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Research Article

Nurses Knowledge and Associated Factors towards Hemodialysis Care at Governmental Dialysis Units in Addis Ababa, Ethiopia

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Abstract

Hemodialysis is a process of purifying the blood of a person whose kidney is not working normally. Little is known about the nurses' knowledge and associated factors while caring for patients undergoing hemodialysis. The aim of this study was to evaluate knowledge and associated factors of hemodialysis among nurses.

Methods: Institution based cross-sectional survey design was conducted among dialysis care provider nurses. A total of 62 nurses giving hemodialysis care were included. Data were analyzed using SPSS version 26.0 software in logistic regression model. Descriptive statistics were expressed as percentage and frequency. Adjusted odds ratio with 95% confidence interval was used to measure factors associated with the outcome variable considering P<0.05 to declare statistical significance.

Result: Among the 62 nurses enrolled, about 70% were knowledgeable regarding hemodialysis. Nurses experience in working dialysis [AOR: 10.18 95% CI: 2.18, 47.40)], training of nurses (AOR=5 95% CI: 1.12-22.20) were significantly associated with the knowledge of nurses regarding hemodialysis care.

Conclusion: In this study we found that nurses experience working in hemodialysis and years of work experience were factors affecting their knowledge towards hemodialysis service. Thus, interventions should focus on improving experience and training of nurses regarding hemodialysis care to improve the compressive knowledge of nurses.

Keywords: Hemodialysis; Dialysis nurse; Knowledge; Associated factors

Abbreviation: AOR: Adjusted Odds Ratio; HD: Hemodialysis; RRT: Renal Replacement Therapy; AV: Arteriovenous; CI: Confidence Interval; USA: United States of America

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 [6]. 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 [7].

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 [11]. 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 [8]. Regardless of many technical improvements in medical care and dialysis delivery that over the last few years, mortality and morbidity rates keep

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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 [4].

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 [1]. The complications of hemodialysis are due to the disease itself as well as the mode of Renal Replacement Therapy (RRT) [13]. 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 [2]. 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 [10]. 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 [9]. 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 [13]. 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' knowledge and associated factors while caring for patients undergoing hemodialysis in Ethiopia. The current study was aimed to evaluate knowledge and associated factors of hemodialysis among nurses.

Methodology

This study was conducted in Addis Ababa, the capital city of Ethiopia and the seat for the African Union. 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.

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 knowledge of nurses regarding hemodialysis care. The mean score was utilized as a cut of point to describe the nurse's knowledge 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 supervisors 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 supervisors 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 and percentages while statistics of numeric variables were presented in medians with standard deviations. Bivariate and multivariate regressions were used to determine the association between dependent and independent variables respectively. Adjusted odds ratio with 95% confidence interval was used to identify factors associated with the outcome variable considering $P<0.05$ to declare statistical significance.

Results

In this study, out of 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 41.6% were males, 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 holders (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 70% of nurses working in the dialysis room of governmental hospitals in Addis Ababa have good knowledge, followed by 30% of nurses were not knowledgeable (Table 2).

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

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

Variables	Category	Frequency	Percent
Knowledge of Nurses	Good	42	70
	Poor	18	30
Hemodialysis is *not only appropriate in situations of a lost kidney function	Yes	38	63.3
	No	22	36.7
The comorbidity DM with kidney failure determines the method of dialysis treatment.	Yes	41	68.3
	No	19	31.7
Erythropoietin (EPO) should be removed from the refrigerator about 15 to 30 minutes before its administration.	Yes	49	83.7
	No	11	18.3
Dialysis does the Correction of electrolyte and acid-base balance disturbances	Yes	58	96.7
	No	2	3.3
Dialytic therapy cannot replace all the functions of a normal kidney.	Yes	34	56.7
	No	26	43.3
In patients undergoing dialysis, the "dry weight" is the weight of the patient after all excess fluid is removed by dialysis.	Yes	55	91.7
	No	5	8.3
Dry weight" may need to adjust from time to time as the actual weight of the patient may change	Yes	58	96.7
	No	2	3.3
Heparin infusion or continuous saline flushing is done to prevent the clotting of blood	Yes	58	96.7
	No	2	3.3
The dialyzer (artificial kidney) is a special filter, through which blood flows, which removes extra fluids and waste products.	Yes	60	100
	No	0	
A patient on hemodialysis who develops Hypotension will show nausea and vomiting symptoms.	Yes	53	88.3
	No	7	13.7
Do dialysis patients need to restrict their diet?	Yes	60	100
	No	0	0
The Common dietary recommendations for dialysis patients are the restriction of sodium, potassium, phosphorus and fluid intake	Yes	59	98.3
	No	1	1.7
The three most common types of vascular access for hemodialysis are central venous catheters, arteriovenous (AV) fistulas and synthetic grafts	Yes	59	98.3
	No	1	1.7
Central venous access is a method of vascular access that is ideal for short-term use until a fistula or graft is ready	Yes	58	96.7
	No	2	3.3
The arteriovenous or AV fistula is the most common and the best method of vascular access for long-term hemodialysis because it lasts longer & is less likely to be clotted or infected.	Yes	59	98.3
	No	1	1.7
Regular exercise of AV fistula can lead to its maturation. Even after initiating hemodialysis, regular exercise of access arm helps to strengthen the AV fistula	Yes	58	96.7
	No	2	3.3
Common problems during hemodialysis include low blood pressure (hypotension), nausea, vomiting, muscle cramps, weakness, and headache	Yes	60	100
	No	0	0
A patient with a high risk of bleeding should be dialyzed with a saline flush.	Yes	57	95
	No	3	5
AKI patient with sever hyperkalemia should treated for hyperkalemia first before starting dialysis	Yes	58	96.7
	No	2	3.3
Basic metabolic profile (electrolytes, urea, and creatinine) should be reviewed prior to acute hemodialysis sessions	Yes	60	100
	No	0	0
Protein is restricted for a renal patient to slow progression and minimize the accumulation of uremic toxins	Yes	52	86.7
	No	8	13.3
Carbohydrate intake is recommended for a renal patient in order to provide energy and decrease protein degradation.	Yes	58	96.7
	No	2	3.3

Table 3: Factors associated with knowledge and practice of nurses working in dialysis center of governmental hospitals in 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

Knowledge Related Factors Towards Hemodialysis

In bivariable logistic regression analysis, experience of nurses, training of nurses regarding hemodialysis, presence of patient assessment guideline, presence of AV-fistula assessment form, were associated with the knowledge 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 multivariate logistic regression analysis, experience of nurses and training of nurses were found to be significantly associated with the knowledge of nurses towards hemodialysis care. Accordingly, Nurses who had 4 years and above experience in working dialysis unithave 10 times more likely to be knowledgeable than who have less than 4 years' experience in dialysis unit [AOR:10.18 95% CI (2.18, 47.4)]. In addition nurses who have been taken training regarding hemodialysis have 5 times more likely to be knowledgeable than who don't have been taken training [AOR: 595% CI (1.12, 22.2)] (Table 4).

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

Variables		Knowledge		COR (95%)	AOR (95%)
		Good	Poor		
Experience of nurses	<4 years	9(15.0)	15(25.0)		1
	4 years and above	33(55)	3(5)	18 (4.33-77.54)	10.18 (2.18, 47.4)*
Training of nurses	Yes	32(53.3)	4(6.7)	11 (2.99-41.8)	5 (1.12-22.2)*
	No	10(16.7)	14(23.3)		1
Presence of patient assessment guideline	Yes	33(55)	5(8.3)	9 (2.66-33.86)	1.5 (0.28- 8.7)
	No	9(15)	13(21.7)		1
Presence of complication management assessment guideline	Yes	18	2	6(1.22-29.4)	1.45 (0.177-11.88)
	No	24	16		1

Discussion

This facility based cross sectional study was conducted to assess knowledge 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; this may shows the newly graduate and expert nurses were interested to the hemodialysis care. These findings was similar to the study done in USA, found that the most respondents in their study were young age [3].

The majority (93.3%) of participants have bachelor's degree and 5% have masters and only 1.7% have 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 holders.

The mean score for knowledge was 20.03 with standard deviation of 1.54. From the 60 participants, 70% had good level of knowledge about hemodialysis care. This finding was higher than study conducted in Sudan, where about 67.2% of them had good knowledge [4]. This difference might be due to majority of the participants had advanced educational level.

In this study 83.7% of respondents had awareness of preserving the erythropoietin and before administer Erythropoietin the drug is removed from the refrigerator about 15 to 30 minutes before its administration. This study was higher than the study conducted in Ceará State University (52.7%) [25].

In this study all respondents had awareness regarding reviewing the basic metabolic profile or routine investigations and measuring vital signs before starting dialysis. This finding was higher than the study done Sudan [7]. The possible reason could be the better educational level, experience and getting training on hemodialysis care.

In the current study there was significant association between year of work experience and the knowledge of nurses. Accordingly, Nurses who had 4 years and above experience in working dialysis unit have 10.5 times more likely to be knowl-

edgeable than who have less than 4 years' experience in dialysis unit [AOR: 10.18; 95% CI (2.18, 47.4)]. This result was supported with the findings of a study done in Addis Ababa, Ethiopia (AA). These show us that the more nurses practice hemodialysis care the better knowledge they become about it. This could be due to familiarity with the procedure and guidelines and hospitals provide training about hemodialysis care for nurses could have a higher opportunity for improving their knowledge.

In this study we found that training had shown significant association with knowledge of nurses regarding hemodialysis care. Nurses who had training about dialysis were 5 times more likely to have good knowledge compared to those who had no training [AOR=5 95% CI (1.12-22.2)]. This finding was in line with the results of study done in Jimma [14], Ethiopia and Kigali, Rwanda [5]. The possible justification could be trained nurses are able to identify early warning signs, and prevent hemodialysis associated complications in patients

Limitation of the Study

The current study could not establish cause-effect relationship since it was a cross-sectional study. Use of small number of population was also another limitation of the study that may affect the generalizability.

Conclusion

In the current study the Knowledge of nurses towards hemodialysis care was high. The year of experience and having training has shown significant association with knowledge among nurses on hemodialysis care. Interventions should focus on providing training and recruiting experienced nurses on hemodialysis care to maintain and improve patient's health status.

Author Statements

Availability of Data and Materials

For those who are interested the data sets analyzed during the current study are available from the corresponding author on reasonable request.

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Author's 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.

References

1. Ahmad S. Clinical Manual Dialysis. 2009.
2. Al-Mawsheki EAA, Mona Ibrahim H, Taha NM. Nurses' Knowledge and Practice Regarding Care for the Patients during Hemodialysis. Cairo Univ. 2016; 84: 1135–1141.
3. Alramadhan E, Alsayed S, Alshalawi A, Alanazi A, Alotiby A, et al. Assessment of the Nurses' Skills during Caring for Hemodialysis Patients. Austin Journal of Nursing & Health Care. 2019; 6: 1052.
4. Ashby D, Borman N, Burton J, Corbett R, Davenport A, et al. Renal Association Clinical Practice Guideline on Haemodialysis. In BMC Nephrology. 2019; 20: 379.
5. Dushimiyimana AV, Bahumura J, Adejumo O, Moreland P, Chironda G. Nurses' knowledge in the early detection and management of acute kidney injury in selected referral hospitals in Rwanda. Rwanda Medical Journal. 2022; 79: 37–44.
6. 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.
7. Kallenbach JZ. Review of Hemodialysis for Nurses and Dialysis Personnel - E-Book - Judith Z. Kallenbach - Google Books. 2019.
8. Lok CE, Mokrzycki MH. Prevention and management of catheter-related infection in hemodialysis patients. Kidney International. 2011; 79: 587–598.
9. Manal S Moustafa Saleh, Jehan Sayyed Ali, Walid M Afifi. Nurses Compliance to Standards of Nursing Care for Hemodialysis Patients: Educational and Training Intervention. Journal of Nursing and Health Science. 2018; 7: 48-60.
10. Mosadeghrad A. A Conceptual Framework for Quality of Care. Materia Socio Medical. 2012; 24: 251-261.
11. Oliver J. Comprehensive Clinical Nephrology. In Journal of Chemical Information and Modeling. 2013; 53: 9.
12. Price CA, Paganini EP. Debate: Should nurses have a larger role in the outpatient dialysis setting than they currently do? Seminars in Dialysis. 1999; 12: 359–362.
13. Sirisan V, Pattarajinda V, Vichitphan K, Leesing R. Nurses Knowledge and Practice Regarding Intradialytic Complications for Hemodialysis Patient 1 Salwa. 2013; 38.
14. Wolide AD, Kumela K, Kerga F, Debalke S, Seboka M, et al. Health sciences students knowledge, attitude and practices with chronic kidney disease in Jimma University, Ethiopia: cross - sectional study. BMC Research Notes. 2019; 389.