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A QUASI EXPERIMENTAL STUDY TO ASSESS EFFECTIVENESS OF ICE CUBE APPLICATION ON PAIN AND ECCHYMOSIS AMONG PATIENTS RECEIVING HEPARIN SUBCUTANEOUSLY AT M.M. HOSPITAL, SADOPUR, DISTRICT, AMBALA, HARYANA.

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ABSTRACT

Background of the study: Subcutaneous heparin is administered extensively to patients who need anticoagulant medicines to reduce the harmful clot formation during hospitalization. Itcan create a more predictable anticoagulant effect, increase bioavailability from the subcutaneous site of injection, and has less frequent dosing requirements. Heparin is an anticoagulant used in the surgical prevention of thrombosis, and it can quickly achieve anticoagulant effects and prevent and treat venous thrombosis. At present, the factors affecting pain and bruising caused by the subcutaneous injection of LMWH include the injection time, the injection site, the injected dose, the needle size, and the application of cold therapy. Cold application is a treatment that reduces tissue temperature, blood flow, and cell metabolism. Cold application, a nondrug intervention, can help reduce the severity of pain by reducing catecholamine levels, increasing endorphin levels, and delaying the transmission of pain signals to the central nervous system. Cold application can also contract peripheral blood vessels andreduce the flow of blood to the tissue, thereby reducing the occurrence of bruises and hematomas studies**. Aim:** is to Assess Effectiveness of Ice Cube Application on Pain and Ecchymosis among Patients Receiving Heparin Subcutaneously.
Material and methods: A quantitative research approach with quasi experimental research design was adopted assess Effectiveness of Ice Cube Application on Pain and Ecchymosis among Patients at selected Hospital District Ambala, Haryana. A total of 60 patient selected by convenient sampling technique i.e., 30 in control group and 30 in experimental group. **Results**: Present study result revealed that in experimental group majority of patients 24(80%) had mild pain, 6(20%) had moderate and no one had worst possible, severe pain. where as in Control Group majority of patients 19(67%) had moderate pain 10(33%) had severe pain, only 1(3%) had mild pain and no one had worst possible pain receiving heparin subcutaneously. whereas Result of size of ecchymosis revealed that in experimental group majority of patients 20(67%) had mild ecchymosis, 7(23%) had moderate ecchymosis and no one had severe size of ecchymosis where as in Control Group majority of patients 15(50%) had moderate ecchymosis, 12(40%) had severe size ecchymosis, only 3(10%) had mild ecchymosis receiving heparin subcutaneously**. Conclusion:** Based on the findings, the study was majority of patient had mild pain and ecchymosis receiving heparin subcutaneously. Findings revealed that ice cube application was effective in reducing the pain and size of ecchymosis among patients receiving heparin subcutaneously.

Key words: Effectiveness, Pain, Ecchymosis, Heparin Injection, Subcutaneous.

Introduction: The safe prescription and administration of medicines is an essential part of safenursing care the administration of some medicines, especially subcutaneous injections,poses greater responsibilities on clinical nurses to assess related adverse drug reactions(ADRs) and the quality and safety of medication process[1]

Subcutaneous heparin is administered extensively to patients who need anticoagulant medicines to reduce the harmful clot formation during hospitalization. Itcan create a more predictable anticoagulant effect, increase bioavailability from the subcutaneous site of injection, and has less frequent dosing requirements. Also, it's simple subcutaneous administration permits short- and long-term prescriptions. However, similar to other medicine, the use of subcutaneous heparin has its own side effects and ADRs including pain at the injection site, local irritation, skin lesions, and bruising. They can result in patients' anxiety, rejection of treatment, and distrust in nurses' competency for medicines management[2].

Heparin is an anticoagulant used in the surgical prevention of thrombosis, and it can quickly achieve anticoagulant effects and prevent and treat venous thrombosis. Low-molecular-weight heparin (LMWH) is prepared by depolymerization of the common form of heparin. Low-molecular-weight heparin is a relatively new anticoagulant that was developed in the 1970s. Compared to heparin, LMWH has the advantages of high bioavailability, a strong antithrombotic effect, and fewer bleeding side effects. Therefore, LMWH is increasingly widely used in clinical practice[3].

These side effects often negatively affect the patient, leading to anxiety, a loss of confidence, and even the refusal to be treated, which may also endanger the safety of the patient. In addition, after bruising, itis necessary to avoid repeated injections in the bruised area, thus limiting the injectable areas. Therefore, when nurses perform subcutaneous injections of LMWH, they shoulduse techniques and methods that minimize the incidence of the abovementioned adverseconsequences to improve patients' satisfaction with the quality of the nursing they receive, enhance their trust in health-care providers, and encourage them to cooperate with treatment[4].

Ice is a therapeutic agent used in medicine as an integral part of injury treatment and rehabilitation. The use of ice pack is widespread because of their effectiveness, convenience, low cost, and ease of transportation. Ice packs can be made with any form of ice; however, commonly used forms are cubed ice and crushed ice. Ice is believed to control pain by inducing local anesthesia around the treatmentarea. Investigators have also shown that it decreases oedema, nerve conduction velocities, cellular metabolism, and local blood flow.[5]

NEED OF THE STUDY

Heparin is an anticoagulant medication that is usually injected subcutaneously. Subcutaneous administration of heparin may result in complications such as bruising, hematoma, and pain at the injection site. For patients and healthcare providers, strategies that can reduce pain and bruising are considered important. Reducingpatients' discomfort and concerns whenever and wherever possible is an important aimof nursing. Several studies have been carried out to see if speed of injection affects theamount of pain and bruising where the injection is given, but results of these studies have differed and study authors have not reached a clear final conclusion.[6]

The International Association for the study of Pain (IASP) defines pain as "anunpleasant sensory and emotional experience associated with actual or potential tissue damage. The American pain society created the phrase "pain: as the fifth vital signs" to increase awareness of pain assessment among the health care professionals,especially nurses.[7]

Department of Health and Human Service, India (2010) stated the prevalenceof subcutaneous injection is 3.2 million injections per person per year. Though subcutaneous injection is most frequently used injection but it causes painful experience for many individuals.[8]

Anticoagulation has proved to be an important treatment modality in preventing thrombus formation. Anticoagulants are often, but incorrectly, referred to as blood thinners. They work by decreasing the formation of additional blood clots. Heparin and low molecular weight heparin are anticoagulants. [9]

Subcutaneous administration of anticoagulant heparin sodium is a frequently performed nursing intervention. The role of nurses attempting to minimize hematoma formation and patient discomfort during the administration of

LMWH.[10] Cold application, known as cryotherapy which is a simple and cheap therapyand has been accepted for decades as an effective non pharmacologic intervention forpain management.[11]

The safe prescription and administration of medicines is an essential part of safe nursing care. The administration of some medicines, especially subcutaneous injections, poses greater responsibilities on clinical nurses to assess related adverse drug reactions (ADRs) and the quality and safety of medication process. ADR is a noxious and unintended response to a drug, which can occur at doses normally used for therapeutic purposes [12]

However, the effect of cold application on reducing pain and bruising induced by the subcutaneous injection of LMWH is controversial. In some studies, there was nosignificant difference between the cold treatment group and the control group in termsof the pain at the injection site, while other studies showed the opposite result. Some researchers also showed that there were no significant differences in the occurrence and size of bruises between the cold application group and the control group, but the results of most studies showed that there were significant differences between the 2 groups. Due to the variability among studies, there is no clear, final conclusionregarding the effect of cold application on the reduction of pain and bruising after LMWH injection, and no meta-analysis has explored this problem. Therefore, the purpose of this article was to review this controversial issue and to evaluate the effect of cold application on pain and bruising after the subcutaneous injection of LMWH.[13]

OBJECTIVES:

1. To assess the level of Pain and Ecchymosis among Patients Receiving Heparin Subcutaneously in both Experimental and Control group in Selected Hospital of District Ambala, Haryana.
2. To evaluate the effectiveness of ice cube application on level of pain and Ecchymosis among patient receiving heparin subcutaneously in SelectedHospital of District Ambala, Haryana.
3. To find the association of pain and Ecchymosis score with selected demographic variables among Patients Receiving Heparin Subcutaneously in Selected Hospital of District Ambala, Haryana.

HYPOTHESIS:

H1: There will be a significant difference in the level of pain and size of ecchymosis between the experimental group and control group after application of ice amongpatients receiving Heparin Subcutaneously.

H0: There will not be a significant difference in the level of pain and size of ecchymosisbetween the experimental group and control group after application of ice among patients receiving Heparin Subcutaneously.

RESEARCH METHODOLOGY

RESEARCH APPROACH/DESIGN: Quantitative research approach with Quasi Experimental research design.

RESEARCH VARIABLES:

Demographic variables: The demographic variables under the study are age, gender, educational status, occupation, previous exposure to subcutaneous injection, body built, body mass index.
Independent variables: Ice Cube Application.
Dependent variables: Pain and Ecchymosis among Patients Receiving Heparin Subcutaneously.
RESEARCH SETTING: The present study was conducted in M.M. Hospital of District, Ambala, Haryana.
TARGET POPULATION: For the present study, target population was all patients receiving heparin injection subcutaneously at M.M. Hospital of District, Ambala, Haryana.
SAMPLE SIZE: The sample size for the present study was 60 patient receiving heparin injection, 30 in control group 30 in experimental group.
SAMPLING TECHNIQUE: In the present study non probability convenience sampling technique was used to select the sample.

SAMPLING CRITERIA:

Inclusion Criteria

1. Patients above 18-60 years of age.
2. Patients those who are willing to participate in the study.
3. Patients receiving subcutaneous injection.

Exclusion Criteria

1. Those who have already developed ecchymosis for some other causes.
2. Patients are with dermatological or neurological disorders which interferer in the action of ice cube.
3. Who receive any other drugs (such as insulin) via injection at the injection site.

RESULTS:

Section I – Frequency and Percentage Distribution of Demographic Variables of Patient

Table 1a. Frequency and Percentage Distribution of Demographic Variables in experimental group and control group.

N=60

Demographic variable	Category	Experimental group(n=30)		Control group (n=30)	
		f	(%)	f	(%)
Age in years	20-30	13	43	10	34
	31-40	6	20	7	23
	41-50	11	37	13	43
Gender	Male	16	53	22	73
	Female	14	47	8	27
Educational status	No formal education	7	23	6	20
	Primary education	9	30	7	23
	Secondary education	10	33	12	40
	Graduation & Above	4	14	5	17
Occupation	Home make	7	23	3	10
	Government employee	4	13	12	40
	Private	8	27	10	33
	Other	11	37	5	17

Table 1a. Depicts the frequency and percentage distribution of demographic variables of patients in experimental and control group.

According to their age in experimental group majority (43%) were in age group of 20-30 years, followed by (37%) were in age group of 41-50 years, (20%) were in 31-40 years of age. whereas in control group majority (43%) were in age group of 41-50 years, followed by (34%) were in age group of 20-30 years, (23%) were in 31-40 years of age.

According to gender of showed that in experimental group majority (53%) were male patients and (47%) were female patients. whereas in control group majority (73%) were female patients and (27%) were female patients.

As per educational status of patients, in experimental group majority (33%) had completed secondary education followed by (30%) had up to primary education, (23%) had no formal education and (14%) had completed graduation and above. Whereas in control group majority (40%) had up to secondary education followed by (23%) had up to primary education, (20%) had no formal education and (17%) had completed graduation and above.

As per occupation status of patients, in experimental group maximum (37%) were doing other self-work followed by (27%) were in private job, (23%) were home maker and (13%)were in government job. whereas in control group maximum (40%) were government employee, followed by (33%) were in private job, (17%) were doing other self-work and (10%) were home maker.

Table 1b: Frequency and Percentage Distribution of clinical profile of patient in experimental group and control group.

N=60

Clinical Profile	Category	Experimental group(n=30)		Control group (n=30)	
		f	%	f	%
Name of Injection	Inj. Flothin 40mg	16	53	15	50
	Inj.Lupenox 40mg	7	23	6	20
	Inj.Clexane 40mg	4	13	6	20
	Inj. Enox 40 mg	3	11	3	10
Previous exposure to subcutaneous injection	Yes	12	20	9	30
	No	18	60	21	70
Previous complication of subcutaneous injection	Yes	13	43	9	30
	No	17	57	21	70
Site of subcutaneous injection	Abdomen	11	36	14	47
	Outer thigh	2	7	5	17
	Buttocks	2	7	1	3
	Outer upper arm	15	50	10	33
Body build	Thin	13	43	3	10
	Normal	12	40	9	30
	Obese	5	17	11	37
	Overweight	0	0	7	23

Table 1b. Depict Frequency and Percentage Distribution of clinical profile .

According to the name of injection given to patient in experimental group majority (53%) were given Flothin 40mg followed by (23%) were given Lupenox 40mg, (13%) were given Clexane 40mg and (11%) were given Enox 40mg. whereas In control group, majority (50%) were given Flothin 40mg followed by (20%) were given Lupenox 40mg, (20%) were given Clexane 40mg and (10%) were given Enox 40mg.

According to Previous exposures of subcutaneous injection in experimental group majority (60%) of study subjects were had no previous exposure of subcutaneous injection and (2 0 %) were had previous exposure. Whereas In control group, majority (70%) of study subjects were had no previous exposure of subcutaneous injection and (3 0 %) were had previous exposure of subcutaneous injection.

According to Previous complication of subcutaneous injection In experimental group majority (57%) of study subjects were had no complication of subcutaneous injection and (4 3 %) were had previous complication. Whereas In control group, majority (70%) of study subjects were had no complication of subcutaneous injection and (3 0 %) were had previous complication.

As per there Body Build In experimental group majority (43%) of study subjects were thin, (40%) had normal weight (17%) were obese and none of them were overweight. Whereas In control group, majority (37%) of study subjects were obese, (30%) had normal weight and (23%) were overweight and (10%) of them were thin.

SECTION – II A-Frequency and percentage distribution of Post-test level of pain score among patients receiving heparin subcutaneously in Experimental and Control group.

Table 2: Frequency and percentage distribution of Post-test level of pain score among patients receiving heparin subcutaneously in Experimental and Control group.

N=60

Level of Pain	Criterion Measure	Experimental Group (n=30)		Control Group (n=30)	
		f	%	F	%
No pain	0	0	0	0	0
Mild	1-3	24	80	1	3
Moderate	4-6	6	20	19	67
Severe	7-9	0	0	10	33
Worst possible pain	10	0	0	0	0

Table 3 and figure3 depicts the frequency and percentage distribution of post-test level of pain of among patients receiving heparin subcutaneously in experimental and control group. Result revealed that in experimental group majority of patients 24(80%) had mild pain, 6(20%) had moderate and no one had worst possible, severe pain. where as in Control Group majority of patients 19(67%) had moderate pain 10(33%) had severe pain, only 1(3%) had mild pain and no one had worst possible pain receiving heparin subcutaneously.

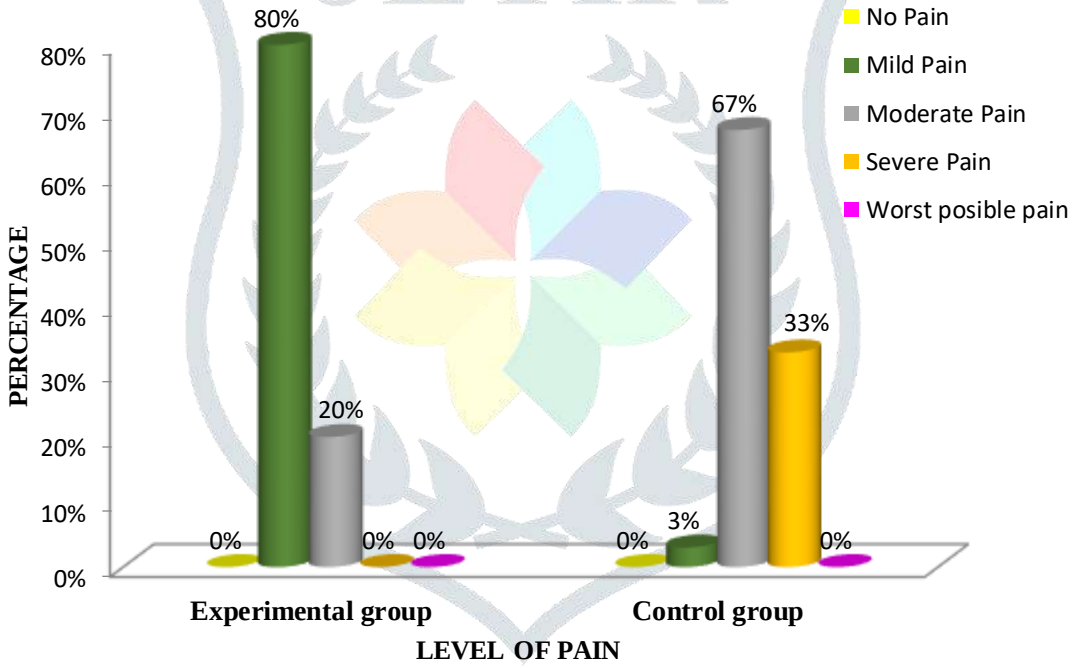

Figure 3: Percentage distribution of Post-test level of pain score among patients receiving heparin subcutaneously in experimental and control group.

SECTION – II B-Frequency and percentage distribution of Post-test Size of Ecchymosis among patients receiving heparin subcutaneously in Experimental and Control group.

Table 2: Frequency and percentage distribution of Post-test Size of Ecchymosis among patients receiving heparin subcutaneously in Experimental and Control group.

N=60

Size of Echymosis	Criterion Measure	Experimental Group (n=30)		Control Group (n=30)	
		F	%	f	%
No Ecchymosis	0 cm	0	0	0	0
Mild Ecchymosis	0.1-1.0cm	20	67	3	10
Moderate Ecchymosis	1.1-2.0 cm	7	23	15	50
Severe Ecchymosis	2.1- 3.0 cm	0	0	12	40

Table 4 and figure 2 depicts the frequency and percentage distribution of post-test size of ecchymosis among patients receiving heparin subcutaneously in experimental and control group. Result revealed that in experimental group majority of patients 20(67%) had mild ecchymosis, 7(23%) had moderate ecchymosis and no one had severe size of ecchymosis where as in Control Group majority of patients 15(50%) had moderate ecchymosis, 12(40%) had severe size ecchymosis, only 3(10%) had mild ecchymosis receiving heparin subcutaneously.

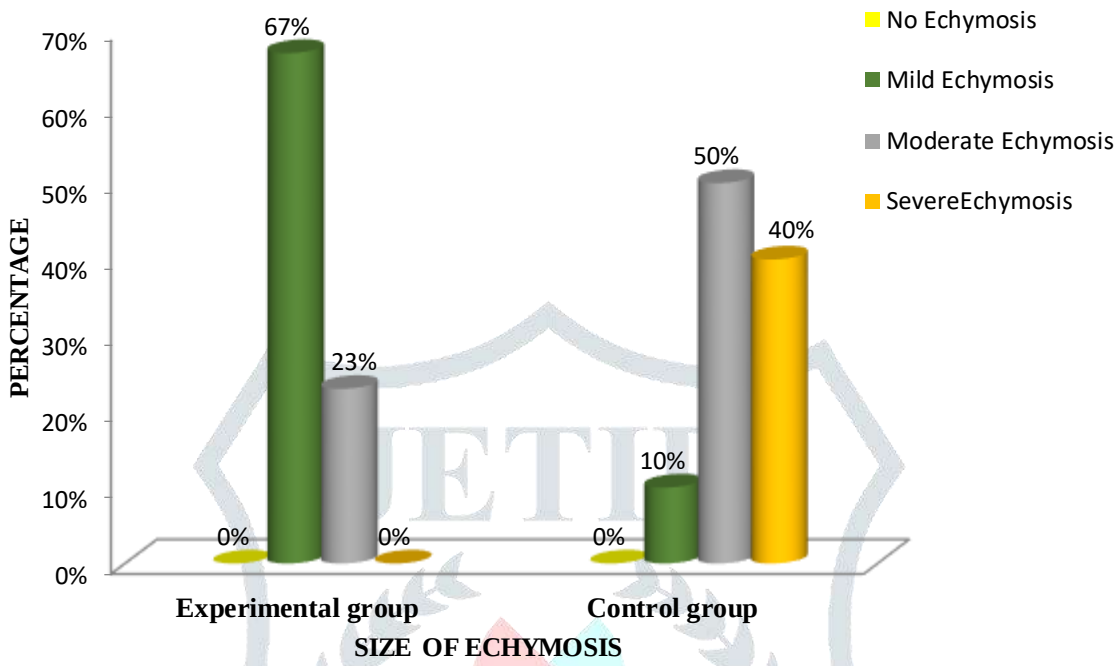

Figure 4: Percentage distribution of Post-test size of Ecchymosis score among patients receiving heparin subcutaneously in experimental and control group.

Section III-A Comparison of post-test level pain score among patients receiving heparin subcutaneously in experimental and control group.

Table 5: Comparison post-test level pain score among patients receiving heparin subcutaneously in experimental and control group**.**

N=60

Level of Pain	Mean	SD	t value	Df	p value
Experimental Group	3.0	1.354	8.617*	29	**0.00001**
Control Group	5.6	0.95			

***p<0.05 level of significance**

Table 5 depicts the comparison of post-test level pain score among patients receiving heparin subcutaneously in experimental and control group. Result showed that in experimental group mean pain score and SD was 3.0±1.35 and in control group mean and SD was 5.6±0.95. To find the difference unpaired t-test was applied the calculated value was (t=8.617, df=29, p=0.00001) indicates highly significant at p<0.05 level of significance. Findings revealed that ice cube application was effective in reducing the level of pain among patients receiving heparin subcutaneously. therefore ice cube application was effective in reducing the level of pain. Research hypothesis is accepted at p<0.05 level of significance.

Section III B: Comparison of post-test size of Ecchymosis among patients receiving heparin subcutaneously in experimental and control group.

Table 5: Comparison post- test size of ecchymosis score among patients receiving heparin subcutaneously in experimental and control group**.**

N=60

Size of Ecchymosis	Mean	SD	t value	Df	p value
Experimental Group	0.830	0.461	9.0797*	29	**0.00001**
Control Group	1.960	0.502			

***p<0.05 level of significance**

Table 5 depicts the comparison of post-test ecchymosis score among patients receiving heparin subcutaneously in experimental and control group. Result showed that in experimental group mean and SD was 0.830±0.461 and in control group mean and SD was 1.960±0.502. To find the difference unpaired t-test was applied the calculated value was (t=9.0797, df=29, p=0.00001) indicates highly significant at $p<0.05$ level of significance. Findings revealed that ice cube application was effective in reducing the size of ecchymosis among patients receiving heparin subcutaneously. Therefore, Research hypothesis is accepted at $p<0.05$ level of significance.

Section IV – Association between post test level pain score among patients receiving heparin subcutaneously in experimental and control group with selected demographic variables.

Table IV-a: Association between post test level pain score among patients receiving heparin subcutaneously in experimental group with selected demographic variables.

N=60

Demographic variable	Category	Level of pain					χ^2 value	Df	p value
		No pain	Mild pain	Moderate pain	Severe pain	Worst possible pain			
Age in years	20-30	0	9	3	0	0	0.3125^{NS}	2	0.8553
	31-40	0	5	1	0	0			
	41-50	0	10	2	0	0			
Gender	Male	0	11	5	0	0	2.7121^{NS}	1	0.0995
	Female	0	13	1	0	0			
Educational status	No formal education	0	6	1	0	0	2.1429^{NS}	3	0.5432
	Primary education	0	6	3	0	0			
	Secondary education	0	8	2	0	0			
	Graduation & Above	0	4	0	0	0			
Name of Injection	Inj. Flothin 40mg	0	12	4	0	0	1.2054^{NS}	3	0.7517
	Inj.Lupenox 40mg	0	6	1	0	0			
	Inj.Clexane 40mg	0	3	1	0	0			
	Inj. Enox 40 mg	0	3	0	0	0			
Previous exposure to subcutaneous injection	Yes	0	8	4	0	0	2.2222^{NS}	1	0.1359
	No	0	16	2	0	0			
Previous complication of subcutaneous injection	Yes	0	9	4	0	0	1.6629^{NS}	1	0.1971
	No	0	15	2	0	0			
Site of subcutaneous injection	Abdomen	0	10	1	0	0	3.4848^{NS}	3	0.3226
	Outer thigh	0	2	0	0	0			
	Buttocks	0	2	0	0	0			
	Outer upper arm	0	10	5	0	0			
Body build	Thin	0	10	3	0	0	1.5144^{NS}	2	0.4689
	Normal	0	9	3	0	0			
	Obese	0	5	0	0	0			
	Overweight	0	0	0	0	0			

***p value < 0.05 level of significance NS-Non Significant**

Table 7a. Depicts the association between post test level pain score among patients receiving heparin subcutaneously in experimental group with selected demographic variables. The chi-square values revealed that there was no significant association with age, gender, education, name of injection, previous exposure, previous complication of injection site of injection and body build of patient at p<0.05 level of significance.

Table IV b: Association between post test level pain score among patients receiving heparin subcutaneously in Control group with selected demographic variables.

N=60

Demographic variable	Category	Level of pain					χ^2 value	Df	p value
		No pain	Mild pain	Moderate pain	Severe pain	Worst possible pain			
Age in years	20-30	0	0	5	5	0	5.3311^{NS}	4	0.2549
	31-40	0	1	5	1	0			
	41-50	0	0	9	4	0			
Gender	Male	0	0	12	10	0	7.3923*	2	0.0247
	Female	0	1	7	0	0			
Educational status	No formal education	0	1	3	2	0	4.9083^{NS}	6	0.5556
	Primary education	0	0	4	3	0			
	Secondary education	0	0	8	4	0			
	Graduation & Above	0	0	4	1	0			
Name of Injection	Inj. Flothin 40mg	0	1	9	5	0	3.3421^{NS}	6	0.7648
	Inj.Lupenox 40mg	0	0	4	2	0			
	Inj.Clexane 40mg	0	0	5	1	0			
	Inj. Enox 40 mg	0	0	1	2	0			
Previous exposure to subcutaneous injection	Yes	0	0	7	2	0	0.9559^{NS}	2	0.6294
	No	0	1	13	7	0			
Previous complication of subcutaneous injection	Yes	0	0	7	2	0	0.9559^{NS}	2	0.6294
	No	0	1	13	7	0			
Site of subcutaneous injection	Abdomen	0	0	8	6	0	7.9452^{NS}	6	0.2420
	Outer thigh	0	0	5	0	0			
	Buttocks	0	0	0	1	0			
	Outer upper arm	0	1	7	2	0			
Body build	Thin	0	0	1	2	0	7.8114^{NS}	6	0.2521
	Normal	0	0	6	3	0			
	Obese	0	0	7	4	0			
	Overweight	0	1	5	1	0			

***p value < 0.05 level of significance NS-Non Significant**

Table 7b. Depicts the association between post test level pain score among patients receiving heparin subcutaneously in Control group with selected demographic variables. The chi-square values revealed that there was significant association with gender (chi value-7.3923, df-2, p-value 0.0247) there was no significant

association found with other demographic variables (age, education, name of injection, previous exposure, previous complication of injection site of injection and body build) of patient at p<0.05 level of significance.

Section V – Association between post test level Ecchymosis score among patients receiving heparin subcutaneously in experimental and control group with selected demographic variables.

Table V-a: Association between post Test level of Ecchymosis score among patients receiving heparin subcutaneously in experimental group with selected demographic variables.

N=60

Demographic variable	Category	Size of Ecchymosis				χ^2 value	df	p value
		No Echy	Mild Echy	Moderate Echy	Severe Echy			
Age in years	20-30	0	8	4	0	1.1180^{NS}	2	0.5717
	31-40	0	5	1	0			
	41-50	0	10	2	0			
Gender	Male	0	14	2	0	2.2493^{NS}	1	0.1336
	Female	0	9	5	0			
Educational status	No formal education	0	4	3	0	6.1313^{NS}	3	0.1053
	Primary education	0	7	2	0			
	Secondary education	0	10	0	0			
	Graduation & Above	0	2	2	0			
Name of Injection	Inj. Flothin 40mg	0	10	6	0	4.2458^{NS}	3	0.2360
	Inj.Lupenox 40mg	0	6	1	0			
	Inj.Clexane 40mg	0	4	0	0			
	Inj. Enox 40 mg	0	3	0	0			
Previous exposure to subcutaneous injection	Yes	0	6	6	0	7.9503*	1	0.0047
	No	0	17	1	0			
Previous complication of subcutaneous injection	Yes	0	8	5	0	2.9350^{NS}	1	0.0866
	No	0	15	2	0			
Site of subcutaneous injection	Abdomen	0	10	1	0	4.7939^{NS}	3	0.1874
	Outer thigh	0	2	0	0			
	Buttocks	0	2	0	0			
	Outer upper arm	0	9	6	0			
Body build	Thin	0	12	1	0	3.2250^{NS}	2	0.1993
	Normal	0	8	4	0			
	Obese	0	3	2	0			
	Overweight	0	0	0	0			

***p value < 0.05 level of significance NS-Non Significant**

Table 8a. Depicts the association between post test level of echymosis score among patients receiving heparin subcutaneously in experimental group with selected demographic variables. The chi-square values revealed that there was significant association with previous exposure to injection (chi value-7.9503, df-1, p-value 0.0047) there was no significant association found with other demographic variables (age, gender, education, name of injection, previous complication of injection site of injection and body build) of patient at p<0.05 level of significance.

Table V-b: Association between post Test level of Ecchymosis score among patients receiving heparin subcutaneously in Control group with selected demographic variables.

N=60

Demographic variable	Category	Size of Ecchymosis				χ^2 value	Df	p value
		No Echy	Mild Echy	Moderate Echy	Severe Echy			
Age in years	20-30	0	4	6	0	6.7431^{NS}	4	0.1500
	31-40	0	1	6	0			
	41-50	0	3	5	5			
Gender	Male	0	3	8	11	6.2216*	2	0.0444
	Female	0	0	7	1			
Educational status	No formal education	0	0	3	3	3.8024^{NS}	6	0.7034
	Primary education	0	0	3	4			
	Secondary education	0	2	6	4			
	Graduation & Above	0	1	3	1			
Name of Injection	Inj. Flothin 40mg	0	1	10	4	7.2500^{NS}	6	0.2983
	Inj.Lupenox 40mg	0	1	2	3			
	Inj.Clexane 40mg	0	1	3	2			
	Inj. Enox 40 mg	0	0	0	3			
Previous exposure to subcutaneous injection	Yes	0	0	5	4	1.4286^{NS}	2	0.4895
	No	0	3	10	8			
Previous complication of subcutaneous injection	Yes	0	0	5	4	1.4286^{NS}	2	0.4895
	No	0	3	10	1			
Site of subcutaneous injection	Abdomen	0	1	4	9	10.9143*	6	0.0509
	Outer thigh	0	0	4	1			
	Buttocks	0	0	0	1			
	Outer upper arm	0	2	7	1			
Body build	Thin	0	0	1	2	3.1241^{NS}	6	0.7131
	Normal	0	1	4	4			
	Obese	0	2	6	3			
	Overweight	0	0	4	3			

***p value < 0.05 level of significance NS-Non Significant**

Table 8b. Depicts the association between post test level of ecchymosis score among patients receiving heparin subcutaneously in control group with selected demographic variables. The chi-square values revealed that there was significant association with gender, (chi value-6.2216, df-2, p-value 0.0444) site of injection (chi value-10.9143, df-6, p-value 0.0509) there was no significant association found with other demographic variables (age, , education, name of injection, previous exposure to injection, previous complication of injection and body build) of patient at p<0.05 level of significance.

NURSING IMPLICATIONS

The findings of the study have implication in the field of nursing profession in the areas of nursing practice,

education administration and research. Nurse acts as an educator, leader, counselor and motivator. The present study emphasized on application of various interventions to reduce the pain and other complication of heparin injection.

Nursing Practice

The expanded role of the professional nurse emphasis those activities which promote health and preventive behavior among people. Nursing practice should be based on scientific knowledge. To thrive as a profession, nursing must keep pace with knowledge and set pace for future healthcare. Information about non-pharmacological methods of reducing injection pain are usually not available in the nursing curriculum but most of the times traditional practice and other hospital protocols can affect the ideal way in implementing such methods. Using the current research findings nurses can use ice application as an effective intervention in their practice. It is cost effective, easy to learn and has no adverse effects. The hospital authorities must implement such methods as it can enhance the comfort of its patients.

Nursing Education

Alternative and complementary therapies are increasing in popularity. The use of non-pharmacologic measures like ice application can be easily incorporated in nursing education along with other complementary therapies. Nurse educators need to highlight the importance of ice application as non-pharmacologic measures in the curriculum of basic nursing education. In service education programmes should be organized periodically to upgrade the knowledge and skills of healthcare professionals in various non-pharmacological methods used in reduction of pain, The result of the study nursing educator can be as an informative illustration to nursing student while teaching subcutaneous procedure and as a therapeutic technique for reducing pain. The nurse educator can also highlight the benefits of the intervention to the nursing students and to the patient by using demonstration ice application at injection site

Nursing Administration

In today's advancing world there is increasing need for quality care. The findings of this study could be made use of by nursing and non-nursing personal. Nursing administration are the key personnel in development of nursing standards and protocols. They must make sure that the nurse-patient ratio is adequate in the medical and surgical ward to provided non-pharmacologic measure like ice application. Necessary administrative support should be provided for the success of such activities. To improve the nursing care provided by healthcare personnel the nurse administrator can use the findings of the study, as a basis for in service education evaluating the effectiveness of administering subcutaneous injection with indigenous technique on the patients. The finding of the study can help the nurse administrator to formulate policies for care of pain at injection site and implementation of this evidence based practice (EBP) at bed side.

Nursing Research

A profession seeking to improve the practice of its members and to enhance its professional stature strives for the continual development of a relevant body of knowledge. Nursing research represents a critically important tool for the nursing profession to acquire such knowledge. Nursing research needs to focus on pharmacologic measures like ice application. The finding of this study helps to expand the scientific body of professional knowledge upon for further research The findings of the research need to be disseminated through publication. Therefore, the utilization of such research findings should be encouraged.

CONCLUSION:

The findings of pain score of the study concluded that in experimental group mean pain score and SD was 3.0±1.35 and in control group mean and SD was 5.6±0.95. To find the difference unpaired t-test was applied the calculated value was ($t=8.617$, $df=29$, $p=0.00001$) indicates highly significant at $p<0.05$ level of significance. Whereas ecchymosis score results shows that experimental group mean and SD was 0.830±0.461 and in control group mean and SD was 1.960±0.502. To find the difference unpaired t-test was applied the calculated value was (t-9.0797, df-29, p-0.00001) indicates highly significant at $p<0.05$ level of significance. Findings revealed that ice cube application was effective in reducing the pain and size of ecchymosis among patients receiving heparin subcutaneously

LIMITATIONS

- The study was limited to 60 patients receiving heparin subcutaneously hence generalization of finding is limited.

- The study was limited to selected hospital Ambala , Haryana.

RECOMMENDATIONS

Base on the study findings the following recommendations are made for future researchers.

- A similar study needs to be conducted in various settings in order to draw generalization of the findings.
- A similar study can be undertaken by using other non-pharmacological methods in reducing pain among the patient those are receiving heparin subcutaneous injection.
- A similar study can be done with larger samples.

REFERENCES:

1. Klingman, L. (2000). Effects of changing needles prior to administering heparinsubcutaneously. Heart and Lung the Journal of Acute and Critical Care, 29(1), 70-
75. Retrieved from website: http://www.researchgate.net/publication/12677440Reviewed on 10/2/2026.
2. Fareed J, Bacher P, Jeske W. Advances in heparins and related research. Anepilogue. Molecules. 2018;23(2):390. Available from [PMC free article] [PubMed] [Google Scholar] Reviewed on 10/2/2026.
3. Hiebert LM. Repeated oral or subcutaneous LMWH has similar antithrombotic activity in a rat venous thrombosis model: antithrombotic activity correlates with heparin on endothelium when orally administered. J CardiovascPharmacolTher. 2017;22(3):264–272. Retrieved from website: [PubMed] [Google Scholar] Reviewed on 10/2/2026.
4. De Campos JDF, Da Silva JB, Beck ARM, Secoli SR, De Melo Lima MH. Subcutaneous administration technique of low-molecular-weight heparins: an integrative review. Clinical Nursing Studies. 2013;1:36–44. Retrieved from website: [Google Scholar] Reviewed on 10/2/2026.
5. Hirsh J, Raschke R. Heparin and low-molecular-weight heparin: the Seventh ACCP Conference on Antithrombotic and Thrombolytic Therapy. Chest. 2004;126(3 suppl):188s–203s. Retrieved from website: [PubMed] [Google Scholar] Reviewedon 10/2/2026.
6. Mohammady M, Janani L, Akbari Sari A. Slow versus fast subcutaneous heparin injections for prevention of bruising and site pain intensity. Cochrane Database SystRev. 2017 Oct 1;10(10): doi:10.1002/14651858.CD008077.pub4.PMID: 28965359 Reviewed on 10/2/2026.
7. Hinkle, J.L., Cheever, K.H. Brunner &Suddath"s Textbook of Medical-Surgical Nursing. 13th ed. Lippincott Williams & Wilkins. Wolters Kluwer. Reviewed on10/2/2026.
8. Batra, G. (2014). Application of ice cube prior to subcutaneous injection of heparinin pain perception and ecchymosis of patients with cardiovascular problems. The Nursing Journal of India, 105(4), 155–159. Retrieved from website: [PubMed] [Google Scholar] Reviewed on 10/2/2026.
9. Harter, K., Levine, M., & Henderson, S. O. (2015). Anticoagulation drug therapy: a review. The western journal of emergency medicine, 16(1), 11–17. https://doi.org/10.5811/westjem.2014.12.22933 Reviewed on 10/2/2026.
10. Yi L juan, Shuai T, Tian X, Zeng Z, Ma L, Song G min. The effect of subcutaneous injection duration on patients receiving low-molecular-weight heparin: Evidence from a systematic review. International Journal of Nursing Sciences. 2016;3(1):79–88. Reviewed on 10/2/2026.
11. Akpinar Reva Balci, Polat HT, Yaman S, Ozer N. The Precautions taken by the nurses to prevent the bruise hematoma and pain associated with subcutaneous heparin. Journal of Anatolia Nursing and Health Sciences. 2010;13(4):19-25. Reviewed on 10/2/2026.
12. International Conference on Harmonisation . (1996). ICH harmonised tripartite guideline for good clinical practice. Buckinghamshire, England: Institute of Clinical Research.Available:from https://apps.who.int/medicinedocs/documents/s22154en/s22154en.pdf, Reviewed on 10/2/2026.
13. El-Deen DS, Youssef NFA. The effect of cryotherapy application before versus after subcutaneous anticoagulant injection on pain intensity and hematoma formation: a quasi-experimental design. Int J Nurs Sci. 2018;5(3):223–229. [PMC free article] [PubMed] [Google Scholar] Reviewed on 10/2/2026..

14. Wang H, Guan J, Zhang X, Wang X, Ji T, Hou D, Wang G, Sun J.Effect of Cold Application on Pain and Bruising in Patients With Subcutaneous Injection ofLow- Molecular-Weight Heparin: A Meta-Analysis.ClinApplThrombHemost. 2020 Jan-Dec; 1076029620905349. Reviewed on 10/2/2026.