

# Assessment of Nurse's knowledge about the Infection Control in the Hemodialysis (HD) Unit

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DOI: 10.47750/pnr.2023.14.S02.242

## Abstract

**Background:** The vascular access is importance for the patient with renal failure to doing the hemodialysis and high risk for infection and this increase the risk of life-threatening from the vascular access of dialysis<sup>1</sup> the Centers for Disease Control and Prevention (CDC) labeled many measures to prevent and break of the infection process through hand hygiene, wear gloves, gown and environmental cleaning<sup>2</sup>

**Methods:** Hospital based – cross sectional study. Participants were randomly assigned to the intervention. Level of knowledge were measured at baseline and at 1 month, involved a systematic collection, analysis and interpretation of data to evaluate the current knowledge. The sample consist of 50 persons and that who were available during study period.

**Result:** The results showed 40 % of population have poo knowledge about the wearing gloves and 70% have good knowledge about the fistula care but the 34% of participants have sufficient knowledge about the universal precautions should be used in HD, 26% don't know about spread of infection in dialysis.

**Conclusion:** Based on the results of current study, we concluded help enhance nursing staff need more education training more knowledge about importance infection control in HD unit to help and minimize the rate of infection in the HD field and we must educate the nursing staff about stander precaution, sterilization, care of fistula, dialysis equipment and machine sterilization, environmental issues and educate about importance of safety removal of waste of HD.

**Keywords:** Hemodialysis - Peritoneal dialysis - Infection Control - Personal protective equipment (PPE) - A septic technique - hand hygiene.

## INTRODUCTION

The infection is second leading cause of death in hemodialysis unit the sepsis indicted for long hospital sitting to patient the, the nurse in (HD) is paly main role in infection control. (5) the venous catheter or vascular access is the first causes of infections but have found other causes of infection in hemodialysis unit include the blood contamination from environmental sources. Nosocomial transmission multidrug-resistant organisms are far more likely in dialysis patients than the general population. Clostridium difficile and hepatitis B virus, hepatitis C virus, and/or human immunodeficiency virus; and airborne infections are both more prevalent in hemodialysis facilities than other care settings, and transmission between patients is a significant risk. the hand hygiene and stander precaution are the very importance in hemodialysis unit to break the chin of infection and decrease of transmission. (6,7,8,9,10)

To protect the patient in the (HD) the CDC with an American Society of Nephrology aim to target zero infections in hemodialysis facilities. (11,12) the nurse a play main role and direct response from all hemodialysis patient and to be knowing and understand about the essential infection prevention and how to break the transmission of pathogen, these six vital links, causative agent infectious reservoir, portal of exit from the reservoir, mode of transmission, portal of entry into host and susceptible host. (13,14)

In hemodialysis unit most of procedure is invasive that need for more a septic technique example for this procedure insertion of cannulation, connect and disconnect of machine, needle of intra veins medication and hemodialysis catheterization all of this procedure needs from nurse wearing gloves to protect them self and patient from infection, the nurse should be more knowledge and skills to manage and prevent of infection transmission. (15,16)

All patient with renal failure should be treated through hemodialysis, peritoneal dialysis or renal transplantation if treat by hemodialysis the main aim of it to remove salt and other waste product from the blood during this process blood pass through an artificial kidney or filter through a tube this need more prevention measure form the staff specially the nurse. (17)

To prevent of infection in hemodialysis have many measure to be knowing and practicing by the nurse and other health care staff this measure firstly place and facility setting special area for rest, drink and eat, clean room for special procedure like dressing, intra veins of medication, storage of drugs supplies and equipment, specific area for remove protective equipment, area for infected patient (18,19,20) after to prepare the sitting the hand hygiene is importance to minimize transmission of the infection in hemodialysis unit and is the basic in the steps of standard Precautions, the WHO is recommended to use of hand hygiene before and after touching a patient or surroundings patient, Before clean/ aseptic procedures and After body fluid exposure risk. If the hand is not soiled the nurse can use alcohol-based hand rub. (21,22)

Personal protective equipment (PPE) Gloves, gowns, surgical masks, goggles/ face shields should be used in dialysis unit and the patient should be wear mask and the choice of PPE depend of the patient condition, should be change as soon as possible if contamination of blood or body fluid lastly the PPE id disposable not used again. In hemodialysis most be give importance to equipment and instrument to assist in protection of transmission of infection in this unit clinical equipment and other items should be disposed and used for one patient, when to give patient medication in hemodialysis first wash hand, proper preparation and single use of injection. Environmental control and Waste management is the last two point in the infection control in hemodialysis unit measure containers for waste should be available at the point of use, sharps container and the staff should be caution to prevent of injury, hemodialysis fluid should be disposed directly into a drain. (23,24,25,26,27)

The staff in hemodialysis high risk to sharp injures hazards such as body fluid, blood -borne pathogens, e.g., HBV, HCV and HIV, may occur during inject of patient or cover of needle or exposure to harmful chemical the health and safety department in the hospital should be ensure all staff is knowledge and understand how to protect them self and patient from this infection transmission. (28,29)

## MATERIALS AND METHODS

**Study Design:** This is hospital based – cross sectional study; involve the systematic collection, analysis and interpretation of data to give a clear picture of a particular situation.

**Study Setting:** This study was conducted in Al Gezira state, central Sudan and the capital, Khartoum.

**Study Population:** The focused groups of the study were the nursing staff working in in HD unit.

**Inclusion criteria:** All nurses they are accepting to participate in the study in hemodialysis unit.

**Exclusion criteria:** They do not accept to participate in the research.

**Sample size:** The sample consist of 50 persons and that who were available during study period.

**Data collection tools:** Interview questionnaire. Data collection technique administrating written questionnaire.

**Data analysis:** Data collected and coded then interred in (SPSS) program version 21 for analysis after that represented in figures and tables.

**Ethical consideration:** Approval was obtained from the person. The participants who were given information about the study and who accept to participate in the study were include. The privacy and dignity of participants protected. The participants in

this study were assured confidentiality through identification coding and reports of data, the name of participants in this study not use in questionnaire, the participants notified by the aims, method, expected outcome, benefits and result of this study. Any participants have his right to ask, to discontinue, and to refuse to answer any question of the study. Written consent taken from the participants.

## Results:

The current study done in this study was conducted in Al Gezira state, central Sudan and the capital, Khartoum. Sample size 50 person were those of 20 males and 30 females. according to educational level (76%) bachelor in nursing. (32%) 10 -15 Year Work in Hemodialysis Unit more than 52% of sample not received any training programs for infection control on hemodialysis unit.

Table (5) clarified that Sufficient knowledge of the study group regarding universal precautions should be used in HD (34%). The study group have poor knowledge about the spread of infection in dialysis (38 %).

Also concerning knowledge about the hand hygiene (54%) of the study group have good knowledge. Regarding knowledge about the wearing gloves (40%) of study group have poor knowledge about how to wear gloves. Concerning knowledge about dressing of HD catheter (40%) poor knowledge.

Study group have good knowledge about the fistula care (70 %), regarding of the HD mechanics Put in sterilization program (40%) have poor knowledge.

Table (1) Explain Sample Distribution from the Gender Variable

Gender	Frequency	Percent
male	20	40
Female	30	60
<b>Total</b>	<b>50</b>	<b>100</b>

Category (1) Explain Sample Distribution from the Gender Variable

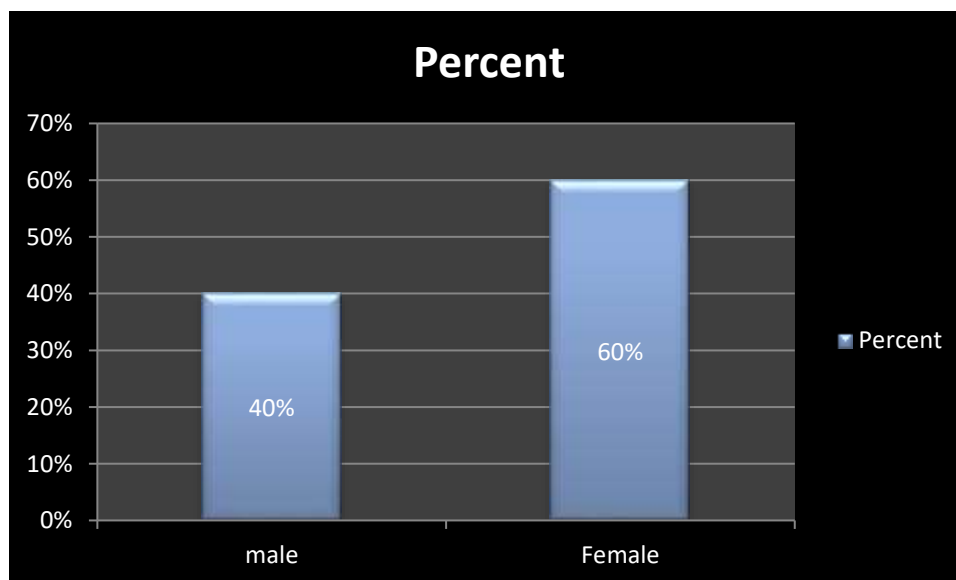


Table (2) Explain Sample Distribution from the Professional Variable

Gender	Frequency	Percent
Diploma	4	8%
Bachelor	38	76%
Master	8	16%
PHD	0	0%
Total	50	100%

Table (3) Explained Year Work in Hemodialysis Unit

Year work	Frequency	Percent
A few than 5	16	32%
(5-10)	16	32%
(10-15)	8	16%
More than 15	10	21%
Total	50	100%

Category (3) Explained Year Work in Home Dialysis Unit

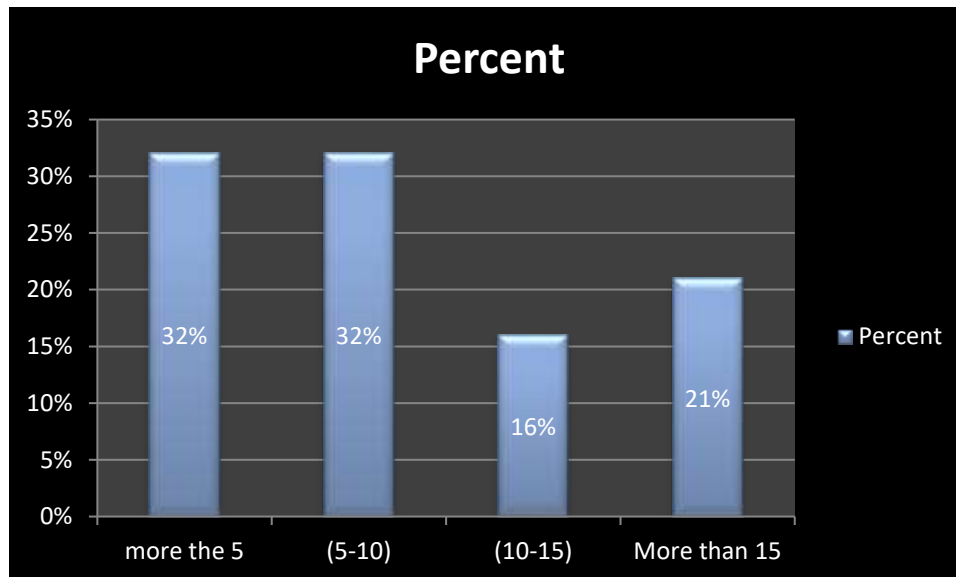
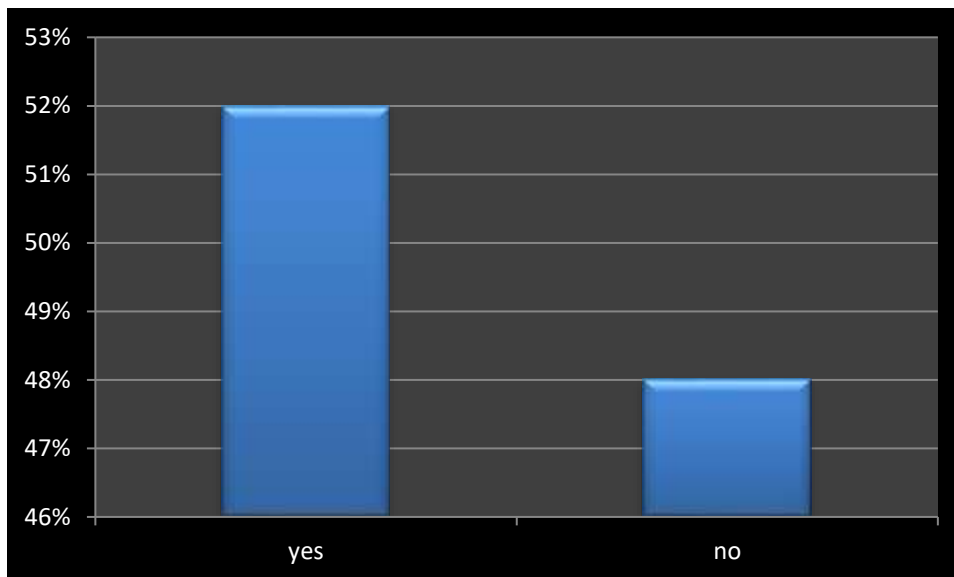


Table (4) Explain have Nurse Staff Received any training programs for infection control on hem dialysis unit

Answer	Frequency	Percent
Yes	24	48%
No	26	52%
Total	50	100%

Category (4) Explain have Nurse Staff Received any training programs for infection control on hem dialysis unit or no



Knowledge and attitude about infection control

Table (5) KNOWLEDGE OF STUDY GROUP ABOUT CONCEPT OF INFECTION

<i>N = 50</i>								
Knowledge	Good		Sufficient		Poor		Don't know	
	F	P	F	P	F	P	F	P
<b>Universal precautions should be used in HD</b>	14	(28%)	17	(34%)	13	(26%)	6	(12%)
<b>Spread of infection in dialysis</b>	11	(22%)	7	(14%)	19	(38 %)	13	(26%)
<b>Hand hygiene</b>	27	(54%)	11	(22%)	4	(8 %)	8	(16%)
<b>Wearing gloves</b>	15	(30%)	10	(20%)	20	(40 %)	5	(10%)
<b>Dressing of HD catheter</b>	6	(12%)	17	(34%)	20	(40 %)	7	(14%)
<b>Fistula care</b>	35	(70%)	8	(16%)	4	(8 %)	3	(6%)
<b>HD mechanics Put in sterilization program</b>	15	(26%)	7	(14 %)	20	(40 %)	8	(16%)
<b>Mean of knowledge</b>	<b>19.1 %</b>							
<b>P. value</b>	<b>0.000</b>							

## DISCUSSION

After analysis of demographic of the interviewed health care providers. Show that the distribution for demographic data that indicate most of the sample is females more than male in the hemodialysis unit this result related to our culture about the nurses is specific for female more than the male This result was similar to demographics characteristics in hemodialysis at Alexandria University hospital who found that more than half of the nurses were between 20 and 30 years, found that most of the participants were female and the majority of them were more than 30 years. (37,38) In addition, the study results explain the level of education among the staff of the nurses and most of the study sample participated in training session within infection control this finding matching with study to explain the importance of the training of nurse staff in hemodialysis unit regard of protection about sharps injury prevention from difference type of hepatitis. (29,30)

the study results indicate by their responses overall assessment about knowledge and attitude of infection control in hemodialysis unit indicate of sufficient knowledge about the universal precautions should be used in HD. This results were similar to the result obtained from study to Infection control guidelines in hemodialysis facilities this study recommended by the important aspects of infection control, including standard precautions, isolation strategy. (31,32)

Which finding their study Nurses' knowledge about hand hygiene these is very importance to knowing by all staff to assist in break of infection chin Based on hand hygiene indications as per recommendations from the Association of Professionals in Infection Control APIC, CDC and World Health Organization (WHO) and in this study more than half of the sample is knowing how to do hand hygiene by proper way. (33,34,35)

Which of their research findings infection prevention knowledge among healthcare personnel and the worker or sample should be knowledgeable about wearing gloves in order to have a positive attitude concerning infection protection. According to the survey, the majority of hemodialysis workers had little awareness of whether to wear clean or sterile gloves, gloves are suggested in the HD context whenever caring for a dialysis patient, whether touching the patient's intact skin (e.g., taking blood pressure) or the patient's dialysis station equipment. Between patients or stations, gloves should be removed and hand hygiene performed. (36)

which revealed their research Respondents' Overall knowledge of infection control practices the staff sufficient knowledge about the dressing of HD catheter the process of dressing is nursing job in dialysis unit or other and should be good knowledge and practice about how to prepare and prevent of infection before and during or after the steps of dressing to catheter or fistula of dialysis to assist and prevent or control infection. Which finding their study Knowledge of HD mechanics Put in sterilization program among the respondents is very poor but some of sample showing good knowledge about HD mechanics Put in sterilization program.

## CONCLUSION

nursing staff need more education training more knowledge about importance infection control in HD unit to help and minimize the rate of infection in the HD field and we must educate the nursing staff about stander precaution, sterilization, care of fistula, dialysis equipment and machine sterilization, environmental issues and educate about importance of safety removal of waste of HD.

## Recommendation

- 1-It is essential to provide good practice for junior's staff should be work under super vision nurse and experience staff.
- 2-It is importance for all nursing staff should be trained.
- 3-While the majority of nursing staff have poor knowledge about hand washing should be education about all stander precaution during in HD unit and read more about it.
- 4-They also need education about the importance of changing the gloves from patent to another.
- 5- Improve their knowledge by advice the importance of reading from books internet and other way of get knowledge about infection control.

Acknowledgment:

This Study is supported via funding from Prince Sattam Bin Abdulaziz University project number (PSAU/2023/R/1444)\*

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