

Impact of Structured Teaching Programme on Peripheral Intravenous Cannulation among Doctors and Paramedical Staff in Medical College

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Abstract

Context Background: A Workshop was conducted on intravenous line insertion among doctors and nursing staff. Theoretical aspect was explained through standees whereas practical aspect was demonstrated through skill mannequin. *Aims:* It was an interventional study conducted for 3 days, where an effect of a training on IV line insertion was evaluated based on pre and post training assessment score. *Settings and Design:* The study population was 582 including medical and n paramedical staff. The training cum workshop was divided in two sections - theoretical part and skill oriented part, theoretical aspect was explained by expert in the field by the PowerPoint presentation then Mannequin training was given. Same training method was used for all the batches. Evaluation of training was done by asking the participants to fill a questionnaire with 10 questions, before and after training session. *Statistical analysis used:* The results were collected and evaluated by applying paired *t* - test and *p* - value obtained SPSS statistical software. *Results:* In pretest out of 582 members, only 16% secured $\geq 70\%$ marks. But in posttest evaluation showed 94% candidates securing $\geq 70\%$. The difference is said to be statistically significant at 95% confidence interval when *p* - value is < 0.05 (0.0001) Out of 582 responders 148 were doctors 434 were paramedical staff. *Conclusions:* Hence, we concluded that intravenous cannulation workshop is essential to improve knowledge and skill of intravenous line insertion.

Keywords: Intravenous line; Training programme; Doctors; Paramedical staff.

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Introduction

Intravenous (IV) means "within vein". Intravenous therapy (IV) is a therapy that delivers fluids directly into a vein and can be used for injections or infusions due to fastest way to deliver fluids and medication¹ and 100% bioavailability. IV Cannulation skills develops from a combination of theoretical instruction and on the job practice.

Educational programs may lead to a substantial decrease in cost, morbidity, and mortality.² Then the researcher thought of taking the task of assessing the knowledge of paramedical staff and doctors and educating them. The Guideline for Hand Hygiene in Healthcare Settings provides Healthcare Workers (HCWs) with a review of data regarding handwashing and hand antisepsis in healthcare settings and it provides specific

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recommendations to promote improved hand hygiene practices and reduce transmission of pathogenic microorganisms.³

Materials and Methods

It was an interventional study. Medical and paramedical staff were included in study and the study population was 582. Workshop was conducted for 3 days. Same training method were used for all the batches of training to maintain the same intensity of training. The training cum workshop was divided in two sections. Theoretical part - PowerPoint presentation and standees were used for better visual impact on the participants. Practicle part - Mannequin training were given to the participants.

Evaluation of Training

A questionnaire (10 questions) for evaluation. The aspects on which they were interrogated like basic classification, site selection, maintenance, complications. The participant were asked to fill up questionnaire paper before and after the training session done.

Analysis

The data were entered to computer and analyzed using SPSS software. Paired *t* - test was used to establish statistical significance between pre and posttraining score. The difference is said to be

statistically significant at 95% confidence interval when *p* - value is < 0.05 (0.0001).

Results

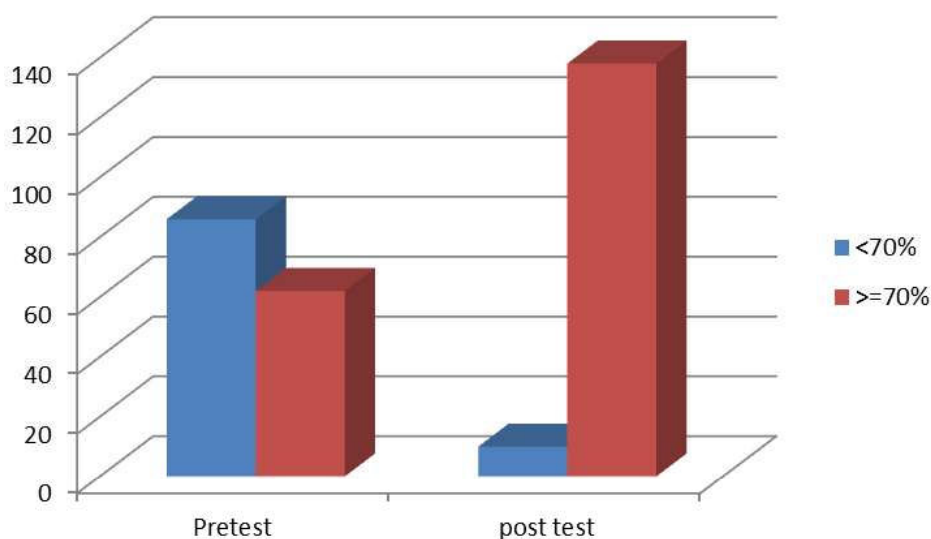
Out of 582 responders 148 were doctors and 434 were paramedical staff. Pre and posttests were conducted with same questionnaire. In pretest out of 582 members, only 16% secured ≥ 70% marks. In posttest evaluation was done through same questionnaires that showed 94% secured ≥ 70%. The data were entered to computer and analyzed using SPSS software and Paired *t*-test was used to establish statistical significance between pre and posttraining score. Which was statistically significant at 95% confidence interval (*p* - value < 0.0001).

Among doctors 41.89% secured ≥ 70% marks in pretest assessment whereas in postworkshop assessment 93.24% secured ≥ 70% marks, (Graph 1).

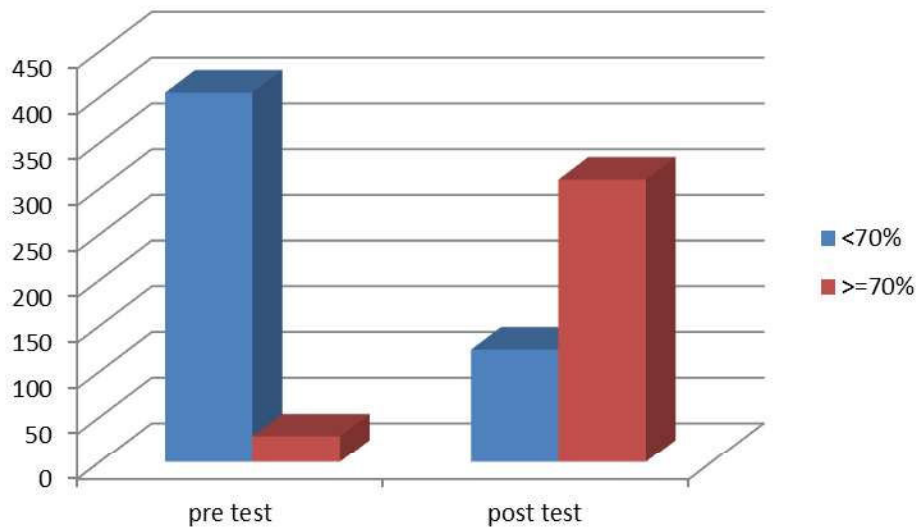
For paramedical staff 6.68% secured ≥ 70% in pretest assessment whereas in posttest assessment 71.49% of them secured 70-90%, (Graph 2 and Table 1).

Table 1: Showing numerical comparision between doctors and paramedical staff and comparison between pretest and posttest result shows *p* - value < 0.01, means it indicates significant difference between two results.

Workshop participants	n (sample size)	Pre-test Mean	Post-test mean	Paired t - test p - value
Doctors	148	13.26	16.63	< 0.01
Paramedical staff	434	7.39	15.77	< 0.01



Graph 1: Showing comparative results of pretraining and posttraining among Doctors (*n* = 148)



Graph 2: Showing comparative results of pretraining and posttraining among Paramedical Staff ($n = 434$)

Discussion

A workshop was conducted on intravenous line insertion among 582 (Doctors and Paramedical) staff in medical college to see the effectiveness of workshop. In pretest only 16% secured $\geq 70\%$. In posttest workshop 94% candidates secured $\geq 70\%$. Which shows significant difference ($p < 0.05$). The comparison was done in the same group for pre and posttest (i.e. doctors pretest and posttest only comparable). That shows that programme with teaching in person along with hands on methods are effective enough for medical and paramedical persons for improvement in knowledge regarding a skill like intravenous cannulation.

- Naomi P Gredy *et al.*⁴ had published an article in Feb' 11 stated that guidelines have been developed for healthcare personnel who insert intravascular catheters and for persons responsible for surveillance and control of infections in hospital, outpatient, and home healthcare settings. They emphasized mainly on educating and training healthcare personnel who insert and maintain catheters.
- A study done⁵ an educational intervention to prevent catheter-associated bloodstream infections in a nonteaching, community medical center in July 2003 concluded that, a focused educational intervention among nurses and physicians in a nonteaching community hospital resulted in a significant, sustained reduction in the incidence of catheter-associated bloodstream infection.^{6,7}
- Dave Davis and his friends did study in 1999 about impact of Formal Continuing

Medical Education and gave conclusion that interactive CME sessions that enhance participant activity and provide the opportunity to practice skills can effect change in professional practice and, on occasion, healthcare outcomes.⁸

- One more study done on impact of an educational program and policy changes on decreasing catheter-associated bloodstream infections in a medical intensive care unit in Brazil² Stated that AAmultiple approach included an educational strategy, targeted to specific problems observed during a careful evaluation of CVC care practices, and policy changes can decrease rates of CVC-BSI.
- Margaret G. Lyons *et al.* A randomized, pretest posttest experimental STU DY done by Scott A Engum to assess Computer-based education *vs* traditional learning methods for Intravenous catheter training suggested combination of these two methods of education to enhance the trainee's satisfaction and skill acquisition level.³ assessed the success of an IV catheter insertion continuing education class aimed at improving experienced nurses' skills levels, confidence, and knowledge regarding IV catheter insertion, maintenance, and infection prevention.¹⁰ Other studies done on complications of peripheral intravenous (IV) catheters in the hand and forearm in a hospital¹¹⁻¹⁴ over a period of time n demanded the need of education n teaching to decrease incidence of complications related to intravenous catheter.

- Webster J and his colleagues suggested that to minimise peripheral catheter-related complications, the insertion site should be inspected at each shift change and the catheter removed if signs of inflammation, infiltration, or blockage are present.¹⁵
- Education in evidence-based care and handling gives nurses and doctors the opportunity to improve their ability to use theoretical knowledge in clinical problems.^{2,16}

Conclusion

- Hence, we concluded that intravenous cannulation workshop is essential to improve knowledge and skill of intravenous line insertion among medical and paramedical staff.

Key Messages

Need of such study to increase awareness about care of intravenous cannulation to decrease intravenous cannulation related infection and complication and thereby, decreasing hospital stay and mortality.

Acknowledgement: Nil.

Conflict of Interest: Nil.

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