

DETERMINATION OF THE SITUATION OF NURSES RELATED TO THE APPLICATION OF PERIPHERIC VENOUS CATHETER*

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ABSTRACT

This study has been conducted to determine the situation of the nurses related to the application of peripheric venous catheter (PVK). This study is conducted among the nurses who work at Aziziye ve Yakutiye Hospitals depending on the Atatürk University in Erzurum. The sample was nurses who accepted to attend the study and working in the signified units between the dates November 2010-February 2011. The questionnaire which was developed by the researchers by reviewing related literature was used. The personal characteristics of the nurses and their knowledge about peripheric intravenous catheters were included in the study. The collected data was evaluated in numbers and in percentage by using SPSS program. Nurses in the study, the most nurses (% 97,3) were before applying PVK made cleaning of the skin and the most nurses (% 90.7) was incorrect applications occlusion of catheter in the steps of the application of PVK.

Key Words: Nursing; Peripheric Venous Catheter; Clinical Applications, Nurse.

PERİFERİK VENÖZ KATATER UYGULAMAYA İLİŞKİN HEMŞİRELERİN DURUMLARININ BELİRLENMESİ

ÖZET

Bu çalışma, periferik venöz kateter (PVK) uygulanmasına ilişkin hemşirelerin durumunu belirlemek amacıyla yapılmıştır. Çalışma Erzurum Atatürk Üniversitesine bağlı Yakutiye ve Aziziye hastanelerinde çalışan hemşireler arasında yürütüldü. Örneklemi Kasım 2010-Şubat 2011 tarihleri arasında belirlenen ünitelerde çalışan ve araştırmaya katılmayı kabul eden hemşireler oluşturmuştur. İlgili literatür gözden geçirilerek araştırmacılar tarafından geliştirilen anket formu kullanılmıştır. Çalışma, hemşirelerin bireysel özellikleri ve periferik intravenöz katater hakkındaki bilgilerini içerir. Toplanan veriler SPSS programında sayı ve yüzdelik olarak değerlendirildi. Hemşirelerin çoğunluğu (%97.3) PVK uygulamadan önce cilt temizliği yaptı ve % 90.7'sinin PVK uygulama basamaklarında katater tıkanıklığında yanlış girişimler uyguladı.

Anahtar Kelimeler: Periferik Venöz Kateter, Klinik Uygulama, Hemşire.

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INTRODUCTION

An intravascular catheter insertion is one of the essential procedures in the healthcare field (1). At present various catheter procedures, such as peripheral, central, arterial, and venous, are used for different purposes. Today, a peripheral venous catheter (PVC), which started being used in clinics 50 years ago, is a common procedure (2). It is known fact that nowadays, 63% of inpatients in European countries, and 50% of the inpatients in the United States of America have a peripheral venous catheter (3).

Nurses are the individuals that conduct the peripheral venous catheterization procedure in clinics, as well as monitoring and providing the necessary care related to the peripheral venous catheter (3). Nurses are expected to improve their knowledge and skills regarding the peripheral venous catheter in order to provide patients with the care they require. In addition, rapid advances in technology and health care need nurses to apprehend that basics related to the up-to-date knowledge and applications, adopt the learning principle for life, and put new information into practice (4,5).

The peripheral venous catheterization is used for various purposes such as enabling the fluid electrolyte balance, giving blood and blood products, giving medication, giving total parenteral nutrition, and monitoring hemodynamic (1,6,7). Infiltration, phlebitis, ecchymosis (bruises), hematoma, septicemia, vascular laceration, hemorrhage, and air embolism are some of the complications that arise due to the peripheral venous catheterization (7-10). These complications are serious complications that are live threatening and can be prevented. Numerous factors can cause these complications, such as the type of catheter, the suitable location for the catheter, the type of infusion fluid, the entrance location of the catheter, the contaminated infusion fluid, the type of dressing used, the duration the catheter is left in, whether or not healthcare professional comply with asepsis, and the fluid used to keep vascular access open (11). The complications caused by the peripheral venous catheter can extend the hospitalization of patients, expose patients to unnecessary diagnosis procedures and treatment, can cause the patient and their close relative stress, increase the workload of healthcare professionals, and result in economical loss (12). The majority of complications can be prevented by carefully evaluating the patient, taking various precautions, and inserting the catheter using a good technique. A successful catheterization plays an extremely important role in maintaining a peripheral venous treatment without complications arising. Numerous factors such as the age, vein structure, skin, and subcutaneous tissue characteristics of the

patient affect the procedure success of the nurse (13). The fact that a number of factors affect the said complications and most of these factors are related to the nurse's practices emphasizes the important role the nurse plays in preventing these complications. Therefore, nurses must be capable of conducting the peripheral venous catheter without problems, and know the complications that could possibly occur. Based on the information provided above, the purpose of this descriptive study was to evaluate the peripheral venous catheter procedures conducted by nurses.

MATERIAL AND METHOD

The population of this descriptive study comprised of nurses working at Aziziye Hospital and Yakutiye Hospital, both connected to Erzurum Atatürk University. The sample group of this study comprised of 364 nurses who worked at the said units between November 2010 and February 2011, and who accepted participating in this study.

A questionnaire, prepared by the researchers based on information they collected reviewing literature (2,8-10,14-15), was used to collect data for this study. The questionnaire contained questions that identified personal characteristics of the nurses and measured their knowledge and procedural experience related to the peripheral venous catheter. A SPSS (Statistical Package for the Social Sciences for Windows-18.0) program was used to collected data and statistical analysis. Data were evaluated as number and percentage, mean in categorical and numerical measurements.

RESULTS

Illustrates the descriptive characteristics of nurses. The majority of nurses participating in this study were aged between 21 and 28 (55.5%) and were vocational school of health graduates (47.3%). 39% of the nurses participating in this study worked in internal diseases, 42.3% worked in surgery, 5.5% worked in pediatrics, and 13.2% of the nurses worked in Accident and Emergency. The longest experience the nurses had was between 6 and 10 years (42.9%) (n=364) (**Table 1**).

Table 1. The Distribution of Clinical Nurses According to Their Descriptive Characteristics (n=364)

Characteristics	N	%
Age		
21–28	202	55.5
29–36	112	30.8
37–44	40	11.0
45 old and above	10	2.7
Level of Education		
High School diploma	172	47.3
Associate degree	68	18.7
Bachelor's degree	118	32.4
Post Graduate	6	1.6
Department of Employment		
Internal Services	142	39.0
Surgical Services	154	42.3
Children Services	20	5.5
Emergency Services	48	13.2
Year of Working		
5 year and under	110	30.2
6-10 year	156	42.9
11-15 year	56	15.4
16-20 year	34	9.4
21 and above	8	2.1

Illustrates the right and wrong applications of nurses related to the stages of inserting a PVC. In terms of the incorrect applications related to the stages of inserting a PVC, 90.7% of nurses applied the incorrect insertion to resolve a blocked PVC, 87.9% did not wash their hands before starting the procedure, 80.2% did not change the peripheral venous catheter at the right time, and 70.3% of nurses did not state the date of the PVC procedure and the name of the individual that conducted the procedure on the fixation material (**Table 2**).

Table 2. The Distribution of the Stages of Application PVC for Nurses (n=364)

The stages of application PVC	Correct		Incorrect	
	N	%	N	%
Give patients information about the application	284	78.0	80	22.0
Wash hands before application	44	12.1	320	87.9
Both venous of the arm to check by inspection and palpation	310	85.2	54	14.8
Venous to make significant	282	77.5	82	22.5
Wear gloves	132	36.3	232	63.7
The skin cleansing before in application of PVK	354	97.3	10	2.7
Wait to dry after cleaning the skin with antiseptic substance	102	28.0	262	72.0
Enter the appropriate angle to the venous	275	75.5	89	24.5
The date of the PVC procedure and the name of the individual that conducted the procedure on the fixation material	108	29.7	256	70.3
The follow before in application of PVK /Observe	153	42.0	211	58.0
The rate of change of PVK	72	19.8	292	80.2
The open of blocked PVC	34	9.3	330	90.7

In terms of the correct applications related to the stages of inserting a PVC, 97.3% of nurses cleaned the patient's skin before inserting the PVC, 85.2% controlled the inspection and palpation of the veins in both arms before choosing the right vein to insert the PVC, and 78% of nurses provided their patients with information regarding the procedure (**Table 2**).

Illustrates to what extent nurses can identify the symptoms and results of local complications that develop in patients that have had a PVC inserted, and to what extent they can identify the suitable nursing intervention to apply. Study results concluded that the complication nurses identified most was infiltration (89.6%). In terms of applying the suitable nursing intervention for local complications, nurses were able to identify the correct nursing intervention for infiltration the most (87.4%) (**Table 3**).

Table 3. The Distribution of Information on Local Complications PVC for Nurses
(n=364)

	Correct		Incorrect	
	N	%	N	%
Identify Signs And Symptoms Of Local Complications				
İnfiltrasyon	326	89.6	38	10.4
Ekstravazasyon	240	65.9	124	34.1
Flebit	254	69.8	110	30.2
Identify The Suitable Nursing Intervention To Apply Of Local Complications				
İnfiltrasyon	318	87.4	46	12.6
Ekstravazasyon	107	29.4	257	70.6
Flebit	138	37.9	226	62.1

DISCUSSION

The results of this study, conducted to evaluate the situation of nurses in relation to conducting the peripheral venous catheter, were compared to results of similar studies available in literature.

Patients should be told what the procedure entails before every procedure. After the necessary explanations are made, the patients should be asked if they have any further questions. The healthcare professional explaining the procedure to the patient must do so in a confident manner, because no patient will trust a nurse that does not trust themselves. The collaboration established between patient and nurse will reduce the stress level of both the patient and the nurse (16). The fact that the majority of nurses participating in this study inform their patients about the PVC procedure before each procedure was a pleasing result (Table 2).

Prior to inserting the PVC, the patient's skin should be cleaned thoroughly with an antiseptic in order to protect the patient from any possible infections that may develop (6). Catheter infections are evaluated as one of the indicators of quality nursing care (17). Therefore, cleaning the skin as part of the PVC procedure is essential. Study results concluded that the majority of nurses cleaned their patient's skin before inserting the PVC (Table 2).

Choosing the right vein is essential for a successful peripheral venous catheterization. Various factors such as the medical history of the patient, their age, their body type and

weight, their general state, their level of physical activity, the state of their veins, and their level of vascular access must be taken into consideration when choosing the right vein. Other properties that should be taken into consideration are the osmolarity of the treatment to be applied, the pH and length of application time, the state of the peripheral veins, any history of neurological disorders, the lymphatic system, any surgical interventions that might affect the procedure, thrombosis, or any problem treated in the past (13,18). Study results concluded that the majority of nurses checked veins in both arms with inspection and palpation before choosing the right vein to insert the PVC.

In the event that the PVC gets blocked during the PVC procedure, the clot should be removed using physiological serum in order to unblock the PVC. In the event that the clot cannot be removed, no force should be applied and the PVC should be changed (8). One of the most incorrect procedure conducted by nurses during the study was that the nurses usually were unable to unblock the blocked PVC using the correct procedure (Table 2).

Hospitalized patients are faced with risks such as a decrease in body resistance due to their illness and the medication they are taking, an environment suitable to create microorganisms due to invasive procedures, and being exposed to numerous microorganisms in the hospital environment. Therefore, it is essential that healthcare professionals working in a hospital environment and nurses, who spend the most time with patients, place importance on washing their hands (19). This is why nurses must wash their hands before and after conducting the PVC procedure. Study results concluded that one of the most incorrect procedure conducted by nurses was not washing their hands. Study results also concluded that the majority of nurses did not change the PVC at the correct intervals (Table 2). The correct interval at which the PVC should be changed is between 72 and 96 hours; therefore, it is essential to write the date on which the PVC was inserted, and by whom it was inserted on the fixation material. Writing the date prevents individuals from forgetting the time the PVC should be changed (10).

The PVC procedure can result in numerous complications. Study results concluded that the most common complications identified by nurses were infiltration, phlebitis, and extravasations; the nursing interventions related to these complications were known (Table 3). Researchs reported that 67.24% of patients developed phlebitis (20), and reported that 20% of patients developed infiltration, while 32.5% developed phlebitis (11). Based on results of conducted studies it is thought that as these complications are the most common

complications that develop in PVC patients, the nurses can identify their symptoms and results, and generally know nursing interventions of these complications.

CONCLUSION

Study results concluded that the nurses participating in the study had sufficient knowledge regarding certain stages of the PVC procedure; cleaning the skin before inserting the PVC, checking the inspection and palpation of veins in both arms before selecting the correct vein, and informing the patient about the procedure prior to conducting the procedure. However, nurses had insufficient knowledge level; applying the correct intervention to unblock a blocked PVC, washing their hands before conducting the procedure, changing the PVC at the right intervals, and writing down when and by whom the procedure was conducted on the fixation material.

In conclusion of these results, nurses should be provided with practical in-service training programs that refresh and update the knowledge of nurses related to the PVC procedure, and new studies should be conducted on PVC with a broader research group.

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