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RESEARCH ARTICLE

“EFFECT OF INTERVENTIONS ON REDUCING THE RISK OF THROMBOPHLEBITIS AMONG IV CANNULATED PATIENTS”.

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Effectiveness, IV cannulated patients, Proximal massage, Palm fisting, Hot application, Thrombophlebitis.

Abstract

A quasi experimental study was done to assess the effect of proximal massage, palm fisting and hot application on reducing the risk of thrombophlebitis among 105 IV cannulated patients admitted in selected hospital of Ambala Haryana. The sample was selected by purposive sampling technique and divided into four groups: PFG (15), PMG (30), HAG (30) and CG (30). The interventions used were palm fisting exercise, proximal massage, and hot application. Data was collected by using VIP scale and VRS scale. Findings revealed that pre test and post test phlebitis mean rank scores at 3rd day were 2.00 ($Z=-1.73$, $p=0.08$), 5.00 ($Z=-2.89$, $p=0.00$), 6.00 ($Z=-3.13$, $p=0.00$) and 8.04 ($Z=-3.3$, $p=0.00$) in PFG, HAG, PMG and CG respectively and pain scores were 5.50 ($Z=-3.05$, $p=0.00$), 7.00 ($Z=-3.29$, $p=0.00$), 4.50 ($Z=-2.59$, $p=0.01$) and 8.50 ($Z=-3.63$, $p=0.00$) in PFG, PMG, HAG, and CG respectively. There was an association of risk of thrombophlebitis with method of drug administration ($\chi^2=1$, $p=0.04$) and with use of anticoagulant drugs ($\chi^2=1$, $p=0.04$) in PFG group and pain score with method of drug administration ($\chi^2=5.0$, $p=0.05$) in PFG and age ($\chi^2=10.48$, $p=0.01$) in CG. The use of hot application was most effective and palm fisting exercise was least effective.

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Introduction:-

Peripheral venous cannulation is indispensable in the practice of modern medicine. It is the commonest and frequently used route of drug administration in hospitals. As compared to other routes, intravenous route delivers fluids and medications very rapidly throughout the body (Saji J, Korula SV et al., 2015), (Verma P, Thakur AS et al., 2010). Although it is a frequently used method of drug administration but it is not free of complications like catheter-related bloodstream infection, extravasations, bleeding at puncture site, infiltration and phlebitis. Among hospitalized patients, 5% to 70% of patients receiving peripheral intravenous therapy develop phlebitis which may lead to mortality and morbidity, increased duration of hospital stays and significant cost (Kaur P, Thakur R et al.,

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2011), (Waite C, Waite P et al., 2004). Local irritation of vein is a common side effect of infusion and drug administration for peripheral venous cannulation. In histological investigation, thrombus formation occurs due to acute inflammation related to several stimuli which are responsible for infusion phlebitis such as use of infusion pump, flow rate of infusion, osmolarity of solution and pH of solution which are infused cannula material cannula width and length (Lanbeck P, Odenholt I et al. 2002). Regarding the incidence in India, about 50% was found in Kolenchery, and 29.8% of phlebitis Chandigarh (Saini R, Agnihotri M et al. 2011). Peripheral intravenous cannulation is affected by characteristics of person such as age, sex, disease condition, presence of co-morbidities and conscious level and cannula related factors such as site and flushing after insertion. Many factors namely chemical factors (drugs and fluid), mechanical (catheter material size and duration of cannulation) and infectious agents may have an effect on cannulation (Rajappa T, Malviya SD 2015). It has been found that 60% of all blood stream infections occur due to venous cannulation. (Curran ET, Coia JE et al., 2000). There are various methods used to reduce the risk of thrombophlebitis and other complications (blood infection). (Rajappa T, Malviya SD 2015).

Peripheral venous cannulation is the most commonly performed invasive procedure that nurses perform. Nurses are mostly responsible for administering intravenous medications and infusion and providing education to patients related to this in the hospital. Phlebitis is still an ongoing problem in medical practice (Scales K. 2005), (Singh R, Bhandary S et al., 2008). Patients require courses of medication repeatedly, that can cause skin and some allergic reactions at the site of cannulation. Because of these skin reactions, the veins may get damaged, so the placement of the cannula often becomes a cause of pain to the patient (Chemocare), (Soysal S, Topacoglu H et al., 2012). Hot application has mainly four effects on tissues of body, including muscle relaxation, pain relief, and dilation of vessels and relaxation of connective tissue. Blood flow increases to injured part due to dilation of blood vessels (Kaur M, Kaur S et al., 2011). In IV infusion, the development of thrombophlebitis requires withdrawal of cannula and reinsertion of cannula. An exploratory study was done to assess Intravenous cannula associated factors of phlebitis. The results showed that 67.2% cannula removals occur due to complications (Maria S, Enes S et al., 2016).

Material And Methods:-

Research Design

Quasi Experimental i.e. Non equivalent control group pretest post test design.

Setting

Maharishi Markandeshwar Institute of Medical Sciences And Research Hospital Mullana, Ambala, Haryana.

Sample size

Power analysis was done with the help of review of literature; in consideration with time frame of the study, and availability of sample (includes exclusion and inclusion criteria).

Cohen's d was calculated
$$d = \frac{\mu_1 - \mu_2}{\sigma}$$

: $\mu_1 = 2.02$, $\mu_2 = 1.32$; so $2.02 - 1.32 = 0.67$

$SD_1 = 0.61$, $SD_2 = 0.47$ $\sqrt{0.61 + 0.47} = 0.67$

With a power of 0.80 the effect size was 0.7 recommended sample size was 33 sample in each group. Hence, a sample of 120 was selected with 30 in each group.

Inclusion criteria

The study included patients who were:

- Willing to participate in the study.
- Having age ≥ 18 years.
- Undergoing IV cannulation during data collection.
- Having IV cannula in upper extremities.

Exclusion criteria

The study excluded patients who were:

- Critically ill.
- Having altered sensorium.

- Mentally ill.

Ethical consideration

Ethical approval was obtained from Institutional Ethical Committee of M. M. (Deemed to be University), Mullana, Ambala, Haryana (IEC number - 1158).

Period of investigation

October 2018 to December 2018

Hypotheses

All hypotheses were tested at 0.05 level of significance:

H₁: There will be a significant difference in mean post-test risk of thrombophlebitis in terms of scores of Visual Infusion Phlebitis Scale and Verbal Rating Scale between PMG, PFG, HAG and CG.

H₂: There will be a significant difference in mean pre-test and post-test risk of thrombophlebitis in terms of scores of Visual Infusion Phlebitis and Verbal Rating Scale in PMG, PFG, HAG and CG.

H₃: There will be a significant association of Visual Infusion Phlebitis and Verbal Rating Scale scores of risk of thrombophlebitis with selected demographic and clinical variables in PMG, PFG, HAG and CG.

Operational definitions

1. **Effectiveness:** It refers to the extent to which interventions (proximal massage, palm fisting and hot application) are able to achieve desired effect in reducing the risk of thrombophlebitis among IV cannulated patients as assessed by the appearance of the site of cannula in terms of pain, redness near IV site, swelling, erythema, induration and palpable cord surrounding to IV cannula.
2. **Proximal massage:** It is the massage given by the researcher on the proximal area about two centimetres away from cannulation site in the direction of blood flow that allows blood to move in one direction after pouring a drop of oil on the site. Gentle massage is provided for a total of 5-10 minutes at an interval of 30 seconds to one minute in sessions of about 20 strokes per session using palmar surface of fingers and given twice a day for three days.
3. **Palm fisting:** It is the exercise performed by patients under the supervision of researcher by squeezing the soft ball in the cannulated hand for 5-10 minutes at an interval of 30 seconds to one minute in sessions for about 20 times in each session and is performed twice a day for three days.
4. **Hot application:** It is the application administered by researcher using towel (12×24 inches) soaked in warm water with temperature range from between 40 °C- 45°C and squeezed in such a way that it retained some water and applied to area about two centimetres away from cannulation site in direction of blood flow for 5-10 minutes, twice a day for three days.
5. **Thrombophlebitis:** It is pain, redness near IV site, swelling, erythema, induration and palpable cord surrounding to IV cannula and pyrexia after cannulation and assessed by VIP Scale and VRS and categorized as no signs of phlebitis, possible first signs, early stage, mild stage, advanced stage of phlebitis and advanced stage of thrombophlebitis.
6. **IV cannulated patients:** patients who undergo IV cannulation in MMIMS&R Hospital.

Tools and techniques

Demographic profile proforma:

It included five items i.e. age, gender, previous history of smoking and alcohol, current alcoholic status, and current smoking status. A self report method was used to collect the data regarding sample characteristics of the patient.

Proforma for Clinical variables:

It included 12 items i.e. cannula size, purpose of cannulation, body part of cannula insertion, anatomical region, number of needle pricks, method of drug administration, patient's relative doing any cannula site care, any bleeding disorder, patient is prescribed for any anticoagulants, previous hospitalization, previous thrombophlebitis and any medication prescribed for cannula site.

Visual Infusion Phlebitis Scale (VIP):

VIP scale is a standardized zero to five points rating scale and used to assess the phlebitis and thrombophlebitis. VIP scale was developed by Andrew Jackson (1998).

Verbal rating scale (vrs):

Keele in 1948 described the verbal rating scale. This scale is used to assess pain intensity of patients and comprised of a score from 0-10. Patients were asked to rate the pain intensity at cannula site. There are six adjectives on the list that range from “no pain” to “worst possible pain”.

The inter-rater reliability was determined by using **Cohen's kappa** and **inter-rater** reliability was found to be **1** for Visual Infusion Phlebitis Scale and **1** for Verbal Rating Scale. Pre assessment at 6 hours and administration of proximal massage, palm fisting, hot application and no intervention; post assessment of risk of thrombophlebitis in PMG, PFG, HAG and CG using VIP scale and VRS scale was done at 18 hours, 24 hours, 30 hours, 48 hours, 54 hours and 72 hours after cannulation. The intervention was administered once a day on day of cannulation and twice a day for next two days and last assessment was done on 72 hours. The data was collected by record analysis, observation and self reporting.

Statistical Analysis

The data was organized and, analyzed and interpreted by using descriptive and inferential statistics using SPSS version 20.0. A p value <0.05 was considered significant for the present study.

Results:-**Sample Characteristics and clinical variables of patients:**

Out of 105 patients, half of patients in CG (50%) & more than half in HAG (56.7%) and most of patients in PFG (73.3%) & PMG (70%) were in the age group of 36-55 years. More than half of patients in CG (56.7%), PMG (56.7%) and HAG (53.3%) were male and most of patients (60%) in PFG were female. About half of patients in CG (43.3%), PMG (53.3%) and more than half in PFG (60%) and HAG (63.3%) were having no previous history of smoking and alcohol. None of patient was having currently alcoholic status in CG (100%), PMG (100%), PFG (100%) and HAG (100%). Majority of patients in CG (80%), PFG (86.7%), PMG (90%) and HAG (90%) were not currently smoker.

Majority of patients in CG (93.3%), PMG (86.7%), HAG (83.3%) and most of patients in PFG (66.7%) were having 22 gauge cannula size in situ. All patients in CG (100%), PFG (100%), PMG (100%) and HAG (100%) were having cannulation for the purpose of both medication and infusion. About half of patient in CG (50%), PFG (53.3%) having cannula in left hand and more than half in PMG (56.7%) and most of the patients (60%) in HAG were having cannula in right hand. About half of patients in CG (43.3%), PFG (46.7%), HAG (40%) and more than half in PMG (53.3%) were having forearm region of cannula in situ. Majority of patients in CG (86.7%), PFG (73.3%), PMG (90%), & HAG (90%) were cannulated in one number of needle prick. All of patients in CG (100%), most of patients in PFG (93.3%), PMG (80%), & HAG (96.7%) were having bolus as method of drug administration. Majority of patients in CG (83.3%), PFG (86.7%), PMG (83.3%), & HAG (80%) were having no cannula site care. None of the patients in CG (100%), PFG (100%), PMG (100%), and HAG (100%) were not having bleeding disorders. Majority of patients in CG (90%), PFG (93.3%), PMG (96.7%) & HAG (96.7%) were not prescribed for anticoagulant drugs. About half of patients in CG 56.7(%, in PFG (60%) were not previous hospitalized and more than half in HAG (60%) & most of patients in, PMG (73.3%) were previously hospitalized. More than half of patients in CG (56.7%) and most of patients in PFG (66.7%) were not having history of thrombophlebitis and more than half of patients in HAG (56.7%) & most of patients in PMG (63.3%) were having previous history of thrombophlebitis. Most of patients in CG (70%) and PFG (66.7%) and majority of patients in PMG (80%) & HAG (80%) were not prescribed for any medication for thrombophlebitis.

Table 1: Friedman Test showing mean, SD, mean rank of scores on VIP scale and VRS scale scores with in PFG, PMG, HAG and CG at different hours

N=105

VIP SCORES					VRS SCORES			
Time	Mean± SD	Mean Rank	F _r	p Value	Mean± SD	Mean Rank	F _r	p Value
PFG								
At 6 hours (Pre test)	0.20±0.41	1.87	62	<0.001*	0.40±0.73	1.83	66.89	0.00*
At 24 hours (Post	0.47±0.74	2.33			0.80±1.08	2.30		

test1)								
At 30 hours (Post test2)	0.60±0.82	2.53			0.87±1.24	2.40		
At 48 hours (Post test3)	1.27±1.10	3.70			1.80±1.42	3.67		
At 54 hours (Post test4)	2.20±0.77	5.13			2.73±1.10	4.97		
At 72 hours (Post test5)	2.40±0.73	5.43			3.47±0.83	5.83		
PMG								
At 6 hours(Pre test)	0.00±0.00	2.50			0.00± 0.00	2.50		
At 24 hours (Post test1)	0.13±0.34	2.70			0.17± 0.46	2.68		
At 30 hours (Post test2)	0.23±0.50	2.90			0.37± 0.76	2.98		
At 48 hours (Post test3)	0.60±0.72	3.87			0.77± 0.93	3.72		
At 54 hours (Post test4)	0.70±0.79	4.08			1.07± 1.20	4.08		
At 72 hours (Post test5)	1.13±0.93	4.95			1.67± 1.26	5.03		
HAG								
At 6 hours(Pre test)	0.00±0.00	2.93			0.00 ± 0.00	2.93		
At 24 hours (Post test1)	0.03±0.18	3.00			0.07 ± 0.36	3.02		
At 30 hours (Post test2)	0.23±0.50	3.35			0.30 ± 0.65	3.35		
At 48 hours (Post test3)	0.30±0.59	3.47			0.47 ± 0.90	3.60		
At 54 hours (Post test4)	0.53±0.90	3.87			0.63 ± 1.03	3.78		
At 72 hours (Post test5)	0.87±1.22	4.38			1.07 ± 1.46	4.32		
CG								
At 6 hours(Pre test)	0.13±0.34	1.63			0.17±0.53	1.70		
At 24 hours (Post test1)	0.53±0.68	2.18			0.67±1.02	2.27		
At 30 hours (Post test2)	1.07±0.90	3.02			1.23±1.19	2.92		
At 48 hours (Post test3)	1.60±1.00	3.83			1.77±1.25	3.83		
At 54 hours (Post test4)	2.27±0.94	4.85			2.40±1.13	4.68		
At 72 hours (Post test5)	2.73±0.980	5.48			3.17±1.05	5.60		

NS -Not significant (p>0.05)

*- Significant (p<0.05)

Minimum VIP Score = 0

Maximum VIP Score = 5

Table 1 shows the mean rank of risk of thrombophlebitis score. In PFG the mean VIP rank of 72 hours (5.43) was higher than the mean VIP rank of 6 hours (1.87) ($F_r = 62$, $p = <0.001$), in PMG the mean VIP rank of 72 hours (4.95) was higher and the mean VIP rank of 6 hours (2.50) ($F_r = 79.07$, $p = <0.001$), in HAG the mean VIP rank of 72 hours

(4.38) was higher than the mean VIP rank of 6 hours (2.93) ($F_t = 45.43$, $p = <0.001$), and in CG the mean VIP rank of 72 hours (5.48) was higher than the mean VIP rank of 6 hours (1.63) ($F_t = 118.45$, $p = <0.001$).

Further table reveals that, the mean rank of pain score. In PFG the mean VRS rank of 72 hours (5.83) was higher than the mean VRS rank of 6 hours (1.83) ($F_t = 66.89$, $p = 0.000$), in PMG the mean VRS rank of 72 hours (5.03) was higher than the mean VRS rank of 6 hours (2.50) ($F_t = 79.64$, $p = 0.000$), in HAG the mean VRS rank of 72 hours (4.32) was higher than the mean VRS rank of 6 hours (2.93) ($F_t = 42.28$, $p = 0.001$), and in CG the mean VRS rank of 72 hours (5.60) was higher than the mean VRS rank of 6 hours (1.70) ($F_t = 119.52$, $p = 0.001$).

Table 2: Wilcoxon Signed Ranks Test showing mean pre test and post test risk of thrombophlebitis in terms of scores of VIP Scale and VRS scale with in PFG, PMG, HAG and CG

N=105

	VIP SCORES					VRS SCORES				
VIP SCORE	Median	Mean Rank	Sum of Ranks	Z	P value	Median	Mean Rank	Sum of Ranks	Z	P value
PFG										
At 6 hours	0.00	2.50	10.00	-2	0.05*	0.00	3.00	15.00	-2.12	0.03*
At 24 hours	0.00					0.00				
At 24 hours	0.00	1.50	3.00	-1.41	0.15 ^{NS}	0.00	1.00	1.00	-1	0.31 ^{NS}
At 30 hours	0.00					0.00				
At 30 hours	0.00	4.50	36.00	-2.64	0.01*	0.00	5.00	45.00	-2.72	0.01*
At 48 hours	1.00					2.00				
At 48 hours	2.00	5.00	45.00	-2.74	0.01*	2.00	5.00	45.00	-2.72	0.01*
At 54 hours	2.00					2.00				
At 54 hours	2.00	2.00	6.00	-1.73	0.08 ^{NS}	2.00	5.50	55.00	-3.05	0.00*
At 72 hours	2.00					3.00				
PMG										
At 6 hours	0.00	2.50	10.00	-2	0.05*	0.00	2.50	10.00	-1.89	0.05 ^{NS}
At 24 hours	0.00					0.00				
At 24 hours	0.00	2.00	6.00	-1.73	0.08 ^{NS}	0.00	2.50	10.00	-1.86	0.06 ^{NS}
At 30 hours	0.00					0.00				
At 30 hours	0.00	6.00	66.00	-3.32	0.01*	0.00	5.00	45.00	-2.76	0.01*
At 48 hours	0.00					0.00				
At 48 hours	0.00	3.50	21.00	-2.26	0.02 ^{NS}	0.00	3.50	21.00	-2.26	0.02*
At 54 hours	0.50					0.50				
At 54 hours	0.50	6.00	66.00	-3.13	0.00*	0.50	7.00	91.00	-3.29	0.00*
At 72 hours	1.00					2.00				

hours										
HAG										
At 6 hours	0.00	1.00	1.00	-1	0.31 ^{NS}	0.00	1.00	1.00	-01	0.31 ^{NS}
At 24 hours	0.00					0.00				
At 24 hours	0.00	3.00	15.00	-2.12	0.03*	0.00	3.00	15.00	-2.07	0.04*
At 30 hours	0.00					0.00				
At 30 hours	0.00	1.50	3.00	-1.41	0.15 ^{NS}	0.00	2.50	10.00	-1.89	0.05 ^{NS}
At 48 hours	0.00					0.00				
At 48 hours	0.00	3.50	3.00	-1.34	0.18*	0.00	1.50	3.00	-1.34	0.18 ^{NS}
At 54 hours	0.00					0.00				
At 54 hours	0.00	5.00	45.00	-2.89	0.00*	0.00	4.50	36.00	-2.59	0.01*
At 72 hours	0.00					0.00				
CG										
At 6 hours	0.00	6.50	78.00	-3.46	0.00*	0.00	5.50	55.00	-2.88	0.00*
At 24 hours	0.00					0.00				
At 24 hours	0.00	7.50	105.00	-3.56	0.00*	0.00	6.00	66.00	-3	0.00*
At 30 hours	1.00					1.00				
At 30 hours	1.00	7.50	105.00	-3.56	0.00*	1.00	7.50	105.00	-3.56	0.00*
At 48 hours	2.00					2.00				
At 48 hours	2.00	6.50	78.00	-3.1	0.00*	2.00	6.50	78.00	-3.13	0.00*
At 54 hours	3.00					3.00				
At 54 hours	2.00	8.04	112.50	-3.3	0.00*	2.00	8.50	136.00	-3.63	0.00*
At 72 hours	3.00					3.00				

NS -Not significant (p>0.05)

*- Significant (p<0.05)

Minimum VIP Score = 0

Maximum VIP Score = 5

Table 2 shows mean rank, sum of rank and Z value of VIP scores within the groups at different hours. From the data it can be concluded that, in PFG there was significant difference in mean VIP rank of At 6 hours - At 24 hours ($Z = -2$, $p = 0.046$), At 30 hours - At 48 hours ($Z = -2.64$, $p = 0.008$), At 48 hours - At 54 hours ($Z = -2.74$, $p = 0.006$), and there was no significant difference in mean VIP rank of At 24 hours - At 30 hours ($Z = -1.41$, $p = 0.157$) and At 54 hours - At 72 hours ($Z = -1.73$, $p = 0.083$). In PMG there was significant difference in mean VIP rank At 6 hours - At 24 hours ($Z = -2$, $p = 0.046$), At 30 hours - At 48 hours ($Z = -3.32$, $p = 0.001$), At 48 hours - At 54 hours ($Z = -2.64$, $p = 0.024$) and At 54 hours - At 72 hours ($Z = -3.13$, $p = 0.002$), and there was no significant difference in mean VIP rank At 24 hours - At 30 hours ($Z = -1.73$, $p = 0.08$). In HAG there was significant difference in mean VIP rank At 24 hours - At 30 hours ($Z = -2.12$, $p = 0.034$), and At 54 hours - At 72 hours ($Z = -2.89$, $p = 0.004$) and there was no significant difference in mean VIP rank in 6 hours - At 24 hours ($Z = -1$, $p = 0.317$) and At 30 hours - At 48 hours

($Z = -1.41$, $p = 0.157$), At 48 hours - At 54 hours ($Z = -1.4$, $p = 0.180$), and in CG there was significant difference in mean VIP rank At 6 hours - At 24 hours ($Z = -3.46$, $p = 0.001$), At 24 hours - At 30 hours ($Z = -3.56$, $p = 0.000$), At 30 hours - At 48 hours ($Z = -3.56$, $p = 0.000$), At 48 hours - At 54 hours ($Z = -3$, $p = 0.002$), At 54 hours - At 72 hours ($Z = -3.3$, $p = 0.001$).

Further table reveals that, the mean rank, sum of rank and Z value of VRS scores within the groups at different hours. From the data it can be concluded that, in PFG there was significant difference in mean VRS rank of At 6 hours - At 24 hours ($Z = -2.12$, $p = 0.034$), At 30 hours - At 48 hours ($Z = -2.72$, $p = 0.006$), At 48 hours - At 54 hours ($Z = -2.72$, $p = 0.006$), and At 54 hours - At 72 hours ($Z = -3.05$, $p = 0.002$) and there was no significant difference in mean VRS rank of At 24 hours - At 30 hours ($Z = -1$, $p = 0.317$). In PMG there was significant difference in mean VRS rank, At 30 hours - At 48 hours ($Z = -2.76$, $p = 0.006$), At 48 hours - At 54 hours ($Z = -2.26$, $p = 0.024$) and At 54 hours - At 72 hours ($Z = -3.29$, $p = 0.001$), and there was no significant difference in mean VRS rank At 6 hours - At 24 hours ($Z = -1.89$, $p = 0.059$) and At 24 hours - At 30 hours ($Z = -1.86$, $p = 0.63$). In HAG there was significant difference in mean VRS rank At 24 hours - At 30 hours ($Z = -2.07$, $p = 0.038$), and At 54 hours - At 72 hours ($Z = -2.59$, $p = 0.010$) and there was no significant difference in mean VRS rank in 6 hours - At 24 hours ($Z = -1$, $p = 0.317$) and At 30 hours - At 48 hours ($Z = -1.89$, $p = 0.059$), At 48 hours - At 54 hours ($Z = -1.34$, $p = 0.180$), and in CG there was significant difference in mean VRS rank At 6 hours - At 24 hours ($Z = -2.88$, $p = 0.004$), At 24 hours - At 30 hours ($Z = -3$, $p = 0.003$), At 30 hours - At 48 hours ($Z = -3.56$, $p = 0.000$), At 48 hours - At 54 hours ($Z = -3.13$, $p = 0.002$), At 54 hours - At 72 hours ($Z = -3.6$, $p = 0.000$).

Table 3: Kruskal Wallis H test/Mann-Whitney test value showing association of Pre test VIP scores of risk of thrombophlebitis with selected clinical variables in PFG
n=15

Clinical Variables		Mean rank	df	η/ψ Value	p value
1	Method of Drug administration				
1.1	Bolus	7.57	—	1 "	0.04*
1.2	Bolus & infusion	14.00			
2	Anticoagulant drugs				
2.1	Yes	14.00	—	1 "	0.04*
2.2	No	7.57			

NS-Not significant ($p > 0.05$)

*- Significant ($p < 0.05$)

Table 4: Kruskal Wallis H test/Mann-Whitney test value showing association of Pre test VRS scores of risk of thrombophlebitis with selected clinical variables in PFG
n=15

Clinical Variables		Mean rank	df	η/ψ Value	p value
11	Method of Drug administration				
1.1	Bolus	7.54	—	0.50 "	0.05*
1.2	Bolus & infusion	14.50			

NS-Not significant ($p > 0.05$)

*- Significant ($p < 0.05$)

Table:5 Kruskal Wallis H test/ Mann-Whitney test value showing association of Pre test VRS scores of risk of thrombophlebitis with selected demographic variables in CG
n=30

Demographic Variables		Mean rank	df	η/ψ Value	p value
1	Age				
1.1	18-35 year	14.00	3	10.48"	0.015*
1.2	36-55 year	14.93			
1.3	56-75 year	16.21			
1.4	76-95 year	29.50			

NS-Not significant ($p > 0.05$)

*- Significant ($p < 0.05$)

Table 3, 4, 5 shows, there was the association of risk of thrombophlebitis among IV cannulated patients with method of drug administration ($\eta=1$, $p=0.04$) and with use of anticoagulant drugs ($\eta=1$, $p=0.04$) in PFG group and pain score with method of drug administration ($\eta=5.0$, $p=0.05$) in PFG and age ($\psi=10.48$, $p=0.01$) in CG.

Conclusion:-

The use of hot application was more effective in reducing risk of thrombophlebitis and palm fisting exercise was least effective. Therefore, it is recommended that the 'hot application' can be used among peripheral venous cannulated patients to prevent complications and increase the patient comfort.

Discussion:-

In the present study more than half (56.53%) of patients were males. This finding was similar with the study conducted by Daud A, Mohamad F et al., (2018) (48.0%), Erdogan BC, Denat Y(2016) (59.3%), Nyika ML, Mukona HD et al., (2018) (52.2%) and Ethel O, Tuoyire DA et al. (2015) (54%) which showed that more than half of patients were and contradictory with findings of the study conducted by Kaur P, Thakur R et al., (2011) showed that, most (70%) of patients were male. Most (60.95%) of patients in present study were from age group of 36-55 years. This finding was similar with the study conducted by Nyika ML, Mukona HD et al., (2018) showed that, most (65.22%) of patients were from age group of 30-59 years and finding was contradictory with the study conducted by Kaur P, Thakur R et al., (2011) (32.0%) and Ethel O, Tuoyire DA et al. (2015) (50.9%) which showed that, less than half of patients were from age of 41-60 years and half of patients were from age of 30-59 years respectively. In the present study among majority (84.76%) of patients 22 gauze cannula were inserted. This finding was contradictory with the study conducted by Parreira P. (2013) (40.6%), Nyika ML, Mukona HD et al., (2018) (43.5%) and Anjum U, Sharma V (2017) (49.1%) which showed that in less than half of patients 22 gauze cannula were inserted. In the present study, in less than half (45.72%) of patients, cannula were inserted in forearm site. This finding was contradictory with the study conducted by Parreira P. (2013) (26.1%) and Anjum U, Sharma V (2017) (23.33%) which showed that, in few of patients cannula were inserted in forearm site. In the present study half (51.43%) of patients were having previous history of phlebitis. This finding was contradictory with the study conducted by Daud A, Mohamad F et al., (2018) which showed that, very few (19%) of patients were having previous history of phlebitis.

In the present study the mean post test of comparison group was 2.73 ± 0.980 and in hot application group was 0.87 ± 1.224 . This finding was similar with the study conducted by Shilpa, M Kaur et al. (2015), which showed that, the mean post test of control group was 1.5 ± 0.71 and in hot application group was 0.95 ± 0.59 and findings of the study was similar conducted by Packialakshmi K, Vidhya T (2017), which showed the mean post VIP score of hot application group was 0.8 ± 0.8 . In the present study the mean post test VRS score in hot application group was 1.07 ± 1.46 . This finding was similar with the study conducted by Packialakshmi K, Vidhya T (2017), which showed the mean post test VRS was 2.4 ± 1.1 .

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