

# Role Of Mock Drills In Competency Based Post Graduate Medical Education In Managing Emergency Clinical Situation.

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**Abstract: Background-** Access to a skilled health professional and quality emergency obstetric care are important factors that improve maternal and perinatal mortality. In Medical simulation (drills) of emergency cases can give ample opportunity for post graduate students to learn, practice and finally can assess system weaknesses and strengths, test policies and procedures for coping with higher levels of competencies and thereby improve teamwork and management and communication skills of post graduates/staff members.

**Aim-** We aimed to compare the effectiveness of traditional video demonstration vs. performing mock drill as a T-L METHOD in terms of competencies of postgraduate students regarding managing emergency clinical situations in OBGY and study perception of postgraduate students of both methods.

**Objectives-**

1. To study and compare between change in WPBA SCORE of traditional video lecture and Mock drills on competencies of post graduate medical students in managing emergency clinical situation

2. To study perception of PG students about Mock drill as T-L tool in pg training.

***Result-There was significant difference in change in WPBA score of traditional video lecture and that of Mock drills on competencies of post graduate medical students in managing emergency clinical situation. The perception of PG students about Mock drill as T-L tool in pg training was good in terms of their confidence level for management of eclampsia.***

***Conclusion- The improvement in WPBA score of mock drills is much better than that seen after video sessions on skill based competencies of post graduate medical students in managing emergency clinical situation. The higher level domain score improved with higher scores competencies improved the change in skill based competency assessment score was much more after mock drill than that after video session. The perceptions of students regarding their confidence level in diagnosing and managing improved more after Mock drill especially in psychomotor and affective domains.***

***Keywords- Competency, Mock Drill, Emergency, Medical education, WPBA Score***

## **INTRODUCTION**

In competency-based education, there is a strong focus on outcomes and professional performance. Typically, holistic tasks are used to train, practice and assess the defined outcomes or competencies. Most of the medical universities as tertiary health care centers the post graduate students are the primary doctors are these emergencies as 1st respondents. Most of these students learn to manage obstetric emergencies with traditional teaching that is mainly discipline based and knowledge oriented. They learn with experience from their seniors and mistakes/deficiencies that happen while managing real emergencies teaching. Outcome of any obstetric emergency is affected by prompt and appropriate care by experienced staff and as first respondents, competency of postgraduate students plays an important role in effective management of these clinical situations. Given that most units will manage only few cases a year, this experience may not be adequate (1).

Access to a skilled health professional and quality emergency obstetric care are important factors that improve maternal and perinatal mortality. In Medical simulation (drills) of emergency cases can give ample opportunity for post graduate students to learn, practice and finally can assess system weaknesses and strengths, test policies and procedures for coping with higher levels of competencies and thereby improve teamwork and management and communication skills of post graduates/staff members.

Simulations involving team based work and management can be especially effective in improving communication and coordination among team members (pg students) and thereby there competencies (2).

As mentioned by RCOG, Emergency obstetric skills and drills training is mandatory in all departments and delivered locally. These simulation learning sessions can finally improve patient safety and can detect undermining factors affecting competencies and help in reducing them. (3). Still simulation based learning is not major part of post graduate curriculum. Hence in present study we aim to evaluate the effect of simulation based teaching on higher skills when compared to traditional video lecture based training. Most of the postgraduate (PG) training in our set up is discipline based .The students generally learn from didactic lectures, group discussions seminars, at the most by video lectures and video demonstration. To manage any catastrophic natural emergency to be managed effectively and promptly the care takers need to be competent in all domains which they can acquire with actual practice on simulated scenarios or and drills that they perform. Mock drills are useful for training both doctors and midwives to manage obstetric crises. Simulation has potential to be used to rate technical skills and behavioral performance during the management of

emergencies, suggesting a role for this tool as both teaching learning and evaluation tool in a risk management.(4)

Simulation is a generic term that refers to an artificial representation of a real world process to achieve educational goals through experiential learning. Simulation based medical education is defined as any educational activity that utilizes simulation aides to replicate clinical scenarios. Although medical simulation is relatively new, simulation has been used for a long time in other high risk professions such as aviation.

Apart from acquiring skills these medical simulation/ mock drills of emergency cases can teach, assess system weaknesses and strengths and test policies and procedures for coping with emergencies. They also have potential to improve teamwork and communication skills of post graduates/staff members. Mock Drills can be especially effective in improving communication and coordination among team members/pg students/staff nurses. As states by Chacko Simulation-based medical education by using best practices and curriculum mapping is need of the hour to maximize educational benefits in the context of shift toward competency-based medical education(1)

Obstetric and neonatal emergencies are rare events. As a result, providers have few real-time opportunities to practice the necessary clinical, teamwork and communication skills shown to improve outcomes during such emergencies. Traditional training approaches— including didactic sessions, manuals, and guidelines—have not been shown to improve adoption of evidence-based practice.(5) Also as advised by Royal College of Obstetricians and Gynaecology (RCOG)\_emergency obstetric skills and drills training should be practiced in all departments and delivered locally. These courses are evolving to include human factors training to improve patient safety and can reinforce how undermining is perceived within teams and how it can be reduced. Drills and simulation exercises should be reinforced and encouraged as improved teamwork is unquestionably a side effect of rehearsal, endorsing that sustained repeated practice is essential for expertise. (3). Still Mock drills are not included routinely or as basic TL tool or evaluation tool in terms of WPBA tool in OBGY Post graduate course curricula world over. Hence we aim to study effectiveness of Mock drills on competencies of PG students of OBGY when compared to traditional video based lectures,

## **METHODOLOGY**

**STUDY TYPE- QUASI EXPERIMENTAL PILOT STUDY**

**STUDY SETTING-** Study was conducted in department of OBGY DMIMSU under guidance of MCI nodal center DMIMSDU.

**STUDY DURATION-** It was done for a period of 6 months from October 2018 To March2019

**SAMPLE SIZE-**18 post graduate students

Ethical committee clearance was obtained .Written informed consent was taken from participating students

**PARTICIPANTS-**

36 Post graduate students of department of OBGY divided in two allocated groups of 18 each.

Group 1- Video lecture used as T-L method

Group 2- MOCK drill used as T-L method

A) WPBA (OSCE)

B) Self-efficiency assessment questionnaire

1. Workplace based assessment of post graduate students for participating (postgraduate) students was done by single professor blinded for the intervention by using a standardized assessment sheet to assess competencies (checklist) – OSCE

2. Self-efficiency Assessment Scale Based On Badura Model(6) –validated questionnaire which was answered/ filled by PG students

(Both validated by subject expert and expert from nodal center)

(Scenario for this research was- Eclampsia drill)-

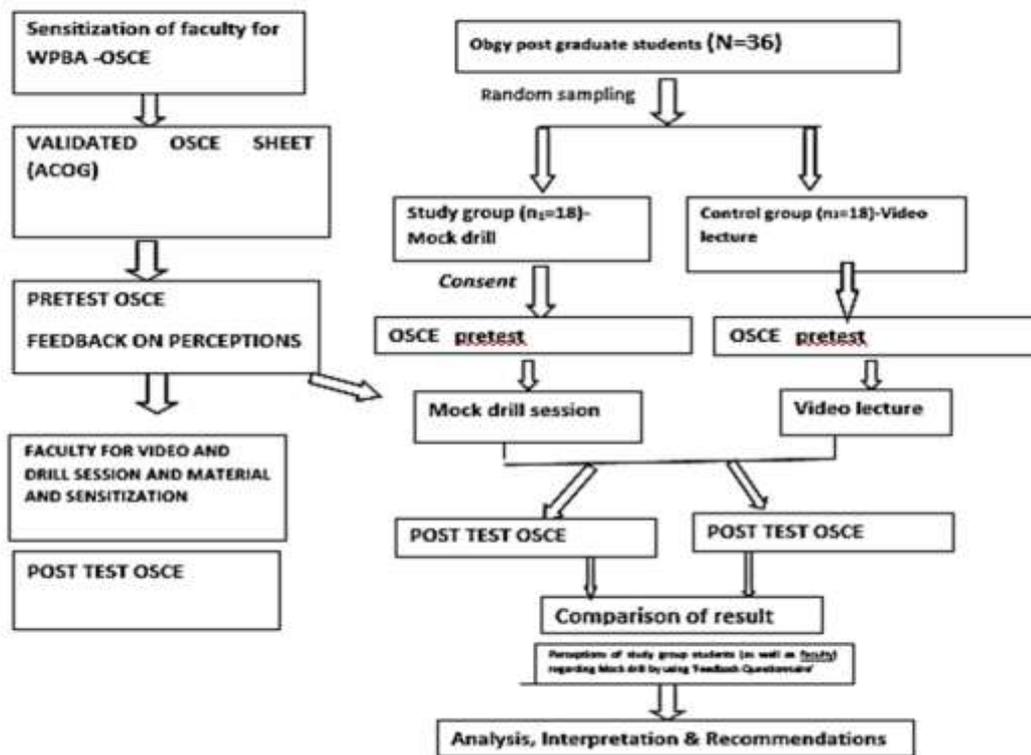
Evaluators (PG guide) was sensitized about the whole project and method of pretest and posttest evaluation but was blinded for the type intervention for posttest. Pretest (wpba) and student's [perception of management of eclampsia was taken was taken before the intervention.

We conducted vedio lecture session for group 1 and Mock drill session for group 2 with participant students. WPBA was by evaluators was done after two session each. The results after vedio session and mock drill session were then compared for significance in difference.

Video session and Mock drill were conducted as per the guidelines given by Royal College of Obstetricians and Gynecologists (RCOG).

**Plan of work**

**Title: Role of mock Drills in competency based post graduate medical education.**



**RESULTS-**

The study was conducted in a period of two months in department of OBGY under guidance of nodal center (MCI) DMIMSU. There were 36 participants - post graduate students of department of OBGY.

TABLE 1 WPBA –Comparison of mean scores of pretest and post test after vedio session

Variable	PRETEST SCORE	POST VIDEO SESSION SCORE	P value
	Mean(SD)	Mean(SD)	
Knowledge of eclampsia	7.72(0.46)	10(0.0)	1.000
History taking skill	8(0.0)	10(0.0)	1.000
Examination skill	5.94(1.05)	6.44(0.51)	0.206
lab tests	8.11(0.32)	10(0.0)	1.000
Anticonvulsant t/t	4.66(0.97)	6.38(0.97)	0.010
Antihypertensive t/t	4.55(1.04)	6.38(0.97)	0.015
Emergency	2.83(0.78)	6.5(0.92)	0.000
Communication	2.66(0.68)	4.88(0.83)	0.000
Attitude	3.33(0.90)	4.94(0.80)	
Decision making	3.38(0.84)	6.5(0.92)	0.000

CHART 1- Comparison of mean scores of pretest and post test after video session

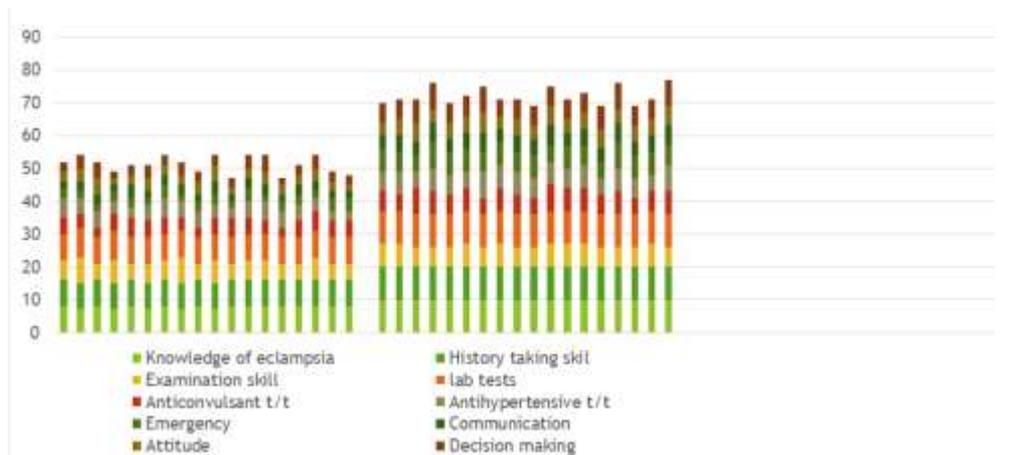


TABLE 2- Comparison of mean score of pretest and mockdrill group

Variable	PRETEST SCORE	POST MOCK DRILL SESSION	P value
	Mean (SD)	Mean (SD)	
Knowledge of eclampsia	7.72(0.46)	8 (0.0)	0.080
History taking skill	8(0.0)	10(0.0)	0.070
Examination skill	5.94(1.05)	8.44(0.51)	0.206
lab tests	8.11(0.32)	10(0.0)	1.000

Anticonvulsant t/t	4.66(0.97)	8.44(0.51)	0.010
Antihypertensive t/t	4.55(1.04)	8.38(0.50)	0.015
Emergency	2.83(0.78)	8.44(0.51)	0.000
Communication	2.66(0.68)	8.44(0.51)	0.000
Attitude	3.33(0.90)	8.5(0.51)	0.000
Decision making	3.38(0.84)	7.44(0.70)	0.000

CHART 2- Comparison of mean score -between pretest and post test of mock drill group

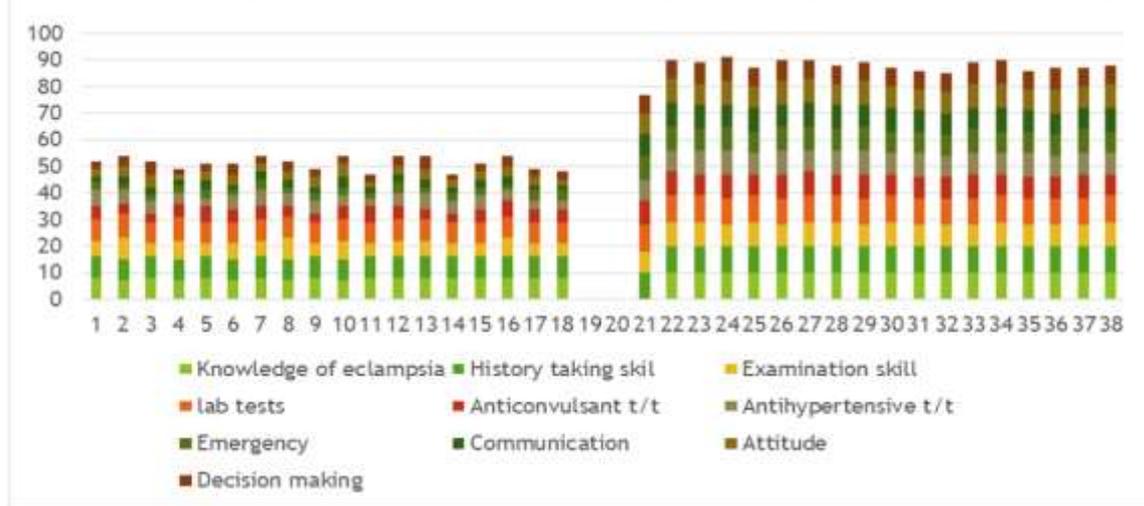


TABLE 3 - Comparison of improvement in WPBA assessment score

Variable		Vedio session	Moc drill session	Chi2	P Value
Knowledge Of Eclampsia	2	13(72.22%)	13(72.22%)	0.00	1.000
	3	5(27.78%)	5(27.78%)		
History Taking	2	18(100%)	18(100%)	0.00	1.000
Examination skill	0	4(22.22%)	0	5.911	0.206
	1	4(22.22%)	4(22.22%)		
	2	4(22.22%)	5(27.78%)		
	3	5(27.78%)	5(27.78%)		
	4	1(5.56%)	4(22.22%)		
Lab tests	1	2(11.11%)	2(11.11%)	0.000	1.000
	2	16(88.89%)	16(88.89%)		
Anti-convulsants	0	3(16.67%)	0	16.800	0.010
	1	4(22.22%)	0		
	2	6(33.33%)	3(16.67%)		
	3	4(22.22%)	4(22.22%)		
	4	0	6(33.33%)		
	5	1(5.56%)	4(22.22%)		
	6	0	1(5.56%)		

Antihypertensive t/t	0	4(22.22%)	0	15.772	0.015
	1	2(11.11%)	0		
	2	8(44.44%)	3(16.67%)		
	3	2(11.11%)	3(16.67%)		
	4	1(5.56%)	7(38.89%)		
	5	1(5.56%)	4(22.22%)		
	6	0	1(5.56%)		
Emergency	2	3(16.67%)	0	19.376	0.002
	3	5(27.78%)	0		
	4	5(27.78%)	2(11.11%)		
	5	5(27.78%)	6(33.33%)		
	6	0	7(38.89%)		
	7	0	3(16.67%)		
Communication	0	1(5.56%)	0	36.00	0.000
	1	5(27.78%)	0		
	2	4(22.22%)	0		
	3	5(27.78%)	0		
	4	3(16.67%)	0		
	5	0	6(33.33%)		
	6	0	10(55.56%)		
	7	0	2(11.11%)		
Attitude	1	11(61.11%)	0	32.00	0.000
	2	3(16.67%)	0		
	3	2(11.11%)	2(11.11%)		
	4	2(11.11%)	0		
	5	0	11(61.11%)		
	6	0	3(16.67%)		
	7	0	2(11.11%)		
Decision making	1	2(11.11%)	0	25.090	0.000
	2	5(27.78%)	0		
	3	6(33.33%)	5(27.78%)		
	4	0	11(61.11%)		
	5	4(22.22%)	0		
	6	1(5.56%)	0		
	7	0	2(11.11%)		

CHART 3- Improvement in WPBA score in two groups individually

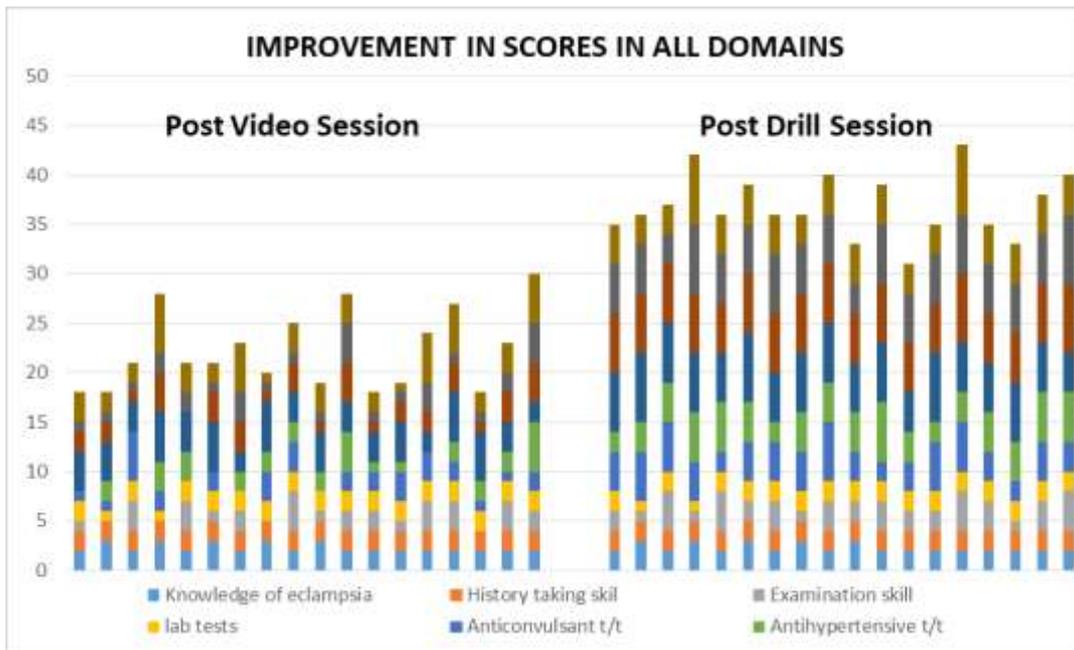
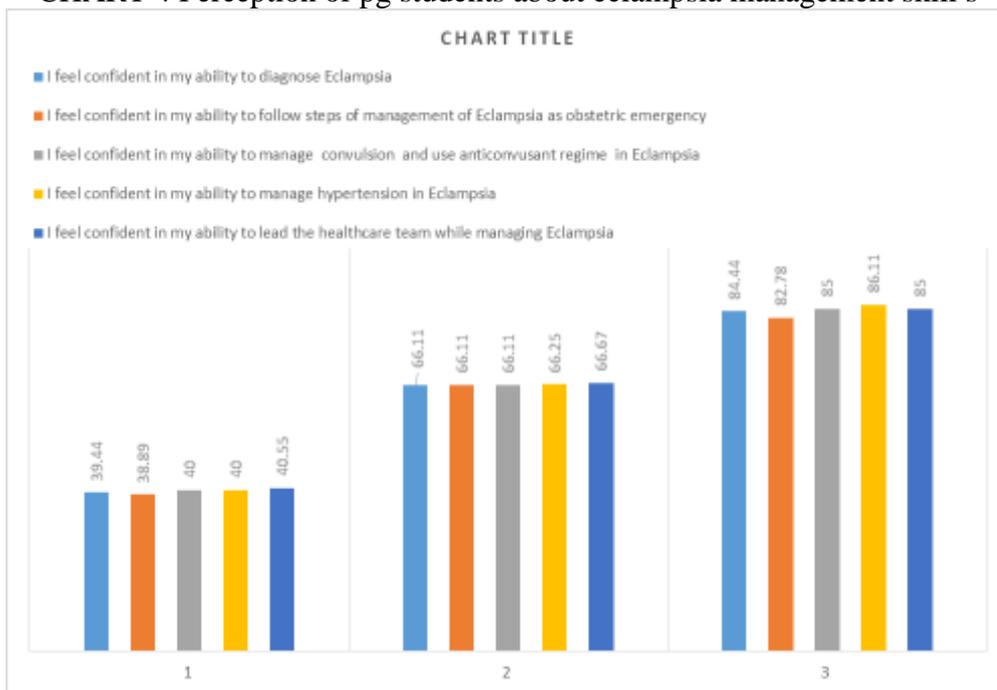


CHART 4 Perception of pg students about eclampsia management skill s



**DISCUSSION**

The aim of this study was to compare the effectiveness of traditional video demonstration vs. performing mock drill as a T-L method in terms of competencies of postgraduate students regarding managing emergency clinical situations in OBGY and study perception of postgraduate students of both methods.

As evident in Table 1 And 2 And Chart 1 And 2 the pretest WPBA (OSCE) scores in both were below average in all domains mainly poor in psychomotor skills.

Daniel et al performed ‘Prospective Randomized Trial of Simulation Versus Didactic Teaching for Obstetrical Emergencies’. They concluded that there was no statistical

difference found between the groups on the pre-training and pretesting multiple-choice questionnaire scores. Performance testing performed as a labor and delivery drill showed statistically significant higher scores for the simulation-trained group for both shoulder dystocia (Sim = 11.75, Did = 6.88, P = 0.002) and eclampsia management (Sim = 13.25, Did = 11.38, P = 0.032).(7)

With emphasis on patient safety and quality outcomes in social consciousness and payer system necessitates that medical educators use high-quality, reliable, valid, educationally sound assessment methods. Workplace based assessment allows the academicians and clinicians to evaluate overall performance levels of trainees.at the same time it is helpful in improving the teaching learning the above findings tell us the skills of post graduate trainees is overestimated when it comes to management and needs periodic assessment of skills in managing obstetric emergencies specially where prompt assessment and management skills are needed. As studied by Neema et al the OSCE scores of post graduate students showed poor results specially in haigher domains. (8)

As seen in Table 1 And Chart 1 - The mean scores of pre-session (baseline) WPBA scores of all 18 pg students in following domains viz. Knowledge of eclampsia ,History taking skill, Examination skill lab tests, Anticonvulsant t/t, Antihypertensive t/t Emergency, Communication, Attitude, Decision making were 7.72(0.46),8(0.0),5.94(1.05) ,8.11(0.32) ,4.66(0.97) ,4.55(1.04) 2.83(0.78), 2.66(0.68) ,3.33(0.90), 3.38(0.84) respectively whereas scores after video session were 10(0.0) ,10(0.0) ,6.44(0.51),10(0.0) ,6.38(0.97) ,6.38(0.97) ,6.5(0.92) ,4.88(0.83) ,4.94(0.80),6.5(0.92) and that after MOCK drills were10(0.0),10(0.0) ,8.44(0.51), 10(0.0) ,8.44(0.5), 8.38(0.50) ,8.44(0.51) ,8.44(0.51), 8.5(0.51),7.44(0.70).

The results in the table show that the WPBA scores were low mainly in the psychomotor domains like examination treatment communication and attitude as well as decision making. Similar results were found by Monica Maria Siaulys et al in their project on Obstetric emergency simulation training course: experience of a private-public partnership in Brazil(9) The values after the video and the mock drill session show increase in score in both groups more in MOCK drill group in terms of psychomotor skills.

As seen In Table 3 Chart 3- The improvement in scores is better in mock drill group than in the video session group specifically in higher domains while that in the knowledge domains there is no significant difference as is evident with p value. The p values in following domains viz. knowledge of eclampsia ,history taking skill, examination skill lab tests, anticonvulsant t/t, antihypertensive t/t emergency, communication, attitude, Decision making are as follows 1.000,1.000, 0.206 ,1.000 ,0.010 ,0.015, 0.002, 0.000, 0.000, 0.000 respectively suggesting that the higher domains improve better with practically doing the skill related task than seeing it.

As shown in table 4 chart 4,the perception of post graduate students about their confidence level for management of eclampsia. in terms of following aspects VIA. ability to diagnose Eclampsia, follow steps of management of Eclampsia as obstetric emergency ,manage convulsion and use anticonvulsant regime in Eclampsia, manage hypertension in Eclampsia, lead the healthcare team while managing eclampsia were assessed .it was found that there was improvement in all aspects after both sessions. The improvement in confidence level that the student felt was specifically more after mock drill than that after video sessions as may be they actually performed those skills. In a study done by Green M et al with nurses as participants with aim to measure perceived confidence and competence in resuscitation before and after Advanced Cardiac Life Support (ACLS) certification in combination with obstetric drills they found that the confidence of nurses increased by 35% and nurse

competence increased by 32%. (2). An educationally sound program that included classroom time and focused drills led to increased perceived confidence and competence for nurses.

Daniels K et al performed prospective randomized trial of simulation versus didactic teaching for obstetrical emergencies.

They also found similar results that performance testing performed as a labour and delivery drill showed statistically significant higher scores for the simulation-trained group for both shoulder dystocia (Sim = 11.75, Did = 6.88, P = 0.002) and eclampsia management (Sim = 13.25, Did = 11.38, P = 0.032). They concluded that in an academic training program, didactic and simulation-trained groups showed equal results on written test scores. Simulation-trained teams had superior performance scores when tested in a labour and delivery drill. Simulation should be used to enhance obstetrical emergency training in resident education (7). Few of the articles reflected on related issues addressed in this study (10-12). Jain et al reported about SNAPPS Clinical Reasoning in Outpatient Settings(13). Shrivastava et al focussed on implications of artificial intelligence (AI) on dynamics of medical education and care (14). Tote et al studied about perception regarding narrative and reflective writing among fellowship candidates (15). Some articles also reflected on Cultural Competency Framework and healthcare manpower estimates in public health (16-18).

Future research (should be) is planned to see effect of mock drills on improvement on patient outcomes (morbidity and mortality) in terms of emergency obstetric care.

## CONCLUSION AND IMPLICATIONS

The WPBA assessment score is below satisfactory landmarks while assessing competencies of management of emergency clinical cases and needs to be assessed for post graduate training.

There is improvement in WPBA score after both traditional video lecture and mock drills on skill based competencies of post graduate medical students in managing eclampsia as emergency clinical situation

The improvement in WPBA score of mock drills is much better than that seen after video sessions on skill based competencies of post graduate medical students in managing emergency clinical situation

The higher level domain score improved with higher scores competencies improved the change in skill based competency assessment score was much more after mock drill than that after video session.

The perceptions of students regarding their confidence level in diagnosing and managing improved more after Mock drill especially in psychomotor and affective domains.

There is significantly more improvement in skill based competencies of post graduate students when they underwent mock drill session than that after video sessions for management of eclampsia as obstetric emergency .Hence mock drills should be part of routine post graduate training for simulation of management of emergencies apart from didactic video sessions for better acquisition of skill based competencies.

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