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ORIGINAL RESEARCH ARTICLE

KNOWLEDGE OF INTRAMUSCULAR INJECTION AMONG THE NURSES OF A TEACHING HOSPITAL

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ABSTRACT

Background: Intramuscular injection (IM) is one of the most frequently use practices in nursing. Lack of knowledge can make the procedure ineffective resulting in lot of complications. The objective of the study was to find out the knowledge of IM injection among the nurses of Chitwan Medical College Teaching Hospital (CMCTH), Bharatpur, Chitwan.

Methods: A descriptive, cross-sectional study design was used among 220 nurses of CMCTH who were selected by using non- probability purposive sampling technique. Self-administered questionnaires were used to collect the data. The data was analyzed using IBM SPSS version 20.0 and descriptive, inferential test was applied.

Results: The age study findings revealed that 60% of respondents belonged to group 21 to 25 years and the mean age was 22.20±2.57 years, 72.3% respondents had completed Proficiency Certificate Level (PCL) Nursing, 90% of respondents were working as staff nurse, 57.3% of respondents were working in general wards, 48.2% of the respondents had hospital experience less than 12 months. Majority of the respondents (71.8%) had inadequate knowledge regarding IM injection. There was statistical significant association between respondents' knowledge regarding IM injection and their age (p <0.001), professional designation (p <0.001), hospital experience (p=0.023), current ward experience (p= 0.026), positive reinforcement (p=0.031), standard protocol (p=0.045), and in-service education (p<0.001) .

Conclusions: It is concluded that standard protocol and frequent in-service education should be provided to increase the level of knowledge regarding IM injection among nurses which will result in better practice and hence better patient satisfaction with no complications.

INTRODUCTION

Intramuscular injection delivers medication through the skin and subcutaneous tissue into certain muscle. Though considered as a simple technique, if the process is not done carefully, it can cause serious complications like abscess, cellulitis, tissue necrosis, granuloma, muscle fibrosis, contractures, tendonitis, injury to blood vessels, bones and peripheral nerves necrosis, hematoma, ecchymosis, infection, pain, periostitis, vascular and nerve injury.[1]

The use of two needles are recommended in the IM injection procedure. One needle is used to prepare the drug and the other for injection, which prevents the discomfort, pain and potential complications. Intramuscular injections are inserted at an angle of 90° to ensure the needle reaches the muscle. Z-track technique is preferred because it reduces the pain, as well as the incidence of leakage of the medication into the needle track. After completion of administering medicine through injection, it is also advocated to allow 10 seconds and then withdraw needle at the same angle as it entered and not to massage the site afterwards, but apply gentle pressure with a gauze swab.[2]

Knowledge and skill regarding IM injection are required to prevent complications and minimize risk to patients. Nurses should understand the relevant anatomy and the proximate anatomical structures so that they are able to identify landmarks and site boundaries safely and confidently. Unnecessary complications can arise from poor technique, lack of understanding, and lack of skill and confidence on the nurses' part.[3] The study aimed to analyze the general aspects of IM injection knowledge and its compliance with current recommendations.

METHODS

A descriptive cross-sectional research design was used to find out the knowledge of IM injection among 220 nurses of different wards of Chitwan Medical College and Teaching Hospital (CMCTH) by using non probability, purposive sampling technique for data collection. Matron, supervisor, ward in-charge, nurses of Pediatric ward, Neonatal intensive care unit (NICU), Pediatric intensive care unit (PICU) and those who were not available during study were excluded from the study. Prior to data collection, ethical approval was obtained from Chitwan Medical College institutional review committee. Data were col-

lected from the nurses of different wards by distributing self-administered questionnaire within two-week time period from June 25th 2017 to July 8th 2017 after obtaining verbal consent. Level of knowledge was scored as one for each correct answer and zero for incorrect answer. The total score was 24 and scoring was categorized as: Adequate knowledge (>65% of the total score) and Inadequate knowledge (<65% of the total score) (El-demerdash, Mohamed & Taha).[5] Researcher was present in each shift change and distributed the questionnaire to the respondents who were available at that time. The respondents were given 20-25 minutes for completion of questions and collected it immediately after completion.

The collected data was checked, reviewed and organized daily for its accuracy, completeness and consistency. The data was entered in IBM SPSS version 20.0. Descriptive and inferential statistics (chi-square test) was used to find out the association between variables.

RESULTS

Out of 220 respondents, 60% of respondents belonged to age group 21 to 25 years, majority of the respondents (91.4%) were Hindu, 77.7% were married and 90% were living with family (Table-1). More than two third (72.3%) of the respondents had completed PCL Nursing, 90% of respondents were staff nurse, 57.3% of respondents were working in general wards. In regard to work experience in hospital near about half of the respondent have work experience less than 12 months. More than half of the respondent have got positive reinforcement and two third of the respondent have said they have hospital protocol and less than half of the respondent had got in-service education (Table-2).

Table 1: Respondents' Socio-demographic Characteristic n =220

Variables	Frequency (%)
Age (in years)	
<21	66 (30.0)
21-25	132 (60.0)
>25	22(10.0)
Mean ±SD 22.20 ±2.576 Min 18 yrs., Max 36 yrs.	
Religion	
Hindu	201(91.4)
Buddhists	16(7.2)
Christian	3(1.4)
Marital status	
Married	49(22.3)
Unmarried	171(77.7)
Living with	
Living single	22(10.0)
Living with family	198(90.0)

Table 2: Respondents' Professional and Organizational Characteristic n=220

Variables	Frequency (%)
Professional qualification	
Proficiency in certificate level (PCL) Nursing	159(72.3)
Bachelor of science in Nursing (B.Sc. Nursing)	42(19.1)
Bachelor in Nursing (BN)	19(8.6)
Professional designation	
Staff Nurse	198(90.0)
Senior Staff Nurse	22(10.0)
Working unit	
General Unit	126(57.3)
Critical Unit	94(42.7)
Hospital experience	
<12 Months	106(48.2)
12-36 Months	96(43.6)
>36 Months	18(8.2)
Mean ± SD 14.88±14.69 Mini 1, max 72	
Current ward experience	
<12 Months	117(53.2)
12-36 Months	85(38.6)
>36 Months	18(8.2)
Mean ± SD= 13.86 ± 14.61, Min 1, max 72	
Frequency of IM injection	
Sometimes	169(76.8)
Always	51(23.2)
Positive reinforcement	
Yes	131(59.5)
No	89(40.5)
Standard protocol regarding IM injection	
Yes	148(67.3)
No	72(32.7)
In-service education regarding IM injection	
Yes	104(47.3)
No	116(52.7)

Table 3: Respondents' Level of Knowledge regarding IM Injection

Level of knowledge	Frequency (%)
Adequate (≥ 65% of the total score)	62(28.2)
Inadequate (<65% of the total score)	158(71.8)
Total	220(100)

Table 3 shows respondents' level of knowledge regarding intramuscular injection, where only 28.2% had adequate knowledge. Out of total score i.e. 24, the maximum score obtained

by the respondent was 23 and minimum score obtained was 7.

Table 4: Association between Level of Knowledge of IM Injection and Selected Variables **n=220**

Variables	Level of Knowledge		p-value
	Adequate	Inadequate	
	n(%)	n (%)	
Age (In Years)			
<21	8 (12.1)	58 (87.9)	
21-25	42 (31.8)	90 (68.2)	<0.001*
>25	12 (54.5)	10 (45.5)	
Professional Qualification			
PCL nursing	42 (26.4)	117 (73.6)	0.356
B.Sc. Nursing	12 (28.6)	30 (71.4)	
Bachelor in Nursing (BN)	8 (42.1)	11 (57.9)	
Professional Designation			
Staff Nurse	48 (24.2)	150 (75.8)	<0.001*
Senior Staff Nurse	14 (63.6)	8 (36.4)	
Hospital Experience			
<12 Months	29 (27.4)	77(72.6)	
12-36 Months	23 (24.0)	73(76)	0.023*
>36 Months	10 (55.6)	8 (44.4)	
Working Unit			
General Ward	34 (27.0)	92 (73.0)	0.64
Critical Care Unit	28 (29.8)	66 (70.0)	
Current Ward Experience			
<12 Months	31(26.5)	86 (73.5)	
12-36 Months	21(24.7)	64 (75.3)	0.026*
>36 Months	10 (55.6)	8 (44.4)	
Frequency of IM Injection			
Sometimes	48 (28.4)	121 (71.6)	0.895
Always	14 (27.5)	37 (72.5)	
Positive Reinforcement from supervisor			
Yes	44 (33.6)	87 (66.4)	0.031*
No	18 (20.2)	71 (79.8)	
Standard Protocol of IM Injection			
Yes	48(32.4)	100(67.6)	0.045*
No	14 (19.4)	58(80.6)	
In-service Education about Injection Technique			
Yes	47 (45.2)	57 (54.8)	<0.001*
No	15 (12.9)	101 (87.1)	

Significance level at <0.05 *p-value is computed from chi-square test*

Table 4 shows association between level of knowledge and selected variables. There is significant relationship between age, professional designation hospital experience, positive reinforcement, hospital protocol and in-service education.

DISCUSSION

Regarding definition of IM injection the study revealed that majority (85.5%) of respondents have adequate knowledge which is similar to the study conducted by El-demerdash,

Mohamed and Taha (2015)[5] which showed that 91.25% of respondents have adequate knowledge. Concerning the time of injection after antiseptic swab and uses of Z-tract technique, the study showed that 39.1% of respondents immediately gave injection after swabbing and only 31.4% of respondents used z-tract technique which is similar with the study conducted by Sakic, Milutinoric and Simin (2012)[4] which concluded that 41.4% of nurses immediately gave injection after swabbing and only 20% of nurses used Z-tract technique.

Concerning the rate of administration of IM injection, this study revealed that only 26.3% respondents injected at 1ml of drug per 10 seconds which is in contrast with the study of Sakic, Milutinoric and Simin (2012)[4] which revealed that half of the nurses (50.7%) injected at 1ml of drug at 10 seconds. Regarding needle withdrawal after injection, this study concluded that only 19.5% nurses withdrew needle after 10 seconds whereas more than half (64.2%) of the respondents immediately withdrew the needle after IM injection which is also similar with the finding of study conducted by Sakic, Milutinoric and Simin (2012)[4] which concluded that 22.8% nurses withdrew needle after 10 seconds whereas 75.1% nurses withdrew needle after immediately.

Similarly, concerning duration of massaging the site or pressing the site, this study revealed that 89.1% of the respondents agreed to press the site for 30 seconds which is contrast with the findings of Sakic, Milutinoric and Simin (2012)[4] which concluded that only 31.7% nurses did not agree to massage the site.

More than half (71.8%) of the respondents had inadequate knowledge regarding IM injection and only 28.2% had adequate knowledge. The finding of the study is similar with the finding of the study conducted by Srividya, Nagabushan and Drupad (2014)[6] which showed that all the steps of IM injection were answered correctly by only 18.8% of respondents. The reason for this finding might be less exposure in clinical field, superficial learning approach and less focus on critical steps while learning the procedure and performing the procedure.

In this study, age ($p<0.001$), professional designation ($p<0.001$), hospital experience ($p=0.023$), current ward experience ($p= 0.026$) were the factors affecting level of knowledge. The reason for this might be that the nurses' self-awareness about being competent in the field as the age increases. As the senior staff nurses have more experience compared to staff nurses, as the experience increases clinical exposure increases which might have increased their level of knowledge.

Also, positive reinforcement ($p=0.031$), standard protocol ($p=0.045$) and in-service education ($p<0.001$) are the factors affecting level of knowledge in the study. So, evidence-based hospital protocol about any procedure and periodic update of the knowledge both by the institution and nurses is necessary to have adequate knowledge.

The study was conducted in only one teaching hospital so, the finding of the study cannot be generalized. CONCLUSION

Based on the findings it is concluded that nurses' knowledge regarding IM injection was inadequate. The factors influencing the knowledge regarding IM injection were age, professional designation, hospital experience, current ward experience, positive reinforcement, and in-service education. IM injection is a complex psychomotor skill requiring knowledge, problem solving and clinical skill. Nurses should have in-depth knowledge of safe and proper IM injection technique to perform the procedure effectively to minimize the complications caused by inappropriate administration of IM injection. Hence, effective in-service education program including the demonstration should be conducted for all the nurses about injection technique with highlighting the critical steps for safe administration of IM injection to the patients.

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