

# The Effects of Planned Program on Nurses ' Practices for Intramuscular Injection Among Pediatric

Mariam Majeed Fahd<sup>1</sup>, Adraa Hussein Shawq<sup>2</sup>

1-Academic Nurse, College of Nursing, University of Baghdad, Iraq

2-Assist. Prof, College of Nursing, University of Baghdad, Iraq

Correspondence to: Mariam Majeed Fahd, Email: Mariam.fahd2104m@conursing.uobaghdad.edu .iq

**Background & Objective:** Inappropriate practice and medical error during intramuscular injection can lead to series of complications especially among pediatric. The study aimed to determine the effect of planned program on nurses ' practices during intramuscular injection.

**Methods:** A quasi-experimental design conducted in Mohamed AL-Mousawi Hospital for Children in Iraq. A non-probabilities sample of (40) nurses divided in two groups, interven and control groups. The planned program was constructed based on CDC guideline(2018) [1] Nurses practice were evaluated by using checklist observation scale. The data was analysis by SPSS program.

**Results:** The finding showed, (30%) of nurses' practice were inadequate before application planned program. However, after program intervention most of nurses recorded adequate level of practice. While the nurses in the control group still scored at inadequate level of practice. The study showed a significant difference among interven group practice during study period at P value (0.05) .

**Conclusion:** The planned program has significant effects on improve nurses practice for IM injection among pediatric.

**Recommendations:** Adapt the planned program as guideline to develop nurses' practice about intramuscular injection for pediatric, reduce IM injection administration as possible among young children.

**Keywords:** Pediatric, IM injection, Nurses practice.

## Introduction

Nurses must be sufficiently skilled and aware, during administer medication especially though injection site due to the numerous dangers connected with intramuscular injections (IM). Nurses are in charge with preparing and safely administering medications as well as keeping patient safety [2].

Parenteral injection administration are typically used to provide faster effect, when the proper technique is not applied and the injection area is not correctly detected complications may be result [3]. Use the appropriate syringe and needle for therapeutic (antibiotics and hormones) and preventative (vaccinations) purposes consider essential practice of nurses' job. [4] According to the World Health Organization (WHO), around 16 billion injections are administered annually for either preventive or therapeutic purposes [5]. The child's age, amount of medication and the degree of muscular development are taken into account while choosing the IM injection site [6].

To prevent any neurovascular problems when administering IM injections, there are specific landmarks to take into account. The Ventrogluteal, Deltoid, Vastus Lateralis, and Dorsogluteal are the

precise landmarks for the sites that are used the most frequently [7]. Due to the risk of sciatic nerve injury, it is not advised to use the dorsogluteal location on children [4]. The vastus lateralis muscle should be used from birth to age 2, and the deltoid muscle should be used in children older than three [8].

The ventrogluteal site was originally utilized as an intramuscular injection site by Hochstetter at the beginning of the 1950s. According to the literature, both adults and children have well-developed ventrogluteal site muscles, which allow for use of the site in young children after seven months [9]. Many researchers stress how crucial it is to have instructions for administering IM injections during training and practice in order to ensure the patient's safety [10].

Nerve damage, discomfort, muscle contracture, bacterial abscesses, cellulitis, tissue necrosis, gangrene, local atrophy, and accidentally injecting into a joint space are among complications connected to intramuscular injection (IM) [11]. gluteal injection-related sciatic nerve injury is an iatrogenic injury that can have serious health repercussions, particularly in children from impoverished nations [12].

For the IM injection process, two needles are advised. In order to avoid discomfort, pain, and potential consequences, one needle is used to prepare the medication and the other for injection. In order to ensure that the needle reaches the muscle, intramuscular injections are placed at a 90° angle. Since Z-track approach lessens pain, it is preferable [13].

Skin-to-skin contact, pressure, and lidocaine-prilocaine topical agents are among the genic therapies appropriate for newborns. Breastfeeding is advised as the primary choice of analgesia during injections, and sucking on sucrose solution is an efficient way to lessen injection pain [14].

It is thought that the nursing practice in the implementation of the intramuscular administration of medication in pediatrics presents a divergence with what is recommended in the scientific literature regarding the technique, muscle choice, and pre and post procedure guidelines. This would allow for a better applicability of the intramuscular medication administration process in pediatrics [15].

**Methods:**

To determine program effectiveness, a quazi experimental design was used (post I & II) that included two groups. A non-probability sample of (40) nurses were participated in the study, they was work in emergency unit, outpatient consulting and neonate care unit .These nurses were divided in two groups, each group included (20) nurses ,as interven and control group. The intervention group was

exposed to the program, while the control group was not. The study starting from 1<sup>th</sup> of February to 15<sup>th</sup> May 2023.

The study conducted at Mohamed AL-Mousawi Hospital for children, in Iraq. This hospital was selected because it the only hospital that provide pediatric health care at different age groups and cases. The planned program was constructed according to CDC guideline (2018) [1] and nurses practice were evaluated by observational checklist scale in order to determine nurses gap about IM injection practice. That include main steps of IM injection site among children and safe practice.

Nurses practice was evaluated by observation checklist scale that used by the researches Souza et al, (2018), in their study about Patient safety during intramuscular injection in pediatrics in Brazil(14). This checklist scale document accepted validity and reliability the observation checklist consists of (20) items about main practice steps during intramuscular injection, safety measurement, and common site of injection among pediatric. Nurses practice was scoring: Never = 1 Sometimes = 2 Always= 3 The level of nursing practice was evaluated by (Inadequate practice= 20-33.33, fair practice=33.34-46.66 and adequate practice=46.67-60). The interven group was exposed to the planned program, while the control group was not. Their practice during IM injection was recorded 3period (preprogram implementation, after program and after one month of program implementation).

**Results**

**Table 1. Distribution of Study Sample by their Socio-Demographic Variables**

Variables	Classification	Study Group		Control Group		$\chi^2$ Sig.
		No.	%	No.	%	
Age	20-24 years old	8	40.0	9	45.0	5.146 .821
	25-29 years old	6	30.0	8	40.0	
	30-34 years old	1	5.0	2	10.0	
	35 to 45	5	25.0	1	5.0	
	<b>M ± SD</b>	<b>28.25 ± 7.96</b>		<b>25.96 ± 3.20</b>		
Gender	Male	3	15.0	7	35.0	1.241 .183
	Female	17	85.0	13	65.0	
Workplace	Emergency department	8	40.0	6	30.0	5.418 .227
	Outpatient consultation	4	20.0	5	25.0	
	Neonate Care Unit	8	40.0	9	45.0	
Education level	School Nursing	7	35.0	5	25.0	1.487 .829
	Diploma Nursing	10	50.0	11	55.0	
	B.Sc Nursing	3	15.0	4	20.0	
Years of Experience	1-5 years	11	55.0	14	70.0	2.216 .696
	6-10 years	6	30.0	5	25.0	
	10-15 years	3	15.0	1	5.0	

No.= Number; %= Percentage;  $\chi^2$ =Chi-square

The results showed that the mean age of the participants in the study and control group were (28.25 ± 7.96) group (25.96 ±3.20). respectively, high percentage of them were recorded at age group 20-24 years (40,45%) respectively. In terms of gender, the high percentage of participants were female in both groups (85% and 65%) respectively. Workplace-related findings, high percentage of the

participants were work at emergency and neonate care unit (40%, 40%), (30%,45%) respectively. With regard to the educational level, diploma in nursing was predominant in the study and control groups (50% and 55%) respectively. Years of experience associated findings showed, more than half of them reported 1-5 years of experience in their workplace (55% and 70%) respectively.

**Table (2): Overall Nurses' Practices about Intramuscular Injection for Children Under Two Years for (Study Group)**

Study G. Practices	Pre-test			Post-test I			Post-test II		
	No.	%	M ± SD	No.	%	M ± SD	No.	%	M ± SD
Inadequate	6	30.0	30.55 ± 6.41	3	15.0	50.35 ± 3.95	6	30.0	47.8 ± 5.68
Fair	14	70.0		0	0.0		1	5.0	
Adequate	0	0.0		17	85.0		13	65.0	
Total	20	100		20	100		20	100	

[Inadequate (I)= 20-33.33, Fair (F)= 33.34-46.66, Adequate (A)= 46.67-60]

The Finding, showed most of the nurses' in study group expressed a Fair practice about intramuscular injection (70%) at pre-test period with mean score (30.55; ± 6.41) that classified as. While

at the post-test I& II the finding, showed high percentage nurses expressed adequate practice (85%,65%) with mean score (50.35; ± 3.95) (47.8; ± 5.68) respectively.

**Table (3): Overall Nurses' Practices about Intramuscular Injection for Children Under Two Years (Control Group)**

Control G. Practices	Pre-test			Post-test I			Post-test II		
	No.	%	M ± SD	No.	%	M ± SD	No.	%	M ± SD
Inadequate	6	30.0	32.55 ± 7.68	7	35.0	32.8 ± 7.21	6	30.0	32.4 ± 7.20
Fair	13	65.0		12	60.0		13	65.0	
Adequate	1	5.0		1	5.0		1	5.0	
Total	20	100		20	100		20	100	

[Inadequate =20-33.33, Fair=; 33.34-46.66, Adequate =46.67-60]

The Finding showed, most of nurses in control group expressed fair level of practice all study period measurement (pre-test, post-test I & II

.With mean score (32.55; ± 7.68) (32.8; ±7.21) (32.4; ± 7.20) respectively.

**Table (4): Statistical Differences between Nurses' Practices and Their Socio – Demographic Data (Study Group)**

Practices	Source of variance	Sum of Squares	d.f	Mean Square	F-statistic	Sig.
Age	Between Groups	.249	3	.083	2.699	.081
	Within Groups	.492	16	.031		
	Total	.741	19			
Gender	Between Groups	.080	1	.080	2.186	.157
	Within Groups	.661	18	.037		
	Total	.741	19			
Workplace	Between Groups	.497	2	.248	17.254	.000
	Within Groups	.245	17	.014		
	Total	.741	19			
Education level	Between Groups	.008	2	.004	.093	.912

	Within Groups	.733	17	.043		
	Total	.741	19			
Years of Experience	Between Groups	.150	2	.075	2.149	.147
	Within Groups	.592	17	.035		
	Total	.741	19			

Sig, Significant level at  $p= 0.05$

The statistics showed, there were no statistical significant differences between nurses' practice and their Socio demographic data except, with their workplace at P value 0.05.

#### Discussion:

Safe and adequate nursing steps during procedure were important some factors such nurses age and experience and educational level ,gender .In order to determine their effects on nurses practice . Table (1) showed, the mean age of nurses were  $(28.25 \pm 7.96)$  and  $(25.96 \pm 3.20)$ , for intervene and control group. This may be explained to newly graduated nurses which were more active to produce care at critical units such emergency & neonate care unites, and to acquire skills related to urgent.

This finding approved with Jaafar and Abed (2020) study, who conducted in Baghdad about impact of educational program on nurses' knowledge regarding head injury according to their findings majority of nurses the majority their finding showed of study group nurses' ages were (20-24) and control group (30-34) years old . [16]. Ltheeth and Abbas (2017) another study in AL-Nasiriyah City about nurses' knowledge for medication error, their finding indicated (43.3%) of nurses were at age group (20-25) years [17] ,more than half of nurses in both groups were female (85.0% ,65.0%) respectively .This result was consistent with the finding of Mahmoud and Shawq (2022) study who conducted in Baghdad about management about care of children treated with ventricular peritoneal shunt that more half of nurses was female gender.[18]According to Hawi and Khudhair (2021),the study was conducted in teaching hospitals in Nasiriya city, the majority of nurses are female(100%) [19].

High percentage of of them were working at emergency and neonate care unit (40%,40%), (30%,45%) respectively. Because the emergency department and the neonatal care unit considered as critical workplace places that admit large number of pediatric patients, the number of nurses should be adequate to provide patient care.

The present result contrasted with the work of the researchers Hamad and Qassim (2019), who

were working on a program in Baghdad to improve nurses' knowledge of occupational health hazards, according to their findings, majority of participants worked on critical care unite [20]. The finding also showed diploma degree in nursing was account half of nursing qualification in both groups (50%,55%) respectively. May be for the period of study in nursing institute was little which encourage them to enroll in such nursing institute.

This result was consistended with the findings of Mousa and Aziz (2022) about educational program for nurses' pediatric surgical wards, who found that diploma in nursing was the most educational levels[21].Another study agreed with the current finding that achieved by Mansour (2019) in Baghdad city about nurses' knowledge for care of intravenous chemotherapy, their finding showed more than half of studied nurses have diploma degree in nursing and more than half of them expressed less than 5 years (55% and 70%) respectively[22]. In the research the newly nurses have little experiences at setting of the study for that they were enrolled of such department to increase their skill, in addition to the hospital policy that include nursing rotation policy. The present finding approved with the finding of the researcher Shauq et al. (2014), in Baghdad city about universal precautions in neonatal intensive care unit their finding two fifth has < 5 years working in nursing[23]

The present finding approved with the finding of the researcher Selman and Ahmed (2018) about nurses' practices for care of patients with heart disease, their finding showed high percentage of nurses have experience less than 5years in their field [24]. Addition, the finding of Hamel and Ahmed (2020), showed that high percentage of nurses expressed less than 5 years of expresses in their workplace [25].

#### Nurses' Practices about Intramuscular Injection for pediatric

The checklist scale of (20) items were used to evaluate the practices of nurses about intramuscular injection for children.The findings showed high percentage of nurses in both group

were expressed inadequate level of practices , before program intervention (pretest ) period (30%) in (table,2). In addition, the mean score were (30.55±6.41,32.55±768) respectively that also referred to inadequate level of practice.

In table (4) the analysis showed there was no statistical significant difference between level of nurses practices in both groups during pre-test period at P value 0.05.

The lack of training, decrease years of experiences that increase the level of practices, in addition the nurse had no reliance on evidence base practice related to IM injection.

This result consistent with Sari et al. (2017) study, which aimed to evaluate the efficacy of training for nurses about IM injection, their result reported more than half of the participants showed low practices level[26]. Additionally, the researcher Souza et al.,(2018) in their study about educational program for intramuscular injection among pediatrics , showed high percentage of nurses documented a failures level of practice during the administration process before program intervention[15].

However, after application the planned program, the finding showed most nurses (interven group) expressed overall adequate practice about intramuscular injection at (post-test I and II) period of measurement (85%,65%) respectively. In addition, mean of score showed adequate level at posttest 1& II period (50.35±3.95) (47.8 ± 5.68) respectively (table,2).

In addition, the analysis indicated a statistical significant difference between the study and control groups during post-test I& II period at P value 0.05(table ,3) This result confirmed nurses' practices will not change without training. While the nurses (control group) still expressed inadequate level of practices during posttest 1& II (32.8 ± 7.21) (32.4±7.20) respectively (table &3). With respect to the statistical mean, the results indicated an improvement in nurses' practices (study group) after application the program compared with control group.

Nurses practice and attitude were change to correct one, they were washing their hand before the procedure, palpate or sterilize the injection site before injection, and press the site of injection & didn't recap needle cover.

A previous study agreed with the current finding that achieved by Gülnar and Özveren (2016) in Turkey, about the education program for nurses

practices about IM injections were examined before and after the training program , it was seen that the rate of nurses practices was marked highly after the training established [27].

In addition, the findings of Vicdan and Fatma Birgili (2019), regarding the training about injection application, their result demonstrated that the nurses' knowledge and practices were improved as a result of the training they received [28] .

### **Differences between Nurses' Practices about intramuscular injection for children under two years and their Socio- Demographic Characteristics.**

The analysis of variance showed that there were no statistically significant differences between nurses' practices with their sociodemographic data except between their practice and workplace at P value 0.05 .

This could be justified for the construction of the planned program that included the most sociodemographic factors difference that could affect on nurses' care about IM injection. However, workplace could a quire heath care works the required skill during provide patient care at different setting.

The finding of the present study approved with Vicdan and Fatma Birgili (2019) in their study indicated also no statistically significant difference between nurses' of knowledge scores and their sociodemographic data[28].

### **Conclusions:**

The planned program has significant effects on improve nurses practice for IM injection among pediatric.

### **Recommendations:**

Adapt the planned program as guideline to develop nurses' practice about intramuscular injection for pediatric, reduce IM injection administration as possible among young children.

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