

ASSESSMENT OF NURSES KNOWLEDGE AND SKILL ABOUT INTRAVENOUS FLUID ADMINISTRATION

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ABSTRACT

Infusion therapy is one of the major responsibilities of nurses. In dealing with intravenous infusion, nurses must have knowledge and skill about what is ordered, and any possible side effects that may occur. This study aims to assess the nurses' knowledge and skill about intravenous fluid administration.

Subjects and methods: A descriptive cross-sectional study design was carried out in Heevi teaching hospital for the period from 4th of January to 7th of February 2022. This study was conducted on probability (random) sample of (30) nurses who provide direct care for patients during the study period. Data were collected using three tools; socio-demographic data, nurses' knowledge questionnaire and nurses' skill checklist about intravenous infusion therapy.

Results: The present study revealed that (63.3 %) of the nurses were needed knowledge and (40 %) of the nurses were needed skill. The study revealed that there was a significant statistical correlation between nurses' knowledge and age, level of education, also there was a significant statistical correlation between nurses' skill and level of education, years of service.

Conclusion: Nurses' knowledge and skill of intravenous fluid therapy was poor. Targeted educational intervention strategies on IV fluid therapy through continuous nursing education sessions or workshops should be conducted regularly with a specific focus on the ionic composition of IV fluids, their indications, and monitoring for associated complications, where deficiencies were most notable.

KEYWORDS: Assessment - knowledge - skill, intravenous fluid.

INTRODUCTION

Intravenous fluid therapy is amongst the commonest routine nursing care procedures and has been practiced for more than 180 years globally¹. It involves the administration of intravenous (IV) fluids, to nearly all hospitalized patients, for body fluid and electrolyte maintenance and as diluents for medications². Intravenous (IV) fluid therapy is one of the most common treatments provided in hospitals each year. Despite this, there is often lack of training for nurses in administering and managing this therapy. This makes nurses considering IV fluids as a routine therapy and often being unaware of its benefits, importance and associated risks³. Nurses are needed to increase their knowledge and performance regarding IV fluid therapy to manage its possible complications and improve patient safety any nurse administering intravenous fluids and drugs

must be competent in all aspects of intravenous therapy⁴. Assessment and training should include both theoretical as well as practical components regarding intravenous fluid therapy, drug administration, local and systemic complications, infection control issues, use of equipment and risk management⁵.

Intravenous therapy and care of vascular devices play a central role in the delivery of modern health care treatment. Intravenous (IV) therapy has become a major component of patient care in hospital and nursing homes. It is prescribed for almost every individual who is admitted to the hospital and is used to support patient with acute and chronic problems⁶. As nurses play a pivotal role in rendering quality care, they must be knowledgeable of modified and advanced technique, to meet the specific need of each patient⁷.

Intravenous (IV) fluid therapy is a key area of managing acutely unwell hospitalized patients. However, errors in fluid prescribing are common and contribute to patient morbidity and mortality through inappropriate prescribing. Prescribing IV fluids involves complex decision-making on the indication, optimal fluid type, volume and rate. Studies have shown that junior prescribers consistently demonstrate poor knowledge associated with a large variation in their practice ⁸.

Objectives of the study:

- 1- To assessment of nurses' knowledge and skill about intravenous fluid at Heevi teaching hospital.
- 2- To find out the relationship between nurses' knowledge, skill and demographic variables that include age, gender, level of education, year of service.

SUBJECTS AND METHODS

Study design:

A descriptive cross-sectional study design was carried out in Heevi teaching hospital, started from 4th January 2022 up to 7th February 2022 to assess the nurses' knowledge and skill about intravenous fluid administration.

The setting of the study:

The present study carried out in Heevi teaching hospital at Duhok city.

The sample of the study:

A probability (random) sample of (30) nurses were selected for the purpose of the study, they were working in different wards in the hospital (Surgical ward, INC, NICU, Red room, Reception).

Instrument:

Study tool "questionnaire" and "checklists" was constructed based on literature review then developed by the researcher to ensure culture and language appropriateness. After the

arrangement of all information obtained above, the tools of the study consisted of three parts: -

Part I: Demographics:

This part is concern with the determination of the demographic characteristics of nurses (Age, Gender, level of education, the years of service).

Part II: Constructed knowledge questionnaire:

The questionnaire consisted of (40 items) were designed to evaluate pediatric nurses' knowledge regarding intravenous lines management. Each item in the final draft has (2) options (correct answer which is equal to 1, incorrect answer = zero).

Regarding the knowledge part, data was gathered through the direct interview (face to face) which had been completed by all sample of the study for 30 minutes by using the knowledge questionnaire.

Part III: Skills evaluation checklist:

This checklist questionnaire consisting of (50 items) was designed to evaluate pediatric nurses' skills regarding intravenous line management. Each item in the final draft has (3) options (excellent which is equal to 2, satisfactory =1, and needs Practice = zero)

Regarding the skill part, the data was collected through the direct observation during practices by the researcher for all samples of the study for 10 to 15 minutes by using the skill checklist.

Statistical analysis:

Percentages and frequency used to calculate the description of the sample. The Chi-square test was used to determine the correlation between knowledges scores, skill of nurses & variables was considered significant when $P < 0.05$.

RESULTS

Table (1): Socio-demographic characteristics of (30) nurses

Variables	Characteristics	No.	%
Age	22-27 years	13	43.34
	28-33 years	9	30.00
	34 -39 years	4	13.33
	Above 40 years	4	13.33
	Total	30	100
Gender	Male	15	50
	Female	15	50
	Total	30	100
Level of education	Nursing high school	10	33.3
	Diploma	16	53.4
	Collage and above	4	13.3
	Total	30	100
Years of service	1-6 years	13	43.3
	7-12 years	6	20
	13-18 years	5	16.7
	19-24 years	6	20
	Total	30	100

Table (1) shows the distribution of the socio demographic characteristics of 30 nurses, they were working in different wards in the Heevi teaching hospital in Duhok city. Concerning nurses age about 43 % of the nurses were belonged the age group, 22 – 27 years old, 50 % of them were male and 50 % female. Also, it

shows that 53.4 % were graduated from institute and 33.3 % from nursing high school. In respect to their years of experience 43.3 % of nurses were had 1-6 years of experience.

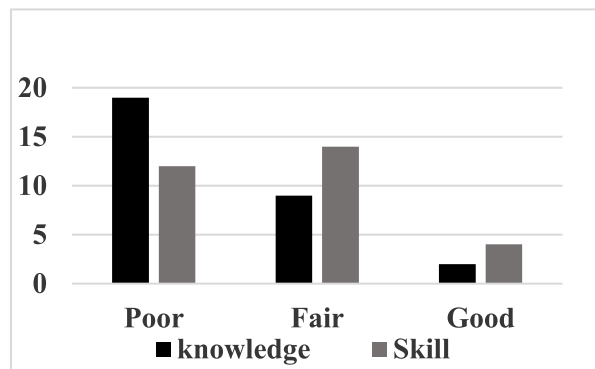


Fig. (1): Total score of knowledge and skill

Figure (1) demonstrate (63.3 %) of the nurses were needed knowledge, while (40 %) of the nurses were needed skill.

Table (2): Association between socio demographical characteristics with nurses’ knowledge.

Variables	Knowledge			X ²
	Poor	Fair	Good	
Age				
22-27 years	10	3	0	0.018
28-33 years	6	3	0	
34 -39 years	2	2	0	
Above 40 years	1	1	2	
Gender				

Male	11	3	1	0.47
Female	8	6	1	
Level of education				
Less than diploma	7	3	0	0.007
Diploma	11	5	0	
Collage and above	1	1	2	
Years of service				
(1-6) years	10	3	0	0.14
(7-12) years	4	2	0	
(13-18) years	3	2	0	
(19-24) years	2	2	2	

Table (3): Association between socio demographical characteristics with nurses' skill.

Variables	Skill			X ²
	Poor	Fair	Good	
Age				
22-27 years	8	4	1	0.5
28-33 years	2	6	1	
34 -39 years	1	2	1	
Above 40 years	1	2	1	
Gender				
Male	6	6	3	0.52
Female	8	6	1	
Level of education				
Less than diploma	6	4	0	0.002
Diploma	6	9	1	
Collage and above	0	1	3	
Years of service				
(1-6) years	4	9	0	0.03
(7-12) years	4	2	0	
(13-18) years	3	1	1	
(19-24) years	1	2	3	

DISCUSSION

Nurses' knowledge and skills in administering intravenous infusion therapy for patients can minimize infusion-related complications and affect patient safety; satisfaction, health care costs, and length of hospital stay⁹.

Concerning socio-demographic characteristics of the nurses:

The present study showed that, the majority of studied nurses (43.34%) were within 22-27 years.

Regarding the gender of the nurses 50 % nurse were male.

Finding out of data analysis showed that the majority of educational level of (53.4 %) were from Diploma graduates. Concerning nurses'

years of experience (43.3 %) had 1-6 years of experience.

Nurses' knowledge regarding IV fluid therapy:

The findings of this study showed that the level of knowledge of IV fluid therapy among nurses was poor. A higher proportion of the participants (63.3%) had poor knowledge of IV fluid therapy compared to those who had good knowledge (6.7%) of IV fluid therapy.

This finding is agreement with a recent study conducted by (Othman, and Ahmed., (2019)¹⁰, they found majority of the nurses (89.4%) had poor scores on IV fluid therapy knowledge.

In contrast, (Anjani Devi, et al. 2016)¹¹ a 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. Perhaps this is due to the lack of educational programs that the nurse receives after graduation.

Nurses' skill regarding IV fluid therapy:

Regarding nurses' skill scores, the present study showed that the majority of nurses (46.7 %) had a moderate level of performance skill regarding intravenous infusion therapy. This finding agreement with (Mohammed et al., 2015)³, they demonstrate that (2 %) of selected samples had poor performance before implementation of the protocol regarding intravenous infusion therapy.

Association between nurses' socio demographical characteristics and their knowledge concerning fluid therapy.

The result of the study indicates that there was a significant association between nurses age group and P value (0.018), this finding agreed with (Lamsal, S. and Shrestha, R. 2019)¹² study reported a positive correlation between age and the nurses' level of knowledge ($p = 0.012$). On the contrary, findings by (Njung'e, and Kamolo, 2021)¹³, they found negative correlations were found between nurses' knowledge of IV fluids and age ($p = 0.13$). Similar findings have been reported by (Fernandez, 2009)¹⁴ in India on correlation with age ($p = 0.90$).

Concerning nurses' gender, there were no significant association with their knowledge ($P = 0.47$), this result strongly agreement with (Njung'e, and Kamolo, 2021)¹³, they mentioned that there is a negative weak correlation between participant's gender and the IV fluid knowledge scores was recorded, with higher scores registered among female nurses compared to their male counterparts which could be attributed to the higher number of females nurses in the wards ($p = 0.07$). This negative relationship, may have been due to the number of males being equal to the number of females nurses participating in the present study due to their inadvertently.

With regard of level of education of the respondents was significantly related to IV fluid knowledge, with Bachelor and above educated nurses ($P = 0.007$). this finding of this present study are in line with the findings (Njung'e, and Kamolo, 2021)¹³, they found that positive correlations were noted between nurses' IV fluid therapy knowledge and the level of education ($p = 0.001$). Perhaps this difference is due to the difference in curricula between nursing institutes and nursing colleges. The current study showed

that there was association between nurses' years of experience and their knowledge ($P = 0.14$). This finding disagreement with (Westbrook, et al. 2011)¹⁵, they Nurses' knowledge on IV fluid therapy was significantly correlated with their working experience whereas a 10.9% reduction in IV therapy-related nursing errors with increase in working experience until the sixth year of practice followed by a decline.

Association between nurses' socio demographical characteristics and their skill concerning fluid therapy.

The result of this study demonstrates that there were nonsignificant association among nurses age group and P value (0.5). This result come in disagree with (Mohamed et al., 2020)¹⁶ who reported that, there is statistical significance difference between age of studied nurses and level of practice with ($P = 0.001$). Concerning nurses' gender, there were no significant association with their skill ($P = 0.52$), this result strongly agreement with (Qtait, M. T. 2016)¹⁸, who demonstrate that there were nonsignificant association between nurses' gender and their performance ($P = 0.369$).

With regard of level of education of the respondents was significantly related to IV fluid skill ($P=0.002$), this result is disagreement with (Mohamed et al., 2020)¹⁶, they mentioned in their study that there was a fair positive association between nurses skill with their educational level and practice level.

Regarding the correlation between nurse's skill and their years of service, the result shows the significant association between nurses' years of experience and their skill ($P = 0.03$). the result shows this result is disagreement with (Abd Alfatah et al., 2013)¹⁷, they showed that there is statistical significant difference between the scores of nurses' practice and their years of experience, also this result supported by (Azer S, 2005)¹⁹ who reported that new nurses had a score of performance higher than old nurses. Also, this agrees with (Gamal 2005)²⁰ who found the youngest nurses with less than one year experience had better practice than older nurses with more experience.

CONCLUSION

Nurses' knowledge and skill of intravenous fluid therapy were poor. Targeted educational intervention strategies on IV fluid therapy through continuous nursing education sessions or workshops should be conducted regularly

with a specific focus on the ionic composition of IV fluids, their indications, and monitoring for associated complications, where deficiencies were most notable. There is a need for further studies incorporating observation of nurses' practice of IV fluid therapy for validation of competency. Clinical significance and relevance: Adequate knowledge and skill regarding IV therapy among nurses is important in ensuring quality healthcare, reducing IV-related morbidity and mortality, and improving patient outcomes.

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