Journal of Health, Medicine and Nursing
ISSN 2422-8419 An International Peer-reviewed Journal
Vol.106, 2023

Nurses Practice and Associated Factors towards Hemodialysis Care in Addis Ababa, Ethiopia

Temesgen Legesse[1]
Addis Ababa University, Black lion hospital
lijteme92@gmail.com, +251 91 718 1363

Amanuel Fanta[1*]
Hawassa College of health sciences nursing department P.o.box 84
amanuelfanta@gmail.com, +251961457900

Teshale Belayneh
Hawassa College of health sciences public health department. P.o.box 84
teshalebe@gmail.com, +251912 897130

Tamrat Legesse
Dilla University college of health sciences.
tamratlegesse@gmail.com + 251913983412

Abstract
Background: Patients on hemodialysis care are at a greater risk of developing infectious diseases that leads to life treating complications. The deficiency in practice of nurses when caring for patients who are in hemodialysis has a negative effect on the improvement of the patient's condition. This study was conducted to determine nurse's practices and associated factors towards dialysis care.**Methods:** An institution based cross-sectional study was employed in this study. A total of 62 nurses giving hemodialysis care were included. Statistical analysis was performed using SPSS version 26.0 software. Frequency with percentage was used to report categorical variables, while mean with standard deviation was used to report quantitative variables. Adjusted odds ratio with 95% confidence interval was used to identify factors associated with the outcome variable in the logistic regression model, considering P<0.05 to declare statistical significance. **Result:** In this study, about 65% of nurses working in the dialysis unit had good practice. Nurses years of experience [AOR: 11; 95% CI (1.29-39.3)], having training [AOR: 8.5; (95% CI; 2.26-27.5)], knowledge [AOR: 12 95% CI: 2.65-56.2)] were significantly associated with the practice of nurses regarding hemodialysis care.**Conclusion:** In this study we found that the nurse's practice towards hemodialysis service was good. Training, experience and knowledge of nurses were significantly associated with the experience towards hemodialysis care. Thus, interventions should focus on improving experience, awareness and training of nurses to improve the practice of nurses regarding hemodialysis care.
Keywords: Hemodialysis, Nurses, practice, Associated factors
DOI: 10.7176/JHMN/106-02
Publication date: March 31st 2023

Introduction

Hemodialysis (HD) is an extracorporeal therapy that is prescribed to reduce the signs and symptoms of uremia and to substitute the partial functions of the kidneys (1). It is the process of cleansing the blood from accumulated waste products. The process happens through the bidirectional movement of particles across a semipermeable membrane. Clinically, this movement takes place in and out of blood, across a semipermeable membrane. If the blood is exposed to an artificial membrane outside of the body, the process is HD (2).

HD has existed for more than 50 years and has prolonged the lives of millions of patients with renal failure worldwide. Although the fundamental principles of HD are still applying today, dialysis technology has technologically advanced markedly (3). It is rapidly becoming more widespread as it has the potential to dramatically make better the quality of life and survival rate of chronic dialysis patients (4). Regardless of many technical improvements in medical care and dialysis delivery that over the last few years, mortality and morbidity rates keep on high and the quality of life of uremic patient is still deprived and there are still important acute complications that had faced by nurses responsible for patients receiving HD in both acute and chronic clinical settings (5).

Generally, Complications of hemodialysis can be divided into two major groups: Treatment-related medical complications: Those are frequent intradialytic complications, these (in order of frequency) include hypotension, muscle cramps, nausea and vomiting, flushing of the face, headache, increased pruritus, chest pain, fever, and chills. The other is Machine-related complications: These complications are due to accidents or failure of safety mechanisms of hemodialysis treatment. They include air embolism, hemolysis, hyperthermia or hypothermia,

blood loss, and conductivity problems (6). The complications of hemodialysis are due to the disease itself as well as the mode of renal replacement therapy (RRT) (6). Hemodialysis remained the most common treatment modality, with approximately 1,929,000 patients undergoing hemodialysis, for 89% of all dialysis patients. In Egypt, the total prevalence of patients on dialysis is 264 per million (7). The incidence and prevalence of end-stage organ failure in Ethiopia, including those of end-stage renal disease, are not known (8).

Quality has become an increasingly predominant part of our lives. The patient is constantly looking for quality care and services (9). In nursing care of hemodialysis patients, quality is a complex concept that has multiple perspectives including the technical and personal aspects also; it should be conforming to standards of care, which are considered as a starting point for better practice. A patient undergoing hemodialysis procedure requires specially trained staff and special nursing care during phases of dialysis and the termination phase (10). When appropriate dialysis care is available early in the course of management, the potential for better health improves, and that patient can remain active in family and community life (11). Nurses are responsible for the direct care of patients undergoing dialysis. Dialysis nurses must have knowledge and skills because they reflected vital features of quality nursing care in the hemodialysis treatment (12). Little is known about the nurses' practice and associated factors while caring for patients undergoing hemodialysis in Ethiopia. The current study was aimed to determine level of practice and associated factors of hemodialysis among nurses.

Methods and Materials

This study was conducted in Addis Ababa, the capital city of Ethiopia. The city has a subtropical highland climate. According to the 2017 estimation, Addis Ababa has a population of 6.6 million people. The city has 52 hospitals, of which 13 are public and 39 Private. Currently, there are 30 hemodialysis centers with a total of 186 hemodialysis chairs and approximately 800 patients on hemodialysis. Four of them are governmental dialysis units, with 31, 7, 5, and 3 hemodialysis chairs available in St. Paul hospital millennium medical college, Minillik II memorial hospital, Zewuditu memorial hospital, and Tikur Anbesa hospital respectively.

An Institution-based cross-sectional study was carried out on hemodialysis care provider nurses from all governmental hospitals dialysis units situated in Addis Ababa, Ethiopia from March to May 2020. A total of 62 nurses were included in the study.

A structured self-administered questionnaire was utilized to collect the data. Data were collected on different socio-demographic and other pertinent variables used to determine the practice of nurses regarding hemodialysis care. The mean score was utilized as a cut of point to describe the nurse's practice regarding hemodialysis care. A supervisor and two data collectors, who had a BSc. degree in nursing, were recruited to assist in the data collection process. Training was given for the supervisor and data collectors on the objectives of the study, the questions, and extent of explanations, the way to keep privacy and confidentiality and other ethical issues. The principal investigator was checked and reviewed the completeness of questionnaires and offered the necessary feedback for the supervisor and data collectors at spot to prevent bias. Data was checked for its completeness; then coded and entered in to Epi Data 4.62 version. Finally, data was exported to SPSS version 25.0 for analysis. Categorical variables were presented using frequency with percentages, while quantitative variables were presented in medians with standard deviations. Bivariate regression analysis was done to identify candidate variables for the final model. Multivariate regression analysis was conducted to determine the association between dependent and independent variables. Adjusted odds ratio with 95% confidence interval was used to report factors associated with the outcome variable, considering $P<0.05$ to declare statistical significance.

Results

In this study, among 62 nurses working in different haemodialysis centres in Addis Ababa governmental hospitals, 60 nurses were participated with the response rate of 96.7%. Majority of participants (70%) were females, and the mean age of the respondents was 29.6±4.12 years. Regarding educational background of the participants, 93.3% of them were BSc holders followed by 5% master's degree (Table 1).

Table 1: Socio-demographic character of nurse's working in dialysis center of governmental hospitals in Addis Ababa 2020.

Variables	Category	Frequency	Precent
Sex	Male	18	30
	Female	42	70
Age	<30 years	39	65
	≥30 years	21	35
Marital status	Single	29	48.3
	Married	27	45
	Divorced	3	5
	Separated	1	1.7
Educational level	Diploma	1	1.7
	BSc	56	93.3
	Masters	3	5
Work experience	< 4 years	24	40
	4 years and above	36	60

In the current study, it was reported that 65% of nurses working in the dialysis room of governmental hospitals in Addis Ababa had good practice, followed by 35% of them having poor practice (Table 2).

Table 2: Practice of nurses working in dialysis center of governmental hospitals in Addis Ababa, 2020

Variables	Category	Frequency	Percent
Practice of nurses	Good	39	65
	Poor	21	35
Were measure the weight of a patient to determine amount of fluid to be removed during dialysis	Yes	50	83.3
	No	10	16.7
Were take vital signs like BP for hemodynamic status, temperature for sepsis and respiration for fluid overload?	Yes	60	100
	No	0	0
Were Ask the patient whether take or not antihypertensive medication, especially if systolic blood pressure is below 100 mmHg	Yes	43	71.7
	No	17	28.3
Were Asses vascular access site for infection	Yes	46	76.7
	No	14	23.3
Were they Sanitizing the machines before starting dialysis?	Yes	60	100
	No	0	0
Was hand hygiene performed before putting on gloves?	Yes	30	50
	No	30	50
Were clean gloves put on before removing the old CVC dressing?	Yes	60	100
	No	0	0
Were gown, protective eyewear and mask or face shield worn during CVC exit site care or before annulation?	Yes	25	41.7
	No	35	58.3
Was a new sterile dressing applied to the CVC exit site?	Yes	54	90
	No	6	10
CVC exit site cleaned with antiseptic beginning at the exit site and working outward toward the periphery?	Yes	59	98.3
	No	1	1.7
Was the Chlorhexidine or antiseptic allowed to dry before applying the clean dressing?	Yes	60	100
	No	0	0
Were the CVC connections disinfected by scrubbing the hub thread for 15 seconds with an alcohol pad and allowed to dry?	Yes	57	95
	No	3	5
Were sterile syringes connected to each port with an aseptic technique?	Yes	57	95
	No	3	5
Was each port aspirated the heparin and check the access for patency?	Yes	60	100
	No	0	0
Were annulations needles inserted aseptically?	Yes	57	95
	No	3	5
Was treatment initiated with aseptic connection to blood lines	Yes	59	98.3
	No	1	1.7
Was the treatment initiated successfully?	Yes	60	100
	No	0	0
Was hand hygiene performed after the CVC initiation or annulation	Yes	59	98.3

Variables	Category	Frequency	Percent
procedure was complete?	No	1	1.7
Was hand hygiene performed before putting on gloves?	Yes	46	76.7
	No	14	23.3
Were gown, protective eyewear and mask or face shield worn during the CVC or AVF discontinuation procedure?	Yes	29	48.3
	No	31	51.7
Was reduce the pump speed up to 100-150 ml/mints and stop it?	Yes	60	100
	No	0	0
Were clean gloves put on before starting the dialysis discontinuation?	Yes	59	98.3
	No	1	1.7
Was the extracorporeal circuit rein fused?	Yes	60	100
	No	0	0
Were the bloodlines properly disconnected?	Yes	60	100
	No	0	0
Were sterile port caps applied post treatment using aseptic technique and apply dressing?	Yes	60	100
	No	0	0
Were needles removed with aseptic technique?	Yes	60	100
	No	0	0
Were needles discarded in the sharps container?	Yes	60	100
	No	0	0
Were needle sites held with clean gauze using clean-gloved hands?	Yes	60	100
	No	0	0

In this study, 60% of nurses working in dialysis unit of hospitals had taken training regarding dialysis procedure and intradialytic complication management, and 66.6% of the nurses who had taken the training reported that they were satisfied by the training (Table 3).

Table 3: Factors associated with practice of nurses working in dialysis center of governmental hospitals of Addis Ababa, 2020

Factors	Category	Frequency	Percent
Have you received training related to dialysis procedure and intradialytic complication management during your professional development?	Yes	36	60
	No	24	40
If yes, are you satisfied with the training?	Yes	24	66.6
	No	12	33.3
Do you have a dialysis procedure and intradialytic complication management guideline or standard in your organization?	Yes	32	53.3
	No	28	46.7
If yes Q (403), are you read the guidelines.	Yes	28	87.5
	No	4	12.5
Do you have a dialysis Patient assessment forms in your organization?	Yes	38	63.3
	No	22	36.7
Do you have a form for assessment of A-V fistula or central venous catheter site in your organization?	Yes	37	61.7
	No	23	38.3
Do you have fluid assessment form in your hospital?	Yes	15	25
	No	45	75
Is their assigned dietician in your hospital?	Yes	0	0
	No	60	100

Practice related factors of nurses towards hemodialysis

In the bivariable logistic regression analysis, experience of nurses, training of nurses regarding hemodialysis, knowledge of nurses, presence of patient assessment guideline, presence of AV-fistula assessment form were associated with the practice of nurses. Those variables that have a p-value less than or equal to 0.25 were entered to a multivariable logistic regression model to adjust for possible confounders. In the multivariable logistic regression analysis, experience of nurses, training of nurses and knowledge of nurses regarding hemodialysis were found to be significantly associated with the practice of nurses. Nurses who had 4 years and above experience in working dialysis unit were 11 times more likely to have good practice compared to those who had less than 4 years' experience [AOR: 11; 95% CI (1.29-39.3)]. Nurses who have been taken training regarding hemodialysis were 8.5 times more likely to have good practice compared to those who don't have been taken training regarding hemodialysis [AOR: 8.5; (95% CI; 2.26-27.5)]. In this study, nurses who were knowledgeable regarding hemodialysis were 12 times more likely to have good practice compared to those nurses who were not

knowledgeable [AOR: 12(95% CI; 2.65-56.2)].

Table 4: Bivariable and multivariable logistic regression on practice of nurses working in dialysis center of governmental hospitals in Addis Ababa, 2020

Variables		Practice		COR (95%)	AOR (95%)
		Good	Poor		
Experience of nurses	< 4 years	6(10)	18(30)		1
	4 years and above	33(55)	3(5)	13.3(2.85-49.9)	11(1.29-39.3)*
Training of nurses	Yes	33(55)	3(5)	13.3(2.75-47.9)	8.5(2.26-27.5)*
	No	6(10	18(30)		1
Knowledge of nurses	Good	37(61.7)	5(8.3)	15.9(10.3-73.3)	12(2.65-56.2)*
	Poor	2(3.3)	16(26.7)		1
Presence of patient assessment guideline	Yes	34(56.7)	4(6.7)	28(6.86-121)	8.6(0.6-24.12)
	No	5(8.3)	17(28.3)		1
Presence of fluid assessment guidelines	Yes	14(23.30	1(1.7)	11(1.35-29.5)	0.34(0.67-22.3)
	No	25(41.7)	20(33.3)		1
Presence of AV – fistula assessment form	Yes	32(53.3)	5(8.3)	14.6(4.00-53.41)	1.32(0.23-21.1)
	No	7(11.7)	16(26.7)		1

Discussion

This facility based cross sectional study was conducted to assess practice and associated factors regarding hemodialysis care among nurses. Among the participants, the majority (70%) were females, which shows the dominance of females over the males. The mean age of the respondents was 29.6±4.12 years; shows that the newly graduate and expert nurses were interested to the hemodialysis care practice. These findings was similar to the study done in USA, found that the most respondents in their study were young age (13).

The majority (93.3%) of participants had bachelor's degree and 5% had masters and only 1.7% diploma; this is due to the fact that people are upgrading themselves and majority of the participants were from teaching and tertiary hospitals that were administered by university, since the university criteria to be recruited is bachelor degree holders.

In this study, it was reported that 65% of nurses working in the dialysis care had good practice, followed by 35% of nurses had poor practice. A study conducted in Saudi Arabia reported that 84.13% of participants had good practice, which is higher than our finding(13). Similarly, results from a study conducted in Khartoum, Sudan reported that 78% of nurses had good practice. However, a study finding in Brazil reported that 47.54% of nurses had good practice which is by far lower than our finding(5). This differences may be due to variation in knowledge, training and experience among nurse and the availability of facilities and services in those various set ups.

In this study, nurses who had 4 years and above experience in working dialysis unit were 11 times more likely to have good practice compared to those who had less than 4 years' experience. This finding is supported with the results of study conducted by Hosien Shahdadi and Mozhgan Rahnama that the nurse's experience had positive effect on the outcome of patients within hemodialysis (14), and other study conducted in Iran supports the this finding (15). This is because experience improves the confidence, protection, and to gain patients' trust and ensure a successful dialysis through adaptation of practice of care.

In the current study, we found that nurses who took training regarding hemodialysis were 8.5 times more likely to have good practice compared to those who did not took training regarding hemodialysis care. This finding was agrees with the results of studies done in Iran(15) and Saudi Arabia(16)This is because of provision of specialized training for nurses improve their skills to manage complication and prevent infections.

In this study, nurses who were knowledgeable regarding hemodialysis were 12 times more likely to have good practice compared to those nurses who were not knowledgeable. This finding was in line with the results of studies conducted in Iran (Iran), Saudi Arabia (16)and Jordan(17). The possible justification could be as nurses gain basic knowledge on hemodialysis to provide high quality care, may take advantage of their technical knowledge.

Limitation of the study

The current study could not establish cause-effect relationship given that it was a cross-sectional study. Use of small sample size was also another limitation of the study that may affect the generalizability of the study finding.

Conclusion

In the current study the practice of nurses towards hemodialysis care was good. The year of experience, having

getting training and their level of knowledge had shown significant association with practice among nurses on hemodialysis care. Interventions should focus on providing training and recruiting experienced nurses with good level of knowledge on hemodialysis care to maintain and improve patient's health status.

Abbreviation

AOR: adjusted odds ratio, HD: hemodialysis, RRT: renal replacement therapy, AV: arteriovenous, CI: confidence interval, USA: United States of America.

Acknowledgements

We are indebted to Addis Ababa University, College of Health Sciences for its financial support for data collection. We are also thankful for the hospitals involved in this study for their cooperation. Finally, the authors are deeply thankful to the supervisors and data collectors.

Authors` Contributions

TB, AF, conceived and designed the study and developed the data collection instruments. TL and TL performed the statistical analysis and wrote all versions of the manuscript. All authors critically revised and approved the final manuscript.

Competing interests

The authors declare that they have no competing interests.

Reference

1. Gilbert SJ, Weiner DE, Gipson DS, Arbor A. National Kidney Foundation's Primer on Kidney Diseases sixth edition Gilbert Scott J., Weiner Daniel E. Bone Disorders in Chronic Kidney Disease. 2014; 276-287. 2017. 4–5 p.
2. Kallenbach JZ. Review of Hemodialysis for Nurses and Dialysis Personnel - E-Book - Judith Z. Kallenbach - Google Books. 2019. p. 3–4.
3. Oliver J. Comprehensive Clinical Nephrology. Vol. 53, Journal of Chemical Information and Modeling. 2013. 1689–1699 p.
4. Lok CE, Mokrzycki MH. Prevention and management of catheter-related infection in hemodialysis patients. Kidney Int. 2011;79(6):587–98.
5. Ashby D, Borman N, Burton J, Corbett R, Davenport A, Farrington K, et al. Renal Association Clinical Practice Guideline on Haemodialysis. Vol. 20, BMC Nephrology. BMC Nephrology; 2019. 1–36 p.
6. Ahmad S. Clinical Manual Dialysis. 2009. 79–92 p.
7. Al-Mawsheki EAA, Mona ;, Ibrahim H, Taha NM. Nurses' Knowledge and Practice Regarding Care for the Patients during Hemodialysis. Cairo Univ. 1135;84(1):1135–41.
8. Ahmed MM, Tedla FM, Leichtman AB, Punch JD. Organ Transplantation in Ethiopia. Transplantation. 2019;103(3):449–51.
9. Mosadeghrad A. A Conceptual Framework for Quality of Care. Mater Socio Medica. 2012;24(4):251.
10. Manal S. Moustafa Saleh (1), Jehan Sayyed Ali (2) Walid M Afifi(3. Nurses Compliance to Standards of Nursing Care for Hemodialysis Patients : Educational and Training Intervention. J Nurs Heal Sci. 2018;7(2):48–60.
11. Sirisan V, Pattarajinda V, Vichitphan K, Leesing R. nurses Knowledge and Practice Regarding Intradialytic Complications for Hemodialysis Patient 1Salwa. 2013;38(3).
12. Price CA, Paganini EP. Debate: Should nurses have a larger role in the outpatient dialysis setting than they currently do? Semin Dial. 1999;12(5):359–62.
13. Alramadhan E, Alsayed S, Alshalawi A, A AA, A SA, A MAA, et al. Assessment of the Nurses ' Skills during Caring for Hemodialysis Patients. Austin J Nurs Heal Care. 2019;6(1):1–5.
14. Shahdadi H, Rahnama M. Experience of nurses in hemodialysis care: A phenomenological study. J Clin Med. 2018;7(2).
15. Manandhar DN, Chhetri PK, Poudel P, Baidya SK, Agrawaal KK. Knowledge and practice of hemodialysis amongst dialysis nurses. J Nepal Med Assoc. 2017;56(207):346–51.
16. Al Qahtani AS, Almetrek MA. Knowledge, Attitudes and Practice of Nurses in Renal Dialysis Units regarding Infection Control in Abha City, Saudi Arabia, 2015. Egypt J Hosp Med. 2017;66:103–14.
17. Alnawafleh K, Mohammad Z, Al-Nwafleh H. Auditing of Nursing Care for Hemodialysis Patients at Ma,an Governmental Hospitals- Jordan. Assiut Sci Nurs J. 2018;6(15.00):89–98.