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Knowledge Regarding Intravenous Therapy among Health Workers of a Teaching Hospital Birgunj, Parsa, Nepal

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ABSTRACT

INTRODUCTION: Intravenous fluid is a continuous process of administration of large amount of fluid into the vein by a drip apparatus. The main purpose of intravenous therapy is to supply fluid and electrolyte to prevent or treat fluid and electrolyte imbalance in the body. The intravenous drug injected through vein into the body for quick action. At the time of infusion the nurse check or observe the flow rate of fluid for any adverse affect and also for others complication. Globally more than 330 million people receive invasive procedure of intravenous catheter placement annually. 60% to 90% patients require an intravenous catheter during hospitalization in US and studies said that 35%-50% patient is in fail intravenous catheters in hospitalization and arise complication. The objective of the study was to find out the knowledge regarding intravenous therapy among health workers of Teaching Hospital Birgunj, Parsa. **MATERIALS AND METHODS:** A descriptive cross sectional study design was adopted for the study. This carried out in national medical college teaching hospital is a tertiary level Hospital, Birgunj, Nepal, with the sample size of 139. The instruments used for the study was a structured knowledge questionnaire was used in the study, after reviewing related literatures, which consists of 28 items and data were collected within 2 weeks. **RESULTS:** Among 139 health workers, 43.2% had moderate level of knowledge, 33.1% had low level of knowledge and 23.7% had adequate level of knowledge. **CONCLUSION**: From the study finding it can be concluded that knowledge regarding intravenous therapy among respondents had moderate level of knowledge. Hence, various educational programmes for health workers should be focused on enhancing their knowledge regarding intravenous therapy which enables them to provide quality care for patients.

Keywords: Health workers, Intravenous therapy, Knowledge

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INTRODUCTION

Intravenous therapy is the administration of medicine, fluids, nutrition, blood and blood products through parenteral route for a patient. Administration of fluids and other product through a vascular access device is considered IV therapy [1]. Intravenous fluid therapy is the most common route use in daily nursing care procedure and has been practiced for more than 180 years globally. The intravenous therapy administered to all hospitalized patients for body fluid and electrolyte maintenance and diluents for medications [2]. Fluid and electrolytes balance is crucial for physiology of human body and its normal functioning and metabolism. About 60% (60-67%) of the total body weight is made up of water. Electrolytes are such as sodium, potassium, chlorine, calcium, magnesium and phosphorus. The body's homeostatic control mechanisms ensure that a balance between fluid gain and fluid loss is maintained. The levels of electrolytes in body can become too low or too high. This can happen when the amount of water in body changes [3].

Intravenous therapy is an effective and fast-acting way to administer fluid or medication treatment in an emergency situation, and for patients who are unable to take medications orally. Approximately 80% of all patients in the hospital setting will receive intravenous therapy [4]. Intravenous therapy (IVT) is the procedure that needs manual skills, professional competency, knowledge about the anatomy and physiology of vascular system [5].

Intravenous therapy is a common and critical component of patient care in hospitals. However, inadequate knowledge or improper administration of intravenous therapy can lead to serious complications, including infections, fluid overload, and medication errors. Therefore, assessing the knowledge level of health workers regarding intravenous therapy is crucial for ensuring patient safety and quality of care.

MATERIAL AND METHODS

Study design and setting

The research design selected for the present study were descriptive research design. Quantitative research approach was selected for the study. The study was conducted in National Medical College and Teaching Hospital Birgunj, Parsa, Nepal. The data collection period

was from 1st October 2023 to 14th October 2023.

Participants , Sample size and sampling technique

All health workers (i.e. Bachelor of science in nursing , proficiency certificate level in nursing , health assistant, Auxiliary nurse midwife, community medicine assistant) working in inpatient department were included in this study. The sample size was calculated by using Solvin's formula i.e. (n) =N/1+N(e)^2, where N= size of the population i.e.139, e = margin of error(5%) , n = sample size . Now, Solvin's formula= N/1+N(e)^2 =139/1+139(0.05)^2 =139/1.3475=103, Adding 10% as non response rate, Total sample size = 10% of estimated sample + estimated sample size = 10% of 103 +103=10.3+103= 113. Hence, total sample size was 113, but to maximize the general population was 139. The Non probability total enumerative sampling was used to select the respondents.

Data collection procedure and study variables

A Structured knowledge questionnaire was used in the study. After reviewing related literature tool was developed according to the objectives of the study. The tool was prepared in English language.

The instrument was divided into two parts:

Part-I: Questions related to socio-demographic variables and Professional related variables such as age, sex, educational qualification, current working department, in-service education, working experience, previous exposure with intravenous therapy which was prepared by the researcher herself.

Part-II: 28 Self-Structured Questions were included to identify the knowledge regarding intravenous therapy, which was multiple choice questions and had 4 options. The questions were set regarding intravenous therapy, its preparation, procedure, complication and treatment or management. Each correct response was scored as '1' and incorrect response as '0'. Highest score was 28 and lowest mark was 0.

The knowledge level was categorized as: Adequate knowledge = (≥71%) of total score (>24), Moderate knowledge = (51%-70%) of total score (22-24), Inadequate knowledge = (≤ 50%) of total score (<22).

Data were collected almost within 2 weeks in evening and morning shift. A Self-administered Structured knowledge questionnaire was used to assess the knowledge regarding intravenous therapy among health workers. The duration of filling of question was appropriately 20-30 minutes. The questions were collected immediately after the completion of questionnaire

Statistical analysis and data management

After completing the data collection, data was checked for completeness and organized for its accuracy completeness and consistency in same day of data collection. Data was organized in order for editing, classifying, coding and tabulating the information. The data was entered and analyzed by using Statistical Package for social science (SPSS) version 22. Data was analyzed by using the descriptive statistics such as frequency, percentage, mean and standard deviation and appropriate inferential statistics like Chi square test was used to examine the association between independent and dependent variables.

Ethical Consideration :

This study approval was obtained from the Institutional Review Committee (Reference no.F-NMC/669/080-081) of National Medical College Nursing Campus, Birgunj, Nepal. Informed consent was taken from the participant and participation in the study was voluntary.

RESULTS:

Table 1 shows that 56.1% respondents were within age group of <25years, 62.6% of the respondents were female, 31% of participants were PCL nursing and 50.4%have had more >2 year working experience.

Table 2 shows that 100% respondents answered a process of administered fluid directly into vein, 99.3 % respondents answered insertion of cannula into vein , 86.35 respondents answered wash hand , regarding height of the solution container 93.5% respondents answered 45cm,69.8% respondents answered normal saline is the safest IV fluid to treat hyponatremia and similarly, 94.2% respondents answered last question normal saline correct answer.

Table 3 shows that majority of respondents 43.2% had moderate level of knowledge, 23.7% had adequate level of knowledge and 33.1% had inadequate level of knowledge.

Table 1: Socio-demographic Variables of Respondents, (n=139)

Characteristics		frequency	%
Age	<25	78	56.1
	20-30	32	23.1
	>30	29	20.8
Sex	Male	52	37.4
	Female	87	62.6
Educational qualification	BSc Nursing	16	11.5
	PCL Nursing	43	31
	Health Assistant	25	18
	ANM	14	10.1
	CMA	41	29.4
Current working department	Critical	74	53.2
	Non-critical	65	46.8
In-service education	yes	39	28
	No	100	72
Working experience	<1 year	36	25.9
	1—2 years	33	23.7
	>2 years	70	50.4

Table 4 shows that there is significance association between knowledge level with sex and educational qualification where there is no significant association between level of knowledge with age , and also there was no association between the level of knowledge with current working department, in service education and working experience.

DISCUSSION

Regarding the level of knowledge, the study revealed that

Table 2: Knowledge regarding intravenous therapy among respondents, (n=139)		
Items	Correct response Number	%
Meaning of IV therapy	139	100
Meaning of intravenous cannula	138	99.3
Appropriate vein used for routine blood draw	54	38.8
Qualified to insert intravenous cannula	138	99.3
Gauze of cannula to administer large amount of fluid	111	79.9
First steps in the insertion of a peripheral line	91	65.5
Materials are necessary when preparing to start IV cannula	129	92.8
First step in preparing the IV Site	120	86.3
The bevel should be, at time of cannula insertion	99	71.2
Vein should avoid to insert IV cannula	116	83.5
Verify the entry intravenous cannula into vein	131	94.2
High of solution container	130	93.5
0.9% normal saline is	123	88.5
Insure of proper placement cannula	76	54.7
Label of the intravenous site	134	96.4
Acceptable degree in process off inserting IV cannula	106	76.3
Before leaving patient room	125	89.9
Standard dwell time	134	96.4
After completion of a vein puncture	86	61.9
IV sets should be changed	137	98.6
Most frequent local side effect	83	59.7
First nurses do if the patient develop phlebitis	97	69.8
Types of fluid	132	98.6
Fewer dissolved particles than the body	63	45.3
Drop factors calculation formula	137	98.6
Most safe IV fluid to treat hyponatremia	97	69.8
Nurses action when patient receive IV dopamine	134	96.4
Nursing management for dry mucosa membranes in client	131	94.2

Table 3: Respondent level of knowledge regarding intravenous therapy , (n=139)		
Level of knowledge	Numbers	%
Adequate	33	23.7
Moderate	60	43.2
Inadequate	46	33.1
Total	139	100

out of 139 respondents, 43.2% of respondents had moderate level of knowledge, 33.1% of respondents had low level of knowledge and 23.7% of respondents had adequate level of knowledge regarding intravenous therapy among nurses. These results were consistent with those of a recent study in India which found that the majority of the nurses (55%) at the general hospital had moderate knowledge while 13% of the respondents had inadequate knowledge [6].

Concerning the association between the level of knowledge regarding intravenous therapy among health workers with selected demographical variables the finding revealed that there is significance association between the level of knowledge regarding intravenous therapy among health workers with sex P-Value=0.015 and educational qualification P-Value=0.01whereas there is no significance association with age, current working department, in-service education and working experience. The present study finding is supported by similar cross-sectional study conducted on nurses knowledge regarding intravenous fluid therapy at a country hospital in Kenya, which reported that knowledge had association with sex (P-Value=0.015) and educational qualification (P-Value=0.01) which revealed that there was significant association between level of knowledge with educational qualification i.e. ($p<0.05$) [7].

Knowledge regarding of intravenous therapy among health workers included general concept of intravenous

Table 4: Association between the level of knowledge regarding Intravenous therapy among respondent and selected variables, (n =139)

Variables	Level of knowledge			Chi-square	p-value
	Inadequate%	Moderate%	Adequate%		
Age					
<25 years	28(35.9%)	36(46.2%)	14(17.9%)	9.240	0.055
25-30 years	8(25%)	10(31.2%)	14(43.8%)		
>30 years	10(34.5%)	14(48.3%)	59(17.2%)		
Sex					
Male	24(45.3%)	23(43.4%)	6(11.3%)	8.347	0.015
Female	22(25.6%)	37(43.1%)	27(31.3)		
Educational qualification					
BSc Nursing	1(6.2%)	7(43.8%)	8(50%)	25.257	0.001
PCL nursing	8(18.6%)	20(46.5%)	15(34.9%)		
Health Assistant	8(18.6%)	13(52%)	4(16%)		
ANM	7(50%)	5(35.7%)	2(14.3%)		
CMA	22(53.7%)	15(36.6%)	4(9.7%)		
Current working department					
Critical	21(28.4%)	32(43.2%)	21(28.4%)	2.497	0.287
Non- critical	25(38.5%)	28(43.1%)	12(18.4%)		
In service education					
Yes	13(33.3%)	20(51.3%)	6(15.4%)	2.423	0.298
No	33(33%)	40(40%)	27(27%)		
Working experience					
<1 year	6(16.7%)	21(58.3%)	9(25%)	6.73	0.152
1-2 years	13(39.4%)	13(39.4%)	7(21.2)		
>2 years	27(38.6%)	26(37.1%)	17(24.3%)		

therapy, preparation, types and procedures, complications and management. Knowledge regarding general concept of intravenous therapy shows that almost all (100%) of respondents answers meaning of intravenous therapy and 38.8% of respondents answered appropriate site for routine blood draw and it shows that knowledge were significantly low in types of fluid or solution.

CONCLUSIONS

From the study finding it can be concluded that knowledge regarding intravenous therapy among respondents had moderate level of knowledge. There is significance association between level of knowledge with sex and educational qualification. Various educational programmes for health workers should be focused on enhancing their knowledge regarding intravenous therapy which enables them to provide quality care for patients.

ADDITIONAL INFORMATION AND DECLARATIONS

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Data Availability: Data will be available upon request to corresponding author.

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