



Evaluation of quality of vascular access care in hemodialysis patients

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General Note



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ABSTRACT

Objectives: Nurses have a special role in maintaining the quality and efficiency of vascular access, which is why they need to be effective in caring for these patients. **Method:** This is a cross-sectional study and available sampling method in which data were collected through observation of nurses' performance. In this study, 200 caring techniques, in 2019 years were observed for patients undergoing hemodialysis. All observations were made by one nurse. The tool used was a checklist of care techniques, which included two parts: demographic characteristics, and techniques of venipuncture and patient connection to the hemodialysis machine, with 14 questions. Data were analyzed using descriptive statistics after entering the SPSS16 software. **Results:** According to the findings, the achieved score 64 (59.8%) for nursing function in AVF care, considerate Optimal, 44 (47.3) in CVC care, Moderate and in share items 104 (52.0) was Optimal domain. **Conclusion:** According to the findings, nurses needed a VAS training in CVC care, suggesting that educational interventions be required. For this reason, it is recommended that appropriate training workshops and interventions be performed for nurses

Keywords: Vascular access, Quality of performance, Nurse, Hemodialysis

1. INTRODUCTION

The prevalence of chronic kidney disease is increasing (Raiisifar et al., 2014), and one of the common treatments in these patients is hemodialysis (Drew et al., 2020). For patients undergoing hemodialysis, there are various types of vascular access, such as Central Venous Catheter (CVC), Arterio Venous Fistula (AVF), Temporary Hemodialysis Catheter, Synthetic graft, and shunt (Adib et al., 2011, Adib-Hajbaghery et al., 2012). AVF & CVC are one of the most common vascular access that create various complications for the patient such as fever, infection, hemothorax, pneumothorax, or even death due to these complications (Qian et al., 2020, Bueloni et al., 2019, Farrington and Allon, 2019).

Nurses have a special role in maintaining the quality and efficiency of vascular access, which is why they need to be effective in caring for these patients (Abdelwahed Mohamed et al. 2019). One of the most important factors in improving caring techniques is education about safety care and prevention of nursing errors (Cant et al., 2020). In fact, patient safety is one of the most important components of service quality and is one of the most important issues in the medical community that have a particular importance in patients undergoing hemodialysis (Garrick et al., 2012).

Due to the increasing prevalence of hemodialysis patients and the importance of nursing care quality in doing the caring techniques for these patients, the present study aimed to determine the quality of vascular access care in hemodialysis patients in 2019 years.

2. METHODS

This is a cross-sectional study and available sampling method in which data were collected through observation of nurses' performance. In this study, 200 caring techniques were observed for patients undergoing hemodialysis. All observations were made by one nurse. The tool used was a checklist of care techniques, which included two parts: demographic characteristics, and techniques of venipuncture and patient connection to the hemodialysis machine. The checklist was designed by Adib-Hajbaghery and also confirmed its validity and reliability, this study was done after obtaining the permission of the tool designer. The checklist has 14 items, including: 1- Respect aseptic rules 2- Applying needle into aneurysm, 3- Using mask, 4- Wearing gloves, 5- Injection of heparin bolus, 6- Closing of venous catheter when connecting patient to machine 7-Correct priming, 8-Adjusted heparin dose according to physician's instructions, 9- Closing of Arterial catheter during patient removal, 10- Start blood flow, 11- Keep close one line while washing another line, 12- Sterile dressing at catheter placement, 13- Correct needle entry and 14- Needle entry distance with fistula. Items 10, 2, 13, 14 were related to AVF, items 9, 11 and 12 to CVC and the rest were related to both groups (AVF & CVC) (2, 3). The items in this checklist were divided into two sections: AVF with 11 items (0-11 score) and CVC with 10 items (0-10 score) and the final score of this checklist regarding quality of care in three desirable areas (76% - 100%), moderate (51% -75% score) and undesirable (0-50% score) were classified (3, 4).

After obtaining permission from the Research Ethics Committee of Kermanshah University of Medical Sciences, the researchers observed the performance of nurses in all turns. Before observing the nurses' behavior, they were explained that the information extracted would be generally reported and the nurses' information would be retained. The observation was done with the knowledge of the nurses and before the intervention sessions it was tried to reduce the sensitivity of the nurses in observing their performance with the presence of a researcher in the ward. It should be noted that if any mistake was made by the nurses, the

researcher only has been recorded the observed information and did not intervene in their care techniques until the research was completed. Data were analyzed using descriptive statistics (mean and standard deviation) by SPSS16 software.

3. FINDINGS

According to the results, 200 care techniques were observed, of which 93 (46.5%) were CVC and 107 (53.5%) AF. Of the 200 observations, 114 (57%) were male nurses and 86 (43%) were female nurses, 155 (77.5%) were bachelor's degree and 45 (22.5%) were master's degree. The mean age of the nurses observed was 44.26 (8.72) years and their mean years of service was 16.49 (7.04) years.

Table 1: Frequency Distribution of Performance Quality Status in AVF & CVC shared Items

Items	Yes N (%)	No N (%)
Respect aseptic rules	126(63)	74(37)
Using mask	178(89)	22(11)
Wearing gloves	147(73.5)	53(26.5)
Injection of heparin bolus	170(85)	30(15)
Correct priming	191(95.5)	9(4.5)
Closing of venous catheter when connecting patient to machine	197(98.5)	3(1.5)
Adjusted heparin dose according to physician's instructions	199(99.5)	1(0.5)

According to the findings, most nurses in the AVF & CVC shared items adjusted the dose of heparin according to the physician's instructions, but many did not follow aseptic techniques (Table 1).

Table 2: Frequency Distribution of Performance Quality Status in CVC

Items	Yes N (%)	No N (%)
Closing of Arterial catheter during patient removal	91(97.8)	2(2.2)
Keep close one line while washing another line	86(92.3)	7(7.7)
Sterile dressing at catheter placement	0(0)	93(100)

Also, in relation to AVF & CVC specific items, most nurses performed well while only in relation to CVC, all nurses did not perform proper dressing of the catheter (Tables 2 and 3).

Table 3: Frequency Distribution of Performance Quality Status in AVF

Items	Yes N (%)	No N (%)
Start blood flow	92(86)	15(14)
Correct needle entry	103(96.3)	4(3.7)
Needle entry distance with fistula	93(86.9)	14(13.1)
Applying needle into aneurysm	90(84.1)	17(15.9)

According to the findings, the points earned 64 (59.8%) for nursing function in AVF care, considerate Optimal, 44 (47.3%) in CVC care, Moderate and in share items 104 (52.0) was Optimal domain. According to the findings, 12 (6%) of the nurses had undesirable performance, 84 (42.0%) had Moderate function and 104 (52.0%) had Optimal function.

4. DISCUSSION

According to the findings, although the score of 104 (52.0%) of the nurses' performance was in favorable range, it was not overall in all nurses which is in line with the study of Haj Bagheri and colleagues (ADIB et al., 2011, Adib-Hajbaghery et al., 2012). Concerning CVC, not all nurses had a proper catheter dressing, which is likely to cause complications.

According to the findings, although the score of 104 (52.0%) of the nurses' performance was in Optimal range, it was not overall in all nurses which is same with the study of Haj Bagheri and colleagues (ADIB et al., 2011, Adib-Hajbaghery et al., 2012). In this study, in 147 (73.5%) observations the nurses used gloves, which is consistent with the results of Abdelsatir et al.'s study that showed 70% of health personnel observed hand hygiene (Abdelsatir and transplantation, 2013).

According to the findings, in the CVC-specific items, nurses' higher performance scores were in the middle range, which was consistent with the results of a review study by Abdelwahed et al. The Nursing Competency in VAC needs more training (Abdelwahed Mohamed et al. 2019). Mahmood et al.'s study of nurses' knowledge of the VA showed that they had a range of poor to excellent knowledge in relation to each of the questionnaire questions (Mahmood and Mohammed, 2016).

5. CONCLUSION

According to the findings, nurses needed a VAS training in CVC care, suggesting that educational interventions be required. For this reason, it is recommended that appropriate training workshops and interventions be performed for nurses.

Abbreviations

AVF: arteriovenous fistula

CVC: central venous catheter

VA: vascular access

VAS: Vascular Access Care

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Conflict of Interest: The authors declare that they have no conflict of interest.

Ethical approval: The study was approved by the Medical Ethics Committee of Kermanshah University (ethical approval code: IR.KUMS.REC.1399.166).

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