International Journal of Health Sciences and Research
Volume 14; Issue: 3; March 2024
Website: www.ijhsr.org
Original Research Article *ISSN: 2249-9571*

Effectiveness of Application of Transparent Film Dressing on Level of Pain During Removal and Incidence of Phlebitis Among Adult Patients with IV Line

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DOI: https://doi.org/10.52403/ijshr.20240332

ABSTRACT

Background: Peripheral venous catheter (PVC) is a common application that is used for care of millions of patients across the world. The aim of the study was to evaluate the effectiveness of application of transparent film dressing on level of pain during removal and incidence of phlebitis among adult patients with IV line, in IGGGH&PGI, Puducherry.
Methodology: The research approach and design selected for this study was quantitative approach and quasi-experimental non-equivalent post-test only control group design. The study setting was IGGGH&PGI, Puducherry. The sample size was 100 (50 in Experimental group and 50 in Control group) which was selected by adopting convenience sampling technique. The level of Pain was assessed by using Modified FLACC Scale and the incidence of phlebitis was assessed by using Observational check list on the day of IV-line removal.
Results: The study results revealed that out of 100 adult patients, majority 27(54%) were female and 26(52%) were in the age group of 51-60 years, 52% of adult patient with transparent film dressing experienced no pain during removal and 66% had no incidence of phlebitis in experimental group. The chi square value $\chi 2=17.606$ at p= 0.000 and $\chi 2= 19.878$ at p= 0.001 revealed that there was statistically significant difference in the Level of Pain and Incidence of Phlebitis between the Experimental and Control Group respectively, indicating that the Level of Pain and Incidence of Phlebitis were not similar among Adult patient with IV line in both the groups. There was a statistically significant correlation between the Level of Pain and Incidence of Phlebitis among Adult Patient with IV line and there was a significant association between level of pain with clinical variables such as indication and site of IV line insertion in experimental group and no. of IV line in control group and there was a significant association between incidence of phlebitis with clinical variables such as indication and site of IV line insertion in experimental group.
Conclusion: The findings of the study revealed that the level of pain and incidence of phlebitis was reduced on removal of transparent film dressing. Thus, study concludes that transparent film dressing is an effective approach for fastening intravenous lines, minimizing pain when changing or removing the dressing, and also being a cost-effective method by lowering the risk of patient complications.

Keywords: transparent film dressing, level of pain, incidence of phlebitis, IV line, adult patient.

INTRODUCTION

The need of health care is being increasing and the individual who are hospitalized, undergo many interventions for diagnostic and therapeutic purposes. The intravenous (IV) applications are the most common type of such interventions which is commonly performed by the nursing officers. [1] About 90% of hospitalized patients require vascular access devices, which help in the administration of medications, fluids, nutrition, and monitoring & diagnostics, and about 90% of all vascular catheters are peripheral intravenous. Although the insertion of such devices has become a routine procedure but much importance was not given to the securement techniques and dressings.[2] The Centers for Disease Control and prevention (CDC) have declared that infections developed are associated with 250,000 catheters per year. PVC-related phlebitis and infections may develop due to four causes: mechanical, chemical, bacterial, and post infusion.[3] Transparent film dressing or tegaderm consists of a thin film backing with a hypoallergenic, latex-free adhesive that gently, yet securely, adheres to skin. Transparent film dressing has a special adhesive for greater holding power in the presence of moisture and wound management protocols. Tegaderm dressings are offered in a variety of sizes, forms, and application techniques to accommodate a range of demands. The frame allows the dressings to be tailored for special applications, when desired.[3]

According to the study conducted by Hideto Yasuda, PIVCs were inserted in approximately 70% of hospitalized patients. The most common and important PIVC-related complication is phlebitis, which occurs with 7– 44% of catheters. Although, few studies observed that the patients with pressure dressing had reported more incidence of hematoma than transparent film dressing. Most of the patients reported that pressure dressings were more uncomfortable and hair pulling effect while removing the dressing, can be one of the factors for this. On the other hand, transparent film dressing was considered to be more comfortable because of its ease of application and removal.[5]

Hence the researcher felt that this study will help the patients to prevent from Health Care Associated Infection through selected nursing strategies by applying sterile transparent film dressing for securing IV line in order to reduce the Incidence of Phlebitis and Level of Pain during removal of IV dressing.

The aim of this study was to evaluate the effectiveness of application of transparent film dressing on Level of Pain during removal and Incidence of Phlebitis among Adult Patients with IV line, in IGGGH&PGI, Puducherry.

The objectives of the study were

- To evaluate the effectiveness of application of transparent film dressing on Level of Pain during removal and Incidence of Phlebitis among Adult Patients with IV line in the Experimental and Control Group.
- To correlate the Level of Pain and Incidence of Phlebitis among Adult Patients with IV line in Experimental and Control Group.
- To associate the Level of Pain with the selected demographic and clinical variables in Experimental and Control Group.
- To associate the Incidence of Phlebitis with the selected demographic and clinical variables in Experimental and Control Group.

MATERIALS & METHODS

The research approach and design selected for this prospective study was quantitative approach and quasi-experimental non-equivalent post-test only control group

design. The study setting was IGGGH&PGI, Puducherry. The sample size was 100 (50 in Experimental group and 50 in Control group) which was selected by adopting convenience sampling technique, and the sample size was calculated by using the formula of n= (P1 (100-P1) + P2 (100 - P2) $(Z\alpha+Z\beta)^2$ /$(P1-P2)^2$, in which the Zα alpha error was 5% power Zβ beta error was 95% (power of the study 80-90%) which was taken through various reviews. The duration of the study was 4 weeks. Homogeneity of sample was selected to control the bias. The inclusion criteria of the study were the patients who were, able to understand Tamil and English and of male, female and transgender, those with the IV line on the day of insertion upto 3days and the patient who were willing to participate in the study. The exclusion criteria of the study were the patients who were already having infection with IV line and those having bleeding disorder and were allergic to certain medication, food items and those who were critically ill and disoriented.

DEVELOPMENT AND DESCRIPTION OF THE TOOLS

In this study, transparent film dressing was independent variable whereas the Level of Pain and Incidence of Phlebitis were dependent variables. Ethical clearance was obtained from the ethical committee of MTPG&RIHS, Puducherry for conducting the study. The period of data collection was one month. The patients were selected from ortho ward, surgery ward for Experimental Group and medical ward for Control Group. The researcher introduced herself to the patients and explained the purpose of the study and also assured that the data obtained will be kept confidential. Demographic and clinical variables were collected from the patients by interview method on the day of admission, who were being indicated for IV line insertion. After, thorough assessment of demographic and clinical variables, the patients in the Experimental Group were secured with transparent film dressing and those in the Control Group were secured with routine adhesive plaster forsecuring the IV line. The procedure took 10 minutes per patient. The patient's IV site was assessed, by the researcher on daily basis. The Level of Pain was assessed by using Modified FLACC Scale and the Incidence of Phlebitis was assessed by using Observational check list on the day of IV-line removal. The IV site was assessed thoroughly and the adult patients who developed phlebitis was given cold application and was applied IG paint at the IV site.

STATISTICAL ANALYSIS

The data were organized, tabulated using descriptive statistics such as frequency, percentage, mean and standard deviation. The inferential statistics such as chi square, paired t-test, F-test, ANOVA were used to find the effectiveness of the intervention, to compare the differences in the variables in the experimental group and control group and to find the association between the variables under study.

RESULT

The distribution of demographic variables of Adult Patients with IV line revealed that majority 27(54%) of them were females and 23(46%) were males in Experimental Group, whereas majority 32(64%) were males and 18(36%) were females in Control Group.

With regard to the age, majority 26(52%) and 25(50%) of the Adult Patients with IV line were in the age Group of 51-60 years, 11(22%) and 11(22%) were in the age Group of 41-50 years, 8(16%) and 12(24%) were in the age Group of 31- 40 years, 5(10%) and 2(4%) were in the age Group of 21- 30 years in Experimental Group and Control Group respectively. (Table No. 1)

Table 1: Frequency and percentage distribution of demographic variables of Adult Patients with IV line in Experimental and Control Group. N =100

Demographic variables	Sub-variables	Experimental Group (n = 50)		Control Group (n = 50)		Chi-square – Test value	p - value
		No.	(%)	No.	(%)		
Gender	Male	23	46.0	32	64.0	χ^2=3.273 d.f. = 1	P =0.070 (N.S)
	Female	27	54.0	18	36.0		
	Transgender	-	-	-	-		
Age Group	21-30	5	10.0	2	4.0	χ^2 = 2.105 d.f. = 3	p 0.551 (N.S) =
	31-40	8	16.0	12	24.0		
	41 – 50	11	22.0	11	22.0		
	51 - 60	26	52.0	25	50.0		

*****p≤0.001, S - Significant, N.S – Not Significant**

Table 2: Comparison of mean scores of Level of Pain among Adult Patients with IV line between Experimental and Control Group. N=100

Descriptive Statistics	Experimental Group n=50	Control Group n =50	t–test value	p - value
Mean	1.14	2.84	t = 5.638	p = 0.000 ***S
S.D.	1.48	1.53		
Range:				
Minimum	0.0	0.0		
Maximum	5.0	7.0		

*****p≤0.001, S - Significant, N.S – Not Significant**

The comparison of Level of Pain between the Experimental and Control Group among Adult Patients with IV line revealed that, majority 26(52%) of adult patient perceived no pain, 21(42%) of them had mild pain, 3(6%) of them had moderate pain and none had severe pain in experimental group, whereas majority 33(66%) of Adult Patients perceived mild pain, 9(18%) of them had moderate pain, 7(14%) of them had no pain and 1(2%) of them had severe pain in the control group. Chi square value $\chi 2$= 17.606 at p =0.000, revealed that there was statistically significant difference in the level of pain between the Experimental and Control Group, indicating that the level of pain was not similar among the Adult Patient with the IV line both the experimental and control groups.

Further, the mean score and S.D. of Level of Pain was 1.14 and 1.48 in the experimental group, whereas in Control Group the mean score and S.D. was 2.84 and 1.53 at p=0.001, implied that there was a statistically significant difference in the Level of Pain between the Experimental and Control Group and showed that the mean score (1.14) of Level of Pain in the Experimental Group was much less than the mean score (2.84) in the Control Group. (Table No. 2)

Thus, inferred that the Level of Pain among Adult Patients with IV line in the Experimental Group experienced less pain during removal of IV line whencompared to Adult Patients with IV line in the Control Group.

Table 3: Comparison of mean scores of Incidences of Phlebitis among Adult Patients with IV line between Experimental and Control Group. N=100

Descriptive Statistics	Experimental Group n=50	Control Group n = 50	t–test value	p-value
Mean	0.58	1.44	t=4.744	p = 0.000 ***S
S.D.	0.88	0.93		
Range:				
Minimum	0.0	0.0		
Maximum	3.0	3.0		

*****p≤0.001, S - Significant, N.S – Not Significant**

The comparison of Incidence of Phlebitis between the Experimental andControl Group among Adult Patients revealed that, majority 33(66%) of adult patient had no signs of phlebitis, 16(32%) of them had early stage of phlebitis, 1(2%) of them had medium stage of phlebitis, none had advance stage of phlebitis in the Experimental Group, whereas majority 35(70%) of Adult Patients had medium stage of phlebitis, 11(22%) of them had no signs of phlebitis, 4(8%) of them had medium stage of phlebitis in Control Group. Chi square value, $\chi 2$= 19.878 at p =0.001, there was statistically significant difference in the Incidence of Phlebitis between the Experimental and Control Group, indicating that the incidence of Phlebitis was not similar among Adult Patients with IV line in both groups. Further, the mean score and S.D. of Incidence of Phlebitis was 0.58 and 0.88 in Experimental Group, whereas in Control Group the mean score and S.D. was 1.44 and 0.93 at p =0.000, implied that there was a statistically significant difference in the Incidence of Phlebitis between the Experimental and Control Groupand showed that the mean score (0.58) of Incidence of Phlebitis was less in the Experimental Group than the mean score (1.44) in the Control Group. (Table No. 3)

Thus, inferred that the Incidence of Phlebitis among Adult Patients with IV line in the Experimental Group was much less when compared to Adult Patients with IV line in the Control Group.

Thus, the hypotheses H1 was accepted.

Table 4: Correlation between the Level of Pain and Incidence of Phlebitis among Adult Patients with IV line in Experimental and Control Group. N=100

Correlation	Experimental Group n= 5 0	Control Group n= 5 0
	R value and p value	
Level of Pain Incidence of Phlebitis Group	r = 0.567 p =0.000 (S)	r = 0.793 p =0.000 (S)

*****p≤0.001, S - Significant, N.S – Not Significant**

The calculated Karl Pearson's value r = 0.567 and r =0.793 at p = 0.000 in the Experimental and Control Group respectively, was statistically significant and revealed that there was a correlation between the Level of Pain and Incidence of Phlebitis among Adult Patients with IV line in the positive direction implying that the pain increased with the development of phlebitis among Adult Patients with IV line in both Experimental and Control Group. (Table No. 4). Thus, the hypothesis H2 was accepted.

The non-significant ANOVA 'F' and 't' values, revealed that there was no significant association between the Level of Pain and the demographic, clinical variables in both the Experimental and Control Group, except the clinical variable indication for IV line in Experimental group and the clinical variable no. of IV line in control group. Hence, H3 was not accepted except the clinical variables of indication and site of IV line insertion in experimental group and no. of IV line in control group.

The non-significant ANOVA 'F' and 't' values, revealed that there was no significant association between the Incidence of Phlebitis and the demographic, clinical variables in both the Experimental and Control Group, except the clinical variable indication for IV line and site of IV line in Experimental group. Hence, H4 was not accepted except the clinical variables of indication and site of IV line insertion in experimental group.

DISCUSSION

The findings of the present study was supported by a comparative study conducted by Premalatha. T, to assess the effectiveness of tegaderm (transparent film dressing) Versus dynaplaster upon Pain Perception and Occurrence of Infection during Removal

among 60 Children at Selected Hospitals, Chennai. The study revealed that the pain perception, prevalence of infection, and effectiveness is better in tegaderm (transparent film dressing) while applications and removing whereas major variation was noted in the dynaplaster. [6]

CONCLUSION

The study revealed that the Level of Pain and Incidence of Phlebitis was less on removal of transparent film dressing. Thus, study concludes that transparent film dressing was an effective measure for fastening intravenous lines, minimizing pain when changing or removing the dressing, and also lowering the risk of patient complications.

Declaration by Authors

Ethical Approval: Approved
Acknowledgement: None
Source of Funding: None
Conflict of Interest: The authors declare no conflict of interest.

REFERENCES

1. Günther SC, Schwebel C, Hamidfar-Roy R, Bonadona A, Lugosi M, Ara-Somohano C, et al. Complications of intravascular catheters in ICU: definitions, incidence and severity. A randomized controlled trial comparing usual transparent dressings versus new-generation dressings (the advanced study). Intensive Care Medicine. 2016 Oct 12;42(11):1753–65
2. Bernatchez SF. Care of Peripheral Venous Catheter Sites: Advantages of Transparent Film Dressings Over Tape and Gauze. Journal of the Association for Vascular Access [Internet]. 2014 Dec;19(4):256–61. Available from: https://www.sciencedirect.com/science/article/pii/S1552885514001615
3. CDC. Infection Control [Internet]. Centers for Disease Control and Prevention. 2020. Available from: https://www.cdc.gov/infectioncontrol/index.html
4. Atay S, Sen S, Cukurlu D. Phlebitis-related peripheral venous catheterization and the associated risk factors. Nigerian Journal of Clinical Practice [Internet]. 2018 Jul 1;21(7):827–31. Available from: https://pubmed.ncbi.nlm.nih.gov/29984711/
5. Yasuda H, Yamamoto R, Hayashi Y, Kotani Y, Kishihara Y, Kondo N, et al. Occurrence and incidence rate of peripheral intravascular catheter-related phlebitis and complications in critically ill patients: a prospective cohort study (AMOR-VENUS study). Journal of Intensive Care [Internet]. 2021 Jan 6;9(1). Available from: https://dx.doi.org/10.1186%2Fs40560-020-00518-4
6. Premalatha T. Effectiveness of tegaderm versus dynaplaster upon pain perception and occurrence of infection during removal among children [Internet]. 2014 [cited 2024 Mar 9]. Available from: http://repository-tnmgrmu.ac.in/349/1/300212814premalatha.pdf

How to cite this article: R. Raveena, A. Felicia Chitra, A. Jalajarani. Effectiveness of application of transparent film dressing on level of pain during removal and incidence of phlebitis among adult patients with IV line. *Int J Health Sci Res.* 2024; 14(3):217-222. DOI: *https://doi.org/10.52403/ijhsr.20240332*

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