

Effects of Helfer Skin Tapping and Z – Track Techniques on Pain Intensity among Hospitalized Adult Patients Who Receiving Intramuscular Injection

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Abstract: Pain caused by some therapeutic and nursing procedures has been a major concern of health care providers. Intramuscular (IM) injection is most frequently used but causing painful experience for many individuals. Moreover, injection pain is a common complaint of patients especially chronic patients who are experiencing repeated injection that let them escape, sometimes faint, to keep away from visiting the physician, or even refuse essential treatments. Aim of the current study was to investigate the effects of helper skin tapping technique and Z-track technique on pain intensity among hospitalized adult patients who receiving IM injection. Subjects and Method, Quasi-experimental design was used in the current study. The current study was conducted in Medical- Surgical departments at Menoufia University Hospital. Total number of hundred participants were randomly alternatively divided into two equal group, 50 for each group, study group I (helper skin tapping technique) and study group II (Z-track technique corresponding to power analysis that matched with the inclusion criteria. Two tools were used to, tool (1) was a structured interview questionnaire to collect socio-demographic and clinical health data, and tool (2) was universal pain assessment. Results showed that there were significant statistically differences between Verbal Descriptor Scale/Numerical Rating Scale (NRS), Wong-Baker Facial Grimace Scale/Visual Analog Scale (VAS) and Activity Tolerance Scale before the intervention (first time of injection using standard traditional technique) and after the intervention (second and third time of injection) for both studied group itself.

Keywords: Helfer skin tapping technique, intramuscular injection, pain, Z- track technique.

I. INTRODUCTION

Pain is a multidimensional phenomenon, it is difficult to define, it is an individual and subjective experience, and no two individuals experience pain is the very same way. The international association for study of pain in 1979 defines pain as "unpleasant sensory and emotional experience associated with actual or potential tissue damage, or describe in terms of such damage (Hinkle & Cheever, 2014).

There are 16 billion Intramuscular (IM) injections administered annually throughout the world (World Health Organization, 2011). In developing countries alone, some sixteen thousand million injections are administered annually, over, 90%, are administered for therapeutic aims whereas 5 to 10% are administered for disease prevention, the foremost important side-effect associated with injections is that the related pain. Injection pain is associated with the penetration of the skin by the needle and to the mechanical and chemical effects of the drug during and after its injection. This pain remains a significant obstacle in medication administration in kids furthermore in their population subject to needle-phobia due to the past experience of pain. The associated pain may thus interfere optimized treatment for these clients (Kanika, 2011).

It is evaluated that around 10% of American adults are trypanophobic (fear of injections) and 1-3% U.K. population has some sort of fear about needles (aichmophobia) or injections (trypanophobia) in the light of fact that they are delivering pain (D'costa, 2014). Pain resulting from IM injection should not be underestimated, because in the light of fact that a painful injection might affect serious apprehension of injection, which may lead a patient to postpone looking medical help as well as, it can harm the nurse-patient relationship. Decreasing patients' pain is critical for all nurses in light of numerous reasons (Ozdemir, et al., 2013; Suhrabi & Taghinejad, 2014).

Cocoman & Murray, (2008); Hunter, (2008); Potter & Perry, (2005); and Serena, (2010) reported that injections have become common practice for nurses over the past half-century. Within the category of parenteral routes, IM injections are the most prevalent application as well as procedural pain is an important source of discomfort for patients in nursing care settings so the nurse should use a variety of interventions to relieve it.

Pain relieving measures is a most fundamental requisite of human right, thus it's the responsibility of the nurse to use best approach to pain management. Nurses have legal and ethical responsibilities for managing pain. Effective pain control measures not only alleviate discomfort that is considered as a central concept to the art of nursing, but also promote clients' quality of life. According American pain society, Pain is referred as "the fifth vital sign" to stress its significance and to improve attention of health care professionals about the importance of effective pain management strategies, as well as continuous assessment (Potter & Perry, 2005 and Zore & Dias, 2014).

It is a challenge to the nurse if there is a method by that, the nurses will give painless injections which will be an excellent relief for those patients who are scared of needles (Malkin, 2008). Different methods are used by the nurses to reduce pain during IM injections such as taping the skin, Z-track, applying pressure, applying heat and cold. Among the different physical interventions the most effective are tapping the skin and application of pressure before injections, rotation of the injection site. Application of pressure produces non-painful stimuli which block the transmission of painful stimuli to the central nervous system resulting in less pain perception. Tapping over the skin is one of the various techniques to keep the muscles relaxed. It is an accepted fact that there is reduced pain while giving injection into a relaxed muscle. Each method will have differences in their effect on the level of pain during IM injection (George; 2007; Serena, 2010 and Tournaire & Yonneau, 2010).

In 1998, Ms Joanne Helfer made an attempt to alleviate pain due to IM injection by developing 'Helfer Skin Tapping technique' in which tapping of the skin over the injection site. It is an accepted fact that there is reduced pain in giving injection into a relaxed muscle because tapping over the skin is considered one of the various techniques to keep the muscles relaxed. As well as, Helfer skin tapping technique is one of the mechanical stimulation over the skin that can alter the balance between the small diameter fibers that carry pain to the brain, and the large diameter fibers that do not carry pain. The large diameter non-pain fibers block the slower small diameter pain carrying fibers (Serena, 2010).

Malkin, (2008) added that Helfer skin tapping technique offers a painless injection experience. It provides a mechanical stimulation and distraction during IM injection and thus helps to decrease pain as described in gate control theory. In Helfer skin tapping technique rhythmic tapping before injection over the skin at the site of injection keeps the muscle relaxed and stimulates large diameter fibers.

As well as, Kozier & Erb, (2009); Nicoll & Hesby, (2002) and Pullen, (2005) who recommended for using Z-track technique for all IM injection. The Z-track technique has been found to be less painful than traditional injection technique and decrease leakage of irritating and discolouring medication into the subcutaneous tissue. Although the Z-track technique is not always used in practice, research evidence does support its effectiveness and recommends its routine use.

The Z-track technique is a method of administering an IM injection that prevents the medication being tracked through the subcutaneous tissue, sealing the medication in the muscle, lead to prevent leakage back into the subcutaneous tissue and skin so minimizing irritation from the medication. Using the Z-track technique, the skin is pulled laterally, away from the injection site, before the injection; then the medication is injected, the needle is withdrawn, and the skin is released (Figure I) (Lynn, 2011 and Jane, 2010)).

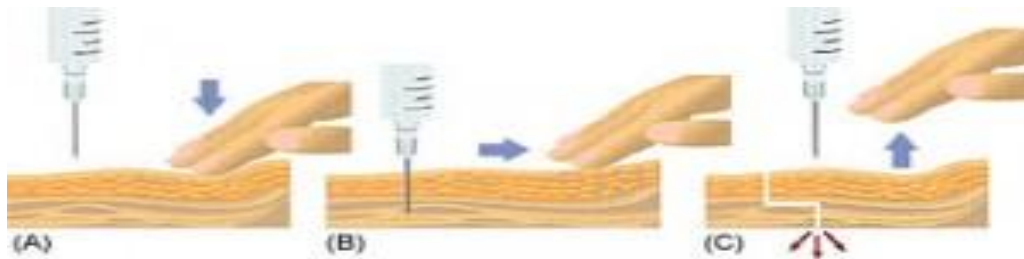


Figure (I): Jane , D. (2010). Z-Track Method. Available at: <http://nursingrib.com/nursing-notes-reviewer/fundamentals-of-nursing/z-track-method/>. Derived on: 15/6/2016.

SIGNIFICANCE OF THE STUDY:

It has been observed over a period of clinical practice with nursing students in Medical - Surgical departments that there are a number of patients complained with pain during administration of IM injections while others didn't complain as well as some patients may complain from swelling or tissue trauma at the site of injection despite using standard traditional technique of IM injection that motivate the researcher to search and carryout the current study.

In addition to, based on the literature review, there is Millions of people are plagued by a fear of injections that get them faint, avoid visiting the physician, or even discontinue essential treatments. As well as, although IM injection is not a benign intervention, and the delivery of medication is fundamental to patient care, it is often seen as a ritualistic practice shared between nurses and not based on research evidence (Carter-Templeton & McCoy, 2008; Floyd & Meyer, 2007 and Nicoll & Hesby, 2002). Moreover, the technique of IM injection has changed over the past years due to evidence-based research and changes in equipment available for the procedure (Hunter, 2008; Perry, et al., 2014 and Workman, 1999).

So, to minimize pain associated with IM injections, nurses should be familiar with recent literature and develop their skills accordingly (Hunter, 2008 and Nicoll & Hesby, 2002). To prevent pain after injection, nurses need to be knowledgeable of the assessment of pain, current evidence based practices regarding pain (Miller & Newton, 2006, Monsivais & McNeill, 2007). As well as, Altıok & Gökçe (2007) reported that nurses' techniques in giving IM injections were traditional rather than evidence based.

Researches in this area are limited on the one hand and on the other hand because this type of non pharmacological techniques can relieve the patients' pain. As well as, the current study was conducted as there was no need of any special tools but just knowledgeable nurse and it is an innovative idea to perform painless injection. Therefore, the researcher decided to conduct the current study.

AIM OF THE STUDY:

The purpose of the current study was to investigate the effects of helper skin tapping technique and Z-track technique on pain intensity among hospitalized adult patients who receiving IM injection

Operational definitions:-

- **Helper skin tapping technique:** It is a technique in which the researcher taps the muscle which is intended to use with the palmar aspect of fingers 16 times in rhythmic manner before the insertion and 3 counts while removing the needle during IM injection.
- **Z-track technique:** It is a technique in which the skin and subcutaneous tissue are pulled and held to one side 2.5–3.75 cm laterally before the needle is inserted deep into the muscle tissue in the identified site. The medication is injected at which time the needle is removed and the tissue are quickly permitted to resume its normal position.
- **Intramuscular injection:** refers to injectable vitamins supplements administered at dorsogluteal muscle among adult patients admitted in the hospital.

Research Hypothesis:

The following research hypotheses are formulated in an attempt to achieve the aim of the current study:

International Journal of Novel Research in Healthcare and Nursing

Vol. 3, Issue 3, pp: (77-94), Month: September - December 2016, Available at: www.noveltyjournals.com

- Both subjects who receive helper skin tapping technique (study group I) and subjects who receive Z-track technique (study group II) will have significantly reduce the level of pain during intramuscular injection.
- There will be significant association between the total pain score and selected socio-demographic variables of patients receiving IM injection.

II. SUBJECTS AND METHOD**Research Setting:**

The current study was conducted in Medical - Surgical departments in Menoufia University Hospital.

Research Design:

Quasi-experimental design was utilized to perform the current study.

Subjects:

The sample size for the current study was calculated 100 (50 in Helper skin tapping technique and 50 in Z-track technique) with power 80 %, confidence interval level 95 %, and sample errors 5 % and also based on previous studies (*Sivapriya & Kumari, 2015; Therese & Suriya Devi, 2014*).

Inclusion criteria

- Age: Adult patients aged 18 to 60 years old
- Sex: Both sexes
- Medication: Receiving Neurovit IM injection.
- Willing to participate in the study

Exclusion Criteria:

- Patients with chronic pain associated with other disease condition
- Sedated, critically ill and unconscious patients
- Adult patients who are receiving IM injection for the first time.
- Patients have impaired circulation, peripheral vascular disease
- Patients who had undergone any painful procedure within 1 hour of the study.

Variables:

The independent variables are Helper skin tapping technique and Z-track technique, while the dependant variable is pain intensity.

Tools:

The data was collected throughout the following two tools:

1- A structured interview questionnaire: developed by the researcher was used to collect the following data: A) the socio-demographic data of adult patients such as age, gender, educational status, marital status, and place of residence. B) clinical health data include medical diagnosis, subjective fear of IM injection, previous IM injection complications, height, weight and body mass index.

2- Universal pain assessment tool: developed by Dalton & McNaull, (1998). This tool is intended to help patient's care providers for assessing pain according to individual patient needs. It explains and uses 0-10 scale for patient self-assessment as well as, use the faces or behavioral observations to interpret expressed pain. So it includes integration among, a) Verbal Descriptor Scale or Numerical Rating Scale (NRS), b) Wong-Baker Facial Grimace Scale or Visual Analog Scale (VAS) and c) Activity Tolerance Scale:

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A - Verbal Descriptor Scale or Numerical Rating Scale (NRS) is a 0-10 scale whereas (zero) = no pain, (1-2) = mild pain, (3-6) = moderate pain, (7-8) = severe pain, (9-10) = worst pain.

B - Wong-Baker Facial Grimace Scale or Visual Analog Scale (VAS) uses the patient's facial expression for assessment whereas (zero) = alert /smiling, (1-2) = no humor /serious / flat, (3-4) = furrowed brow / pursed lips /breath holding, (5-6) = wrinkled nose / raised upper lips /rapid breathing, (7-8) = slow blink /open mouth, (9-10) = eye closed /moaning /crying.

C- Activity Tolerance Scale uses the patient's self-assessment activities whereas (zero) = no pain, (1-2) = can be ignored, (3-4) = interferes with tasks, (5-6) = interferes with concentration, (7-8) = interferes with basic needs, (9-10) = bed rest required.

Reliability of the universal pain assessment which includes numerical rating scale "NRS" and visual analog scale "VAS" was tested in the previous study that was done by Hawker, et al., (2011) for patients who suffering from rheumatic arthritis pain, the NRS test-retest reliability was ranging between $r = 0.95$ and 0.96 , while the VAS test-retest reliability was ranging between $r = 0.86$ and 0.95 .

METHOD OF THE STUDY:**1- Written Approval:**

Permission to carry out the study was taken from responsible authorities after explanation of the purpose of the study.

2- Tools development:

Tools I was developed by the researcher after reviewing of the relevant literature and content validity was tested by seven experts in the field included nurse educators and medical specialist, then modifications were done accordingly to ascertain relevance and completeness. validity and reliability was tested by using test-retest method. The other adopted tool II are used as itself without any change and its validity and reliability have been established in several studies.

3- Protection of Patient's Rights and Consent:

At the initial interview each patient was informed about the purpose and benefits of the study, and informed that their participation is voluntary, also confidentiality and anonymity of the patients were assured. Finally, patients' formal consent for participants has been obtained.

4- Pilot study:

A pilot study was conducted on 10% of study sample (10 patients) to evaluate the developed tools for clarity and applicability then necessary modification was carried out. The data that was obtained from the pilot study was not included in the actual study.

5- Data collection:

- Data collection was extended from the first of January to the end of June 2016.
- Each patient who agreed to participate in the study and fulfilling the inclusion criteria has been interviewed individually Medical-Surgical departments in Menoufia University Hospital.
- A convenient sample was divided randomly and alternatively into two equal groups:
 - *Study group (1)*: received Helfer skin tapping technique during administration of IM injection
 - *Study group (2)*: received Z-track technique during administration of IM injection
- **Data collection was passed as the following:**
 - a) Patient was interviewed by the researcher to fill out the socio-demographic characteristics and clinical health data.
 - b) By considering the several factors that might affect on pain during injection, such as drug and amount injected, technique used, needle size, patient position, and speed of delivery. Therefore, the IM injection protocol for all patients and technique (table I) is used for standardization of these factors and would manipulate all patients in the same manner.

TABLE (I) INTRAMUSCULAR INJECTION PROTOCOL FOR ALL PATIENTS AND TECHNIQUES

FACTOR	DESCRIPTION
Drug	Neurovit.
Amount of drug	3 ml
Syringe size	24 gauge
Site	Site Right and left dorsogluteal site
Position	Right/ left side-lying position with knee flexed
Wipe Area	Cleansed with alcohol and allowed to air-dry before needle insertion
Insertion angle	Angle 90°
Aspiration	Aspirated
Speed	Rapid
Needle withdrawal	At the same angle as insertion
After the injection	Light pressure applied at the injection site and not massaged
Researcher	One

c) In the first time, patient was served as a control group where was no intervention , the researcher administered IM injection of Neurovit vitamin by using standard traditional technique to the patient in dorsogluteal muscle in side lying with a flexed knee as well as the patient’s face point toward the researcher. Then the pain was recorded just immediately after IM injection.

d) In the two subsequent doses were administered to the same patients who were served as a study groups because Helder skin tapping technique was applied for study group I and Z-track technique was applied for study group II. The researcher positioned the patient in side lying with a flexed knee as well as the patient’s face point toward the researcher. Then the pain was recorded just immediately after IM injection for two subsequent doses.

6- The comparison was done between two groups to investigate the aim of the current study

STATISTICAL ANALYSIS:

The collected data were tabulated and analyzed by SPSS (statistical package for the social science software) version 20 on IBM compatible computer.

Two types of statistics were done:

1) **Descriptive statistics:** were expressed as mean and standard deviation (X+SD) for quantitative data or number and percentage for qualitative data.

2) **Analytic statistics:**

1- Chi-square test (χ^2): It is the test of significance used to study association between two qualitative variables.

2- Mann-Whitney test (non-parametric test): is a test of significance used for comparison between two groups not normally distributed having quantitative variables.

3- T- test: is a test of significance used for comparison between two groups of normally distributed quantitative variables.

4- Kruskal-Wallis test: is a test of significance used for comparison between three groups that not normally distributed quantitative variables.

5- Repeated-Measures ANOVA: is a test of significance used when the researcher had a single line of data for each participant, with the repeated measures entered as separate variables on that same line

6- Spearman correlation was used for quantitative variables that were not normally distributed or when one of the variables is qualitative.

P-value at 0.05 was used to determine significance regarding:

- P-value > 0.05 to be statistically not significant.

- P-value ≤ 0.05 to be statistically significant.
- P-value ≤ 0.001 to be highly statistically significant.

III. RESULTS

TABLE (II): SOCIO-DEMOGRAPHIC CHARACTERISTICS FOR BOTH STUDIED GROUPS

Socio-demographic characteristics	Studied groups				Test of significance	P value
	Group I (Helfer skin tapping) (n=50)		Group II (Z-track technique) (n=50)			
	No.	%	No.	%		
Age (years):					t- test = 0.12	0.90 NS
Mean±SD	39.72 ± 11.36		39.44 ±10.98			
Range	20.0 – 58.0		20.0 – 58.0			
Age categories (years):					χ^2 =0.08	0.99 NS
18-29	10	20.0	10	20.0		
30-39	15	30.0	16	32.0		
40-49	15	30.0	15	30.0		
50-60	10	20.0	9	18.0		
Gender:					χ^2 =0.04	0.84 NS
Male	26	52.0	27	54.0		
Female	24	48.0	23	46.0		
Education:					χ^2 =0.05	0.99 NS
Illiterate	23	46.0	22	44.0		
Read & write	5	10.0	5	10.0		
Middle education	14	28.0	15	30.0		
High education	8	16.0	8	16.0		
Occupation:					χ^2 =0.04	0.97 NS
Working	22	44.0	23	46.0		
Not working	9	18.0	9	18.0		
Housewife	19	38.0	18	36.0		
Marital status:					χ^2 =0.35	0.95 NS
Single	16	32.0	14	28.0		
Married	25	50.0	25	50.0		
Widowed	6	12.0	7	14.0		
Divorced	3	6.0	4	8.0		
Residence:					χ^2 =0.04	0.84 NS
Rural	27	54.0	26	52.0		
Urban	23	46.0	24	48.0		

Table (II) showed that the mean age for study group I was 39.72 ± 11.36 while for study group II was 39.44 ± 10.98 , and more than half of study group I and II were males (52% & 54% respectively). Regarding to education and occupation, the majority of study group I and II were illiterates and worked (46% & 44%; 44% & 46% respectively). In relation to marital status half of study group I and II were married (50 % & 50% respectively). Concerning to residence, more than half of study group I and II lived in rural areas (54% & 52% respectively). Moreover, there were not significant statistically differences between study group I and II regarding socio-demographic characteristics.

TABLE (III): CLINICAL HEALTH DATA FOR BOTH STUDIED GROUPS

History	Studied groups				Test of significance	P value
	Group I (Helfer skin Tapping) (n=50)		Group II (Z-track technique) (n=50)			
	No.	%	No.	%		
Fear of IM injection:						
Yes	21	42.0	22	44.0	$\chi^2 = 0.04$	0.84 NS
No	29	58.0	28	56.0		
Previous complication of IM injection:						
Yes	19	38.0	21	42.0	$\chi^2 = 0.16$	0.68 NS
No	31	62.0	39	58.0		
Medical diagnosis:						
Liver diseases	13	26.0	14	28.0	$\chi^2 = 2.17$	0.70 NS
Renal diseases	10	20.0	9	18.0		
Hematological disease	11	22.0	9	18.0		
Surgical interventions	8	16.0	13	26.0		
Orthopedic	8	16.0	5	10.0		

Table (III) revealed that more than half of study group I and II had not fear of IM injection (58% & 56% respectively) and had not previous complication of IM (62% & 58% respectively). In relation to medical diagnoses, the majority of study group I and II had liver disease (26% & 28% respectively). No significant statistically differences were found between study group I and II regarding clinical health data.

TABLE (IV): BODY MASS INDEX FOR BOTH STUDIED GROUPS

Anthropometric measurements	Studied groups				Test of significance	P value
	Group I (Helfer skin tapping) (n=50)		Group II (Z-track technique) (n=50)			
Height (cm):						
Mean±SD	166.78 ± 7.20		167.18 ± 7.11		t- test = 0.27	0.78 NS
Range	157.0 – 180.0		157.0 – 180.0			
Weight (Kg):						
Mean±SD	74.26 ± 13.49		73.85 ± 13.19		t- test = 0.15	0.87 NS
Range	52.0 – 92.0		52.0 – 92.0			
BMI:						
Mean±SD	26.46 ± 6.34		26.18 ± 6.22		t- test = 0.22	0.82 NS
Range	17.0 – 36.0		17.0 – 36.0			
BMI categories:	NO.	%	NO.	%		
<18.5 (underweight)	5	10.0	5	10.0	$\chi^2 = 0.05$	0.99 NS
18.5 - 24.9 (normal)	22	44.0	23	46.0		
25 - 29.9 (overweight)	5	10.0	5	10.0		
30 - 39.9 (obese)	18	36.0	17	34.0		

Table (IV) presented that the majority of study group I and II had normal body mass index with mean (26.46 ± 6.34 & 26.18 ± 6.22 respectively). Moreover, there were not significant statistically differences between study group I and II concerning body mass index.

TABLE (V): MEANS AND STANDARD DEVIATION OF UNIVERSAL PAIN ASSESSMENT FOR BOTH STUDIED GROUPS IN THREE TIMES OF INJECTION

Universal Pain assessment	Studied groups				Test of significance	P value
	Group I (Helfer skin tapping) (n=50)		Group II (Z-track technique) (n=50)			
	Mean±SD		Mean±SD			
1) Verbal Descriptor Scale						
• First injection	3.64±1.89		3.52±1.79		U=0.27	0.78 NS
• Second injection	1.38±1.0		1.34±1.02		U=0.20	0.83 NS
• Third injection	1.32±1.01		1.28±1.03		U=0.17	0.86 NS
Test of significance	F=195.77		F=197.37			
P value	≤0.001 HS	P1=≤ 0.001 P2=≤ 0.001 P3=0.08	≤0.001 HS	P1=≤ 0.001 P2=≤ 0.001 P3=0.08		
2) Wong-Baker Facial Grimace Scale						
• First injection	3.24±1.64		3.16±1.60		U=0.22	0.82 NS
• Second injection	1.20±0.94		1.18±0.98		U=0.12	0.90 NS
• Third injection	1.18±0.96		1.14±1.01		U=0.21	0.82 NS
Test of significance	F=151.73		F=166.32			
P value	≤0.001 HS	P1=≤ 0.001 P2=≤ 0.001 P3=0.32	≤0.001 HS	P1=≤ 0.001 P2=≤ 0.001 P3=0.15		
3) Activity Tolerance Scale						
• First injection	2.96±1.42		2.88±1.36		U=0.23	0.81 NS
• Second injection	1.12±0.87		1.64±1.04		U=2.37	0.01 S
• Third injection	1.08±0.94		1.60±1.08		U=2.35	0.01 S
Test of significance	F=151.51		F=112.63			
P value	≤0.001 HS	P1=≤ 0.001 P2=≤ 0.001 P3=0.42	≤0.001 HS	P1=≤ 0.001 P2=≤ 0.001 P3=0.15		

U= Mann-whitney

F= repeated measure ANOVA

P1: Comparison between first injection and second injection.

P2: Comparison between first injection and third injection.

P3: Comparison between second injection and third injection

Table (V) showed that there were significantly lower mean values for both study group I and II itself concerning to three component of universal pain assessment in second and third time of injection compared to first time of injection. Moreover, there were not significant statistically differences between second and third time of injection for both study group I and II itself. As well as, there were no significantly statistically differences between study group I and II regarding three component of universal pain assessment except in activity tolerance scale especially in second and third time of injection, where p- value = 0.01; p- value = 0.01 respectively.

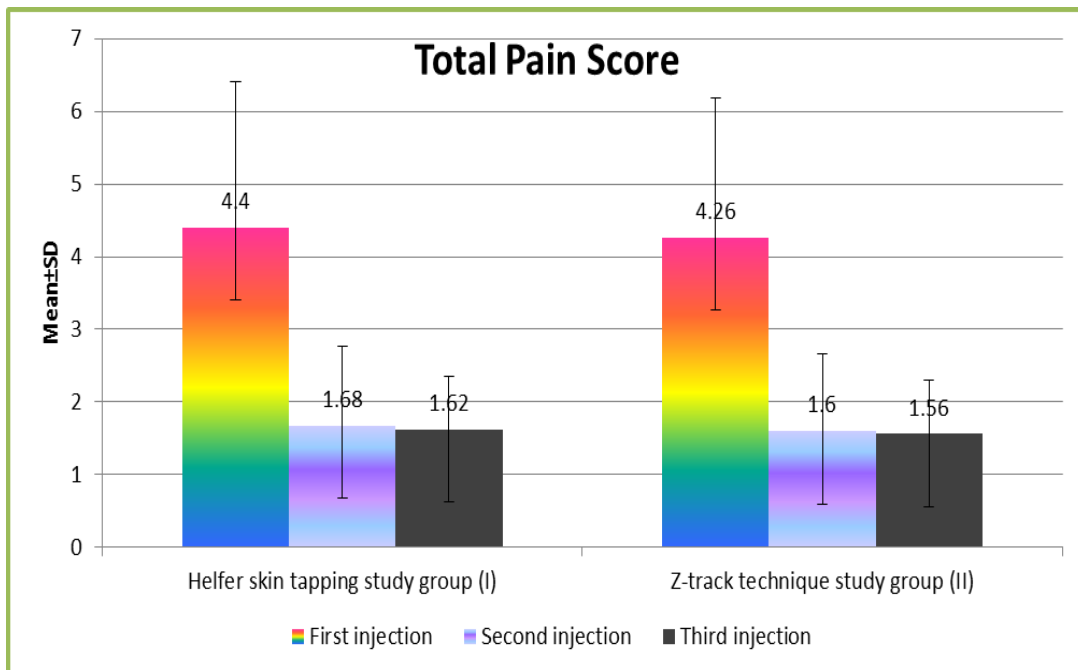


FIGURE (II): MEANS AND STANDARD DEVIATION OF TOTAL PAIN SCORE FOR BOTH STUDIED GROUPS IN THREE TIMES OF INJECTION

Figure (II) reported that there were highly significant decreasing of total pain in second and third times of injection for both study group I and II itself compared with the first time of injection, where P value = ≤ 0.001 and ≤ 0.001 respectively.

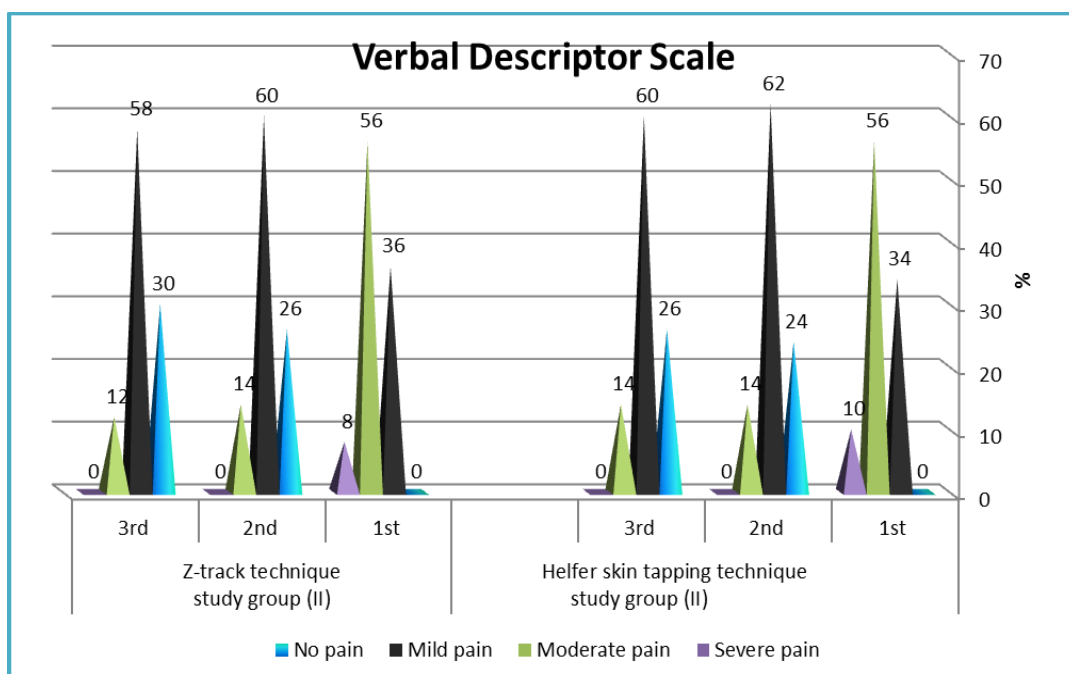


FIGURE (III): DISTRIBUTION OF VERBAL DESCRIPTOR SCALE/VAS FOR BOTH STUDIED GROUPS IN THREE TIMES OF INJECTION

Figure (III) showed that more half of study group I (Helper skin tapping) had moderate pain (56%) and (56%) for study group II (Z-track technique) in first time of injection but the majority of study group I and II in second and third time of injection had mild pain (62% & 60 % respectively) and (60% & 58% respectively).

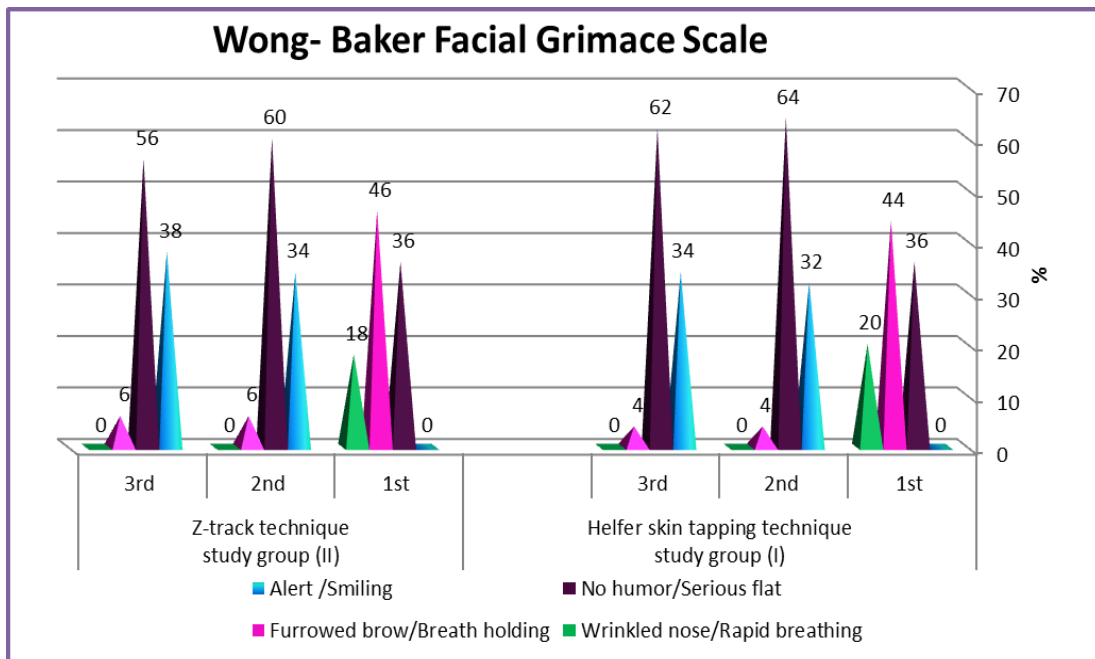


FIGURE (IV): DISTRIBUTION OF WONG-BAKER FACIAL GRIMACE SCALE FOR BOTH STUDIED GROUPS IN THREE TIMES OF INJECTION

Figure (IV) showed that the majority of both study group I (Helper skin tapping) and study group II (Z-track technique) had no humor/serious flat in second and third time of injection (64% & 60 % respectively) and (62% & 56% respectively) but in the first time of injection had furrowed brow/breath holding ((44% & 46% respectively).

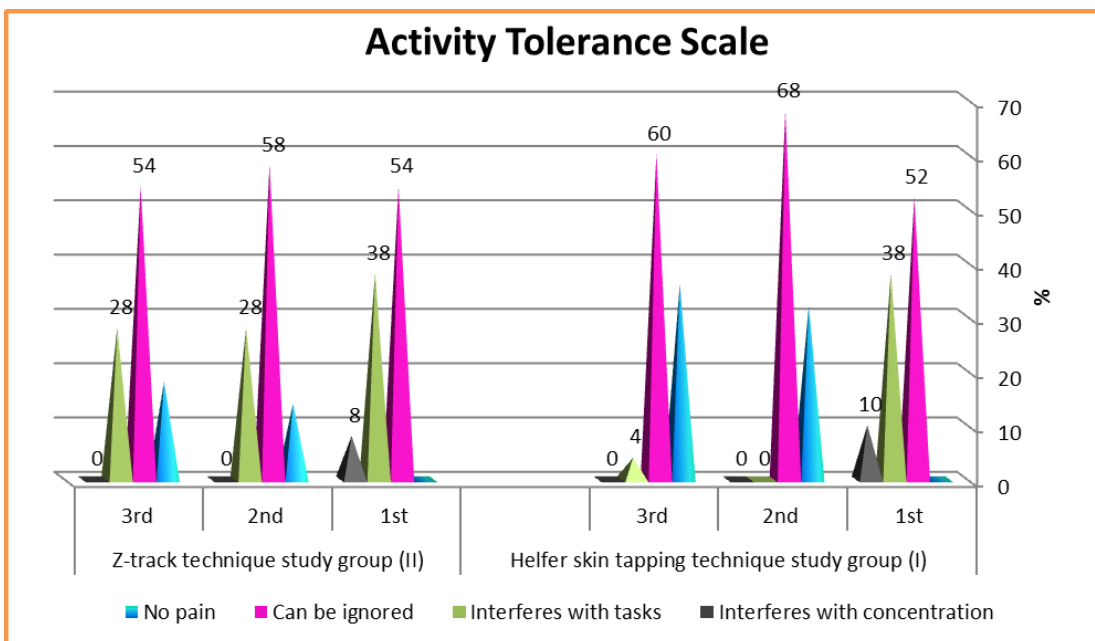


FIGURE (V): DISTRIBUTION OF ACTIVITY TOLERANCE SCALE FOR BOTH STUDIED GROUPS IN THREE TIMES OF INJECTION

Figure (V) reported that the majority of both study group I (Helper skin tapping) and study group II (Z-track technique) can be ignored the pain as a result of IM injection in three times of injection, in the first time (52% & 54% respectively), in the second time (68% & 58% respectively) and in third time (60% & 54% respectively). As well as there were significant statistically differences between study group I and II regarding activity tolerance in the second and third time of injection.

TABLE (VI): RELATIONSHIP BETWEEN SOCIO-DEMOGRAPHIC CHARACTERISTICS AND BODY MASS INDEX WITH TOTAL PAIN SCORE

	Total score of pain scale	Test of significance	P value
	Mean ± SD		
Age categories (years):			
18-29	5.30±2.45	K =9.81	≤ 0.02 S
30-39	3.13±1.40		
40-49	4.33±0.72		
50-60	5.50±2.63		
Gender:			
Male	3.23±1.10	U =4.23	≤ 0.001 HS
Female	5.66±1.99		
Education:			
Illiterate	4.95±1.79	K =16.02	≤ 0.001 HS
Read & write	3.00 ±0.0		
Middle education	5.07±2.33		
High education	2.50±0.53		
Occupation:			
Working	3.45±1.05	K =7.40	≤ 0.02 S
Not working	5.11±2.97		
Housewife	5.15±1.92		
Residence:			
Rural	5.14±2.28	U =2.41	≤ 0.01 S
Urban	3.52±1.12		
Marital status:			
Single	4.93±2.23	K =16.89	≤ 0.001 HS
Married	3.48±1.0		
Widowed	7.50±1.22		
Divorced	3.0±0.0		
BMI	r		≤ 0.003 S
	0.40		

r=spearman correlation

Table (VI) presented that there were significant statistically differences correlations between age, gender, education, occupation, residence, marital status and body mass index with total pain score where, p value = ≤ 0.02; ≤ 0.001; ≤ 0.001; ≤ 0.02; ≤ 0.01; ≤ 0.001 and ≤ 0.003 respectively.

IV. DISCUSSION

The aim of the current study was to investigate the effects of helper skin tapping technique and Z-track technique on pain intensity among hospitalized adult patients who receiving IM injection. To fulfill the aim of this study, two tools were used to collect the socio-demographic and clinical health data as well as universal pain assessment. The study was conducted with 100 adult patients receiving Neurovit IM injection (50 for helper skin tapping technique study group I and 50 for Z-track technique study group II) in Medical- Surgical departments at Menoufia University Hospital.

Regarding socio-demographic characteristics, the study subjects' age ranged from 20 to 58 years, with mean 39.72±11.36 for study group I and 39.44±10.98 for study group II. In this context, a series of studies assessed pain after IM injection works on the same age group and agreed with the results that were mentioned by Güneş, et al., (2013); Kanika, et al., (2011), and Ağaç & Güneş, (2010). In addition to, the study done by Lakhani, et al., (2014), who worked on the intensity of pain experienced by respondents given IM injection with/without skin tapping technique mentioned that the age group was 20- 50 years.

According to gender, more than half of study subjects were male. In this regard, this is not consistent with a series of studies that assessed pain intensity after IM injection that found more than half of study subjects were females as were mentioned by Lakhani, et al., (2014) and Zore & Dias,(2014).

In relation to marital status of current study subjects, about half of the patients, were married. This is consistent with Ramadan, et al., (2016) who found that more than half of patients, were married. Regarding to educational level of current study subjects, the majority of the patients were illiterate. These patients' educational characteristic did not similar to Ramadan, et al., (2016), Lakhani, et al., (2014); Zore and Dias, (2014) who found that about half of the subjects had basic/intermediate education. In relation to residence, the majority of patients were from rural regions that affiliate and receive medical treatment in Menoufia University hospital, this finding was agreement with Ramadan, et al., (2016) who reported that the majority of study subjects were from rural region.

In relation to clinical health data in the current study, The majority of study subjects were diagnosed with liver disease for both studied groups. This was in line with Ramadan, et al., (2016) who reported that the majority of study sample were patients diagnosed with liver disease. On point of view, Menoufia governorate had the largest institute of liver in Middle East so it is aimed from all patients who complained from liver diseases.

Regarding to the body mass index in the current study, the majority of the patients had normal body mass index (BMI) that was ranged from 18.5 to 24.9 with mean 26.46 ± 6.34 for study group I and 26.18 ± 6.22 for study group II. This may due to the majority of the patients were male as well as were worked, this was in agreement with Lakhani, et al., (2014) who found that a large portion of the respondents had a BMI ranging 18.5-24.9 which meant that they had normal body weight as well as, Suhrabi & Taghinejad, (2014) found that BMI were (23.74 ± 4.45 vs. 23.88 ± 5.74). In the opposite direction with Ramadan, et al., (2016) who reported that body mass index was mean 31.0 ± 4.3 and two-third of study subjects were obese.

EFFECT OF HELPER SKIN TAPPING TECHNIQUE ON REDUCING PAIN INTENSITY:

In present study, it revealed that the pain score was reduced when IM injections were administered using Helper Skin Tapping Technique (second and third time of injection) rather than routine standard technique (first time of injection) and there were highly significant decreasing of total pain in second and third times of injection for study group I itself. This finding come congruent with Hassnein & Soliman, (2016) who were reported the same result. In addition to, Serena, (2010) conducted a quasi-experimental study (one group pre-test and post-test design) was conducted on 60 patients in India to assess the effectiveness of Helper skin tap technique on pain in relation to IM injection as well as the study revealed that the effectiveness of Helper Skin Tap Technique has produced a statistically highly significant in reducing pain during IM injection among patients at $p < 0.05$ level. The same of these result reported by Helfer, (2010) reported that the perception of pain intensity is lessen when IM administer using Helfer technique. Moreover, A study was conducted in US, by an emergency room nurse regarding painless injection technique; the investigator tapped the gluteus maximus muscle before inserting the needle and while removing the needle. This study concluded that by following helper skin tap technique patient experienced less pain while receiving IM injection (Joanne, 2000).

When comparing effectiveness of Helfer technique and Traditional standard technique, by using universal pain assessment before and after the intervention, that consisted from the verbal descriptor pain scale or NRS, Wong Baker facial Grimace Scale and activity tolerance scale, the present study showed that there was a significant positive for the previous three mentioned items before and after the intervention between the first and second time of injection as well as between first and third time of injection.

Moreover, by using verbal descriptor pain scale or NRS that demonstrated pain level, the findings of the current study demonstrated that the majority of the patients had mild pain level on application of Helfer skin technique in second and third time of injection in study group I while in traditional standard technique (first time of injection) had moderate pain. This findings of the current study was congruent with Mini, et al, (2014) who reveled that pain level decrease on experimental group due to application of skin tapping as majority of experimental group reporting mild pain. The same of Zore & Dias, (2014) illustrated that pre test cases reporting moderate pain while post test reporting mild pain. Although Serena,(2010) who founded that one third of patient has no pain with IM administration on verbal rating scale.

Concerning, Wong Baker facial Grimace Scale, it was no humor/serious flat in the majority of the patients on Helfer Skin Tapping Technique in second and third time of injection but furrowed brow in traditional standard technique, this was not consistent with the results that reported by Hassnein & Soliman, (2016) who found that alert/smiling on the majority of patient on helper technique and furrowed brow and wrinkled nose for traditional technique.

According to activity tolerance scale, more than the half of study group I (Helfer skin tapping) can be ignored the pain as a result of IM injection in three times of injection, as well as , about one third of patient has no pain with IM injection in second and third time of injection. This was not in a line with Hassnein & Soliman, (2016) who reported that more than half of the patients having no pain on Helfer technique and more than one third have pain that can be ignored on traditional standard technique

EFFECT OF Z- TRACK TECHNIQUE ON REDUCING PAIN INTENSITY:

In present study, it revealed that the pain score was reduced when intra muscular injections were administered using Z-track technique (second and third time of injection) rather than routine standard technique (first time of injection) and there were highly significant decreasing of total pain in second and third times of injection for study group II itself. This findings come congruent with Keen, (2010) who reported that when the Z- track intramuscular injection technique was compared with the standard injection technique for occurrence and severity of pain and lesions at the injection site. The Z-track technique significantly reduced incidence of pain and lesions at selected time intervals, severity of discomfort at selected time intervals, and severity of lesions at all-time intervals post injection.

As well as, Jolae, et al., (2013) who applied a comparative study on pain caused by standard and Z-track method for I.M injection, The results showed that the pain associated with IM injection was significantly decreased when Z-Track method was used. Moreover, Beyea & Nicoll, (1995) and Keen, (1990) suggested that the Z-track technique should be used with the full range of IM medications, as it is believed to reduce pain as well as the incidence of leakage.

RELATION OF SOCIO-DEMOGRAPHIC CHARACTERISTICS AND PAIN SCORE:

According to present study there was a significant relation between pain score and age, the age group (50- 60) and (18-29) have higher degree of pain and decreased on age group (30 -39). This findings come congruent with Ozdemir, et al., (2013) reported that higher injection pain was associated with increased age. In addition to, Potter & Perry , (2005) as well as Cupitt & Kasipandian, (2004) mentioned that IM injections can exacerbate muscle pain due to the loss of muscle tone, strength and mass in older adults. Although these results not supported by Osamu, (2014) who reported that pain intensity didn't significantly differ by age group. In addition to, Komiyama , et al., (2007) reported that age does not affect on injection pain.

In the current study, regarding to sex, the females have higher pain level than males, this was consistent with Hassnein & Soliman, (2016) and Racheal, (2012) who reported that women feel pain more than men and also Jerin, (2011) founded that the mean value of pain level is greater in female than male. Nearly to that Chan, (2003) reported female were reporting more pain from all IM injection than men. As well as, Chan, et al., (2006) explained that women have more subcutaneous tissue in the buttocks when compared with men and pain receptors are located within the subcutaneous layer, not in muscle tissue. Thus, women consistently report more pain from all IM injections. But this was opposing to Ozdemir, et al., (2013) found that pain intensity for men was higher than for women. In the same of context, Antonio, et al, (2012) found that no sex differences between male and female in prevalence and intensity of pain.

Concerning to marital status , these results revealed that pain level increased in widowed patients and this was not consistent with Hassnein & Soliman, (2016) who mentioned that pain level increased in divorced patients . As regarding to education , the present study showed that middle education had more pain level while high education had less pain , these also near to Hassnein & Soliman, (2016) who mentioned that middle education have more pain level while illiteracy have less pain. Although, Ozdemir, et al.,(2013) reported that patient with higher level of education have more pain intensity, and these findings contradict with those of Antonio, et al., (2012) who mentioned that low educational level increase pain intensity . According to residence, the present study showed that pain level increased in people coming from rural than urban areas. This was not consistent with Hassnein & Soliman, (2016) who showed that pain level increased in people coming from urban than rural areas. As well as, by Tripp, et al., (2006) who reported that being female, low income

and rural residence associated with greater pain, on the other side Komiyama, (2014) mentioned that the place of residence doesn't affect pain intensity.

V. RECOMMENDATIONS

In the light of the findings obtained from the current study the following recommendations are derived and suggested in nursing.

a) Recommendation for nursing practice:

- Helper Skin Tapping and Z-track techniques can be adapted to the procedure of IM injection. Nurses can be taught about the Helper Skin Tapping and Z-track techniques; and it can be practiced in the clinical setting.

b) Recommendations for nursing education:

- Helper skin tapping and Z-track techniques can be included in the literature on IM injection.
- The procedure of using Helper Skin Tapping and Z-track techniques for IM injection can be included into the nursing curriculum.
- Nursing students can be taught about Helper Skin Tapping and Z-track techniques for IM injection.

c) Recommendations for nursing administration:

- Policies for the procedure of IM injection can be developed based on the study findings by incorporating Helper Skin Tapping and Z-track techniques into the procedure.
- Nurse Managers can update about the procedure of IM injection using Helper Skin Tapping and Z-track techniques as well as educate nurses about it through in-service education programs.
- Nursing administrators can motivate nurses to use Helper Skin Tap and Z-track techniques in their clinical areas.

d) Recommendations for future nursing researches

- Replication of the study using a larger probability sample from different geographical areas to attain more generalizable results.

VI. CONCLUSION

Injection itself is a fear to all irrespective of the ages because it causes pain. It is a foremost responsibility of the health care giver to provide a care for easing of discomfort like pain by using Helper Skin Tapping and Z-track techniques for IM injection . So that the health care receiver will be much benefited without any hurdles. So in future these kinds of studies definitely will be useful to the entire health care delivery system.

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