Nurses' knowledge towards Intravenous cannula insertion
at public and private hospitals in Sana'a City- Yemen

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Abstract*:* Background: the Peripheral IV cannula is one of the most frequently used medical devices in the world; to give intravenous therapy with drugs, and blood components is indispensable in today's health care. Objective: is to assessing nurses' knowledge towards IV cannula insertion. Methods: Descriptive, hospital- based study, was conducted in Sana'a city in university of science and technology hospital, republican educational hospital, Kuwait educational hospital and Saudi German hospital from June2018 to September 2018, study covered all nurse's in hospital they were (100) nurses, the data were presented in pre- designed questionnaire firstly, then collected by direct interview by participants. Result: The results found a total of nurses have moderate knowledge about IV cannula insertion and indication of insertion (100%), also and about (63.5%) have ability to control in infection before, during and after cannula insertion, the study showed that more than half (71.7%) have good knowledge about site insertion of I.V cannula. Conclusion: The study recommended that regular program to discuss problems that faced them during cannula insertion. Such as lack of general information, not the rehabilitation of nurses scientifically, lack in training courses of nurses and not to evaluate the skills of nurses periodically. Recommendation: The nurses need to be trained, education and conducting courses how to care and maintenance of IV cannula.

Keywords: Intravenous cannula, Nurses, Knowledge and Practice, Sana'a City.

معرفة الممرضات بإدخال الكانيولا الوريدية في المستشفيات العامة والخاصة
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المستخلص: الخلفية: الكانيولا الوريدية هي واحدة من أكثر الأجهزة الطبية استخدامًا في العالم؛ يتم عن طريقها إعطاء العلاج الوريدي بالأدوية ومكونات الدم أمرا غنى عنه في مجال الرعاية الصحية اليوم، والهدف: تقييم معرفة الممرضات تجاه إدخال الكانيولا الوريدية. طرق البحث: دراسة وصفية تستند إلى المستشفى الذي أجري فيه البحث في مدينة صنعاء في مستشفى جامعة العلوم والتكنولوجيا والمستشفى التعليمي الجمهوري ومستشفى الكويت التعليمي والمستشفى السعودي الألماني من يونيو 2018 إلى سبتمبر 2018، غطت الدراسة جميع الممرضات في المستشفى وهم (100) ممرضًا، وقدمت البيانات في استبيان مسبق التصميم أولاً، ثم تم جمعها عن طريق المقابلة المباشرة. من قبل المشاركين. النتائج: أظهرت النتائج أن إجمالي الممرضات لديهم معرفة متوسطة بإدخال الكانيولا الوريدية ومؤشر الإدخال (100%)، كما أن حوالي (63.5%) لديهم القدرة على التحكم في العدوى قبل وأثناء وبعد إدخال القنية، وأظهرت الدراسة أن أكثر من النصف (71.7%) لديهم معرفة جيدة بإدخال القنية الوريدية في مكان الحقن. الخلاصة: أوصت الدراسة ببرنامج منتظم لمناقشة المشاكل التي واجهتهم أثناء إدخال الكانيولا. مثل نقص المعلومات العامة، وليس تأهيل الممرضات علمياً، وقلة الدورات التدريبية للممرضات وعدم تقييم مهارات الممرضات بشكل دوري. التوصية: الممرضات بحاجة إلى التدريب والتعليم وإجراء دورات حول كيفية رعاية الكانيولا الوريدية.

الكلمات المفتاحية: الكانيولا الوريدية، الممرضين، المعلومات والممارسة، مدينة صنعاء.

Introduction

Peripheral venous catheter is one of the most frequently used medical devices in the world. Intravenous therapy with drugs, nutrients and blood component is indispensable in today's health care. Peripheral intravenous cannulation is a produce in which the patient's skin is punctured with a needle to allow insertion of a temporary plastic tube into a vein[1]

Thrombophlebitis and infection are common complications of peripheral venous catheter and their use should be discontinued because of occlusion or leakage. Insertion, monitoring and assessing peripheral venous catheter site is a common nursing activity. The guidelines recommend that peripheral intravenous catheter should be removed or replaced every (12- 72) hour according to type of treatment, to avoid complicating such as thrombophlebitis.[2]

Furthermore, the smallest necessary peripheral venous catheter should be well documented with date, time, size and location in the patient's chart. A primary goal of intravenous cannula therapy is to maintain patents, comfortable intravenous cannula access that can be used to administer the prescribed therapy reliably and safely.[3]

Nosocomial infection national surveillance service, 2002 postulates that (6.2%) of hospital-acquired bacteremia may be directly attributable to peripheral intravenous cannulation. Some might argue that is a small percentage, but for the patients who develops a bacteremia any percentage is going to be significant. Infection may be localized or systemic; however, peripheral intravenous cannulation are more commonly associated with localized than systemic infection because of the high number of peripheral intravenous cannula inserted annually serious infection have resulted in significant annual morbidity.[4]

The majority of patients who undergo peripheral intravenous cannulation well not experience serious ill effects. However, individuals who do develop complications, the temporary / long term loss or use of a limb may affect an individual's choice of occupation causing economic impact. Loss of working days increased nursing time and the costs of treating peripheral intravenous cannulation complications will contribute to the economic burden felt by both the patient and the healthcare organization.[5]

Aim of the study:

This study was aimed to assessment the nurses' knowledge towards IV cannula insertion.

Subjects and Methods

This study was carried out at AL- Gumhori Hospital, AL- Kuwait Hospital, University of Science &Technology Hospital and Saudi German Hospital. The hospitals provide most types of medical services **(Medicine, Surgery, Obstetrics/Gynecology, pediatric, emergency and ICU). A descriptive cross sectional study** to assess nurse's knowledge toward IV cannulation insertion in hospitals where the study was conducted. The sample size was (100) nurses were participated in the study. Data was collected by used of questionnaire. The questionnaire consists of 20 questions divided into 5 parts: 1) Demographic data composed 6Q from (1- 6) questions covering the: Age, Gender, Marital status, Educational level, Year of experience, working department. 2) Nurse knowledge towards uses and tools of I.V cannula insertion composed 6 Q from (7- 12) questions. 3) Nurse knowledge towards characteristic vein of I.V cannula insertion composed 3Q from (13- 15) questions. 4) Nurse knowledge towards sterile techniques of I.V cannula insertion composed 2Q from (16- 17) question. 5) Nurse knowledge towards complication of I.V cannula insertion composed 3Q (18- 20) questions. **The content validity** was established by a panel of (5) expertise who reviewed the tool for clarity, relevance, comprehensiveness, understanding, applicability and ease for implementation and according to their opinion minor modification were applied. **The content reliability** was used to examine whether the questionnaire had internal consistency. The knowledge tools had a good internal consistency, the test was been done. **A pilot study** was carried out on ten nurses (10 %) in hospitals where the study was conducted to test the clearly and practicability of the tools. The results of the data obtained from the pilot study helped in modification of the tool, item were then corrected as needed. **Data collection** was carried out from June 2018 to September 2018 in morning and afternoon shift, The study tool was purposive method sampling, it was knowledge of nurses towards Intravenous cannula insertion at public and private hospitals in Sana'a City- Yemen; the questionnaire sheet filled by the nurses, while they were on work place, the study tool is took approximately 15- 20 minutes to complete.

The data was collected. Upon completion of data collection, variables included in each data collection sheets were organized and tabulated and were code prior to computerized data entry by using

SPSS, version 21. Data are summarized by using arithmetic mean X as an average describing central tendency of data. Used the paired t- test test for quantitative variable and McNemar test for qualitative variable. Statistical significance was considered at P- value < 0.05. The mean and standard deviation of total knowledge score were calculated according the following table:

Level	Percentages
Good	76%- 100%
Moderate	51%- 75%
Poor	0%- 50%

The official permission to conduct the study was taken from the faculty of Medical Sciences, Al-Razi University to managers of hospitals where the study was conducted (AL- Gumhori Hospital, AL-Kuwait Hospital, University of Science &Technology Hospital and Saudi German Hospital) and Verbal consent was taken from the participant. The purpose of study was explained prior to questionnaire distribution. At the initial interview, the researcher informed each nurse about the nature, purpose, and benefits of the study, and was informed that her participation is voluntary. Confidentiality and anonymity of the subjects was also assured through coding of all data. The researcher was assured that the data collected and information was confidential and would be used only for the purpose of the study.

Result

Table (1): Distribution of demographic characteristics among nurses (n=100)

Demographic characteristics	F	%
Age		
25 to 35 years	84	84
36 to 45 years	11	11
More than 45 years	5	5
Qualification		
Diploma in Nursing	63	63
Bachelor in Nursing	35	35
Master in nursing	2	2
Marital status		
Unmarried	45	45
Married	55	55

Demographic characteristics	F	%
Gender		
Male	47	47
Female	53	53
Duration of Experiences (years)		
From 1- 3 years	48	48
From 4- 6 years	15	15
＞ 6years	37	37

Table (1) shows that the distribution of demographic characteristics among nurses. The results of the study showed that more than four fifth (84%) of the nurses aged ranged from 25 to 35 years old. Near of two third (63%) of the nurses had diploma degree in nursing. As regards marital status, more than half (55%) of the nurses were married and less than half (48%) their experiences were from 1- 3 years.

Table (2): Distribution of the sample according to work place (n=100).

No.	Items	Response 100%
1	Medical department	35
2	Pediatric department	18
3	Surgical department	17
4	Surgical critical care unit	10
5	Other department	9
6	Gynecology and obstetrical department	6
7	Cardiac care unit	5
	Total	100

Table (2) Showed distribution of the sample there were the more than one third of participants are work in medical department about (35%), followed by about (18%) are work in pediatric department, whereas the participants who works in Cardiac Care Unit about (5%) only.

Table (3): The total of knowledge of nurses' towards I.V cannula (n=100).

Item	Responses 100%
Knowledge of nurses' towards uses and tools of I.V cannula	45.4
Knowledge of nurses' towards characteristics of insertion of I.V cannula	71.7
Knowledge of nurses' towards sterile technique of I.V cannula	66.3
Knowledge of nurses' towards complication of I.V cannula	85.3
The total of correct answers	67.2

Table (3) Shows the distribution of the sample of nurse's knowledge toward of I.V cannula. The sample response was poor (45.4%) based on knowledge about the uses and tools of an IV cannula, while their answer was moderate (71.7) toward characteristics of insertion of I.V cannula, also about sterile technique of I.V cannula (66.3) and their answer was good (85.3%) about the knowledge of nurses towards complication of I.V cannula. While, the total of nurses' knowledge towards I.V cannula is moderate (67.2%).
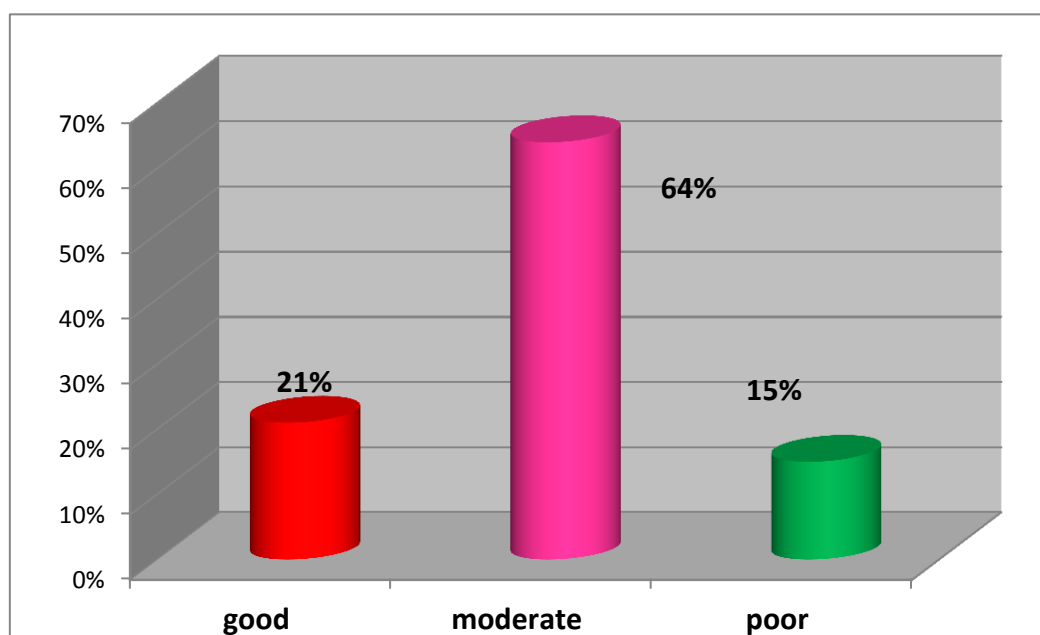

Fig. (1): The level of knowledge of nurses' towards I.V cannula (n=100).

Figure (1): The distribution showed the nurses 'knowledge responses to the intravenous cannula. The results were approximately two- thirds (64%) of the participants who answered with a moderate level, the other participants' response level followed them answered near of quadrate (21%) at a good level, while another participants were answered only less than one fifth(15%) at a poor level.

Table (4): Association between the level of knowledge toward I.V cannula and their demographic characteristics (n=100).

demographic characteristics	Level of knowledge toward of I.V cannula			(p- value)
	Good	Moderate	poor	
Marital status				
Unmarried	8	32	5	0.00
Married	13	31	10	
Gender types.				
Male	9	30	8	0.00
Female	12	33	7	
Education level.				
Diploma	17	37	8	0.00

demographic characteristics	Level of knowledge toward of I.V cannula			(p- value)
	Good	Moderate	poor	
Bachelor degree	4	25	6	
Master degree	0	1	1	
Experiences years.				
From 1- 3 years	6	35	7	
From 4- 6 years	5	6	4	0.00
> 6years	10	22	4	

Table (4) Show in this table that highly statistically significant relationship between the level of knowledge I.V cannula and their demographic characteristics (marital status, gender types, education level and experiences years), (P value= 0.00).

Discussion

Peripheral venous catheter is one of the most frequently used medical devise in the world, intravenous therapy with drugs, nutrients and blood component is indispensable in today's health care. Peripheral intravenous cannulation is a produce in which the patient's skin is punctured with a needle to allow insertion of a temporary plastic tube into a vein.[1]

There our study was aimed assessing nurses' knowledge toward IV cannula insertion. The present study explains that majority (84%) of study group their ages range between (25- 35 years). That result was agreeing with assessment of the level of knowledge and practice on intravenous canalization[6]

Regarding the sex in the present study approximately half of nurses (52%) were female because this category from people more polarization in the hospitals, this result was disagreeing with **(Jones, 2014)**[7] that say more than third (37%) were female only.

Furthermore, the present study of experience of years approximately half of participants (48%), this result was agree with **(Qamar, 2016)**[8] were her result (49%) with assess nurses' knowledge towards care and maintenance of peripheral intravenous cannulation.

The level of education in the present study showed that more than half of nurses (62%) from diploma, because don't enough training and qualification progress, and the economy of Yemen is poor. This result was agreeing with **(Wilson, 2010)**[9] in his article nurses' knowledge and practice toward care and maintenance of peripheral intravenous cannulation that his result was (79.2%). While another study was disagreeing with assess nurses' knowledge and practice toward care and maintenance of peripheral intravenous cannulation **(Qamar, 2016)**[8].

Regarding level of knowledge show in this present study was near of tow third (64%) participants who answered with a moderate level because the continuous training and education for participants was few.

This study was agree with **(Sandeep Kauri, 2017)**[10] were his result near tow third (65.16%) in descriptive study to assess knowledge and practices regarding venous access devices. While disagree with (**Morris, 2008**)[11] in his letter that was titled nurses' knowledge about insertion procedure for peripheral insertion central catheter in new born, where the results were more than four- fifths (87%) good.

Conclusion

Based on the finding of the present study it can be concluded that: The most of participants from age between 25 to 35 years about (84%). More than half of participants are females (52%). Approximately half (48%) of participants are had years' experiences from 1- 3 years. Near tow third (62%) of participants are had diploma degree. Highly statistically significant relationship between the level of knowledge I.V cannula and their demographic characteristics (P value = 0.00).

Recommendation

The nurses need to be trained, education and conducting courses how to care and maintenance of IV cannula. To keep these programs continuous by encouraging the rotation between the staff in the hospital. Establishes regular training program and workshops about infection control measure especially for invasive procedure.

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