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Effectiveness of Blunt Pressure Technique on Level of Pain During Intramuscular Injection Among Patients Attending Out Patient Department at Selected Tertiary Care Hospital, Coimbatore

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ABSTRACT

Introduction: Pain is a continuous, most complex and sensory response for every one life. It is defined as an unpleasant, subjective, sensory and emotional human experience. Many non- pharmacological techniques are used to reduce pain one among them is Blunt Pressure Technique. This technique involves using plastic blunt pins pressure is given to the injection site there by the pain transmission and perception is reduced. Methodology: The research design adopted in this study was quasi experimental post-test only control group design. Purposive sampling technique was used to select 50 study participants, among them 25 samples were allotted in interventional group and 25 samples in routine care group. For the interventional group IM injection was given using Blunt Pressure Technique, routine care group received injection as per Hospital routine technique and the level of pain was assessed for both groups using Standardized Numerical Pain Rating scale

Result and Discussion: The mean and Standard Deviation pain score for interventional group was 0.48±0.3 and routine care group 2.6±0.4 Independent paired 't' test value (t=21.2) was higher than the table value and statistically significant at the level of $p<0.001$.Demographic variables such as Age ($\chi^{2=}8.460$) and Clinical variables such as Type of medication ($\chi^{2=}3.84$), Presence of co morbid illness ($\chi^{2=}5.99$) found to have association with the level of pain.

Conclusion: The study concluded that Blunt Pressure Technique was effective in reducing the level of pain during intramuscular injection.

Keywords: Blunt Pressure Technique, Level of pain, Intramuscular injection, Numerical Pain Rating Scale
Effectiveness

Introduction:

Pain is an unpleasant emotional and sensorial feeling caused due to possible tissue damage that arises from any part of the body, and it depends upon the individual-to individual life experience. Administration of intramuscular injection is one of the common nursing function frequently used in clinical practice even though it was considered as simple procedure but it causes serious complication if not administer properly.

Pain is a multifaceted, complex condition that can result from actual or potential tissue injury that cause unpleasant feelings and sensory stimuli. However, it is an individual and subjective feelings that can be difficult to explain, and it is thought to be the primary focus of human rights in terms of both preventing and alleviating pain.

According to the WHO (world health organization) injection is the most frequently used medical procedure. Every year 16 million of injections are administered to the growing countries. The huge majority, throughout 95% of given intramuscular injections given as curative care. India gives 25-30% of global injection load. The great unpredictability around the success rates of IM injections in current clinical practice is from 32 to 52 % are studies that demonstrate every year.

Analgesics act as one of the most powerful key sources for pain relief, even though this is not the only way to relieve pain with low risk to patient. There is a rich source of many non – pharmacological nurses' activities that can assist in pain relief with the low risk to the patient. But these measures are not replaceable for medication, and these are very necessary and appropriate to relieve pain episodes. In case of severe pain non pharmacological interventions and medication might be the most effective way for relieve pain.

Intramuscular (IM) injection, which is widely used regarded as an integral component of healthcare services, it represents one of the most significant sources of pain for an individual, selective, and subjective event that can be challenging to explain, and preventing as well as relieving pain is considered the basic human consideration. Hence, the best approach to pain management is the major responsibility of nurses. The agent that can affect pain in IM injection includes, the medication injected and its volume, technique used, patient anxiety, patient position, medication delivery rate, injection site, and the needle length. However, a good injection technique and approaches will reduce the pain for those who are receiving intramuscular injection.

2. Method:

The present study was conducted to assess the assess the effectiveness of Blunt Pressure Technique on level of pain during intramuscular injection among patients attending outpatient department, Coimbatore. The study utilized a quasi-experimental post-test only control group design. Ethics committee approval was received from the Institutional Human Ethics committee with reference project No. 21/422. The sample was estimated using power analysis.

$$N= \frac{Z^2xNxSD^2P}{(N-1)e^2+ZxSD^2p}$$

$$= \frac{1.96x1.96x5022x1.4x1.4}{5022-1x0.4x0.4+1.96x1.96x1.4}$$

$$= \frac{27797.58}{808.73}$$

$$=46.7$$

The pilot study report showed that mean and Standard Deviation of interventional group was 0.6 ± 0.2 and routine care group was 2.6 ±

0.5, calculated't' value was 9.09. Chi square value showed that there is no association found between posttest levels of pain with selected background variables.

Data Collection Tool: The tool used for the present study had to parts with **section A** Demographic variables consist of Age, Gender, Marital status, Education status, Occupation, Type of work. Clinical variables consists of BMI (body mass index), Frequency of receiving intramuscular injection, Type of medication, Size of the needle in gauge, Volume of injectable medication, Number of injection taken in the past 3 months, Presence of co-morbid illness.

Section B consist of Standardized Numerical Pain Rating Scale was used to assess
The level of pain

Intervention: By using blunt pressure technique intramuscular injection was administered to the interventional group, following the disinfection of the skin, a round plastic disc with multiple blunt pins was placed over the selected gluteal injection site of study participants. The disinfected cotton swab was kept near the middle finger. Applying gentle pressure with two fingers over disc for 5 seconds. Injection was administered through the middle of the hole created in the disc at 90-degree angle. The ring finger and small finger were placed over the disc. And hub of the needle was clasped using forefinger and thumb. The syringe was gradually withdrawn to check whether the placement is in right place then the medication was slowly injected. After the completion of injection, the hub of the needle was held and the syringe was withdrawn. The cotton ball was pressed at the injection site. The pressure over the disc and injection site was held for 1 min following injection. The level of pain was assessed by using standardized Numerical Pain Rating Scale.

Routine Care Group:

Administration of intramuscular injection using routine hospital technique was followed.

Content validity

The content validity of the tool and the intervention protocol was obtained from one medical and six Nursing experts of Medical and Surgical Nursing Department and one statistician. The experts gave their valuable opinion on the clarity and appropriateness of the tool. The reliability of the tool was determined by Inter Rater Reliability method. The calculated kappa value of Standardized Numerical Pain Rating Scale was 1.0 it indicates that the tool was highly
Reliable, feasible and practicable to conduct study

Data collection procedure: Purposive sampling technique was used to select the sample

Statistical analysis: The information was entered into excel sheet and examined through IBM SPSS software version 20 data analysis plan included descriptive and analysis where frequency and percentage distribution were calculated to analysis demographic variables. Mean a standard deviation was calculated to analyse the post-test level of pain, $p < 0.001$ was consider highly significant.

Inferential statistics include use of independent paired ‘t’ test to compare the post-test level of pain $p < 0.001$ as consider statistically significant.

3. Result:

Majority of the study participants in interventional group 7(28%) were in the age between 31-50years, 11(44 %) were between age 20-30 years in routine care group. Majority of study participants in interventional group and routine care group 15(60%) were female, and 22(88%) were married. 12(48%) study participants in interventional group and 15 (60%) in routine care group were graduates. 12(48%) of study participants in interventional group were homemaker. Most of the study participants 14(56%) are moderate workers. More than half of the study participants were healthy 20(80%). The study participants in interventional group 13(52%) received intramuscular injection sometimes. Almost all the study

participants 14(56%) received water-based medication, about 1.6-3ml of medication 15(60%) was received through 24gauge needle, In routine care group 5(20%) majority of study participants had no co morbid illness only few 3(12%) had hypertension 5(20%) diabetes as co-morbid illness, among routine care group 15(60%) had severe pain whereas 13(52%) had no pain in interventional group.

The mean and Standard deviation score of interventional and routine care group was 0.48 ± 0.3 and 2.6 ± 0.4 respectively. The calculated 't' test value t=21.2 found to be statistically significant at the level of significance $p<0.001$, this infers that Blunt Pressure Technique is effective in reducing level of pain while receiving intramuscular injection. The study participant's age, type of medications, presence of co-morbid illness has association with the post-test level of pain.

Table 1

Frequency and percentage distribution of clinical variables

S.No.	Clinical Variables	Interventional group(n=25)		Routine care group (n=25)	
		f	%	f	%
1.	**BMI**				
	Below (18.5) Under weight	1	4	0	-
	(18.5-24.9) Healthy weight	16	64	23	92
	(25-29.9) Over weight	8	32	2	8
	30 or greater Obese	0	-	0	-
2.	**Frequency of intramuscular injection**				
	Often	3	12	3	12
	Sometimes	13	52	12	48
	Rarely	9	36	10	40
	Never before	0	-	0	-
3.	**Type of medication**				
	Oil based	11	44	12	48
	Water based	14	56	13	52
4.	**Size of the needle**				
	21 G	0	-	0	-
	22 G	0	-	0	-
	23 G	2	8	3	12
	24G	23	92	22	88
5.	**Volume of injectable medication injection**				
	0.5-1.5 ml	10	40	3	12
	1.6-3 ml	15	60	22	88
6.	**Number of injections taken in the past 3 months**				
	1-5 times	12	48	9	36
	6-10 times	13	52	2	8
	More than 10 times	0	-	14	56
	No	0	-	0	-
7.	**Presence of co morbid illness**				

	Hypertension	3	12	2	8
	Diabetes mellitus	2	8	5	20
	No	20	80	18	72

Table 2

Mean, Standard Deviation and Independent paired't' test value of Post-test Level of Pain among study participants in Interventional group and Routine care group.

S. No	Group	No pain		Mild pain		Moderate pain		Severe pain		Worst pain	
		f	%	f	%	F	%	f	%	f	%
1.	Interventional group (n=25)	13	52	12	48	-	-	-	-	-	-
2.	Routine group (n=25)	-	-	-	-	10	40	15	60	-	-

Note: ***p< 0.001, S-significant, N.S-Not Significant

Mean and Standard Deviation value of post-test level of pain among interventional and routine care group was 0.48 ± 0.3 and 2.6 ± 0.4 respectively.

The calculated't' value 21.2 was greater than the table value 3.30 which is highly significant at the level of p<0.001.Which statistically implies that Blunt Pressure Technique was highly effective in reducing pain during intramuscular injection.

4. Discussion:

Majority of the study participants in interventional group 7(28%) were between the age of 31-50 years, 17(68%) were female, 12(48%) were married, graduate and homemaker. Most of them were healthy 20(80%), more than half of study participants 15(60%) received 1.6-3 ml of water based medications 14(56%), 13(52%) received intramuscular injection 6-10 times,

Majority had no co-morbid illness only few had Hypertension 2(8%). Majority 23(92%) had received intramuscular injection using 24 Gauge needle, 14(56%) are moderate worker. Among routine care group of study participants majority 11(44%) were between 20-30 years, more than half of them 12(48%) were married, 15(60%) were graduate and homemaker 10(40%), most of them were healthy 19(72%). Nearly half of them had undergone injection more than 10 times, 14(56%) also had co-morbid illness few had diabetes mellitus 5(20%), more than half of them 22(88%) were received injection through 24 Gauge needle. This finding was supported by other similar study, the researcher found that 63.7% of the individuals were male 47.1% were belonged to the age group of 31-50 years. 51% of the individuals were graduates and nearly half of the individuals were unemployed (45.1%). Based on the occupation, 27.5% were professionals. Among the number of injections in the past 3 months, 68.6% have not had injection in the past 3 months. Obese individuals were 35.3%, overweight individuals were 28.4%, normal and underweight individuals were 27.5% and 8.8%, respectively. Drugs received by the individuals were vitamin (39.2%), vaccine (35.5%), and antibiotic (14.7%), hormones (10.8%). Most of the individuals (65.7%) received injection in the gluteal site. More than half of the individuals (54.9%) received 0.1–1 ml of injection, 24.5% received 1.1–2 ml of injection, and 20.6% received 2.1–5 ml of injection**. (Dinesh Kumar Suganandam, 2020)**

The first objective is to assess the level of pain among study participants in interventional group and routine care group. The findings revealed that more than half of the study participants 15(60%) in routine care group had severe pain, while receiving intramuscular injection following routine hospital technique, whereas in interventional group 13(52%) had no pain while receiving intramuscular injection through Blunt Pressure Technique.

The findings was supported by other study A randomized clinical trial was used to assess the level of pain among 56 study samples who required Methocarbamol injection The pain was measured by using visual analogue scale. The study result shows that the. The pain intensity in innovative method minimum was 0 and maximum was 4, same as in conventional injection, the lowest pain intensity was 0 and highest pain intensity was 6. The conclusion of the study is innovative method can be used as a substitute for conventional method to reduce intramuscular injection pain. **(Salari M, 2018)**

The second objective is to evaluate the effectiveness of blunt pressure technique on level of pain among study participants during intramuscular injection in interventional group. The findings revealed that the Mean and Standard deviation value of level of pain among interventional group and routine care group was 0.48 ± 0.3 and 2.6 ± 0.4 respectively. The calculated't' test value 21.2 was greater than the table value 3.30 which is statistically significant at the level of $p<0.001$

This findings supported by A Randomized Control Trial used to carry out to determine the effect of the Shot Blocker application during intramuscular injection. The patients were randomized into two group's experimental group and control groups. The total study participants were 176 among them 88 study participants were selected in experimental group and 88 study participants in the control group. Data were collected by using a questionnaire method and pain assessed by using Visual Analog Scale (VAS). The results showed that the mean VAS scores of the experimental and control groups were 1.2 ± 1.3 and 1.1 ± 1.6. Significant difference was found between the mean VAS scores of the experimental and control groups ($p> 0.05$). The study concluded that administration of IM injection in adults using Shot Blocker was reducing the severity of pain. **(Sefika Dilek, 2020)**

The third objective was to associate the level of pain among patient receiving intramuscular injection with their selected background variable.

The finding revealed that in interventional group, demographic variable such as type of work ($\chi^2 =20.795$, $p=0.05$) had significant association with level of pain. Whereas in routine care group demographic variables such as age ($\chi2=8.4$) had shown association, clinical variables such as type of medication ($\chi2=9.642$) used for the study participants, Presence of co-morbid illness ($\chi2=9.954$) had shown statistical association with the post-test level of pain at $p<0.05$ level of significant.

The study supported by the other study A quantitative approach randomized control trial with post-test only design study was conducted to determine the effectiveness of blunt pressure technique on pain response among patient receiving intramuscular injection .Among 108 study participants, 54 were taken among for study result showed that occupational and drug used for study participants had shown significant association with the level of pain at $p<0.001$**(Dinesh Kumar suganandam, 2020)**

Table 3 association of selected demographic variables with their post-test level of pain among study participants in interventional group and routine group

S.No	Demographic variable	No pain		Mild pain		Moderate pain		Severe pain		Worst pain		χ2 value
		f	%	f	%	f	%	f	%	f	%	
1.	**Age in years**											
	20-30	0	-	0	-	2	8	9	36	0	-	χ2=8.460
	31-40	0	-	0	-	3	12	3	12	0	-	d.f =3
	41-50	0	-	0	-	0	-	2	8	0	-	p=7.82
	51-65	0	-	0	-	5	20	1	4	0	-	**S****
6.	**Type of work**											
	Sedentary work	5	20	3	12	0	-	0	-	0	-	χ2=20.795
	Moderate work	7	28	7	28	0	-	0	-	0	-	d.f = 2
	Heavy work	1	4	2	8	0	-	0	-	0	-	p=13.82
												S***
3.	**Type of medication**											
	Oil based	0	-	0	-	1	4	11	44	0		χ2=9.64
												d.f=1
	Water based	0	-	0	-	9	36	4	16	0		p=3.84
												S**

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References:

1. Patrick David Wall, Melzack, R., Mcmahon, S. B., & Koltzenburg, M. ,Textbook of pain (2006) Inglaterra: Elsevier publication.
2. Arora, N. Injection practices in India. WHO *South-East Asia Journal* of Public Health, 1(2), 189. 2018 https://doi.org/10.4103/2224-3151.206931
3. Ayinde, S., Hayward, R., Nowacka, M., Manley, A., & Ross, J. P061 Evaluating intramuscular injection techniques to reduce injection-associated pain in adults. Sexually Transmitted Infections, 2021 97(Suppl 1), A76–A76. https://doi.org/10.1136/
4. Bajracharya, R. Factors associated with safe intramuscular injection practice among nurses of a teaching hospital. *Journal of Patan Academy of Health Sciences*, 2019 6(2), 70–74. https://doi.org/10.3126/jpahs.v6i2.27235
5. Çelik, N., & Khorshid, L. The Use of Shot Blocker for Reducing the Pain and sAnxiety Associated With Intramuscular Injection. Holistic Nursing Practice, 29(5), page no .2015 , 261–271.

https://doi.org/10.1097/hnp.0000000000000105

6. Inangil, D., & Inangil, G. The effect of acupressure (GB30) on intramuscular injection pain and satisfaction, *Journal of Clinical Nursing*, 2020, 29(7-8), 1094– 1101. https://doi.org/10.1111/jocn.15172
7. Kara, D., &YapucuGüneş, Ü. The effect on pain of three different methods of intramuscular injection, *International journal of nursing practice*, *22*(2), 2016 page no .152–159. https://doi.org/10.1111/ijn.12358
8. Karabey, T. & Karagözoğlu, Ş.The Effect of Helfer Skin Tap Technique and ShotBlocker Application on Pain in Deltoid Muscle Injection . *Clinical and Experimental Health Sciences* , 11 (4) , pageno. 2021 721-726DOI: 10.33808/clinexphealthsci.861801