Investigating the Effectiveness of the Helfer Skin Tap Technique on Intramuscular Injection Pain and Trypanophobia in Adult Patients

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Abstract

Background: Pain from intramuscular (IM) injections is a widespread issue affecting patients globally. It can lead to complications ranging from temporary discomfort to chronic, long-term effects. Nursing interventions are essential for minimizing injection-related pain and preventing associated complications. **Aim:** to Investigating the Effectiveness of the Helfer Skin Tap Technique on Intramuscular Injection Pain and Trypanophobia in Adult Patients. **Design:** A Quasi-experimental study **Setting:** The current study was conducted in medical and surgical department of Minia University Hospital, Egypt. **Sample:** A purposive sample of 200 subjects receiving intramuscular analgesics were conveniently selected (100 subjects were assigned for intramuscular injection using **Helfer skin tap technique (HSTT)** and 100 subjects control group using **routine technique**). **Tools:** Three tools were utilized: Tool (1) Demographic and Medical Data Sheet, Tool (2) Visual Analog Scale (VAS), and Tool (3) Trypanophobia Rating Scale. **Results:** The mean VAS score was statistically significant between study and control group with P value = 0.000, and Patients receiving the Standard Technique reported predominantly mild Trypanophobia (45%), while most HSTT recipients reported no Trypanophobia (67%). The difference in Trypanophobia levels between groups was statistically significant (MH=6.8, p=0.002). **Conclusions:** HSTT significantly reduced both perceived pain and trypanophobia during intramuscular injections compared to standard techniques. Patients reported substantially lower pain and fear levels with HSTT, with statistically significant differences between the two methods. **Recommendation:** Training programs on applying the Helfer skin tapping during injection should be conducted for All health professionals', especially nurses in the health setting and in medical centers to reduce pain during administration IM injection

Keywords: Helfer Skin Tap Technique, Intramuscular injection, Pain, Trypanophobia Adult

Introduction

Various routes of medication administrations are topical, oral, sublingual, buccal, and parenteral. When it comes to parenteral delivery, injections are regarded as the gold standard of various types of drugs, intravascular (IV) and intramuscular (IM) injection are the most common parenteral routes of medication administration globally **(Karabey& Karagozoglu, 2020; Güven & Calpbinici, 2020, Potter, et al., 2017)**. Drugs, intravenous fluids, or blood products are also administered using peripheral intravenous catheters. by inserting a tiny catheter into the patient's peripheral veins**. (AbdelRazik etal., 2021)** Medication is absorbed more quickly with IM injection route than through the subcutaneous route because it is deposited into deep muscle tissue, which has a substantial blood supply **(Katzung, B. G., & Trevor, A. J. (2021).** According to reports, IM injections are used in at least sixteen billion countries annually, with ninety-five percent of those injections being used to cure illnesses **(WHO, 2016).**

When it comes to medicine administration, IM is the most popular method since it is absorbed more quickly than oral and subcutaneous routes and because irritating medications can be applied safely **(U.S. Food and Drug Administration (FDA). (2020)).** The absorption rate of IM injection is slower than that of intravenous (IV) injection, but it

is faster than that of subcutaneous (SC) injection. Additionally, a greater quantity of medication can be given, and many medications that cause irritation or discoloration of the tissues can be provided thus **(Berman et al., 2016; Wilkinso, et al., 2016; Potter, et al., 2017).**

Since the IM mode of drug delivery is a component of illness treatment and necessitates expertise, it prioritizes the patient safety concept **(Gorski et al., 2021).** Because if IM injections are not administered with careful as well as appropriate procedure, they may result in serious complications like muscle fibrosis or contracture, abscess and gangrene, accidental IV injection, necrosis, cellulitis, as well as hematoma. They may also cause skin and tissue trauma, hematoma, and infections like abscesses. Additionally, there is a chance that an injection into the gluteal muscle could cause paralysis, nerve damage, or damage to the sciatic nerve **(Martín et al., (2017), Bolger & Gordon T. (2018), and Joanna Briggs Institu 2019).**

The process of IM is painful and uncomfortable. Other factors include the choice of needle, the amount of drug injected, the chemical makeup of drug, a procedure used, and the fact that the needle should not be changed after the drug has been drawn into the injector **(WHO, 2021) & Mitchell & Whitney, (2019).**

Trypanophobia, is an overwhelming anxiety of clinical procedures that include needles. It is closely associated with phobias of sharp items, needles, and pins. Despite the fact that needle phobia is widespread, it can have severe consequences that may lead to patients' avoidance or delay in receiving medical care, or failure in following the prescribed treatment. Trypanophobia may have many causes as hypersensitivity to pain (hyperalgesia), and bad or traumatic memories triggered by viewing a needle **(Adebayo & Mwankabatika, 2021).** Various techniques as muscle relaxation, and deep breathing are considered some coping strategies that helps lessen symptoms and decrease anxiety (**Güven & Calpbinici, 2020; Daharnis, Ifdil, Amalianita, Zola& Putri, 2021).**

The Helfer Skin Tap Technique (HSTT) is an evidence-based nursing intervention aimed at minimizing pain via IM injections in adults. This technique involves a swift, firm tap on the skin at the place of injection prior to needle insertion, which stimulates sensory nerves and helps distract the patient from the sharp sensation of the needle. Research indicates that HSTT can significantly reduce perceived pain compared to traditional IM injection methods, making it a valuable tool for healthcare providers Given the discomfort often associated with IM injections particularly in adult patients requiring frequent medications or vaccinations adopting pain-reducing techniques like HSTT can enhance patient compliance and overall treatment experience **(Kara & Öztürk, 2021)**.

The physiological mechanism behind HSTT lies in the gate control theory of pain, where the tactile stimulus from the tap interferes with pain signal transmission to the brain. This method is particularly beneficial for adults, who may experience heightened anxiety or needle-related distress. Studies have demonstrated that patients receiving IM injections with HSTT report lower pain scores and greater satisfaction compared to those receiving standard injections **(Smith et al., 2020)**

Despite its advantages, the HST remains underutilized in many healthcare environments, increased awareness and training among nurses and other medical professionals could promote its widespread adoption, ultimately improving patient care. Future research should explore its effectiveness across different adult populations, including elderly patients and those with chronic conditions requiring frequent IM injections. By integrating HSTT into routine practice, healthcare providers can reduce procedural pain, minimize injection-related anxiety, and enhance therapeutic outcomes for adult patients **(Johnson & Lee, 2022)**.

During any invasive operation, nurses are essential in reducing pain and discomfort. By assisting the patient in assuming a comfortable position and using a variety of physical and psychological interventions, the nurse can effectively alleviate the pain and discomfort experienced during intramuscular injection. Physical treatments and injection techniques that reduce injection pain are superior to other methods since they are simple to implement in clinical practice and don't require extra time or money **(Barnhill, et al. (2020).**

Significance of the study:

Globally, approximately sixteen billion IM injections are given annually, primarily for medical purposes. The most frequent local reaction and side effect is pain, which arises from the needle piercing the skin. Both chemical and mechanical factors

contribute to this pain (**Kaur, 2019; Chaudhari & Vageriya, 2019).** Furthermore, some individuals experience trypanophobia, an anxiety related to receiving injections **(Shree, 2020).** Given the crucial role of evidence-based methods in ensuring quality nursing care, and the scarcity of evidence examining the efficacy of the HSTT in decreasing IM injection pain, this research was undertaken to address this gap. The researchers are optimistic that their work will enrich nursing practice and potentially reduce the suffering of adult patients undergoing IM injections. Therefore, the study's objective was to evaluate the effect of the HSTT on pain perception and trypanophobia in patients who are taking pain medication. Nevertheless, there aren't many studies that look into how HSTT can lessen trypanophobia and IM injection pain. By lowering interventional pain, nurses who regularly use the HSTT can help patients feel more comfortable

Aim of the study

This study was done to investigating the effectiveness of HSTT on intramuscular injection pain and transphobia in adult patients.

Hypothesis:

- **H_1:** There will be statistically significant reduction in pain score between patients who will receive standard technique and HSTT.
- **H_2:** There will be statistically significant reduction in trypanophobia level between patients who will receive Standard Technique and HSTT.
- **H_3:** There will be a statistically significant difference between selected baseline variable and pain level between patients who will receive Standard Technique and HSTT.

Subjects and methods:

Research design:

This research employed a quasi-experimental research design with control as well as study groups.

Setting:

The actual research was performed in general medical and surgical departments located in the second and third floors at Minia University hospital, Egypt.

Sample:

A purposive sample of two hundred (200) adult male and female patients receiving intramuscular injection and fulfill an inclusion criteria were involved in the research. There were one hundred of them in the control group as well as one hundred in the experimental group.

Sample size: The sample size with a 95% confidence level, 0.5 standard deviation (the predicted variation), and a 5% (0.05) margin of error was calculated using the following formula.

$$n = e2 \cdot (1 + e2 \cdot Nz2 \cdot p \cdot (1 - p))z2 \cdot p \cdot (1 - p)$$

(N is the population size (sample). P 0.5, Z is the standard normal value 1.96 with confidence level 95%. E is the margin of error 0.05. A total number of one hundred adult male as well as female patients were estimated to conduct the current study.

Inclusion criteria:

Volunteers for sharing in the research, conscious male and female patients able to express their degree of pain were included in this study. Who have analgesic injection 75 mg/3 ml through intramuscular route (IM injection), and who didn't take chemotherapy or have neuropathy.

Exclusion Criteria:

Patients were not eligible for the research if they had received any type of oral or parenteral (IV) analgesic medications suitable to administration or took sedatives in under two hours pre the procedure. Patients unable to assume lateral position with knee slightly flexed. Those who suffered from impaired circulation, or any bleeding disorders, and peripheral vascular disease (sensory perceptual alterations) as neuritis were excluded from this study.

Tools of data collection

Tool I: Demographic and Medical Data Sheet:

After reading relevant literature, the researchers created it. It included factors including age, gender, marital status, occupation, education, presence of chronic diseases, past IM injection problems, and body mass index (BMI). was employed, and to determine the degree of pain, the Visual Analogue Scale was employed.

Too II: Visual Analogue Scale (VAS):

- With the VAS, patients must assess their pain using a line scale ranging from zero to ten, where zero signifies no pain, one to three for minor pain, four to six for moderate pain, seven to nine for severe pain, and ten for worst possible pain. The straight line indicates a continuous range of intensity. Four levels of pain severity are defined: none (zero points), mild (from one to three points), moderate (from four to six points), and severe (from seven to ten points).
- A patient shows where on the VAS they feel pain by marking the relevant spot. With this scale, the patient has complete autonomy in determining how severe the pain is **(Hayes & Patterson (1921).**
- The VAS serves as a measurement tool that is widely utilized, both on a national scale and internationally. VAS has been demonstrated through scientific evidence to be a valid and reliable scale for those aged 18 and over **(Joseph & Palappallil (2017); Begum & Hossain (2019)**.

Tool III: Trypanophobia (Anxiety) Rating Scale:

The scale adopted from **(Cao et al., 2017).** It is presented to the patients in form of large pictures of facial expressions of increasing levels of anxiety portrayed by a visual analogue scale for anxiety. Knowing that the Faces Anxiety rating Scale was a single-item, five-point self-reported scale, consisted of five faces represented the levels of anxiety, where the first item represented a neutral or “no anxiety” face and the last item represented "highest anxiety". There were specific categorical levels of anxiety used: no anxiety, mild, mild-moderate, moderate, moderate-high, and highest anxiety.

Pilot study

A pilot test was conducted on ten percent (eight newborns) of the total sample involved in the research to ensure viability, objectiveness, relevance, clarification, and adequateness of the research tool and to identify potential difficultuies with the tool.

Validity of the tool

The tool's content validity was identified by five specialists in nursing. After consulting with the guide, modifications were made depend on suggestions and comments from the experts. The experts unanimously agreed on all aspects of a tool.

Reliability of the tool

The tool's reliability, specifically the VAS and anxiety rating scale, was determined by giving it to ten patients at Minia University Hospital in Egypt. Inter rater method as well as Karl Pearson's coefficient of correlation were used to compute the reliability. The correlation coefficient r' achieved a value of 0.97. Thus, the tool was very dependable.

Ethical Considerations:

The Head manager of Minia University Hospital granted permission to perform this study, and all subjects signed an informed consent document. Adults' rights were strictly safeguarded, encompassing the right to choose whether to take part in the research and the right to exit the research without any cause at any point, with no adverse repercussions.

Procedure:

Once the Research Ethics granted official permission to proceed with the current study, the researchers advanced as follows:

- To begin with, the experimental and control groups were informed about the purpose of the research.
- In both the experimental and control groups, ventrogluteal place IM injections were given. Moreover, while the experimental group received IM injections using HSTT, the control group received them using the routine technique.
- The descriptive feature form was completed using the face-to-face interview method. One minute after the application of the IM injection, pain related to the IM injection was assessed using a VAS and anxiety scale.

Procedure of HSTT IM Injection for Experimental group:

1. To administer the injection in the ventrogluteal site, hold the patient’s knees in a flexed position while you place them on their side.
2. Once the injection site has been decided on, use the fingertips of your dominant hand to strike the skin (approximately 15 times) for around five seconds in order to relax the muscles.
3. Remove the syringe cover with your dominant hand after disinfecting the skin with alcohol. Form

the non-dominant hand into a V-shape and strike the skin with it three times.
4. On the third stroke, simultaneously insert the syringe with a 23-gauge, 2.5 cm needle into the muscle at a right angle.
5. After aspiration, keep tapping the skin with the fingers of your non-dominant hand while injecting the medication with your the dominant hand at a speed of one ml every 10 seconds.
6. Once the medication has been injected, position the non-dominant hand in a V-shape and tap the skin 3 times while withdrawing the syringe needle on the third tap **(Helfer, 2000).**

The IM Procedure for Control group

1. Place the patient in a side-lying position by securing the knees in the flexor while injecting into the ventrogluteal site.
2. Once you have established the injection place, disinfect the site with alcohol.
3.Using the thumb as well as index finger of your non-dominant hand, stretch the skin and insert a syringe with a 23-gauge, 2.5 cm needle into the muscle at a 90-degree angle.
4. Following the aspiration, use your dominant hand to inject the medication at a speed of one ml every ten seconds.
5. Remove the syringe needle ten seconds post the drug has been taken **(Shah & Narayanan, 2016)**

Data analysis:

IBM SPSS Statistics Version 20.0 was used to statistically evaluate the data.. For categorical measurements, numbers and percentages were utilized, while means and standard deviations were used for numerical measurements. The t test was applied to independent groups with normal distribution for comparing numerical measurements between the two groups, while the homogeneity of the experimental and control groups was assessed using a bidirectional Chi-square test. Results were regarded as significant at the $p < 0.05$ level

Results:

Table (1): Frequency and Percentage Distribution of Demographic and Medical Variables in the Studied Groups. (n = 200).

Descriptive Features	Experimental Group (n.:100) M±SD	Control Group (n.:100) M±SD	t	P
The average age	39.64±16.69	39.84 ±13.59	- 0.271	0.787
BMI	25.26±3.31	27.11±5.74	- 1.963	0.053
	No. %	No. %	X^2	P
Gender				
Female	52 52.0	56 56.0	0.161	0.688
Male	**48** 48.0	**44** 44.0		
Marital status				
Married	68 68.0	66 66.0	0.045	0.832
Single	32 32.0	34 34.0		
Education				
Illiterate	**4 4.0**	**8 8.0**	**4.867**	**0.301**
Literate	**20 20.0**	**20 20.0**		
Primary school	**16 16.0**	**20 20.0**		
High school	**40 40.0**	**46 46.0**		
Graduate	**20 20.0**	**6 6.0**		
Chronic Disease				
Yes	**22 22.0**	**20 20.0**	**0.060**	**0.806**
NO	**78 78.0**	**80 80.0**		
Occupations				
1. Professionals	**13 13.0**	**20 20.0**	**0.080**	**0.401**
2. Businesses	**6 6.0**	**5 5.0**		
3. Laboure	**34 34.0**	**32 32.0**		
4. Government Services	**27 27.0**	**23 23.0**		
5. Any other specialty	**8 8.0**	**6 6.0**		
6. Not working	**12 12.0**	**14 14.0**		
Fear of I.M injection				
1. Yes	**83 83.0**	**78 78.0**	**0.045**	**0.832**
2. No	**17 17.0**	**22 22.0**		

Previous complications from IM injections						
1. Yes	**69**	**69**	**67**	**67**	**0.060**	**0.806**
2. No	**31**	**31**	**33**	**33**		

Independent Samples t-test (t): Used for comparing **age** and **BMI** between groups (parametric data). **Chi-square Test (X^2)** Used for categorical variables (gender, marital status, etc.).

Table (1) shows that, there was half of the studied groups experimental and control group, the age ranged from 21-39 old age, with the mean of age (39.64±16.69 & 39.84±13.59) respectively, (25.26±3.31 & 27.11±5.74) respectively were within the BMI group. Moreover, the table revealed that above half of the study as well as control groups were females (52%, 56 %) respectively.

In regard to marital status, (68%, 66%) of the experimental as well as control groups were married. In additions above more than one third (40%) of the experimental group was high school as well as less than half (44%) of the control group was high school. Results also, revealed that minority of experimental as well as control groups not had occupation.

Lastly, the table founded that most (83%) of experimental group were was afraid from IM injection before and during intramuscular (IM) injection while the highest percentage (78%) among control group where fear from IM injection before and during intramuscular (IM) injection. Also, the results showed that, two third (69%, 67%) of the experimental as well as control groups respectively were had previous complications from IM injections. There were not statistically significant variations between both groups regard their socio-demographic characteristic and P- value at 0.832.

Table 2: Comparison of the VAS average scores between the control as well as study groups (No.:200)

VAS scores	Control group (n.:100) M±SD	Experimental group (n.:100) M±SD	t	P
	2.88±1.02	0.18±0.39	-17.449	0.000

VAS=Visual Analogue Scale; **M**=Mean; **SD**=Standard Deviation, **t**=test, **p**=p value

Table 2 was showed that, the mean VAS score of patients via IM injection performed with HSTT (0.18±0.39) is lower compared to (2.88±1.02)during IM injection performed with the standard technique. There was a statistically significant variations between the groups ($p < 0.05$).

Table (3): Comparison of Pain levels among Patients Receiving Intramuscular Injection by Standard Technique and HSTT (n = 200)

Visual analogue pain rating scale	Control group (Standard Technique)		Experimental group (Helfer Technique)		MH	P-value
	No.	%	No.	%		
-No pain (score 0)	21	21.0	59	59.0	5.1	0.003**
-Mild pain (score 1-2)	19	19.0	37	37.0		
-Moderate pain (score 3-6)	58	58.0	4	4.0		
-Severe pain (score 7-9)	2	2.0	0	0.0		
-Worst pain (score 10)	0	0.0	0	0.0		

MH: test of Marginal homogeneity for related groups *** P ≤0.05 (significant) & ** highly significant at 0.001**

Table 3 indicated that, the highest percentage of patients in the control group (Standard Technique) reported moderate pain, while more than half of patients in the (HSTT) reported no pain (58% & 59% respectively). A highly statistically significant variations were found between the two interventions in the two group in relation to pain level (MH = 5.1 at P= 0.003).

Table (4): Multiple linear regression analysis for the association between application of HSTT on intramuscular injection and Presence of pain among experimental group after adjusting to socio-demographic and medical characteristics after Implementing Nursing Intervention (n=100):

	R^2	Adjusted R	β	SE	T	F	P value
Crude model	0.147	0.021	1.000	0.466	2.14	2.15	0.034*
Multivariate model	0.160	0.086	0.782	0.468	2.67	2.16	0.049*

* Statistically significant difference ($P \leq 0.05$) ** highly Statistically significant difference ($P \leq 0.01$)

Table 4 displays that, the HSTT on IM injection for adult, is significantly associated with pain either alone or after adjusting for demographic characteristics with β at 1.000 in the crude model and 0.782 in the multivariate model. These mean that implementing the HSTT on intramuscular injection could decrease pain intensity during IM injection for adult.

Table (5): Comparison of **Trypanophobia (Anxiety) Rating Scale** among Patients Receiving Intramuscular Injection by Standard Technique and HSTT (n = 100)

Anxiety Rating Scale	Study Group				MH	P value
	Control group (Standard Technique)		Experimental group (Helfer Technique)			
	No.	%	No.	%		
-No anxiety	41	41.0	67	67.0	6.8	0.002**
-Mild anxiety	45	45.0	29	29.0		
-Mild- Moderate anxiety	12	12.0	4	4.0		
-Moderate anxiety	2	2.0 0.0	0	0.0		
-Moderate –high anxiety	0	0.0	0	0.0		
-Highest anxiety	0		0	0.0		

Using Mann-Whitney U Test (MH)

Table 5 indicated that, the highest percentage of patients in the first (Standard Technique) reported mild anxiety, while about two third in the (HSTT) reported no anxiety (45% & 67% respectively). A highly statistically significant variations were found between the two interventions in the studied groups in relation to anxiety level (MH = 6.8 at P= 0.002).

\Table (6) Selected Demographic and Medical Variables in relation to Pain Level among the two groups (n = 200).

Selected Demographic and Medical Variables	Pain Level in Control group (Standard Technique)		Pain Level in Experimental group (Helfer Technique)	
	X2	P-Value	X2	P-Value
-Age	0.640	0.726	0.128	0.90
-Gender	4.078	0.048*	0.60	1.86
-Education	0.757	0.685	0.35	0.95
-Previous IM injection complications	8.49	0.001**	6.8	0.002**
- BMI	9.470	0.005**	5.1	0.003**

***P ≤0.05 (significant)**

Table 6 showed that there was a significant relation between pain level and selected variables (gender, previous IM injection complications & BMI in the control group (Standard Technique) as (x^2=4.078, 8.49 & 9.47 at p value= 0.048, 0.001& 0.005 respectively), while in the experimental group (HSTT) there was only a significant relation between pain level and Previous IM injection complications and BMI (x^2=6.8 & 5.1 at p value=0.002 & 0.003).

Table (7): Relation between Selected Demographic and Medical Variables with the Trypanophobia (Anxiety) Rating Scale Level among the two groups (n=200).

Selected Demographic and Medical Variables	Anxiety Level in Control group (Standard Technique)		Anxiety Level in Experimental group (Helfer Technique)	
	X2	P-Value	X2	P-Value
-Age	2.39	0.065	1.27	0.309
-Gender	1.40	0.253	0.445	0.812
-Education	0.102	0.99	0.887	0.533
-Previous IM injection complications	1.43	0.242	0.21	0.83
-Body Mass Index (BMI)	0.602	0.699	0.44	0.66

P ≤0.05 (significant)

Table 7 As showed that there was no significant relation between anxiety and selected variables in both Standard and HSTT in the two group.

Discussion:

Regarding the socio-demographic data of adult's patients in the present study there was half of the studied groups experimental and control group the age ranged middle adulthood, these results are corroborated by **Ozdemir (2013),** whose study demonstrated the impact of methyl-prednisolone injection speed on the perception of IM pain. Informed that patients in this age group experience more pain. While, contrary to the findings of the actual research with **Osamu (2014),** whose results indicated that pain intensity did not differ significantly by age group.

Regarding body mass index (BMI), this study found that participants had a higher BMI (overweight range) compared to the control group. This contrasts with **Patidar (2021)**, where the majority of participants fell within the normal BMI range. Notably, all respondents in both studies had prior exposure to intramuscular (IM) injections."

According to these studies, women experience higher levels of pain than men do, and over half of the experimental and control groups were female. These findings were consistent with **Hassnein & Soliman (2016) and Racheal (2012),** who found that women experience more pain than men. **Jerin (2011)** also found that women experience higher mean pain levels than men, and **Racheal (2012),** who conducted research on women experiencing more pain than men, agreed with the study's findings.

According to **Chan et al. (2006),** pain receptors are found in the SC layer rather than in muscular tissue, and women have more subcutaneous tissue in their buttocks than males do. As a result, all IM injections cause more pain for women. However, this was in contrast to **Ozdemir et al. (2013),** who demonstrated that men experienced pain at a higher intensity than women. **Antonio et al. (2012)** also found no gender variations in the prevalence and severity of pain between males and females. However, in my opinion, women experience more agony than men do since men tend to hide their suffering in order to maintain their masculine image. Additionally, research on the differences in pain tolerance between men and women indicates that, due to hormonal and psychological variables, men are more tolerant of pain than women.

A large majority of patients in two groups married status this finding was in concordance with**, Patidar, (2021)** the study revealed that, the maximum respondent was found married. Furthermore, the results of the actual study revealed that, whereas lower half of the experimental and the control group held a high school, this finding was in concordance with **Suganandam, et al., (2020)**. These findings contrast with **Lakhani (2014)**, who reported that a majority of subjects in the experimental group had only primary-level education, while most adults in the study similarly had limited educational attainment.

A large majority of patients in two groups fear of IM injections, this finding was in concordance with **Ivanova–Student & Hristova, (2021)** who showed that, when asked group if there was a fear of punctures as well as injections, a significant majority reported experiencing this fear, while only a small minority indicated no fear. A large majority of patients in two groups no complaint from chronic disease, this finding was disagreement with **Khatab, & Ahmed, (2019)** Concerning the presence of associated diseases, diabetes mellitus was the most prevalent condition among patients in both Group I as well as Group II. Also, **Ahmed (2016)** who stated that orthopedic problems are increased in patient more than 40-year-old.

A large majority of patients in experimental group lowering mean VAS score of patients through IM injection with HSTT with mean VAS score of patients through IM injection procedure with than the stander technique; this finding was in concordance with **Shah & Narayanan (2016)** who revealed that, is significant reduction in pain perception level through IM injection scores of patients taking IM injection with HSTT and highly effective in reducing pain perception, compared to that with Conventional Technique (CT).

Also, **Güven, et al., (2020)** this study showed that there were differences in the mean VAS score across the groups. Following HSTT intervention, the experimental group's VAS score decreased dramatically, but the control group's VAS score did not. Depending on the IM injection, the study demonstrated that HSTT was helpful in reducing pain.

Additionally, **Mini et al. (2014)** found that applying skin tapping reduced the experimental group's pain level, with the majority of the group experiencing very mild pain. These findings align with contemporary research demonstrating the efficacy of tactile interventions for IM injection pain management. **Ueki et al. (2019)** established that mechanical distraction techniques using blunt pressure significantly reduce perceived pain

compared to conventional methods. Similarly, **Hajipour et al. (2021)** systematically confirmed that properly applied manual pressure at the injection site produces clinically meaningful pain relief, supporting the physiological basis for this intervention.

Khanra, & Lenka, (2018) According to the study's findings, the HSTT reduces IM pain in adult patients more effectively than the conventional standard procedure. Immediate discomfort was decreased by exerting local pressure around the injection site and using manual pressure or rhythmic tapping over the injection site **(Ayinde et al., 2021).** According to the researcher's perspective, using the HSTT to the skin at the injection site helped to relax the muscles both before and after the IM injection, which also lessened injection pain.

On the other hand, this result disagreed with **Soliman & Hassnein (2016)** who passed, it was discovered that patients' perceptions of pain were considerably higher with regard to the traditional technique's pain level than with the HSTT.

According to the findings of the study, one of the crucial nursing care procedures during the process is tapping the muscles at the injection site both before and during the surgery. **Joanne (2000)** Using the palmer side of the dominant hand, tap the intramuscular injection site sixteen times to relax the muscle. Then, make a "V" with the thumb and other fingers of the non-dominant hand, and tap the skin three times while inserting and withdrawing the needle. The balance between the large diameter fibers that do not transport pain and the tiny diameter fibers that do is altered by the mechanical tapping stimulation applied to the skin using this approach. Through efficient skin tapping, the big diameter, or non-pain, fibers block the small diameter fibers, slowing the reaction to pain. These evaluations by **Neupane (2019)** aid in understanding the significance of tapping during IM injection procedures for all age groups.

Recent studies further validate the efficacy of the HST for pain reduction via injections. **Kaur et al. (2019)** demonstrated that patients receiving standard technique (ST) injections reported significantly higher pain perception compared to those treated with HST, with statistical analysis confirming this difference as significant. These findings are supported by **Mahato (2019)**, whose research similarly concluded that HST produced clinically meaningful pain reduction, establishing it as an effective intervention for procedural pain management.

According to the current study's findings, there were statistically significant variations in the experimental and control groups' pain levels as well as in adult sociodemographic information like age, gender, and the type of intramuscular injection used. Additionally, patients in the experimental group who used HST experienced less pain than those in the control group who used a standard technique. The current findings were consistent with a study by **Vathani et al. (2017)** that looked at how the HST affected the amount of pain experienced after intramuscular injections. According to their findings, patients who received the intervention experienced a statistically significant decrease in post-procedure pain scores when compared to the control group.

The findings of the actual research were in line with those of a research performed by **Karabey and Karagözoğlu (2021)** that looked at the distribution of post-injection pain scores among personnel based on various injection techniques. The study found that there was a significant and statistically significant variations in the average pain scores of the various techniques used to control pain.

Also, **Therese and Devi (2014)** found that the HST was more effective than the Routine Technique when it came to giving Intramuscular Injections with little to no pain. They also found that the HST was associated with low drug volume, low drug dosage, and lateral position, but not with the other variables. It was determined that employing the HST to administer an intramuscular injection reduces the impression of pain severity **Therese & Devi, (2014).** But this finding is contrary to the current study findings **Jyoti, et al., (2018)** patients' primary post-test pain levels were significantly correlated with their marital status and occupation, but not with their gender, educational background, or occupation. Also, the literature includes studies reporting results that support our findings concerning IM injection with the HSTT. In the study conducted by **Karabey and Karagozoglu (2021)** with patients who were vaccinated with Hepatitis B, the HSTT was found to be more effective in reducing pain than the standard technique.

In another study conducted by **Kaur et al., (2019)** with adult patients receiving IM Diclofenac treatment due to orthopedic problems, the patient's pain was evaluated with

3 different pain scales and the HSTT was compared with the standard intramuscular SIM. The study found that the pain intensity of patients who were given IM injections with the HSTT were low in all. Also, this results consistent with the findings of **Jyoti et al., (2018)** carried out a study with 60 adult patients and concluded that the pain intensity of patients whose IM injections were administered using the HSTT were significantly lower than those of the patients who received (SIM) stander intramuscular technique.

Additionally, the actual research found that, most patients in the control group (Standard Technique) reported moderate pain, while more than half of patients in the (HSTT) reported no pain. A highly statistically significant variations were found between the two interventions in the two group in relation to pain level. Also, the current study found that the greatest number of the experimental group had moderate pain level and zero percentage of severe pain level; whereas the control group one third had mild pain level and under one fifth had moderate pain level.

These findings align with previous research on tactile interventions for pain management. **Cherian (2017)** demonstrated that rhythmic skin tapping significantly reduced reported pain levels among adult males, with most participants showing marked improvement from moderate pain levels post-intervention. Similarly, **Dimpleshree et al. (2020)** found substantially lower pain scores in their experimental group compared to controls, with statistical analysis confirming these differences as significant. The calculated 't' value shows statistically significant difference, which clearly demonstrated that there was significant decrease in pain experience after using HSTT among experimental group**.**

In the same vein Chen et al. (2021) found that a significant proportion of painful medical procedures resulted in moderate to severe pain levels. However, only a minority of patients received proper pain assessment or interventions, highlighting a concerning gap in pain management practices. Similarly, a recent evidence by **Juntilla, et al., (2018)** mentioned that, pain was felt by both the comparison and intervention groups. However, when the HSTT was used, the intervention group reported less moderate discomfort than the comparison group, which reported severe pain.

The current study demonstrated that the HSTT significantly lowered anxiety levels in patients receiving intramuscular injections compared to the standard technique. Notably, the proportion of patients experiencing no anxiety increased substantially with the HSTT, while mild anxiety was more prevalent with the standard method. This marked difference in anxiety scores was statistically significant and consistent with the reduction in pain reported. In the same line a study by **Gökçe & Bodur (2021)** that comparing cold application and the HSTT to a control, found that both interventions, including the HSTT, significantly reduced anxiety. Also, **Korkmaz & Doğan (2020)** revealed that specific patient population receiving a particular injection, demonstrated that the HSTT significantly lowered anxiety levels. Another study by **Canbulat et al, (2016)** compared two tactile stimulation methods and found that the HSTT was effective in reducing anxiety in children receiving IM injections.

As regards relation between selected demographic and medical variables and scores of pain level, the actual study explored that there was a significant relation between pain and selected variables (gender, previous IM injection complications and BMI) in the first injection (Standard Technique). While in the second injection (HSTT) there was only a significant relation between pain and previous IM injection complications and (BMI). However, an analysis of the literature revealed that patients with substantial subcutaneous adipose tissue reported less apparent injection discomfort. The current study did not show parallelism with the literature in this aspect. Apparently, the current study explained that findings as the Standard IM injection technique had its negative relation that affected by several factors as BMI, however the HSTT naturalized that effect.

Furthermore, **Rautela, Thomas and Rita (2020)** investigated the real experimental investigation to evaluate the impact of HSTT on the degree of pain experienced by pregnant women receiving an intramuscular injection of tetanus toxoid. According to their findings, there was no correlation between the study group's religion and BMI and the amount of pain antenatal moms felt during IM injections using the HSTT, but there was a significant correlation with the calculated Fisher's exact test value.

Additionally, as women made up over half of the study group, the current study investigated whether pain and specific factors like gender were

significantly correlated. The current researchers explain that because men conceal and deny their pain in order to maintain their manly image, women had higher levels of expressed and felt pain than men. Additionally, research on the difference between men and women's pain tolerance revealed that men were more tolerant of pain than women due to hormonal and psychological variables. Age-related differences in pain perception were not statistically significant, according to the current study. Furthermore, the research population averaged middle adulthood, and the majority of patients were middle-aged individuals. It may be assumed that older individuals will feel less pain following injections due to physiological changes and regressions in the transmission and perception of pain with aging. According to **Jyoti, Arora, and Sharma's (2018)** study, there was a significant correlation between pain scores and one's occupation and marital status, but no statistically significant correlation between gender and educational background.

The current investigation demonstrated that there was no significant correlation between anxiety and certain demographic and medical characteristics and anxiety levels in Standard and HSTT within the same study group. However, **Peter and Mathew (2019) and Menaka, Malarvizhi, and Glory (2019)** confirmed that there was no statistically significant correlation between the demographic factors and the amount of pain experienced by infants receiving the vaccine via the HSTT during intramuscular administration.

The study's findings, the three hypotheses supported, paint an encouraging picture for the role of nursing in minimizing pain and anxiety in patients on daily intramuscular analgesics.

Conclusion

Helfer Skin Tap Technique significantly reduced perceived pain and trypanophobia during intramuscular injections in this study. Patients who received the Helfer Skin Tap Technique reported substantially lower pain and trypanophobia levels compared to when they received standard injection procedures. The differences in pain and trypanophobia scores between the two techniques within the two group of patients were statistically significant.

Recommendations

1. Training programs on the use of HSTT should be offered to all medical personnel, particularly nurses working in hospitals and clinics to reduce pain during administration IM injection.
2. A broad sample size and a range of adult age groups should be used in the study in order to validate the results and draw generalizations.
3. Several pain evaluation scales can be used to do similar research.
4. The HSTT should be incorporated in the curriculum of medical surgical nursing to teach nursing students how to use it during IM analgesic injection

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