



“A Study to Assess the Effectiveness of Proximal Massage and Palm Fisting in Reducing the Risk of Thrombophlebitis among Intravenous Cannulated Patients”

Miss. Anuradha Gurappa Melligeri^{1*}, Deelip S Natekar², Mr. Sadanand Byakod³, Miss. Revati Angadi⁴, Miss. Madhu Hallur⁵, Mr. Prasannakumar Kuri⁶, Mr. Prajwal Vaijapur⁷, Miss. Pooja Hiremath⁸, Miss. Akshata Talawar⁹

1. Lecturer and Department of Medical Surgical Nursing, Shri B.V.V.Sajjalashree Institute of Nursing Sciences Navanagar Bagalkot, Karnataka, India.
2. Principal, (Ph.D. in Nursing), Shri B.V.V.S Sajjalashree Institute of Nursing Sciences, Bagalkot, Karnataka.
3. Bsc. Nursing 4th year Shri B.V.V.S Sajjalashree Institute of Nursing Sciences Navanagar Bagalkot, Karnataka,

(Received: 11 June 2024

Revised: 16 July 2024

Accepted: 10 August 2024)

KEYWORDS

Visual infusion thrombophlebitis score scale, proximal massage, palm fisting, erythema.

ABSTRACT:

Background :- Swelling and cessation of fluids are common problems among thrombophlebitis patients which usually in proper management of proximal massage and palm fisting and also it can create pulmonary embolism if not treated properly.

Method :- The data was collected from 60 patients. By using convenient sampling technique data was selected. Visual infusion thrombophlebitis score scale was used to assess the risk of thrombophlebitis in experimental group and control group. T test was done to assess the effectiveness between experimental and control groups and chi - square test was done to find out the association of post test scores with their selected socio - demographic variables.

Result :- Majority of subjects 60% had indicating no any signs of thrombophlebitis, 50% had slight pain and slight redness near IV site, 26.66% had pain near IV site, erythema, induration, 16.66% had pain along path of cannula, erythema, induration, 6.66% had pain along path of cannula, erythema, induration, palpable venous cord.

Conclusion :- Proximal massage and palm fisting exercise are non invasive, simple technique, and effective in reducing the risk of thrombophlebitis among intravenous cannulated patients.

Key words :- Visual infusion thrombophlebitis score scale, proximal massage, palm fisting, erythema.

1. Introduction

Veins are tube like shape, but they often appear flatten and irregular because of their thinner walls and lack of tunica media.¹ Major function of the vein is to Carry deoxygenated blood from the body to heart and to carry oxygen rich blood from lungs to heart.²

Veins are performing the following functions such as carrying the blood, regulating blood pH, acting as a blood reservoir.³ Thrombophlebitis means it is a

condition that causes a blood clot to form and block one or more veins, often in the legs. In superficial thrombophlebitis the vein is near the surface of skin.⁴

It may develop the complications pulmonary embolism, post – phlebotic syndrome, chronic edema and chronic venous ulcers.⁵ Proximal massage is a massage technique that involves using gentle strokes in the direction of fluid flow, starting at the most proximal region of the body.⁶



Proximal refers to that is closer to the centre of the body. When performing a massage it is often recommended to start at the most proximal region and work towards the most distal region.⁷

Palm fisting may also refer to an exercise that can help reduce the risk of thrombophlebitis in patient receiving the chemotherapy and who have an IV cannula.⁸ Palm fist is a hand with the fingers clenched tightly into the palm, and the thumb doubled inward across the fingers.²

2. Methods

Study design and participants: - True experimental post test only control group design was adopted for the present study. Convenient sampling technique was used for this study to select the sample for the study through randomization of the samples to the experimental and control group with help of sample random sampling through lottery method. Data were collected for 30 days from 12\06\2024 to 12\07\2024 at inpatients department of HSK hospital and research centre Bagalkot. The study was conducted among 60 IV cannulated patients selected from inpatients units of HSK hospital and research center, & obtained administrative permissions and enrolled all the patients approaching IPD service. The study was explained to prospective participants; their consent was obtained and enrolled. The same procedure of enrolment of subjects was carried out until the required number of subjects was enrolled.

Inclusion criteria: - This study includes IV cannulation patients who are attending the HSK hospital Bagalkot. The patients who are willing to participate in the study. The patients who are having IV line for more than 3 days.

Exclusion criteria :- The patients who are not willing to participate in the study, Patient from paediatric, Obg, Emergency ward are excluded, The patients who are suffering from chronic disease like paralysis, stroke such patients are excluded to study.

Sample size estimation: - The estimation was done using the result (Mean and standard deviation). The confidence level was 95 % (Alpha =5%), The Z alpha value at 5% level of significance is 1.96. The power of

test was 80%. The sample size estimated by statistician is 56.

Statistical analysis: - The data is analysed in terms of objectives of study using descriptive and inferential statistics. In descriptive statistics frequency and distribution was used to analyzed demographic variables, Mean and standard deviation used to assess the effect of proximal massage and palm fisting to reduce the risk of thrombophlebitis. In inferential statistics independent t test will be used to assess the effectiveness between two groups. Chi-square test will be used to find out the association of post test score with their selected socio demographic variables.

Ethical clearance :- The present study was accepted from institutional ethical committee of B.V.V.S Sajjalashree Institute of Nursing Sciences Navanagar Bagalkot.

3. Results

Frequency and percentage distribution of sample according to socio demographic variables in experimental group and control group

SI no	Socio demographic variables	Experiment al group percentage	Control group percentage
1	Age a)25 – 35 b)36 – 45 c)46 – 55 d) More than 56	26.66% 13.33% 23.33% 36.66%	13.33% 23.33% 43.33% 20%
2	Gender a)Male b)Female c)Transgender	73% 26.6% 0	43.3% 56.6% 0
3	History of smoking a)Yes b)No	20% 80%	6.6% 93.33%
4	Current alcohol status a)Yes b)No	33.3% 66.6%	13.33% 86.6%
5	Current smoking status a)Yes b)No	10% 90%	3.3% 96.6%
6	Duration of illness a)Less than 6 months b)6 months – 1 year	86.6% 6.6% 0%	46.6% 33.3% 16.6%



	c)1 year – 2 year d)More than 2 years	6.6%	3.3%
7	Cannula size a)18 G b)20 G c)22 G	0 100% 0	0 100% 0
8	Site of cannula a)Brachial vein b)Basalic vein c)Cephalic vein d)Dorsal metacarpal vein	3.3% 96.6% 0 0	0 100% 0 0
9	Frequency of infusion a)Once b)Twice c)Thrice d)More than thrice	13.3% 56.6% 26.6% 3.3%	33.3% 43.3% 16.6% 6.6%
10	Previous hospitalization a)None b)One time c)Two time d)Three time e)More than three time	30% 36.6% 23.3% 3.3% 6.6%	73.3% 23.3% 3.3% 0 0
11	History of previous thrombophlebitis a)Present b)Absent	83.3% 16.6%	16.6% 83.3%

The majority (43.33%) of thrombophlebitis patients were in the age of 46 – 55 years, majority are males (73%), majority of history of smoking said no history (93.33%), majority of current alcohol status is no (86.6%), majority of current smoking status is no (96.6%), majority of duration of illness is less than 6 months (86.6%), majority of cannula size is 20G (100%), majority of site of cannula is Basalic vein (100%), majority of frequency of infusion is twice (56.6%), majority of previous hospitalization is none (73.3%), majority of history of previous thrombophlebitis is present (83.3%).

POST TEST LEVEL OF PATENCY OF INTRAVENOUS LINE AMONG PATIENTS IN EXPERIMENTAL GROUP.

S.No	GRADES	FREQUENCY	PERCENTAGE
1)	Grade – 0	18	60%
2)	Grade – 1	8	26.66%
3)	Grade – 2	4	13.33%
4)	Grade – 3	0	0

5)	Grade – 4	0	0
6)	Grade – 5	0	0

The majority of subjects 18(60%) had Grade – 0 sign (indicating no any signs of thrombophlebitis, IV site appears healthy), 8(26.66%) had Grade – I sign (Slight pain near I.V. site or slight redness near I.V site, Possible first signs of thrombophlebitis), 4(13.33%) had Grade – II sign (Pain near I.V site, Erythema, Induration, Early stages of thrombophlebitis), and 00 (00%) of the subjects had Grade – III, Grade – IV, Grade – V signs of thrombophlebitis.

S.NO	GRADE	FREQUENCY	PERCENTAGE
1)	Grade – 0	0	0
2)	Grade – 1	15	50%
3)	Grade – 2	8	26.66%
4)	Grade – 3	5	16.66%
5)	Grade – 4	2	6.66%
6)	Grade – 5	0	0

The majority of subjects 15(50%) had Grade – I sign (Slight pain near IV site, or slight redness near IV site, Possible first signs of thrombophlebitis), 8(26.66%) had Grade – II sign (Pain near I.V site, Erythema, Induration, Early stages of thrombophlebitis), 5(26.66%) had Grade – III sign (Pain along the path of cannula, erythema, induration, medium stage of thrombophlebitis), 2(6.66%) had Grade – IV sign (Pain along the path of cannula, erythema, induration, palpable venous cord, advanced stage of thrombophlebitis), 0(0%) had grade – V and grade – 0 signs of thrombophlebitis.

COMPARISON OF PATENCY OF IV LINE AMONG PATIENTS IN EXPERIMENTAL GROUP AND CONTROL GROUP.

GRO UPS	TO TA L SC OR E	ME AN	STAN DARD DEVI ATION	ME DIA N	T CALCU LATION	T TA BL E
Experi mental group	5	0.53	0.73	0	4.10624	1.66
Contro l group	5	1.63 3333	1.2726 12	2		



Represents to compare the mean and standard deviation of the post test level of patency of intravenous line among patients in experimental group and control group. In experimental group the mean score was 0.53 with standard deviation of 0.73 and in control group the mean score was 1.633333 with standard deviation of 1.272612. The mean difference was 1.103333 and the calculated “ t ” value was 4.10624 indicating that there was a significant difference in post test level of patency of intravenous line among patients in experimental and control group at P<0.05 level, **H1**:- Post test thrombophlebitis score of experiment group will be significantly lower than post test thrombophlebitis score of control group. **H1 is accepted.**

ASSOCIATION OF POST TEST LEVEL OF PATENCY OF INTRAVENOUS LINE AMONG PATIENTS IN EXPERIMENTAL GROUP WITH THEIR SELECTED SOCIO DEMOGRAPHIC VARIABLES

S.N O	SOCIO DEMOGRAPHIC VARIABLES	CHI SQUARE	P VALUE	ASSOCIATION
1	Age	0.023	0.88	Not significant
2	Gender	0.028	0.8	Not significant
3	History of smoking	0.312	0.92	Not significant
4	Current alcohol status	0.625	0.692	Not significant
5	Current smoking status	0.987	0.709	Not significant
6	Duration of illness	0.192	0.912	Not significant
7	Cannula size	0.564	0.768	Not significant
8	Site of cannula	0.674	0.923	Not significant
9	Frequency of infusion	0.8333	0.594	Not significant
10	Previous hospitalization	0	1	Not significant
11	History of previous thrombophlebitis	1	0.317	Not significant

This table represents that association of IV cannulated patients in experimental group with their selected socio demographic variables.

Calculated Chi – square value is lesser than table value for all socio demographic variables in experimental group. Age (X2 = 0.023, P=0.88), Gender

(X2 = 0.028, P=0.8), History of smoking (X2 = 0.3125, P =0.92), Current alcohol status (X2 = 0.625, P = 0.692), Current smoking status (X2 =0.9877, P = 0.709), Duration of illness (X2 = 0.1923, P = 0.912), Cannula size (X2 = , P =), Site of cannula (X2 = , P =), Frequency of infusion (X2 = 0.8333, P = 0.594374), Previous hospitalization (X2 = 0, P = 1), History of previous thrombophlebitis (X2 = 1, P = 0.317311).

Whereas, **H2** is rejected for all socio demographic variables like History of smoking, Current alcohol status, Current smoking status, Duration of illness, Cannula size, Site of cannula, Frequency of infusion, Previous hospitalization, History of previous thrombophlebitis as there no significant association found between post test level in maintenance of patency of intravenous line in IV cannulation patients.

ASSOCIATION OF POST TEST LEVEL OF PATENCY OF INTRAVENOUS LINE AMONG PATIENTS IN CONTROL GROUP WITH THEIR SELECTED SOCIO DEMOGRAPHIC VARIABLES.

S. N O	SOCIO DEMOGRAPHIC VARIABLES	CHI SQUARE	P VALUE	ASSOCIATION
1)	Age	0.023	0.88	Not significant
2)	Gender	0.028	0.8	Not significant
3)	History of smoking	0.312	0.92	Not significant
4)	Current alcohol status	0.625	0.692	Not significant
5)	Current smoking status	0.987	0.709	Not significant
6)	Duration of illness	0.192	0.912	Not significant
7)	Cannula size	0.564	0.768	Not significant
8)	Site of cannula	0.674	0.923	Not significant
9)	Frequency of infusion	0.8333	0.594	Not significant
10)	Previous hospitalization	0	1	Not significant
11)	History of previous thrombophlebitis	1	0.317	Not significant

This table represents that association of intravenous line among patients in control group with their selected socio demographic variables



Calculated Chi – square value is lesser than table value for all socio demographic variables in control group. Age($X^2 = 2.7436$, $P = 0.097$), Gender ($X^2 = 1.4932$, $P = 0.221$), History of smoking ($X^2 = 0.5966$, $P = 0.439$), Current alcohol status ($X^2 = 0.0066$, $P = 0.235$), Current smoking status ($X^2 = 1.746$, $P = 0.478$), Duration of illness ($X^2 = 2.0881$, $P = 0.148$), Cannula size ($X^2 = 2.001$, $P = 0.112$), Site of cannula ($X^2 = 2.344$, $P = 0.148$), Frequency of infusion ($X^2 = 1.2239$, $P = 0.268$), Previous hospitalization ($X^2 = 0.5966$, $P = 0.439$), History of previous thrombophlebitis ($X^2 = 0.5455$, $P = 0.460$).

Whereas, **H2** is rejected for all socio demographic variables like History of smoking, Current alcohol status, Current smoking status, Duration of illness, Cannula size, Site of cannula, Frequency of infusion, Previous hospitalization, History of previous thrombophlebitis as there no significant association found between post test level in maintenance of patency of intravenous line in IV cannulation patients.

DISCUSSION

The findings of this study were supported by a quasi experimental with post test only control group design was used.¹⁰ 60 subjects who were newly cannulated. IV medications were included in the study in which 30 subjects were selected as experimental and control group each. Subjects in experimental had given proximal massage the socio-demographic and clinical data of the patient was collected, through interview schedule. The patency of IV cannula was assessed by the standardized tool visual infusion phlebitis scale in both groups. Descriptive statistics, chi- square test were used to analyze the data. There is a significant maintenance of patency of IV cannula in experimental group [$p=0.007$]. No association was found between patency, sociodemographic and clinical variables. Proximal massage and palm fistng is an effective method in maintaining the patency of IV cannula.

The findings of this study were supported by an Experimental study which was conducted to evaluate the effectiveness of proximal massage and palm fistng in maintaining the patency of thrombophlebitis among intravenous cannulated patients in sarvodaya hospital Bangalore.¹¹ The study was conducted in sarvodaya hospital, Agahara, Dasarahalli. Bangalore. Simple random sampling technique was adopted to select 60 samples based on certain predetermined criteria. The

data was generated using an observational checklist. Findings related to mean practice to compare the patency of peripheral venous catheter in Experimental and Control groups. The mean score for Experimental group is 0.53 with the standard deviation 0.73. The mean score for Control group is 1.63 with the standard deviation 1.27. The calculated t test value for this was 4.10624, which is found to be significant at 0.05 level. Thus the findings showed that, the intervention of 2nd hourly intermittent proximal massage and palm fistng was found to be effective.

CONCLUSION

Proximal massage and palm fistng exercise are non invasive, simple technique, and effective in reducing the risk of thrombophlebitis among intravenous cannulated patients.

References

1. Gao Y. *Biology of Vascular Smooth Muscle*. Springer Singapore; 2017.
2. Boyette LC, Burns B. *Physiology, Pulmonary Circulation*.
3. Monos E, Berczi V, Nadasy G. Local control of veins: biomechanical, metabolic, and humoral aspects. *Physiological reviews*. 1995 Jul 1;75(3):611-66.
4. Homans J. Thrombophlebitis of the lower extremities. *Annals of Surgery*. 1928 May 1;87(5):641-51.
5. Winter MP, Scherthaner GH, Lang IM. Chronic complications of venous thromboembolism. *Journal of Thrombosis and Haemostasis*. 2017 Aug 1;15(8):1531-40.
6. Holey EA, Cook EM. *Evidence-based therapeutic massage: a practical guide for therapists*. Elsevier Health Sciences; 2012 Mar 19.
7. Holey EA, Cook EM. *Evidence-based therapeutic massage: a practical guide for therapists*. Elsevier Health Sciences; 2012 Mar 19.
8. Devi S, Jaswal P, Sarin J. Effect of interventions on reducing the risk of thrombophlebitis among IV cannulated patients. *International Journal of Nursing Education and Research*. 2020;8(1):6-12.
9. Baker F. Anthropological notes on the human hand. *American Anthropologist*. 1888 Jan 1;1(1):51-76.



-
10. Yuan H, Kunaviktikul W, Klunklin A, Williams BA. Improvement of nursing students' critical thinking skills through problem-based learning in the People's Republic of China: A quasi-experimental study. *Nursing & health sciences*. 2008 Mar;10(1):70-6.
 11. S G Vinoli, Study to evaluate the effectiveness of proximal massage and palm fisting to reduce the risk of thrombophlebitis among intravenous cannulated patients, Nov-2007: 01-128.