International Journal of Science and Research (IJSR)
ISSN: 2319-7064
ResearchGate Impact Factor (2018): 0.28 | SJIF (2018): 7.426

Effectiveness of a Training Programme on Intravenous Cannulation Therapy: An Interventional Study

Kaur Varinder[1], Kaur Jasbir[2], Thakur Rachna Devi[3]

1st Assistant Professor, Obstetrics and Gynaecology Nursing, Maharishi Markandeshwar University College of Nursing, M. M. University, Kumarhatti-Solan, H.P., India
2nd Dean & Principal, Mental Health Nursing, Maharishi Markandeshwar College of Nursing, M. M. University, Kumarhatti-Solan, H.P., India
3rd Clinical Instructor, Maharishi Markandeshwar College of Nursing, M. M. University, Kumarhatti-Solan, H.P., India

Abstract: ***The effectiveness of skills laboratory training is widely recognized. The training of scientific knowledge, basic clinical skills are essential for participants in order to develop nursing professionalism. There is an increasing demand upon nursing personnel to be effective experts in IV cannulation. It covers under inserting, monitoring and maintaining intravenous access are essential components of nursing. Traditionally, the triad of knowledge, skills required for quality of nursing practice. Providing an opportunity for the demonstration of clinical procedures through expert trainer as well as their observation and ultimately independent performance by participants, hands-on practices essentially draws upon the instructional principle of ''see one, do one''. Training using manikin showed improvement in post-training 83.3% knowledge level of intravenous cannulation skills.***

Keywords: Intravenous cannulation, Nurses, Care, Effectiveness

1. Introduction

Intravenous cannula is a little plastic tube that has been mounted on a needle for insertion into the client's vein that requires frequent access to the blood stream. Intravenous cannula insertion needs a sterile technique as it enters into the client's vein. Intravenous cannulation and its care is a therapeutic procedure in patient care.

Nurses should be skillful and show enough expertization in intravenous cannulation to reduce tissue damage, blood loss, frequent punctures into the vein as it enhance health, reduce complications and duration of hospitalization of the clients. Nurses are responsible for the insertion, manipulation, infusion, intact maintenance, care of catheter and safe removal. Intravenous cannulation is one of the most common invasive procedures that nurses perform and it carries with it a high risk of complication. For example, phlebitis rates reported for patients receiving intravenous therapy have been as high as 80% with the rates in most hospitals ranging between 20% and 80%. Other complications resulting from intravenous cannulation include thrombophlebitis, extravasation and infection resulting from bacteremia and septicemia.

Patients also experience unnecessary discomfort or pain. Nurses performing the procedure should be well trained as many complications can arise from peripheral intravenous cannulation.

Care of patient with intravenous access device include dressing, flushing and heparin locking for prevent infection and intravenous cannula with related complications such as infiltration (4.54%), phlebitis (5.79%) thrombosis (6.02%), air embolism (15.08%), swelling in the area of infection site (15.54%), burning sensation (36%), pallor of the skin (41%), catheter related bacteremias (43%) are major and common clinical problem particularly in critically ill patients.

Intravenous cannulation become more widely used in today's healthcare environment, nursing teaching faculty requires expert knowledge in relation to venous catheter insertion and its care for guide the student nurses to prevent complications and maximize efforts to optimize the individual's health status. Nursing officers should be aware of this safety peripheral intravenous cannulation to implement in the clinical setting to improve the health status of the client and to minimize the complications.

Training Programme is necessary to update their knowledge, skill and competence in intravenous cannulation. Approved policies, education, clinical skills, procedures based on current evidence can be implemented and evaluated for the change in practice. The research study and working area created insight in investigator mind and felt the need to design a study to conduct training programme for nursing tutors & staff nurses who are working in selected nursing colleges & hospitals on Intravenous Cannulation and its care. This will help to learn and improve knowledge of nursing teaching faculty regarding Intravenous Cannulation and its care.

2. Materials and Methods

A cross-sectional interventional study was done to assess the effectiveness of a training programme on Intravenous cannulation among the nursing personnel. It was conducted by nursing team members at Maharishi Markandeshwar College of nursing in September 2019. A total of 30 had registered most of them were in the Nursing officers and with a few in a Nursing teaching faculty, from various clinical and basic sciences departments. All participating

members were undergoing the training for the first time. A Speakers was invited from outside, and members of M. M. College of nursing were also engaged in many sessions. The four sessions were held for one day, with eight hours of training schedule a day. The training involved a combination of different of teaching methods that is lecture cum demonstration with power point, role play, white board, etc. under group activities and team based learning, thus making the sessions very interesting. Topics covered in the training programme that is concepts, indication, complication, care and its management of intravenous cannulation therapy. Finally, the sessions were wrapped with an orientation towards how to give feedback to participants. All the participants attended all the sessions. This study involved a pretest, educational intervention, and posttest. O_1, X, O_2. $O_{1,2}$ is the Observation of the dependent variable (pretest and posttest); X is the Exposure to the educational intervention, the independent variable.

The intervention group (n = 30) trained IV cannulation in a nursing foundation laboratory receiving instruction. Emphasis was placed on practical exercise of peripheral IV catheter insertion on a trainer model in the shape of a human arm model name and number is "Injectable Training Arm Model (XC-434)". It allows for the puncture of multiple veins, e.g. the cephalic vein, the basilic vein and the median cubital vein. The exercise was carried out as a role-play. It creates a more realistic training situation, to enhance the participants' involvement and to support the acquisition of patient nurse communication.

A pre-test and post-test containing 20 questions were given 20 minutes from various topics included in the sessions were given on a day before the start and after the Training Programme, to test the participant's improvement in knowledge. The questionnaire contained both open ended and closed ended questions. An answer key was prepared for all the questions. For the open ended questions the criteria selected were the inclusion of key words and the sentences giving the same meaning. Each correct response was awarded one mark and an incorrect response was not given any marks. All participants were given participation certificates at the end.

3. Statistical Analysis

The mean test score of pre-test and post-test were compared by using paired t-test, for p-value of <0.005. The statistical package used was window SPSS 16.0 version.

4. Results

This study was conducted on 30 participants all of them were nursing personnel and working in various colleges and hospital of Himachal Pradesh. The mean post-test scores of correct responses (17.34±1.325) showed highly significant improvement as compared to the pre-test scores (10.4±2.26), using t-test. The number of incorrect responses in post-test were (2.67±1.29) decreased as compare to pre-test (9.2±2.411). The number of not attempted questions were also decreased in the post-test (0) compared to pre-test (0.4±0.78). [Table/Fig:-1]

Responses	Pre- test score (Mean ± SD)	Post- test score (Mean ± SD)	p-value
Correct	(10.4±2.26)	(17.34±1.325)	<0.005
Incorrect	(9.2±2.411)	(2.67±1.29)	<0.005
Not attempted	(0.4±0.78)	(0)	<0.005

Table Number 1: Comparison of Pre-Test and Post-Test Scores

Participatants feedback shows that training programme created more interest, enthusiasm, and inspiration to learn the topic. They also increased peer coordination and group dynamics.

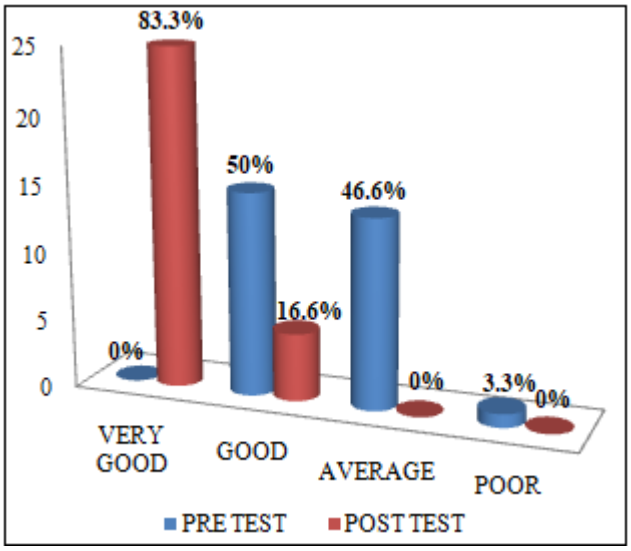

Figure 1: Knowledge level of Pre-Test and Post-Test Scores

5. Discussion

This study prospectively investigated the effectiveness and transfer of IV cannulation skills acquired by nursing personnel through training session. An analysis of the data has helped the investigator to get a clear understanding of the study undertaken. The interpretation drawn from the findings of the study were based on the knowledge related to IV cannulation practices regarding cannula size selection, site of insertion, maintenance of cannula line, assessment of phlebitis and prompt management of any signs of phlebitis were inadequate.

In this study, it was shown that the pre-knowledge of the nurses regarding knowledge level was 3.3% Poor, 46.6% Average and 50% Good which were not up to the mark and then training was provided, and their knowledge has been gradually increased up to 83.3% Very Good and 16.6% Good which was a good achievement. Similarly, in other studies also it was noted that pre-knowledge of nursing personnel regarding knowledge practices was less which directly reflects on the complication of IV cannulation. After the training programme Knowledge level is improved and their practices also improved and which resulted in decreased in the complication like phlebitis and others.

6. Limitation

The limitations of the present study were the short duration of training programme and the small number of participants. We assume that our results can be applied to technically

related techniques which require venipuncture, such as taking blood samples or blood cultures. This training programme is consistent with the clinical reality of ‘‘see one, do one.”

7. Conclusion

There was an improvement in the knowledge skills after the training programme. The participant gave a good feedback about the sessions and expressed their wish to attend to more such training programme. It leads to an improvement in patient safety and better medical care. Future studies should address the durability of skills acquired through simulation based training with long-term follow-ups of participants. Furthermore, researchers should investigate how concomitant clinical supervision affects the transfer of procedural skills from a simulated setting into clinical practice. The findings of this study show that there is highly statistical significant relation difference between pre-test and post-test.

8. Acknowledgements

I owe my acknowledgements to Dr. (Mrs.) Jasbir Kaur, Dean & Principal of our College of Nursing, for giving us the opportunity to conduct this training Programme, and the management of Maharishi Markandeshwar University (MMU). A special thanks to our faculty members, Ms. Rupam G., Ms. Shaweta S. who had helped us with the review of literature.

References

[1] A N Siriwardena, M., S., A., J S., (2009). *An evaluation of an educational intervention to reduce inappropriate cannulation and improve cannulation technique by paramedics.* Retrieved from: https://www.ncbi.nlm.nih.gov

[2] Ajitha S., Anu, L. (2015). *A prospective study to assess the effect of selective parameters of insertion on peripheral intravenous cannula site among in patient of a selected hospital in NCR* . Retrieved from: https://www.researchgate.net

[3] Anna, C. (1996). *Factors influencing nurses' handling and control of peripheral intravenous lines an interview study.* International Journal of Nsg Studies 33(2): 131-142.

[4] Cook L. (2007). *Choosing the right intravenous catheter*. Home Health C Nurse Sep: 25(8): 523-31: Quiz 532-3.

[5] Cicolini G, Bonghi Ap, El al.(2009) *Position of peripheral venous cannulae and the incidence of thrombophlebitis an observational study*. J Adv Nsg. Jun: 65(6): 1268-73 EPUB 2009 Apr 3.

[6] Ferreira M, C., Farias, D., Almeida, V.,(2012). *Care of nursing team to children with peripheral venous puncture: descriptive study*. Retrieved from: http://dx.doi.org/10.5935

[7] Gupta, A., Mehta, Y., Juneja, R., & Trehan, N. (2007). *The effect of cannula material on the incidence of peripheral venous thrombophlebitis. Anaesthesia*, Vol-62, 1139-1142.

[8] Gilleece. (2005). *Central Venous Catheter Placement: Extending the role of the nurse J R Coll Physicians Lond*. Retrieved from: URL: www.nebi.nlm.nih.gov

[9] Karadeniz, K., Tatlisumak, O., B. (2003). *Nurses' knowledge regarding patients with intravenous catheters and phlebitis interventions*. Retrieved from: https://www.ncbi.nlm.nih.gov

[10] Menamin. (1993). *Catheter fracture: a complication in venous access devices cancer nurse journal.* Retrieved from: www.nebi.nlm.nib.gov

[11] Morris, H., M. (2008). *Strategies for preventing peripheral intravenous cannula infection.* Br J Nursing 2008 Oct 23-Nov 12: 17(19) : S14-21.

[12] Nurcan, D., A. (2008). *The effect of nurse training on the improvement of intravenous applications.* 28 (2): 179-185.

[13] Osei-Tutu, T.,, Debrah, A., H. (2015). *Peripheral intravenous cannulation and phlebitis risk at cape coast teaching hospital*. Cape Coast Teaching Hospital, Postgraduate Medical Journal of Ghana,. Vol 4 (1).

[14] Pastor R, S., E, et al. (2008). *Insertion and Maintenance of peripheral venous catheters in neonates.* Retrieved from: https://www.ncbi.nlm.nih.gov

[15] Smith B. (2006). *Peripheral intravenous Catheter dwell times a comparison of 3 securement methods for implementation of a 96-hour scheduled change protocol*. DOI:10.1097/00129804-200601000-00004

[16] White, S., A.(2001). *Peripheral intravenous therapy related phlebitis rates in an adult population*. Journal of Infusion Nursing, Vol- 24; 19-24.

[17] W. L., Liao, S. F., Lee, W. C., Huang, C. H., & Fang, C. T. (2010). *Soft tissue infections related to peripheral intravenous catheters in hospitalized patients: a case–control study. Journal of Hospital Infection.* Retrieved from: https://www.ncbi.nlm.nih.gov