CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES

http://doi.org/10.5281/zenodo.1407490

Available online at: http://www.iajps.com Research Article

A RANDOMIZED TRIAL TO ASSESS COMPLEX PROCEDURAL SKILLS EFFECTIVENESS LEARNT THROUGH SIMULATION AND HANDS-ON JOB WITH PATIENTS

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Abstract:

Objective: *We aimed to compare and contrast the learning procedural skills effectiveness on patients against simulations (models & dummies).*

Methods: *We included 74 interns from Gynecology & Obstetrics Department (Services Hospital, Lahore) from October 2016 to November 2017. We identified five basic procedural skills including cervical (Pap) smear taking, manual vacuum aspiration, intrauterine contraceptive tool insertion, suturing and making of an episiotomy and management of the 3rd stage labour. Two random groups were made having 38 interns in Group – I and the remaining 36 interns in Group – II. Four weeks of training of five procedural skills was carried out in Group – I on dummies and models; whereas, Group – II was given initial training on the patients. In the presence of standard checklist, identical objectives were achieved in both the groups on model and patients.*

Results: *After the four weeks evaluation no significant variation was observed in outcomes of both the groups. However, at the end point of training better outputs were received by Group – I than Group – II with respective scores of (86.7 ± 2.7) against (80.4 ± 4.8) with significant P-value of (< 0.001). Variation was more marked in the procedural skills of intrauterine contraceptive tool insertion, suturing and making an episiotomy and third stage labour active management.*

Conclusion: *Outcomes clearly speak for the development of skills on dummies and models before patients, which can be employed in the training of healthcare workers for the development of their procedural skills and effective performance of complex procedures. Outcomes suggest and favour the initiation of skill development programs through dummies and simulations and after that practical hands-on job with patients.*

Keywords: *Simulation, Procedural Skills, Mannequins, Dummies, Models and Assessment.*

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Please cite this article in press Sidra Hashim et al., ***A Randomized Trial to Assess Complex Procedural Skills Effectiveness Learnt Through Simulation and Hands-On Job with Patients.,*** *Indo Am. J. P. Sci, 2018; 05(08).*

INTRODUCTION:

Human subjects are directly used for the learning of procedural skills by the medical interns in a traditional way especially the patients [1]. With an increased patient awareness in Pakistan numerous assessments need to be informed and written consent of the patients before the start of the evaluative process [2]. There is a need for the standardization in the field about the practice of alternative approaches and strategies in order to teach procedural skills with the help of simulations and models which was initiated back in the seventeenth century and evolved over the decades [3 – 5]. Numerous settings are effectively using simulations for skill development, the curriculum is widely relying on these innovative methods but only highly paid institutions are able to afford this facility [6 – 11].

Pakistani society is very much conservative and repeated female procedures are difficult to maintain in the Obstetrics & Gynecology practice which favours the use of models and simulations for the procedural skills development as ample practice on female patients is limited [12]. We aimed to compare and contrast the learning procedural skills effectiveness on patients against simulations (models & dummies).

METHODS:

We included 74 interns from Gynecology & Obstetrics Department (Services Hospital, Lahore) from October 2016 to November 2017. We identified five basic procedural skills including cervical (Pap) smear taking, manual vacuum aspiration, intrauterine contraceptive tool insertion, suturing and making of an episiotomy and management of the 3rd stage labour. Two random groups were made having 38 interns in Group – I and the remaining 36 interns in Group – II. Four weeks of training of five procedural skills was carried out in Group – I on dummies and models; whereas, Group – II was given initial training on the patients. In the presence of standard checklist, identical objectives were achieved in both the groups on model and patients.

As our training sessions were interrupted so twelve interns were unable to make it throughout the period of research. We selected a pragmatic training design in the light of concerns raised by the trainers and our approach was traditional in nature. Sample size selection was also pragmatic without any historical data and estimation of the power. We basically aimed at the performance and competency of five basic skills of Ob-Gyn which were cervical (Pap) smear taking, manual vacuum aspiration, intrauterine contraceptive tool insertion, suturing and making of an episiotomy and management of the 3rd stage labour.

Group – I was trained on models and dummies; whereas, Group – II was trained while their assignments in a labour ward, gynaecological emergency department and operation theatres. Group – II had an interaction with actual patients in the wards, operation theatres, emergencies and OPDs. Cross-over of the groups was made after the completion of four training weeks. The major difference in both groups was the sequencing of their training. Both groups enjoyed the same interaction facilities and chances during their training.

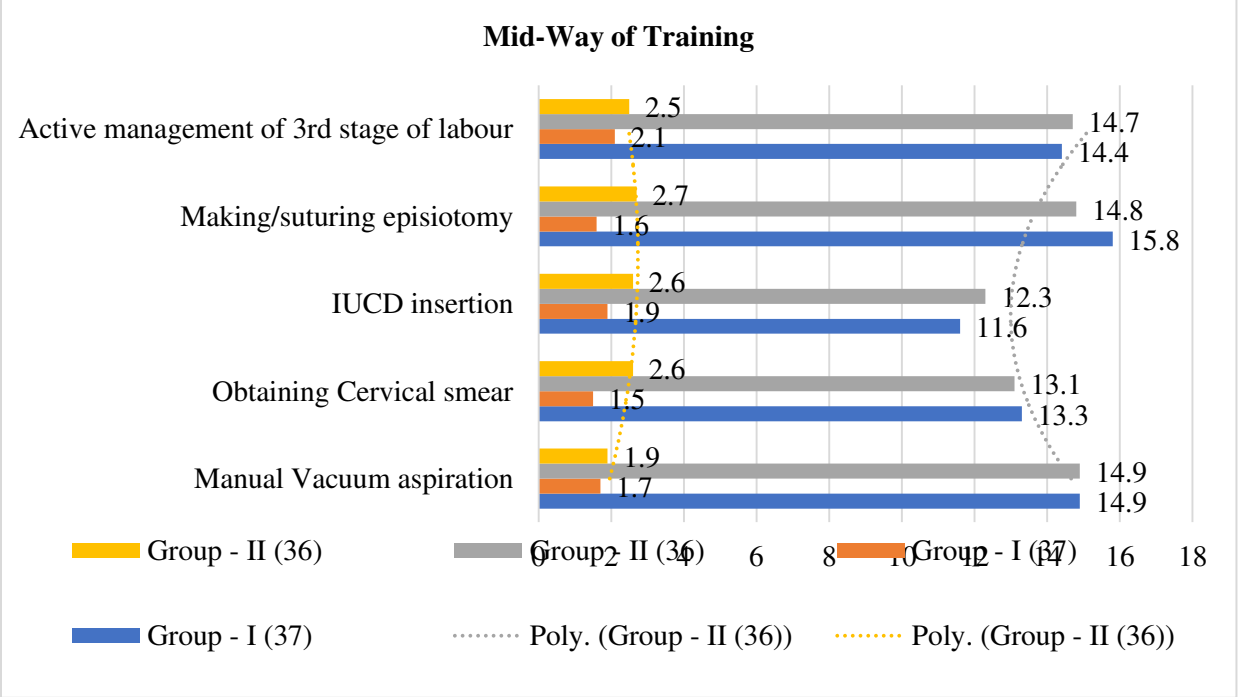
Clinical supervisors who were blind to the distribution of the training groups were tasked to evaluate the intern's competency of procedural skills with a given set of tools and structures assessment scheme. Quantitative scores were obtained through globally accepted checklists. Supervisors also indicated shortcomings and imparted remedial training schemes.

RESULTS:

After the four weeks evaluation, no significant variation was observed in outcomes of both the groups. However, at the end point of training better outputs were received by Group – I than Group – II with respective scores of (86.7 ± 2.7) against (80.4 ± 4.8) with significant P-value of (< 0.001). Variation was more marked in the procedural skills of intrauterine contraceptive tool insertion, suturing and making an episiotomy and third stage labour active management.

Table – I: Group performance on procedures in the intent-to-treat analysis (midway of training) Data as a mean score ± SD

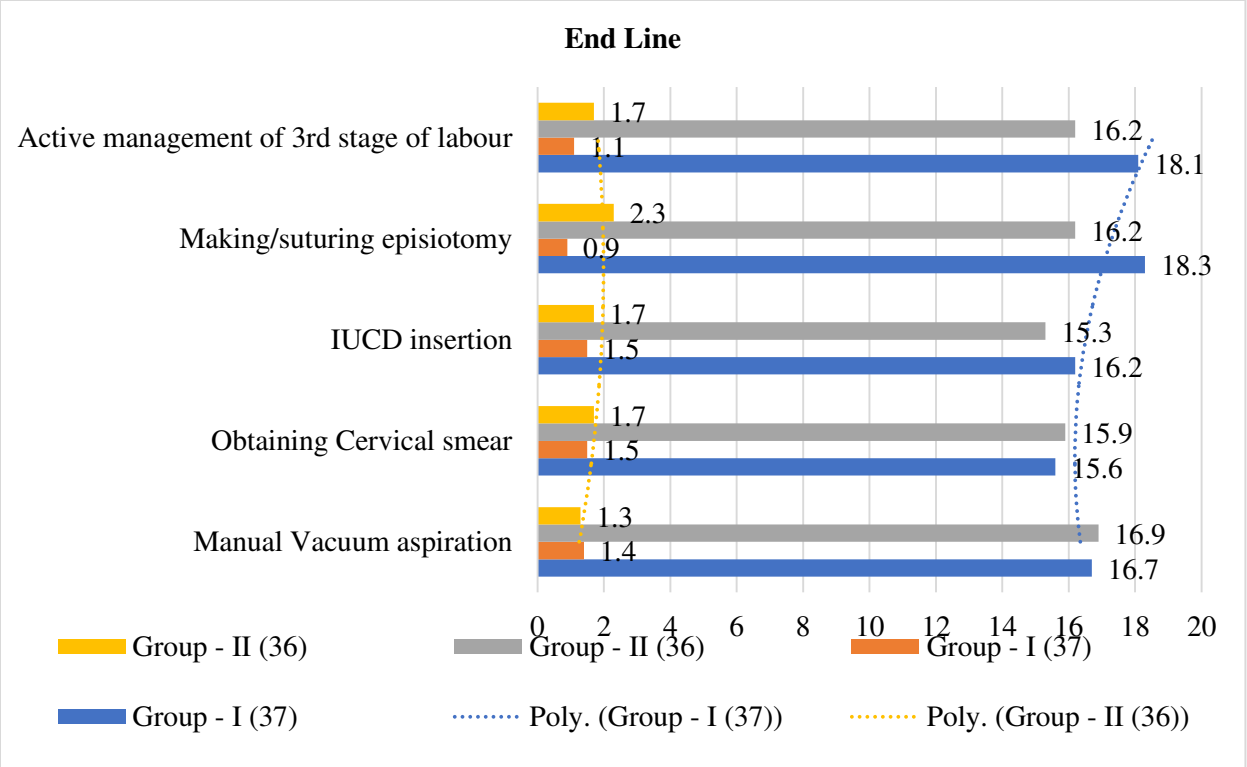
Procedures evaluated	Group - I (37)		Group - II (36)		P-Value
	Mean	± SD	Mean	± SD	
Manual Vacuum aspiration	14.9	1.7	14.9	1.9	0.996
Obtaining Cervical smear	13.3	1.5	13.1	2.6	0.97
IUCD insertion	11.6	1.9	12.3	2.6	0.219
Making/suturing episiotomy	15.8	1.6	14.8	2.7	< 0.05
Active management of 3rd stage of labor	14.4	2.1	14.7	2.5	0.627



Group – I performed better than Group – II after eight weeks as shown in the outcomes of Table – II.

Table – II: Group performance on procedures in the intent-to-treat analysis (end-line) Data as a mean score ± SD

Procedures evaluated	Group - I (37)		Group - II (36)		P-Value
	Mean	± SD	Mean	± SD	
Manual Vacuum aspiration	16.7	1.4	16.9	1.3	0.505
Obtaining Cervical smear	15.6	1.5	15.9	1.7	0.438
IUCD insertion	16.2	1.5	15.3	1.7	0.018
Making/suturing episiotomy	18.3	0.9	16.2	2.3	< 0.0001
Active management of 3rd stage of labor	18.1	1.1	16.2	1.7	< 0.0001



DISCUSSION:

Anxiety, less practice exposure and fear are associated with the traditional learning styles of the procedural skills which also lead to transgression and harm to patients [13]. Sceptic view is prevalent about the simulation-based training with the help of dummies and models. This modern approach can be taken as an alternative without any compromise with the set standards and policies [14 – 16]. Improved performance has been observed in various prospective studies about the employment of models in training [17]. Low economical settings face the issue of maintenance and procurement of these models and dummies. Long run facilities can be secured with a one-time investment. Effective laboratory skills can be maintained with the help of effective employment of models and well-trained and skilled facilitators [18, 19]. Furthermore, locally manufactured and affordable model and training equipment are also available for better and effective outcomes. There was a visible difference in the final outcomes of the training at models and actual patients. Skills development and confidence was also improved in the Group – I participants who practised initially at models and dummies and later at the actual patients.

Preference is given to the training with the help of simulations and models as it reduces the harm factor towards patients and improved confidence in the healthcare workers. Short learning curves are also observed in the trainees who train on models and dummies with better clinical practice [20 – 22]. Higher protocol adherence, a better understanding of the procedures and dealing with the complications is better in the simulation and model-oriented training. Higher comfort level was also observed in the interns who trained on models and dummies before interacting with the actual patients. Several studies have also prosed this scheme as an alternative in the comfort of the residents in the performance of routine procedures with comfort and competence [23, 24]. Patient-doctor relationship relies on their interaction and it is an integral element of healthcare. This skill of interaction is also that much important as the technical skill is mandatory. Entire reliance on models and dummies is again not an effective strategy, both the strategies are equally important and need to be employed simultaneously by replacing and supplementing each other.

It was pertinent to notice the variation in the more invasive skills of IUCD insertion, AMSTL and suturing & making an episiotomy. Outcomes of Group – I was better than Group – II, which suggests about the suitability of this approach for the transmission of procedural skill and competence in the interns especially for difficult procedures [27].

Interns can perform repeat procedure on dummies without any harm and they can master a certain skill without any mental stress; whereas, in actual patents, there is no chance of error and margin of mistake is very much restricted almost near to zero. Actual patients feel discomfort and real-time application needs proper consideration of the comfort of the patients. The real application may also cause adversities in the procedures and may cause serious consequences in the health of the patients. Model and dummies present more objective and effective approach for the achievement of training objectives by ensuring high standards of validity [28, 29]

We need to promote improved, objective and innovative training strategies with better and effective outcomes for an actual doctor to patient's interaction as well. Simulators have been used for decades in various fields such as aviation and driving before actual assignments and interaction with human lives [30].

CONCLUSION:

Outcomes clearly speak for the development of skills on dummies and models before patients, which can be employed in the training of healthcare workers for the development of their procedural skills and effective performance of complex procedures. Outcomes suggest and favour the initiation of skill development programs through dummies and simulations and after that practical hands-on job with patients.

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