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A Cross Sectional Study To Assess Nurse's Perception of Risk Factors For Infusion Phlebitis In Selected Hospitals, Jazan, Saudi Arabia

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Abstract: *Intravenous therapy is one of the most common procedures performed in hospitals that allow rapid and accurate administration of medication. Phlebitis became the most common complication of this type of treatment. The aim of the present study was to investigate nurse's perception of risk factors for phlebitis in hospitals of Jazan, Saudi Arabia. The Design of this study was descriptive research design. A convenience sample of hospital nurses recruited in 3 hospitals in jazan, Saudi Arabia. In results it was found that a high rate of incorrect answers related to infusion phlebitis was observed.*
Conclusions: *These finding suggest that nurses should be trained about the risk factors for infusion phlebitis.*
Recommendation: *Strategies for improvement should include knowledge about the risk factors for infusion phlebitis, care of patients with IV cannulization*
and safe practices.
Keywords: *Cross-sectional study, Nurses, perception, phlebitis, risk factors*

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I. Introduction

Peripheral venous cannulation (PVC) is a common procedure carried out in hospitals to allow rapid and accurate administration of medication. However, the placement of an intravenous cannula can have undesirable effects, the most common of which is phlebitis.

Peripheral cannula or catheter related phlebitis is caused by the inflammation of the tunica intima of a superficial vein. The inflammation is due to irritation of the tunica intima by mechanical, chemical or bacterial sources. If left untreated it can lead to infection or thrombus formation. According to the standards of the Infusion Nurses Society (INS), the accepted phlebitis rate is 5% or less.It is estimated that in the UK 20% -80% of patients with PVC develop phlebitis. This broad range has also been reported in studies from Saudi Arabia and other countries, which suggests poor identification of phlebitis or poor reporting protocols.

Among hospital inpatients, intravenous fluid therapy is the most common invasive procedure. More than 90% of patients in hospitals receive IV therapies through certain form of intravenous device. The most common complication is infusion phlebitis, which is defined by pain, erythema, swelling and palpable thrombosis of the cannulated vein.

In 2004, Tomford observed that the skill of the IV nurses who insert the cannula affects the incidence of phlebitis. Several studies have also indicated that well trained IV therapists and routine documentation are associated with a lower risk of catheter infection than is seen with regular nurses.

A nurse should possess required knowledge and skills for setting up and maintaining IV equipment, the patient's venous system, as well as knowledge of the physical & chemical characteristics of the administered medications. Given that intravenous therapy is often accompanied by complications, phlebitis being among the most common, nurses has a responsibility to minimize this incidence.

Evidence suggests that nurse's knowledge of infusion phlebitis and its risk factors may influence the risk for infusion phlebitis, so our study performed in Jazan, KSA in three hospitals investigated perception of the risk factors for infusion phlebitis.

II. Significance Of The Study

Intravenous therapy is an integral part of professional nursing practice in all healthcare institutions. Phlebitis is considered a major problem in clinical practice that can result in more serious complications that lead to the use of antibiotics or a possible surgical intervention .Nurses' knowledge and early recognition of risk factors for the development of phlebitis can reduce complications. This improves the quality of care, patient

safety, patient satisfaction ratings, and at the same time reduces length of hospital stay and the overall cost of health care. Nurses are critical to reduce adverse outcomes. There are no studies to assess nurses Knowledge about infusion phlebitis in Jazan hospitals. The aim of the present study was to investigate nurse's perception of risk factors for phlebitis in hospitals of Jazan, Saudi Arabia.

III. Subjects And Method

3.1 aim of the study.
The aim of the present study was to investigate nurse's perception of risk factors for phlebitis in hospitals of Jazan, Saudi Arabia.

3.2 Research Question.
What is the nurse's perception about risk factors for phlebitis in hospitals of Jazan, Saudi Arabia.?

3.3 Operational definitions-
i. Nurses: was operationally defined in this study as a clinical nurse specialists who work in at King Fahad Central Hospital , Al-Hayat National hospital and Prince Mohammed Bin Nasser Hospital in one range of specialties, such as Medical & surgical unit, Obstretics & Gyeanecology unit, Emergency department & ICU.
ii. Perception: was defined as how nurses' perceive (beliefs and attitudes) the importance of decrease incidence of phlebitis in their clinical setting.

3.4 Research design.
Descriptive research design was utilized to carry out the current study.

3.5 Research Setting
The study was conducted at King Fahad Central Hospital , Al-Hayat National hospital and Prince Mohammed Bin Nasser Hospital. King Fahad Central Hospital which is a tertiary hospital with 350 beds, Al-Hayat National hospital with 250 beds and Prince Mohammed Bin Nasser Hospital with 300 beds. All these hospitals have all important departments i.e. Medical & surgical unit, Obstretics & Gyeanecology unit, Emergency department & ICU.

3.6 Subjects.
We used a convenience sample .All 102 nurses of these 3 hospitals who provided informed consent were included. 34 nurses were from King Fahad central hospital,33 nurses were from Prince Mohammed bin Nasser hospital and 35 nurses were from Al Hayat National hospital.

3.7 Instruments of the Study.
Two tools of data collection were used in this study.
1. Tools one: it include socio- demographic characteristics of the study subjects' as.age.sex, Experience, Level of Education, Job Rank and Area of job of participants in study
ii.Tools two
14 questions listing several answer options. assessing perception of risk factors for infusion phlebitis was developed by Lanback and Colleages. As it was not copy righted, permission was not necessary to use and modify some of their items for our study.

3.8 Procedure
This study was conducted during the period from 1st October '2017 to 30th December'2017.An official permission to carry out the study was obtained from the responsible authorities .
In addition to obtaining the institution's permission, oral consent was obtained from the participant nurses; the data was collected after explanation of the purpose of the study. Each participant notified about the right to refuse to participate in the study both anonymity and confidentiality were ensured.

3.9 Pilot Study.
Pilot study was conducted two weeks before final study on 10 subjects. These subjects were not included in final study. It was conducted to check the clarity of the statements, and simplicity of questions and to check the most common topics related to the study. These numbers of pilot study were excluded from the total number of study sample. Necessary corrections and modifications were done based on findings of pilot study to develop the final form of the tools. The questionnaire face validity was 1.0.To assess the reliability of the questionnaire, a pilot test. Item reliability was good with Cohen's K>0.6.

3.10. Analysis of the Results .The data were collected and tabulated using Statistical Package for Social Science (SPSS/version 20). Quantitative data were expressed as mean & standard deviation (X±SD). Qualitative data were expressed as number and percentage. P-value at 0.05 was used to determine level of significance.

IV. Results

4.1. Sample characteristics of 100 nurses of 3 hospitals of Jazan, Saudi Arabia.

Of the 102 enrolled nurse participants all of them had responded. Only two respondent return questionnaire incomplete so they were not included in study.100 % of the participants were clinical nurse and 90% were female and only 10 % were male. The population was young and 57% of participants were less than 30 years of age. Most of the participants (45%) were having 5-10 years of experience and (40%) participants were having less than 5 years of experience.63% population had bachelors degree and 37% population were having Diploma in nursing. Regarding job rank 95% of respondent staff nurses and only 5% were nurse incharge or at higher level. Most participants worked in medical ward (53%), surgical ward (25%), emergency & ICU (20%) and Obstetric and gyeanocology ward (5%) respectively.

Demographic and participants characteristics are summarized in Table1.

Table *1: Sample characteristics of 100 nurses of 3 hospitals of Jazan, Saudi Arabia*

Characteristics	**N(%)**
Gender-	
Male	10
Female	90
Age-	57
< 30 years	26
30-40 years	17
> 40 years	
Experience-	
< 5 years	40
5-10 years	45
>10 years	15
Level of Education-	
Diploma in nursing	37
Bachelor in nursing	63
Job Rank	
Staff Nurses	95
Nurse Incharge	5
Area of job of participants in study	
Medical Ward	53
Surgical Ward	25
Emergency & ICU	20
Obstetrics & Gynecology Ward	5

Figure 1: Distribution of professional experience

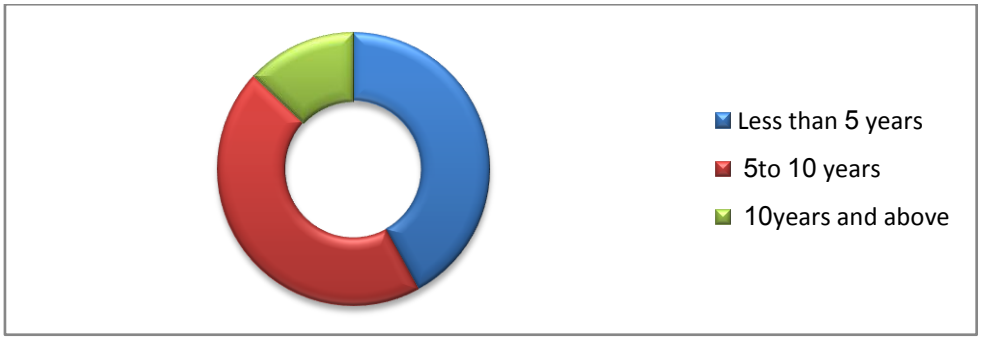

Figure 1. Dipicts the professional experience of the participant nurses.40% of participant nurses were having less than 5 years experience. Nurses who were having 5-10 years experience was 45% and nurses who had experience more than 10 years were only 15%.

Figure 2.Distribution of professional education of participants

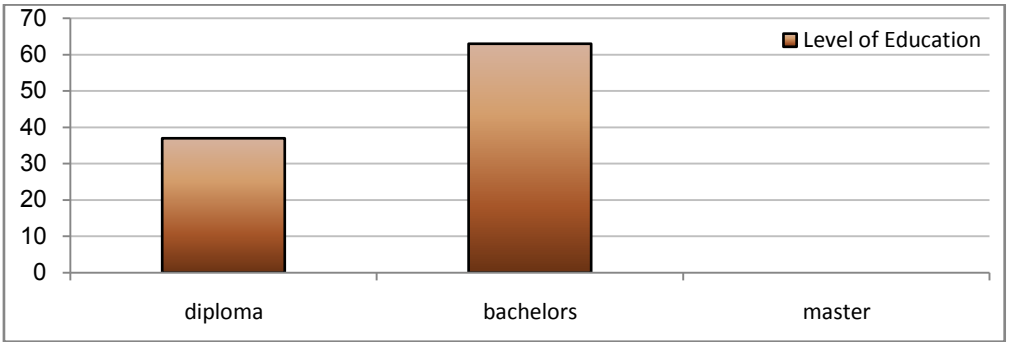

Figure 2: Shows distribution of professional education of participants. Most of the participant nurses (63%) were having bachelors' degree and 37% of nurses were having diploma in nursing. None of the participant was having master's degree.

4.2 .The results of study

Figure 3: Frequency of answers to the risk factors for phlebitis:

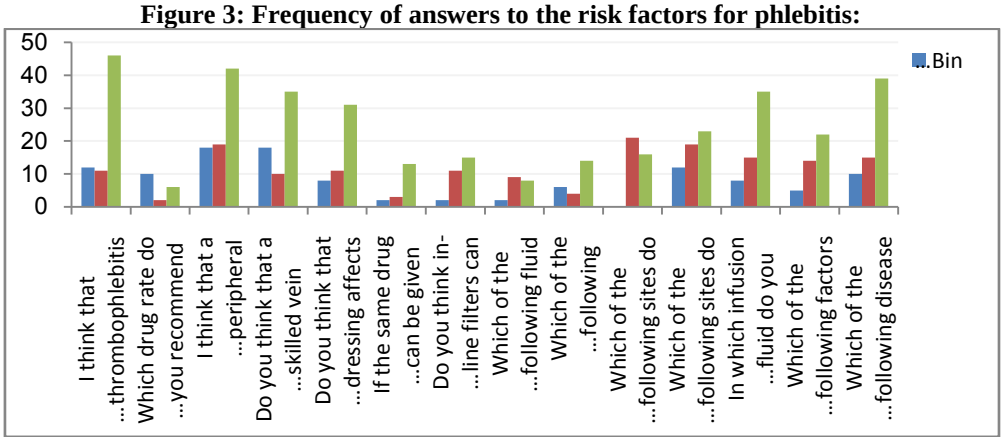

Figure 3: By analyzing the 14 answers to the questionnaire, a high rate of incorrect answers were found to be related to the questions about the flow rate for a drug that often causes phlebitis (77.3%) and about the quality of peripheral venous catheter decreases the risk for phlebitis (66%) .Most of the nurses perception was wrong regarding the importance of dressing to reduce risk of phlebitis (84.6%).After analyzing nurse's perceptions about the risk factors for phlebitis, we observed a difference on a level of education and experience of the participants.

Figure4:

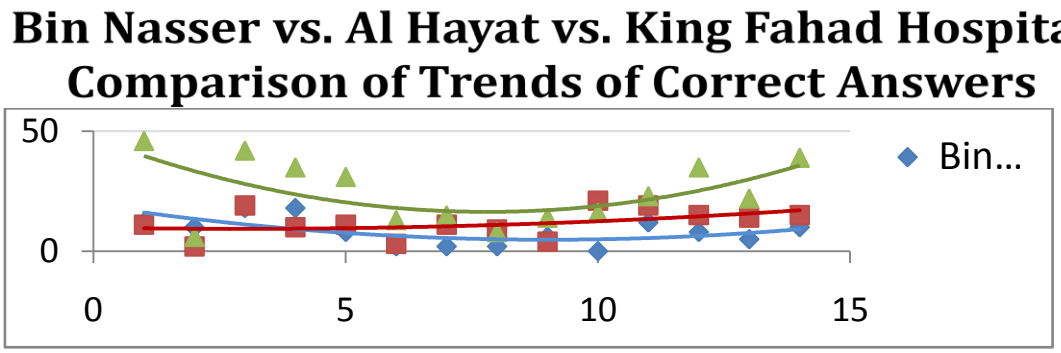

Figure 4 shows the comparison of correct answer among staff nurses of 3 hospitals included in study. By analyzing answers to the questionnaire we found that high rate of correct answers were given by the participant nurses of King Fahed central hospital and the high rate of incorrect answers were given by the nurses of Prince Mohammed Bin Nasser hospital. None of the participants of Al Hayat National hospital had given correct answer regarding the site of insertion of catheter which decreases the risk of phlebitis.

Discussion

Phlebitis is the most common complication of intravenous catheter, and it can lead to many problems, including higher costs of therapy and longer hospital stays. In our study almost all of the nurses believed that phlebitis was a large or medium problem. The result indicated that phlebitis is most common side effect in clinical practice and the nurse should pay enough attention to it.

Results of the previous studies show that the incidence of phlebitis increases three or four days after PVC insertion(8), or when a cannula is inserted in an antecubital vein(5,16) or wrist region(8)

4.1 Patient specific factors

Old age, females ,the presence of underlying medical disease (cancer, immune deficiency) appears to be at increase risk of peripheral vein infusion phlebitis.70.7% of nurses knew the risk increases with old age. However only 14.4% nurses knew that dressing helps in reducing the incidence of phlebitis.

4.2 Site of catheter insertion

Only 47.3 % participants knew that wrist is a proper site for insertion of peripheral venous catheter as it decreases the risk of phlebitis. According to the updated CDC guidelines Insertion of the catheter in the forearm or the antecubital fossa is associated with a higher risk than in the hand or the wrist. There is still another dilemma to be resolved for successful intravenous management. There was a significant difference of nurse's perception of the appropriate insertion site for an intravenous cannula to reduce incidence of phlebitis.

However, Giancarlo conducted a multi-center prospective study in 2014 does not support our study as he found that the antecubital fossa and forearm veins may be the preferred anatomical sites for peripheral intravenous cannulation.

4.3 Duration of catheter retention

Currently, routine replacement of the IV cannula is thought to reduce the risk of phlebitis and blood stream infection.CDC guidelines recommended replacement of peripheral intravenous cannula no more frequently than every 72-96 hours. In our study 79.7 % nurses believed that a catheter should be replaced no less than 72 hours to prevent irritation of the vein. Only 20.3 % nurses gave incorrect answer.

However Webster's' study in 2013 found no evidence to support the current practice of routinely changing catheters every 3-4 days.

4.4 Fluid and Drugs

It is well known that high as well as low pH and osmolality of a drug or fluid can increase the risk of phlebitis. However in this study only 32.1% knew that high pH can increase the risk, 84% of the nurses did not aware of the risk associated with high concentration. Obviously, these nurses lack knowledge regarding the impact on phlebitis of the characteristics of fluid and drugs.

Xiamg-Ferrgi et al (2013) study supports that many nurses does not have knowledge about impact of drugs and fluids on phlebitis.

4.5 In line filters

Studies have indicated that in line IV filters could be an effective approach to remove contaminants from IV solution, thus reducing the rate of phlebitis. In our study 23 % of the nurses believed that in line filters can reduce the risk of phlebitis, while 77 % of nurses did not know that in line filters reduces the risk of phlebitis or indicated they were uncertain about their effects.

4.6 Other Factors

CDC guidelines report indicates that no evidence supports the idea that the dressing affects the risk for phlebitis. The majority of nurses (87.6%) in this study answered this question incorrectly.

Several studies have indicated that well –trained IV therapists and routine documentation are associated with a lower risk of catheter infection than regular nurses.

V. Conclusions

5.1 In conclusion, several of the recommended procedures for preventing infusion phlebitis were not known by most of the participating nurses. It is especially alarming that factors proven to be harmful, such as use of dressing to prevent phlebitis. A periodic check of nurse's perceptions about the risk factors for the development of phlebitis, using questionnaire that was administered in our study, can help nurse managers determine where nurse should receive training. The staff nurses need to involve in identify the care of patients with IV cannulization and safe practices otherwise patients will be sufferer as well as country.

VI. Recommendations

Based on the findings of the current study, the following recommendations are suggested:

1. Develop and implement ongoing training workshops on preventing infusion phlebitis for nurses in selected hospital.

2 Further studies should be conducted based on more randomized sampling process to ensure generalizability of the results.

Limitation

This study was conducted only in three hospitals of Jazan, Saudi Arabia and the participants in this study were selected by convenience sampling. Our results may be affected by selection bias. It is quite possible that nurses of other hospitals have even better or worse knowledge.

The fact that different members of the nursing team assessed and recorded the development of phlebitis may have created different assessment criteria.

Conflict Of Interest

All contributing authors declare no conflict of interest.

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