majority of the students and all the teachers enjoyed the training session.

During IUCD insertion we use ‘Withdrawal technique’ to insert the device in the uterus. Initially both the IUCD and the insertion tube are introduced into the uterus and then the insertion tube is withdrawn. This causes opening of the arms of the device to T position. Then the insertion rod is removed. Even though we teach the students about this Withdrawal technique they do not understand it till they perform it individually. In this study all the students had

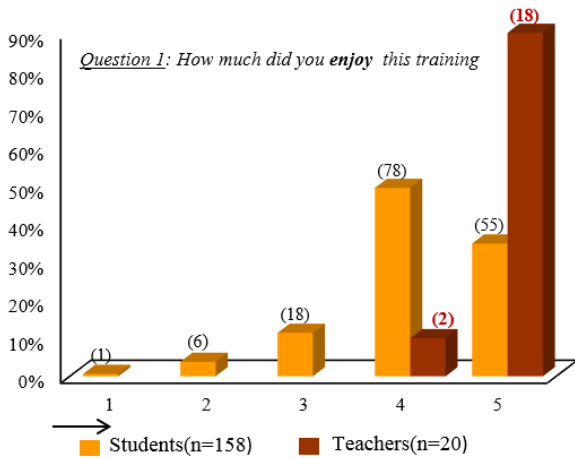


Fig. 2: Reaction assessing question

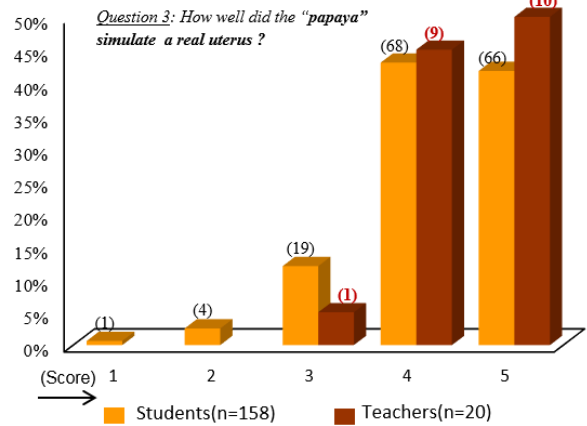


Fig. 4: Fidelity assessing question

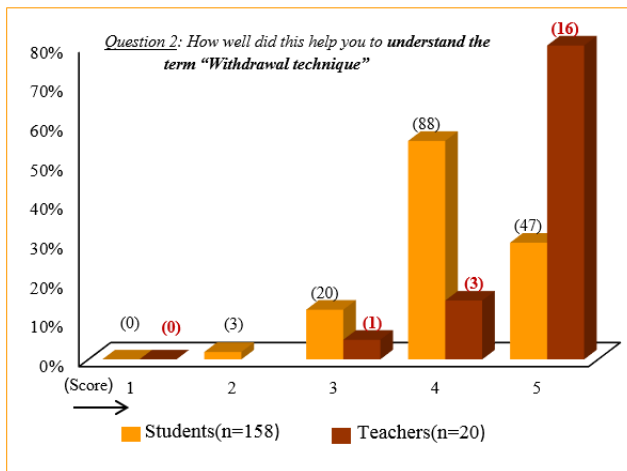


Fig. 3: Knowledge assessing question

shape and structure and it can be used as a simulator with high fidelity.

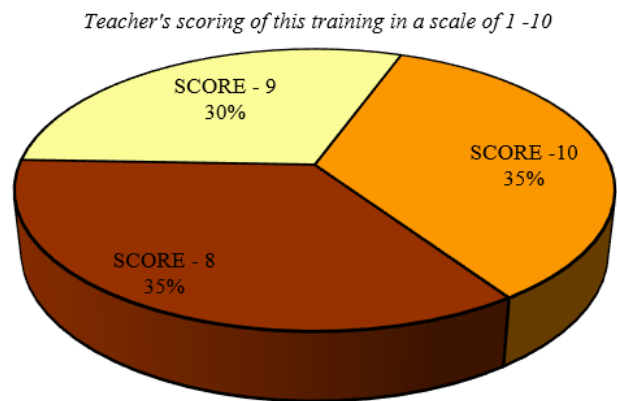


Fig. 5: Teacher's overall scoring of the training

an opportunity to practice the procedure individually in a papaya and there was a window created in the papaya so that the student can see what happens inside the uterus (papaya) as shown in Figure 1. 85% of students and 95% of teachers gave a score of 4 and 5 respectively for the question 'How well did this help you to understand the term "Withdrawal technique"?' Thus, the term 'Withdrawal Technique' was understood well by this training.

Fidelity refers to the degree of realism created by the selected simulation equipment, the setting and the experience. High fidelity of a simulator is important for the success of a simulation based teaching and learning.²¹⁻²³ To assess the fidelity of the simulator as perceived by the students and teachers in our study, we had asked the question – 'How well did the "papaya" simulate a real uterus?' 94% of students and 95% of teachers gave a score of 4 and 5 respectively. Thus, majority of students and teachers were convinced that papaya simulated an uterus in

The teachers were asked to score the overall training in a range of 1-10. 35% of teachers gave a score of 10, 30% gave a score of 9 and remaining 35% gave a score of 8. This shows that all the teachers involved in the training liked and recommend this method of using papaya as a simulator to teach IUCD insertion and removal.

Skill development by the students was assessed by a self-scored confident level (0-5) before and after the training. It was analyzed by paired t-test and it showed a significant rise ($p < 0.05$)

6. Limitations

Even though the papaya has many similarities with the uterus, it is not a perfect realistic model. It does not mimic some features like the attachment of the IUCD to the uterus, the tone and texture of the stem is not the same as cervix –

Table 1: Paired t-test for skill acquisition

Pair 1		Paired Samples Statistics						
		Mean	N	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
Pair 1	pre	2.20	158	1.161	.092	-20.882	157	0.000
	post	4.14	158	.753	.060			

it cannot be held and handled with a speculum.

Papaya is relatively inexpensive and it is available in most houses and shops in all tropical regions. In places where it is not available, other fruits such as melons and avocado can be used and adapted as models.

7. Future Perspectives

Transfer of the acquired knowledge shall be assessed by a feedback from the same interns at the end of their internship on how this training helped them to do the procedure in real life situation with comfort and gave them confidence for counseling the patients.

8. Conclusion

This hands-on training on IUCD insertion & removal using papaya is found to have high fidelity and is very useful for the students to acquire knowledge and skill and is also approved and appreciated by the teaching faculty. It can be also used to teach the procedure with individual hands on training to undergraduate medical students, interns, post graduate students, nursing students and also nursing assistants. Even if they do not do the procedure on real patients, this training will help them to gain confidence and interest in women health. This can be included as a routine part of the curriculum for final year students and in Intern orientation programs.

9. Conflict of Interest

There are no conflicts of interest in this article.


10. Source of Funding


None.

References


- McGaghie WC, Issenberg SB, Petrusa ER, Scalese RJ. A critical review of simulation. *Med Educ.* 2010;44(1):50–63.
- Bradley P. The history of simulation in medical education and possible future directions. *Med Educ.* 2006;40(3):254–62.
- Okuda Y, Bryson EO, Demaria S, Jacobson L, Quinones J, Shen B, et al. The utility of simulation in medical education: what is the evidence? *Mt Sinai J Med N Y.* 2009;76(4):330–43.
- Ghilardi MF, Moisello C, Silvestri G, Ghez C, Krakauer JW. Learning of a sequential motor skill comprises explicit and implicit components that consolidate differently. *J Neurophysiol.* 2009;101(5):2218–29.
- Ruddy RM, Patterson MD. Medical simulation: a tool for recognition of and response to risk. *Pediatr Radiol.* 2008;38(4):700–6.
- Sadideen H, Hamaoui K, Saadeddin M, Kneebone R. Simulators and the simulation environment: getting the balance right in simulation-based surgical education. *Int J Surg Lond Engl.* 2012;10(9):458–62.
- 7.UG-Curriculum-Vol-III.pdf . [Cited 2022 May 26]. Available from: <https://www.nmc.org.in/wp-content/uploads/2020/01/UG-Curriculum-Vol-III.pdf>.
- Gentile AM. A Working Model of Skill Acquisition with Application to Teaching. *Quest.* 1972;17(1):3–23. doi:10.1080/00336297.1972.10519717.
- Pacheco MM, Newell KM. Transfer of a learned coordination function: Specific, individual and generalizable. *Hum Mov Sci.* 2018;59:66–80. doi:10.1016/j.humov.2018.03.019.
- Amerjee A, Akhtar M, Ahmed I, Irfan S. Hybrid simulation training: An effective teaching and learning modality for intrauterine contraceptive device insertion. *Educ Health Abingdon Engl.* 2018;31(2):119–24. doi:10.4103/efh.Efh_357_17.
- Piryani RM, Piryani S, Shrestha U, Acharya A, Kanskar S, Shahi M, et al. Simulation-based education workshop: perceptions of participants. *Adv Med Educ Pract.* 2019;10:547–54. doi:10.2147/AMEP.S204816.
- Nitschmann C, Bartz D, Johnson NR. Gynecologic simulation training increases medical student confidence and interest in women's health. *Teach Learn Med.* 2014;26(2):160–3.
- Khadivzadeh T, Erfanian F. The effects of simulated patients and simulated gynecologic models on student anxiety in providing IUD services. *Simul Healthc J Soc Simul Healthc.* 2012;7(5):282–7.
- Cole SD, Nelson HCM, Jenkins BD, Poon CY, Rankin SC, Becker DE, et al. PennDemic Simulation Framework: An Innovative Approach to Increase Student Interest and Confidence in Disasters Preparedness/Response and Interdisciplinary Teamwork. *Front Public Health.* 2021;9:682112. doi:10.3389/fpubh.2021.682112.
- Field C, Benson LS, Stephenson-Famy A, Prager S. Intrauterine Device Training Workshop for Preclinical Medical Students. *MedEdPORTAL.* 15:10841. doi:10.15766/mep_2374-8265.10841.
- Zafar Z, Habib H, Kols A, Assad F, Lu ER, Schuster A, et al. Reinvigorating postpartum intrauterine contraceptive device use in Pakistan: an observational assessment of competency-based training of health providers using low-cost simulation models. *BMC Med Educ.* 2019;19(1):261. doi:10.1186/s12909-019-1683-y.
- Bartz D, Paris A, Maurer R, Gardner R, Johnson N. Medical student simulation training in intrauterine contraception insertion and removal: an intervention to improve comfort, skill, and attitudes. *Contracept Reprod Med.* 2016;p. 1–3. doi:10.1186/s40834-016-0009-2.
- Paul M, Nobel K. Papaya: A simulation model for training in uterine aspiration. *Fam Med.* 2005;37(4):242–4.
- Steinauer J, Preskill F, Robertson P. Training medical students in intrauterine procedures using papayas. *Med Educ.* 2007;41(11):1099–100.
- Another Use of Papaya as a Teaching Model [Internet]. [Cited 2022 May 27]. Available from: <https://fammedarchives.blob.core.windows.net/imagesandpdfs/fmhub/fm2005/September/Louisa535.pdf>.
- Tun JK, Alinier G, Tang J, Kneebone RL. Redefining Simulation Fidelity for Healthcare Education. *Simul Gaming.* 2015;46(2):159–74.
- Norman G, Dore K, Grierson L. The minimal relationship between simulation fidelity and transfer of learning. *Med Educ.* 2012;46(7):636–47.
- Lefor AK, Harada K, Kawahira H, Mitsuishi M. The effect of simulator fidelity on procedure skill training: a literature review. *Int J Med Educ.* 2020;11:97–106. doi:10.5116/ijme.5ea6.ae73.

Author biography

W Jesi, Assistant Professor  <https://orcid.org/0000-0003-2808-1458>

V Dhanalakshmi, Associate Professor  <https://orcid.org/0000-0001-8519-3486>

T Padmavathi, Associate Professor  <https://orcid.org/0000-0003-0807-4082>

P Rajavel Murugan, Professor  <https://orcid.org/0000-0001-5056-5788>

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