

Knowledge of Nurses regarding Safe Administration of Parenteral Medication in Government Hospital, Lahore: Pakistan

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Abstract: Safe administration of parenteral medication is very important for the quality care of patient and it is very important for the cure of disease and promoting client health. Every individual nurse should know about the importance of safe administration of parenteral medication and should have enough knowledge to perform safe practice. To assess the knowledge of nurses regarding safe administration of medication. A cross sectional descriptive study design was used in this research project for assessing the knowledge of nurses about safe administration of parenteral medication, the sample size was 200 nurses which are selected from Punjab institute of cardiology randomly and the data was collected from the participants through self-administered questionnaire. It is revealed from the study that 99.5% of the participants was female while only 0.5% are male, 47% of the participants were belong to age group 35-45 years of age and 56% of the nurses were strongly agree to the safe administration of parenteral medication. Study participants have enough knowledge regarding the safe administration of parenteral medicine.

Keywords: knowledge, Nurse, Hospital, parenteral medication.

INTRODUCTION

Parenteral medication mean the administration of medicine by means other than the alimentary tract [1]. The word parenteral was derived from the two words "Para" and "enteron" means to avoid the intestine [2].

According to Zeghal, Mouelhi, & Louati [3] in 1940 the first report related to Medicine administration attracted the authors' attention toward medication administration errors. A recent report by the institute of Medicine reports that 44,000-98000 deaths occur due to errors in medicine administration each year in the USA [3]. According to food and drug administration (FDA), about 1.3 million injuries occurred each year in United States due to administration of medication with wrong drug, wrong dose, wrong timing, and wrong route [4].

Safe administration of parental medicines is important for a nurses to prevent the cross infection among nurses and patients. To prevent the spread of pathogens, aseptic technique is important to reduce the morbidity and mortality rate [5]. According to Nursing and Midwifery Council report [6] proper hand washing, use of anti-septic lotion and gloves are important for nurses to prevent the transmission of infection. Nurses Knowledge about proper site, rout, and angle are important. Nurses also need knowledge about drugs and their actions to reduce problem in medication administration. Medicine administrations should be safe and effective. Nurses should be properly trained to administer the drugs effectively [6].

According to [7] nurse play a vital role in administration of safe medication, nurses and health care agencies can work collaboratively to improve safe administration of parental medication which can decrease the chance of error, but due to unsafe administration of the parenteral medicine patient life may be compromised [7].

A study by Ndosu, & Newell [8], to evaluate nurses' knowledge about medication administration showed that nurses have inadequate or poor knowledge about standard medicine administration protocols [8].

According to the Study of [9] nurse' negligence and mistake, lack of knowledge and experience came to affect the safety of patients. The Lack of knowledge and awareness of high-risk medications and negligence in calculating the drip speed of high-risk medication" were identified as human-related factors involved in injection error, reflecting a lack of preparedness on the part of the nurses administering drugs [9].

Studies show that some factors such as medication miscalculations, lack of knowledge and proficiency as well as neglecting the hospital's medication protocol due to lack of time, extreme tiredness, inadequate work experience and inappropriate work environment may be related to the medication administration errors made by the nurses [3].

According to The Nursing and Midwifery Council in [6] the nurses requires to be responsible for their actions and omission in administering any medication, nurses must use professional judgment and apply their knowledge and skills in the given situation acting in the best interests of the patient [6].

Objective of the study

Assess the knowledge of nurses about safe administration of parenteral medication in Nawaz Sharif social security Hospital Lahore.

Significance of study

The study will help to explore the knowledge of nurses regarding parenteral medication administration. On the basis of this research work policy maker of the hospital will be able to take sufficient measure for improving safe practice of staff nurse regarding parenteral medication administration to minimize the chances of error.

Research questions

- What is the knowledge of staff nurses about safe administration of parenteral medication?
- What is the importance of wearing gloves during administration of parenteral medicine?

CHAPTER 2

Literature review

Nurse-related medication administration errors like other medical staffs' errors may cause reversible and irreversible complications which result in higher cost and even increasing mortality [7].

The study of Knauff *et al.*, [10] for safe and accurate administration of medication hand hygiene is the best and easiest way to prevent the spread of microorganisms. The nurse need hand washing after and before the administration of medication, Hand hygiene should be carried out as indicated, either with soap and running water. The nurses need to Wearing non-sterile, well-fitting, single-use gloves, when administering medication to the patients, when performing venipuncture or venous access injections, because of the potential for blood exposure at the puncture site for the prevention and control of infections a set of guidelines and practices is necessary to be used like proper hand hygiene, safe injection practice, use of aseptic techniques and handling of sharp wastes [10].

According to Hatzivassiliou *et al.*, [11] nurses' characteristics that contribute to medication errors include lack of knowledge about of the patient, or the patient's diagnosis, the names, purposes, and correct administration of the medication, also not knowing how to operate intravenous pumps or infusion devices, poor medication calculation skills, and failure to adequately prepare medications before administration [11].

In the study review of the written intravenous therapy procedures for aseptic technique proved that aseptic requirements including hand washing should be followed before the medication administration and cleaning ampoules, vials and intravenous infusion closures. Errors associated with poor aseptic technique were the result of failure of the implementation of standard protocols [12].

According to, segel, DeSantis, & Jemal [13] it is important for the nurses to be effective in hand washing techniques before and after the administration of parental medication to the patients, for the prevention of infections proper septic technique must be utilized and for the safety of client and transmission of disease medical device should be used not more than one time like syringes and needles [13].

The nurses need to make sure the identity of the patient before medication. Always follow agency policy for patient identification. Communicate with your patient before and after administration of medication. Provide information to patient about the medication before administering it. Answer questions regarding usage, dose, and special considerations. Give opportunity to the patient to ask questions [14].

The ability of the nurse is very crucial for the proper identity of the route for parental administration for a particular patient which involves knowledge about the action and adverse effect of the medicine. To be competent nurse must be adequately trained and should have enough knowledge about pharmacology which can improve the correct administration of parental medication. To administer parenteral medications safely, it is very important to understand how to prevent an infection, prevent medication errors, and prevent discomfort to the patient [15].

CHAPTER 3

Methodology

The cross-sectional descriptive study design was used in this study A self-administered questionnaire was distributed among the participants to assess the knowledge about safe administration of parental medication. Staff nurses from the Punjab institute of cardiology Lahore were the target population of this study, which was comprised of 400 nurses. Inclusion criteria for the study was the staff Nurses working in Punjab institute of cardiology.

Exclusion criteria for the study was the head Nurses and nursing assistant working in PIC. Participants were selected through Simple random sampling technique for data collection. Sample size was 200 according to Solvins' formula for sample collection. Questionnaire was consists of 10 questions adopted from (Martha Polovich) having questions on likert scale in the following format strongly agree, Agree, Neutral, Disagree, Strongly disagree. Data analysis was be done by SPSS version 21. Confidentiality and privacy of the participants was considered. The participants were informed about the objectives of my study.

Sample Size Formula

$$n = N / 1 + (N)(E)^2$$

Where,

n= Sample size N= Total population, and E is margin of error.

$$n = 400 / 1 + 400(0.05)^2$$

$$n = 400 / 1 + 1$$

$$n = 400 / 2$$

$$n = 200$$

CHAPTER 4

DATA ANALYSIS

This chapter includes 2 portions of analysis. First analysis is demographic analysis. It gives us details of 4 demographic questions which is gender, Age, marital status and stay in organization. Descriptive analysis is used for assessment of knowledge regarding safe administration of parenteral medication which include 10 questions of knowledge. Reliability of the scale is measured through Cronbach's alpha value while the validity is measured through KMO value.

Demographic Analysis

Gender

Data was taken from Punjab Institute of Cardiology Lahore from Nurses which include 99.5% of female nurses while only 0.5% were male.

Age

Participants of the study were belong to different age group and it is revealed from the study that 8% of the participants belong to age group 18-25 years of age, 47% belong to 25-35 years of age, 34% belong to 35-50 years of age and only 11% of the participants belong to age group above 50. The more details are given in below Figure-1.

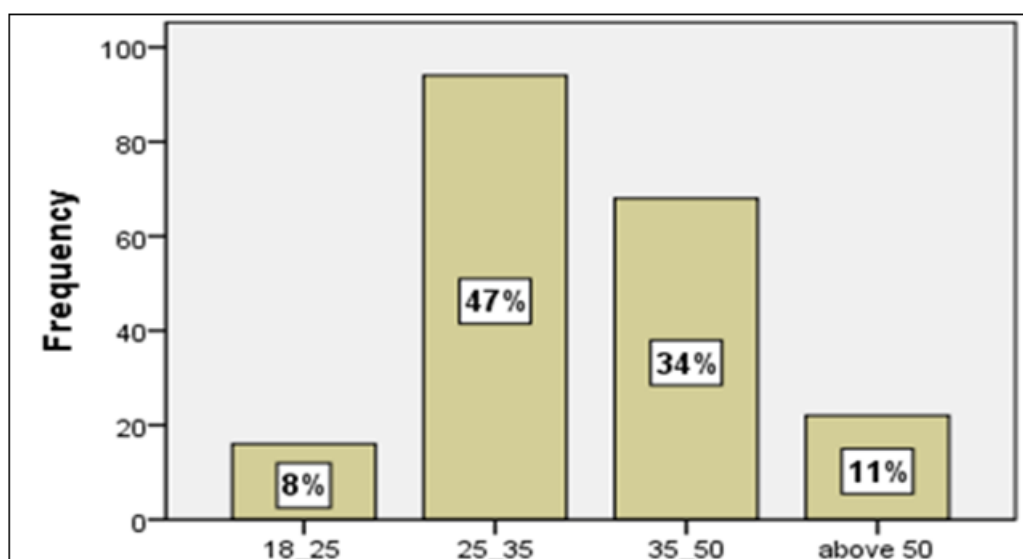


Fig-1: Distribution of Age

Marital Status

Demographics of the questionnaire also include marital status of the participants and the participants of the study belong to two groups either

married or non-married. It is revealed from the study that 75.5% of the participants were, married while only 24.5% were unmarried. The more detail are given in the figure below.

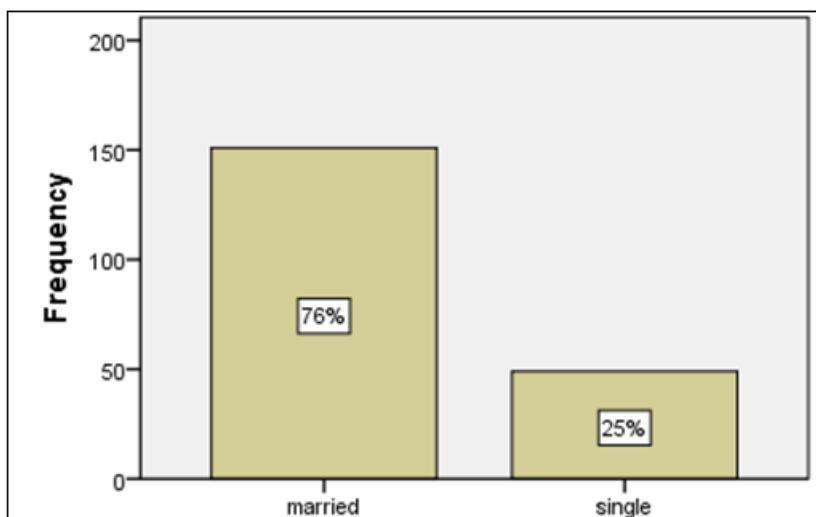


Fig-2: Distribution of marital status

Stay in organization

Participants were also asked about their experience in organization and the time they spent in current organization where they were working, 11% of

the participant have less than one year experience, 53.5% have experience 1-5 years, 22% have 6-10 years while 13% of the participants have above 10 years of experience.

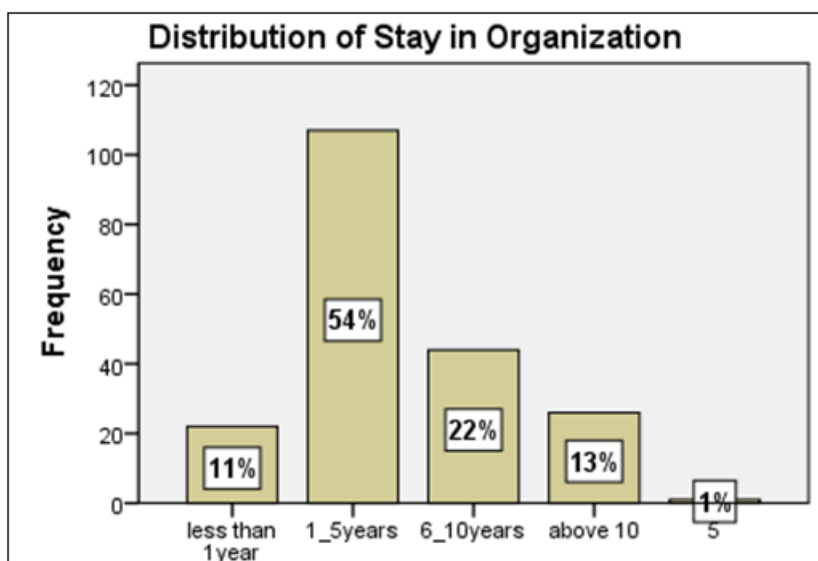


Fig-3: Distribution of Stay in Organization

Descriptive and normality statistics

Normality tests

At first data was analyzed for missing values and other typing errors were also analyzed so that errors could rectify. Value of the data was assessed by analyzing normality. Normality was examined through

skewness, kurtosis and histograms [16]. Scores of Knowledge were normally distributed and were well in range +1 to -1 more over z scores of both skewness and kurtosis were well in the range of +1.96 and -1.96 hence findings indicated normality of the data.

Table-1: Summary of skewness and kurtosis results

Values	Knowledge
Skewness	-.465
S.E	.172
Kurtosis	1.338
S.E	.342

Descriptive Analysis of Independent variables Knowledge

Summed scores were used to calculate means range, median and standard deviation with the purpose

of conducting descriptive analysis of Knowledge. Sample of 200 nurses was used for analysis purpose range of score was 20 as our mean and standard deviation are (M = 42.07, SD = 2.78)

Table-2: Summary of Descriptive Analysis

Variable	Range	S.D	Mean	Median
Burn out	20.00	2.78458	42.07	42.0000

Validity and Reliability Assessment

Table-3 presents Cronbach’s alpha for four scales used in the study. Cronbach alpha is the most commonly used measure of scale reliability [17].

Table-3: Summary of Reliability analysis

Independent Variable	Cronbach alpha
Knowledge	0.73

Cronbach alpha above 0.70 is considered to be the acceptable indicator of internal consistency reliability [18-21]. The alpha values of knowledge was 0.73 which is acceptable

Convergent validity

Convergent was established by applying factor analysis. Factor analysis was performed by using principle component analysis with varimax rotation. Each of the dimensions was analyzed by performing factor analysis.

At start complete instrument was consisted on total 10 items. Instrument was consisting of 1 independent variable, Criteria for factor loading were .50 and items below that set criteria were dropped from analysis. More over all assumption of factor analysis was fulfilled .assumptions imply that KMO value must be above .60 and Bartlett’s test must be significant so whole set criteria was fulfilled.

Table-4: Summary of KMO Bartlett’s assumptions

Independent variable	KMO	Bartlett’s Test		
		Approx	df	Sig
Knowledge	.590	148.717	45	.000

Findings

Participants of the study were asked about 10 questions of knowledge regarding safe administration of parenteral medication and the response of the respondents were in 5 likert scale which start from strongly disagree to strongly agree.

First question about knowledge which was asked from the participants was “ is safe administration is injection is very important” 0.5% of the respondents were strongly disagree, 3% were Disagree, 17.5% were neutral, 56% were agree and 22.5 were strongly agree to this statement, the more detail are given in below Figure-4.

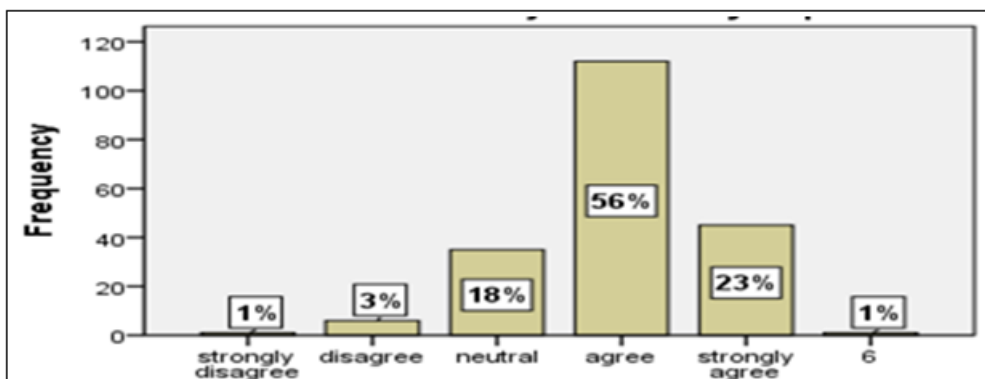


Fig-4: Is safe administration of injection very important

Second question which were asked from the participants was “does unsafe administration of medicine cause injuries” 2% of the respondents were

disagree, 12.5% were neutral, 54.5% agree and 30.5 were strongly disagree.

Table-5: response of the participants toward “Unsafe administration of medicine cause injuries”

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	4	2.0	2.0	2.0
	Neutral	25	12.5	12.5	14.5
	Agree	109	54.5	54.5	69.0
	strongly agree	61	30.5	30.5	99.5
	Total	200	100.0	100.0	

Third question which were asked from the participants was “Gloves are important during parenteral administration of medicine” 2% of the

respondents were disagree, 11% were neutral, 57% were agree and 29% were strongly agree to this statement, the more detail are given in Table 6.

Table-6: Response of the participants toward “Using Gloves are important via administering parenteral medicine”

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	4	2.0	2.0	2.0
	neutral	22	11.0	11.0	13.0
	Agree	114	57.0	57.0	70.0
	strongly agree	59	29.5	29.5	99.5
	Total	200	100.0	100.0	

Fourth question which were asked from the participants was “aseptic techniques are important during administration if parenteral medicine” 0.5% of

the participants were disagree, 9% were neutral, 52% were agree while 38% were strongly agree to this statement, the nore detail are given in below Figure-5.

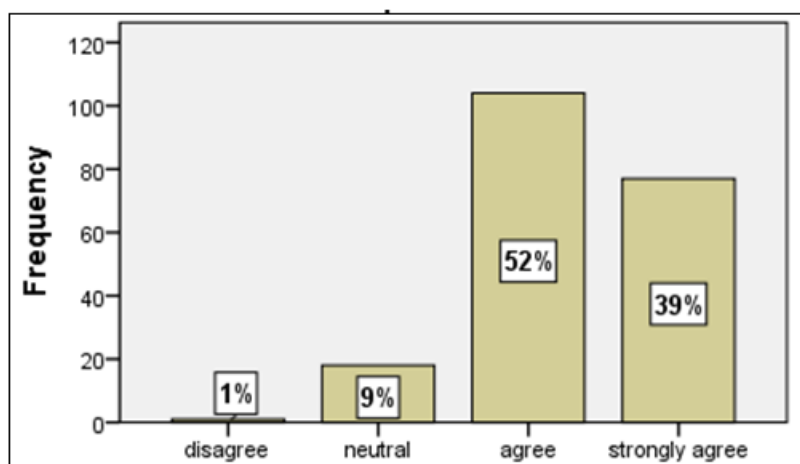


Fig-5: Aseptic techniques are important during administration of parental medicine?

Fifth question about assessing knowledge of the participants was “ Nurses know about the proper site, rout and angle of injection” 0.5% of the

respondents were disagree, 10.5 were neutral, 51.5% were agree and 37.5% were strongly agree to this statement

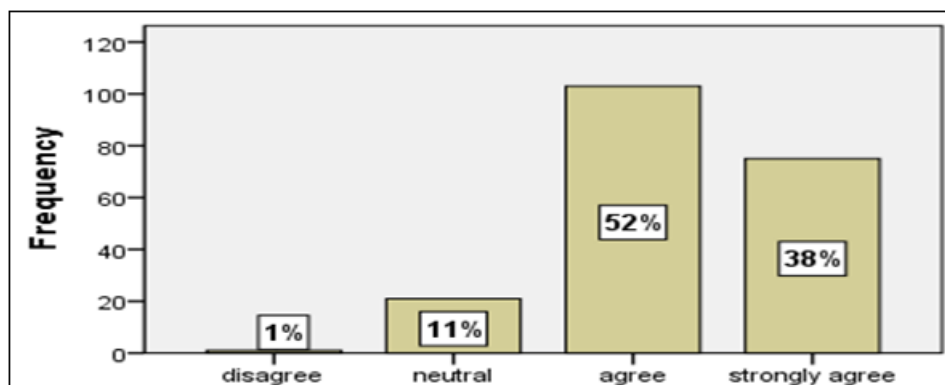


Fig-6: You think nurses know about the proper site, rout and angle of injection?

Sixth question about knowledge which were asked from the participants was “hand washing important before and after medication” 11.5% of the

respondents were neutral response, 53.5 agree to this statement while 35% of the respondents were strongly agree to this statement.

Table-7: Response of the participants toward “it is important to wash hand before and after medication”

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	23	11.5	11.5	11.5
	agree	107	53.5	53.5	65.0
	strongly agree	70	35.0	35.0	100.0
	Total	200	100.0	100.0	

Seventh question which were asked from the participants was “nurses performs hand washing practice frequently” 0.5% of the respondents were

disagree, 8% of the respondents neutral. 58.5% of the respondents were agree and 33% of the respondents were strongly agree to this statement.

Table-8: Shows response of the participants toward “nurses performs hand washing practice frequently”

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	1	.5	.5	.5
	neutral	16	8.0	8.0	8.5
	agree	117	58.5	58.5	67.0
	strongly agree	66	33.0	33.0	100.0
	Total	200	100.0	100.0	

Eighth question which were asked from the participants was “ Aspirate of intramuscular injection is important” 1% of the respondents were disagree, 12%

of the respondents were neutral, 50.5% of the respondents were agree and 36.5% of the respondents were strongly agree to this statement.

Table-9: Shows response of the participants toward “Aspirate of intramuscular injection is important”

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	2	1.0	1.0	1.0
	neutral	24	12.0	12.0	13.0
	Agree	101	50.5	50.5	63.5
	strongly agree	73	36.5	36.5	100.0
	Total	200	100.0	100.0	

Ninth question which were asked from the participants about assessing their knowledge was “ different types of needles are required of different types of drugs administration” 11.5% of the respondents give

neutral response, 65% were agree and 23.5 % of the respondents were strongly agree to this statement , more detail about this statement are given in Figure-7.

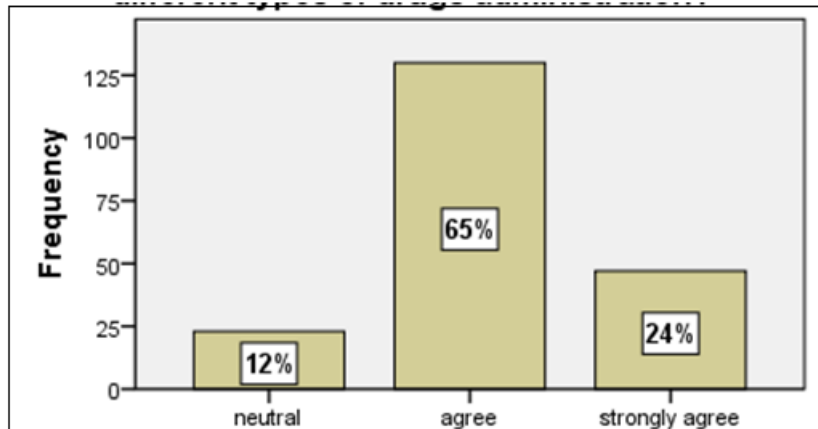


Fig-7: You think different types of needles required of different types of drugs administration?

Tenth question which were asked from the participants was “nurses have appropriate knowledge of medicine administration” 4% of the respondents give

neutral response, 50.5% were agree while 45.5% of the respondents were strongly agree to this statement, the more detail are given in Figure-8.

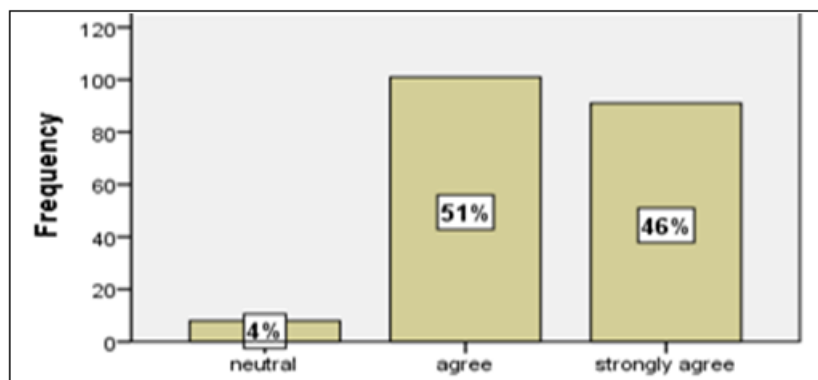


Fig-8: You think nurses have appropriate knowledge of medicine administration?

DISCUSSION

Safe administration of parenteral medication is very crucial and important for the proper management of quality care of the patient and due to the safe administration of parenteral medication the injury due to unsafe administration of parenteral medication would be minimize

According to food and drug administration (FDA), about 1.3 million injuries occurred each year in United States due to administration of medication with wrong drug, wrong dose, wrong timing, and wrong route [4].

The finding of this study revealed that nurses have enough knowledge regarding safe administration of parenteral medicine and were well aware about the proper rout and needle requirement for the administration of parenteral medicine.

Study shows that 88% of the nurses believed that aspiration of intramuscular is very important and 92% of the nurses believed that this is very important to wash hand prior to the use of parenteral medicine.

According Hatzivassiliou *et al.*, [11] hand washing is very imprtant before handling and adminstartion of any kind of medicin and it is very crucial for parenteral medicin.

It is portrayed from my study that 90% of the nurses are well aware from the proper site, route and time of medicin and believed that it is very imprtant for evey nurse to know about the proper site, rout and time for adminstartion of parenteral medicine

According to [7] nurse play a vital role in administration of safe medication, nurses and health care agencies can work collaboratively to improve safe administration of parental medication which can decrease the chance of error, but due to unsafe administration of the parenteral medicine patient life may be compromised and it is very important for every individual nurse to know about the proper rout and dosage of drug administration.

CONCLUSION

Safe administration of parenteral medication is very important and every nurse should know about the

safe administration of parenteral medicine. Nurses have sufficient knowledge regarding the administration of parenteral medicine but there is lack of proper practice exist.

Limitation

This was a cross sectional study and only one hospital in which 200 nurses were studied which cannot be generalized.

RECOMMENDATION

- Nurses should know about the proper route and dosage of drug administration
- Hospital should focus on the protocol of safe drugs administration
- Education program should be done in the hospital about drugs administration
- Every nurse should have enough knowledge regarding drugs, side effect and complication of the medicine.

Dedication

I humbly dedicate this piece of work to my family, particularly my parents who offered me unconditional Love throughout My Life

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