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Whites Science
A Scientific Erudition

Effectiveness of Hands on Training over Conventional Lecture Demonstration Method in Procuring a Cervical Smear for Papanicolaou Examination

Preetha Prabhakaran. S[1*], Shobha Sreedharan Pillai[1] and R. Sajith Kumar[2]

[*1]Department of Obstetrics and Gynaecology, Government Medical College, Ernakulam, Kerala, Pin code: 682301, India

[2]Medical Council of India NODAL Centre for Faculty Development, Government Medical College, Kottayam, Kerala, Pin code: 686008, India

Abstract

Introduction: Pap smear serves as a major screening test for cervical cancer. It is one of the competencies addressed by the MCI for the Graduate Medical Education. Studies show that newly qualified doctors are unable to perform procedural skills mostly because of lack of training [1]. **Aims and Objectives:** To compare the effectiveness of conventional method of lecture demonstration over hands on training and to know the students' perspective towards the teaching methodology. **Methods:** This was a quasi experimental study comparing 2 groups of students with one group given lecture demonstration and second group hands on training in obtaining a Pap smear. After the intervention period, both groups were assessed independently by another faculty by DOPS (direct observation of procedural skills) and the results were compared. **Observation and Results:** Data obtained after DOPS was classified in to 2 categories 1. Unable to perform or Able to perform only with repeated assistance 2. Able to perform with limited assistance or Competent in the procedure. DOPS assessment revealed that there was improved performance in the students trained by the hands on technique than conventional lecture demonstration. 86.7% of the students trained by hands on technique were able to do the procedure with limited assistance. While only 40% of the lecture demonstration could do the procedure by limited assistance. Data was analysed by 2x2 contingency table by FISHER's exact test, which gave the two–tailed p-value as 0.0209 which meant the association was statistically significant.

Keywords: Pap smear, Hands on training, DOPS, Lecture demonstration

Carcinoma cervix accounts for a major proportion of female genital cancer. Preinvasive lesions if treated give a 100% survival and early invasive lesions if treated have 92% survival [2]. Pap smear serves as the major test for screening in carcinoma cervix with high specificity and high sensitivity. It is also comparatively cheap, making it an ideal screening test in a primary health care setting. In developed countries the incidence of cervical cancer has decreased due to early diagnosis and treatment but in developing countries like India 80% of cervical cancers is diagnosed at an advanced stage [3]. Adoption & implementation of screening is of prime importance in cervical cancers. It is recommended that all women between 20-69 years who are sexually active should undergo Pap smear screening every 3 years [4]. Studies are limited in assessing the competency of residents, in obtaining a Pap smear. In a US, Canadian clerkship directors' meet 2004, 80% of attendees opined that students should learn Pap smear [5]. It is one of the core competency identified by ACGME (The Accreditation Council for Graduate Medical Education) in women's health. In India MCI also has addressed that obtaining a Pap smear in a primary health care setting, is a competency in Gynaecology for GME.

***Corresponding Author**
prepragmc[at]gmaildotcom

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Learning in a clinical environment has much strength. Learners are motivated by the relevance of study. There is active participation from the student. Attitude, communication skills, clinical reasoning, empathy all can be integrated with teaching, if it occur in a clinical setting [6]. This study was based on the hypothesis that hands on training is better than lecture demonstration in achieving procedural skills.

AIM

To improve the competency of the medical graduate in obtaining a Pap smear.

OBJECTIVE

1. To compare the effectiveness of conventional lecture demonstration with hands on training in obtaining a PAP smear.

2. To find out the perception of students regarding the two teaching learning methods.

MATERIALS AND METHODS

Study Type: Quasi experimental study

Study Source: 30 students of Final MBBS-8th semester, posted in O&G department during the study period.

Study Period: July-August 2015.

Sampling Technique: Non randomised sampling (instructor assigned) was used. Both groups contained 4 boys and 11 girls, making it demographically comparable.

Inclusion Criteria: All students who had given informed consent for study.

Exclusion Criteria: Those who were not willing to be a part of study.

Method: A number of 30 students of final MBBS-8th semester posted in O&G department during the study period were selected. Informed consent obtained from all. They were divided into 2 groups of 15 each. 15 students posted in OP were allocated into group 1 and were given lecture demonstration in taking Pap smear. As per ethical committee meeting, lecture demonstration was given to small groups of 5 students each, with a minimum, 3 patients. 15 students, who were doing internment in labour room were allocated into group 2 and were given hands on training in obtaining a Pap smear. 3 minimum chances were given to hands on training group in attaining the procedural skill. After the study period all the students were subjected to DOPS [7] by another examiner with checklist and the marks obtained were tabulated and grouped in to 2 categories.

1. Unable to perform + able to do it only with repeated assistance
2. Able to perform with limited assistance + competent in the procedure

The DOPS results were analysed by Fisher's exact test for 2x2 contingency table 2. The students were given Feedback in Likert scale regarding the assessment of teaching methodology. The responses were categorized into 2 groups.

1. Agree + strongly agree
2. Neutral + disagree + strongly disagree

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Responses also were analysed by Fisher's exact test for 2x2 contingency table, to note statistical significance (If p-value is <0.05, the association between rows and columns of the table was considered statistically significant). Pap smear slides obtained by the students of both group were also analysed for satisfactoriness [9] by the pathology department.

Ethics: IRB and Ethical committee clearance for the project was sought and obtained (REF NO: IEC/10/2015, Dated 09/07/2015). Informed consent was taken from students undergoing the study and the patients who came for Pap smear.

Ethical Issues: One group may be deprived of a better teaching method, so it was decided to cross over the groups after data collection.

OBSERVATIONS AND RESULTS

DOPS assessment revealed that there was significant improvement in the performance of students trained by hands on technique when compared with lecture demonstration (Table 1).

Table 1: DOPS assessment results

DOPS	LECTURE DEMONSTRATION	HANDS ON
UNABLE TO PERFORM THE PROCEDURE	1	0
ABLE TO PERFORM THE PROCEDURE UNDER DIRECT SUPERVISION ONLY WITH REPEATED ASSISSTANCE	8	2
ABLE TO PERFORM THE PROCEDURE WITH LIMITED SUPERVISION /ASSISTANCE	6	11
COMPETENT TO PERFORM THE PROCEDURE UNSUPERVISED	0	2
TOTAL STUDENTS	**15**	**15**

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The DOPS marks were rearranged into 2 groups

1. Unable to perform + able only with repeated assistance
2. Able to perform with limited assistance + competent to perform

The data was analysed by Fishers exact test for 2x2 contingency table, using graph pad calculator, to know any association between 2 methods and the outcome (Table 2) [8].

Table 2: DOPS assessment in 2 groups

GROUP	LECTURE DEMONSTRATION Freq	%	HANDS ON Freq	%
UNABLE/Repeated assistance	9	60	2	13.3
ABLE/COMPETENT	6	40	13	86.7

By fishers exact test the two tailed p value is 0.0209 which means the association between the rows and columns is statistically significant. So 86.7% of hands on training group was able to perform the procedure with limited assistance, when compared to lecture demonstration, where only 40% could do it with limited assistance.

Analysis of DOPS Assessment: Criteria given for assessment was further categorized to 2 groups for comparison (Table 3).

1. Group: meets expectation + above expectation + well above expectation
2. Group: well below expectation + Below exp + Borderline

Table 3: Analysis of DOPS results

Question	criteria	Lecture demonstration (Freq)	%	Hands on training (Freq)	%	p-value & Statistic Significance
1. Demonstrates adequate knowledge, Indications, anatomy, Technique	Below exp	12	80	2	13.3	p-value 0.0007 statistic significant
	≥ expectation	3	20	13	86.7	

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2. Obtains informed consent	Below exp	13	86.7	6	40	p-value 0.0209 statistic significant
	≥ expectation	2	13.3	9	60	
3. Demonstrates appropriate preparation pre procedure	Below exp	10	66.7	5	33.3	p-value 0.1431* not statistic significant
	≥ expectation	5	33.3	10	66.7	
4. Technical ability	Below exp	10	66.7	3	20	p-value 0.0253 statistic significant
	≥ expectation	5	33.3	12	80	
5. Aseptic technique	Below exp	10	66.7	2	13.3	p-value 0.0078 statistic significant
	≥ expectation	5	33.3	13	86.7	
6. Seeks help when required	Below exp	1	7.1	2	13.3	p-value 1.000* not statistic significant
	≥ expectation	14	92.9	13	86.7	
7. Post procedure management	Below exp	7	46.7	2	13.3	p-value 0.1086* not statistic significant
	≥ expectation	8	53.3	13	86.7	
8. Communication skills	Below exp	12	80	3	20	p-value 0.028 statistic significant
	≥ expectation	3	20	12	80	
	Below exp	5	33.3	2	13.3	

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9. Consideration of patient/ professionalism	≥ expectation	10	66.7	13	86.7	p-value 0.3898* not statistic significant
10. Overall ability to perform	Below exp	9	60	2	13.3	p-value 0.0209 statistic significant
	≥ expectation	6	40	13	86.7	

Feedback Form Analysis

Feedback was taken from the students regarding the assessment of teaching methodology.

Scores given in Likert scale were

- Strongly disagree,
- Disagree
- Neutral
- Agree
- Strongly agree

The feedback obtained was analysed by 2x2 contingency table by categorizing the scores into 2 groups and looking for any association between rows and columns in the findings by Fisher's exact test (Table 4).

1. Group: Strongly agree + agree

2. Group: Neutral + disagree + strongly disagree

Table 4: Feedback of teaching methodology analysis

QUESTION	criteria	lecture demonstration		Hands on training		p-value statistical significance
		Freq	%	Freq	%	
1. Teaching methodology was knowledgeable (cognitive)	Agree +strongly agree	10	66.7	15	100	p-value 0.0421 statistically significant
	Neutral +disagree+Strongly disagree	5	33.3	0	0	
2. Teaching methodology was effective	Agree+strongly agree	7	46.7	15	100	p-value 0.0022 statistically significant
	Neutral+disagree+	8	53.3	0	0	

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	Strongly disagree					
3. Teaching methodology enhanced learning skills	Agree+strongly agree	2	13.3	15	100	p-value 0.0001 (statistically extremely significant)
	Neutral+disagree+ Strongly disagree	13	86.7	0	0	
4. Teaching methodology produced change in attitude	Agree+strongly agree	11	73.3	12	80	p-value 1.000* (statistically insignificant)
	Neutral+disagree+ Strongly disagree	4	26.7	3	20	
5. Teaching methodology generated interest in the subject	Agree+strongly agree	10	66.7	13	86.7	p-value 0.3898* (statistically not significant)
	Neutral+disagree+ Strongly disagree	5	33.3	2	13.3	
6. Are you confident in taking a PAP smear in future	Agree+strongly agree	3	20	14	93.3	p-value 0.0001 (statistically extremely significant)
	Neutral+disagree+ Strongly disagree	12	80	1	6.7	
7. Teaching methodology helped in more retention of knowledge	Agree+strongly agree	0	0	15	100	p-value was 0.0001 (statistically extremely significant)
	Neutral+disagree+ Strongly disagree	15	100	0	0	

In the feedback there were 2 open questions also, regarding the positive and negative points of each teaching methodology.

Pap Smear Report Analysis: 30 slides were examined by the Pathologist, the criteria kept for satisfactory slides [2,4,9] include-

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Adequate cellularity, squamous cells >5000, no blood in the smear ,presence of endocervical cells, properly labelled, unbroken slides. When slides were analysed for satisfactoriness, it revealed better performance in hands on training group (93.3%) when compared to lecture demonstration (73.3%), but the association was not statistically significant when measured by Fishers' exact test (Table 5).

Table 5: Comparison of slide reporting between two groups

Reporting on slides	Lecture demonstration		Hands on training	
	frequency	%	frequency	%
Satisfactory with Endo cervical cells	0	0	3	20
Satisfactory slides, but no endocervical cells	11	73.3	11	73.3
Unsatisfactory	4	26.7	1	6.7

Total satisfactory reports in Hands on training group was 93.3%, while lecture demonstration group had 73.3%, even though with repeated assistance. If Odds ratio was used it was 5,showing association, But When Fisher's exact test was used to know the p value it is 0.1686 .This means the association between the rows and columns is not statistically significant.

DISCUSSION

After analyzing the data one can see that when 86.7% of hands on training group were able to perform Pap smear by limited assistance, only 40% of lecture demonstration group was able to do it with limited assistance. In hands on training, there is one to one teaching and student is under direct supervision so they are more oriented to learn. Similar study was conducted in 2004 ,where residents were allocated to 2 groups ,one group received intervention as educational instructions, skills workshop and feedback on Pap smear adequacy was analysed which showed trained residents were twice likely to obtain satisfactory slides. There was 21%increase in skill based competency namely, adequacy of Pap smear in the intervention group [10].

To become technically proficient in any procedure the following strategy has to be adopted [11,12].

1. Attainments of cognitive knowledge-steps, equipment, consent, attitude
2. The Instructional phase-divide the procedure into key steps and explain [13]
3. Demonstrate the key steps-comprehension
4. Perform independently, single components first
5. Performing the complete procedure

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This can be in a skills lab either on a manikin, animal model, cadaver then on a real patient. In the study conducted, first 3 steps were common to both groups, but hands on training group were getting the last 2 additional steps for improving their efficiency. Another study conducted for improving psychosocial and motor skills by SDL (self directed learning) packages in pelvic examination and Pap smear also showed wide acceptance among residents [14]. DOPS is a direct observation and reporting on a procedural skill based on checklists. Traditional exams used to miss lot of things and stress was given to certain specific points. Nowadays patient safety, clinician safety, procedure outcome, patient comfort, all are significant and assessment by checklists helps the trainees to attain overall competency [15,18]. Faculty development should be conducted in procedural education of trainees by OSTE(objective structured teaching exercise) This entails a simulated encounter in which faculty are observed teaching a standardized student and this is used to evaluate the teaching skills [16]. In the data analysis we can see that most of the criteria were met by hands on training group while lecture demonstration group lacks technical ability, communication skills, aseptic technique etc. Pre procedure preparation and post procedure management even though showing increase in hands on group, it is not up to the level of statistical significance when measured by fisher's exact test. This may be because of the instructor's teaching skill. Student's feedback analysis gives an upper hand to hands on training method. There was significant level of confidence and retention of knowledge in the hands on training group. Attitude change even though given in feedback didn't come to practice when assessment of DOPS was done. Interest in subject also was not much increased to become statistically significant. Assessment of pathological reports shows that 93.3% of hands on group were able to generate satisfactory report. But 73.3% of lecture demonstration group even though performed with repeated assistance has generated satisfactory reports. The p value for this table was 0.1686, which shows that the association between rows and columns is not statistically significant. It means hands on training increases the procedural skill but quality of smears are almost comparable in both groups. Endocervical cells were visible only in hands on training group, but it was also not much significant, only20%.Presence of endocervical cells is important, to know that transformation zone[(17)] is included. So to make the students competent in a cancer screening procedure more practice is needed [19,20]. Even though the smear quality, didn't produced marked changes in our study, it is seen that skill based training reduces need for repeated smears, decreases patient frustration and as a whole improves the quality of patient care [14]. The two open questions asked about the positive and negative points of the teaching methodology generated positive responses more for hands on training. Positives of hands on training were i.e., the learners gained more practical knowledge, increased confidence, step by step teaching, teacher was guiding, felt like real doctors, knew the importance of asking consent before touching the patient, now more concerned about patient's privacy, pain etc Negatives of hands on training method were- less stress on theoretical knowledge, more time consuming, more equipments, more attempts were needed. Positives of lecture demonstration were minimal, well demonstrated, better than simple lecture, less tension for students, only passive listening. Negatives of lecture demonstration were- confidence not attained; responses of patient and their feelings were not given importance while teaching.

LIMITATIONS OF THE STUDY

Absence of randomization and blinding, instructor bias and student bias may be there. Absence of skill lab and manikin also was a limitation, so have to do hands on training on live patients directly.

CONCLUSION

After the study it has to be concluded that hands on training is the better way to teach procedural skills like Pap smear, when compared to lecture demonstration. Students have to be given opportunities to do pelvic examination, Pap smear, conduct normal labour, all hands on, to make them competent. From the students feedback also we can infer that they have a positive attitude for

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such training. Quality of smear does not show much difference in 2 groups, but ability to perform the skill is much high in hands on training group.

IMPLICATIONS

In the present era of Competency based medical education there is an increasing need on the faculty to develop programmes which increases the performance status of the medical graduates. More studies in this field have to be welcomed, to know the pros and cons of conventional methods and what changes can be made in the teaching learning methodology, for the ultimate aim of attainment of `DOES HOW 'of MILLER'S PYRAMID by the medical graduate.

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ANNEXURES

1. Student Consent Form
2. Informed Consent For Patients
3. Feedback Form
4. DOPS Assessment Checklist

1. Student Consent Form: I am ready to participate in the educational project "effectiveness of hands on training over conventional lecture demonstration in taking Pap smear done by Dr. Preetha Prabhakaran S. I know the purpose of study and I am giving consent to be a part of the study voluntarily. I know that I can withdraw from the study at any time. I can ask questions and get clarifications at any time. I am convinced that my identity, the information given by me and the assessment marks obtained will be kept strictly confidential will not be used for academic purposes. It can be used for educational research purposes only, maintaining confidentiality. Signed by participant/name/date. Counter signed by researcher/name/date:

2. Informed Consent for Patients (Mother Tongue): I am giving consent to undergo Pap smear examination conducted by final year students under supervision. I know that it is a part of teaching skills to medical students. I accept this voluntarily.

3 (a). Feedback Form with Data- Group 1

Lecture demonstration	1 Strongly disagree	2 disagree	3 Neutral	4 agree	5 Strongly agree

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1.Teaching methodology was Knowledgeable(cognitive)			5	10	
2. Teaching method was effective		2	6	7	
3. Teaching method enhanced our Learning skills and gained confidence		6	7	2	
4. Whether teaching method had any change in your attitude towards patient	2	2		5	6
5. Teaching method was adequate in Generating interest in the subject		3	7	5	
6. Are you confident in taking a pap smear in future		4	8	3	
7. There was adequate Knowledge retention with this method	9	4	2		
8. What do you like most about the methodology(open)					
9. What did you like least of the methodology(open)					

3 (b). Feedback Form with Data- Group 2

Hands on	**1 Strongly disagree**	**2 disagree**	**3 neutral**	**4 agree**	**5 Strongly agree**
1.Teaching methodology was Knowledgeable(cognitive)				2	13

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2.Teaching method was effective				4	11
3.Teaching method enhanced Learning skills and gained confidence				1	14
4.Whether teaching method produced any change in your attitude towards patient		2	1		12
5.Teaching method was adequate in generating interest in the subject			2	2	11
6.Are you confident in taking a pap smear in future			1	5	9
7 .There was adequate Knowledge retention with this method				3	12
8.What do you like most about the methodology(open)					
9.What did you like least of the methodology(open)					

DOPS Assessment Checklist

1. Demonstrates understanding of indications, relevant anatomy, and technique of the procedure?
2. Obtains informed consent
3. Demonstrates appropriate preparation pre-procedure?
4. Technical ability?
5. Aseptic technique?
6. Seeks help when appropriate?
7. Post procedure management?
8. Communication skills?
9. Consideration for the patient /professionalism?
10. Overall ability to perform?

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Grades Given

1. Well below the expectation for stage of training
2. Below the expectation for stage of training
3. Borderline for the stage of training
4. Meets the expectation for stage of training
5. Above the expectations for training
6. Well above the expectations for training

For Analysis: Results were categorised in to 2 groups

1. Group: well below the expectations + below the expectations

2. Group: meets the expectation for training +above the expectation + well above the expectations

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