



Knowledge and Practice of Hemodialysis Amongst Dialysis Nurses

Dhiraj Narayan Manandhar,¹ Pramod Kumar Chhetri,¹ Prakash Poudel,¹ Samir Keshari Baidya,¹ Krishna Kumar Agrawal¹

¹Department of Nephrology, Nepal Medical College and Teaching Hospital, Jorpati, Kathmandu, Nepal.

ABSTRACT

Introduction: Dialysis nurses should have a good knowledge regarding hemodialysis treatment. The status of Nepalese dialysis nurses on this aspect is unknown. This study was done to assess the knowledge and practice on different aspects of the hemodialysis treatment.

Methods: We distributed validated questionnaires to the participants in a biannual conference in Kathmandu on 24th September as most of the dialysis nurses attend the event. We calculated mean and standard deviation for continuous variables and frequencies and percentage for the responses and compared counseling with different parameters.

Results: Total 94 out of 116 participants who were giving care to dialysis patients were in the study. Total 39 (42%) received formal nursing training in hemodialysis and 71 (78%) respondents always counseled patients regarding fluid intake. A total of 37 (96%) trained nurses always counseled the importance of regular dialysis. Seventy-six (81.7%) respondents did counseling on vaccination against Hepatitis B. Counseling on vaccination against influenza and pneumococcus was 47 (50%). When comparing educational status, respondents below bachelor level did more frequent counseling than level above ($P=0.03$). All the respondents knew the importance of hand washing and BP monitoring during hemodialysis. Ninety-one (96.7%) respondents knew how to deal with BP changes during hemodialysis. Seventy-three (77.6%) respondents were very confident on managing complications. Only 31 (33%) respondents knew how to deal with patients on continuous ambulatory peritoneal dialysis.

Conclusions: Dialysis nurses have knowledge on basic procedures of hemodialysis but there is a space for improvement in dealing with complications to provide quality service to hemodialysis patients.

Keywords: *counseling; hemodialysis; Nepal; nurse.*

INTRODUCTION

Number of patients with end stage kidney disease (ESKD) is increasing so are the centers providing hemodialysis (HD) especially after the reimbursement policy of the Government of Nepal. HD is the most common mode of renal replacement therapy (RRT) in Nepal.^{1,2}

As HD became safer; nephrology became a specialized field in nursing and this therapy: a major responsibility of nurses. Dialysis nurses should have good knowledge

Correspondence: Dr. Dhiraj N Manandhar, Department of Nephrology, Nepal Medical College and Teaching Hospital, Jorpati, Kathmandu, Nepal. Email: dhiraj783@gmail.com, Phone: +977-9851001966.

and practice regarding HD treatment. However, nurses posted to this specialized area have little or no knowledge initially so they need training and updates.³ The quality of the service provided depends on the quality of the nurses working in the center.

In Nepal, knowledge and practices of dialysis nurses on different aspects of HD treatment has not been assessed. We conducted a pilot study to assess these aspects, the results of which motivated to conduct this nationwide study.

METHODS

A cross-sectional study was conducted in Kathmandu on September 24th, 2016. The National Dialysis Nurses and Technicians Conference is a bi-annual event attended by participants from different cities of Nepal. The 2nd conference was chosen for the study expecting it to represent the Nepalese dialysis nurses. Ethical clearance was taken from Institutional Review Committee, Nepal Medical College. A validated questionnaire was used for the study.⁷

We excluded the questionnaires completed by non-dialysis nurses and technicians. All the questionnaires were collected and the parameters were coded and entered in the Microsoft Excel format. Statistical Package for the Social Sciences (SPSS) version 17.0 was used for the statistical analysis. We calculated mean and standard deviation for continuous variables and frequencies and percentage for the responses and compared the counseling with different parameters using chi-square test. P value of ≤ 0.05 was considered as significant.

RESULTS

A total of 94 participants were included in the study. Out of 23 questions on counseling, nursing practice and complications of HD, there was a 100% response in 19 questions and 88 (93.6%), 89 (94.7%), 90 (96.8%) and 93 (99%) response in other four questions making an overall response rate of 96.8% (Table 1). Mean age of the study population was 31.2 ± 10.4 years. Total 59 (64%) respondents were from the age group 20 to 29 years (Figure 1). Average age of the trained nurses was 27.6 ± 9.5 yrs. Only two were males in the study.

Only 39 (41.4%) had received a formal nursing training in dialysis (Figure 2). There was a disparity in the duration of the training course for dialysis nurses. It ranged from one to six months. Regarding the job status of the HD nurses, 35 (38%) are working on contract basis. A total of 18 (47%) trained HD nurses

are working on contract basis.

Table 1. Showing response rates of questions having non-respondents.

Questions	No. of non-respondents	Response rate n (%)
Counseling on fluid intake	4	90 (96.8)
Counseling on regular HD	1	93 (99)
Confidence on complications	6	88 (93.6)
Knowledge on complications	5	89 (94.7)

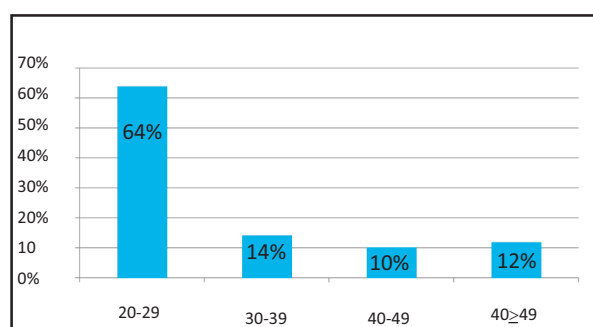


Figure 1. Distribution of respondents according to the age group (n = 93).

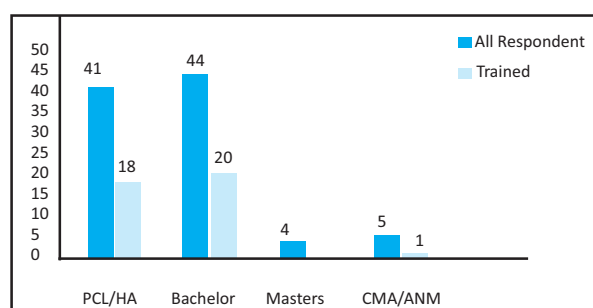


Figure 2. Educational status of the respondents.

PCL: Proficiency Certificate Level; HA: Health Assistant; CMA: Community Medical Assistant; ANM: Auxiliary Nurse Midwife.

Comparing the educational status of the respondents with different counseling parameters, we found that the counseling was done more by respondents who had educational status below bachelor level and was statistically significant ($P = 0.03$). Comparing the special training in HD with the counseling parameters, it was statistically not significant.

There were 86 (91.5%) and 91 (96.8%) respondents who always counseled regarding regular HD and diet

respectively. Only 48 (51%) and 47 (50%) always counseled on need of influenza and pneumococcal vaccination (Table 2).

All the participants knew about the importance of hand washing and observing sterile techniques. Only 31 (33%) participants knew how to deal with patients on Continuous Ambulatory Peritoneal Dialysis (CAPD) (Table 3). All the trained nurses knew how to deal with changes in BP and muscle cramp during HD treatment (Table 4). Around 3/4th of the respondents (77.6%) considered themselves to be very confident in managing the complications (Figure 3).

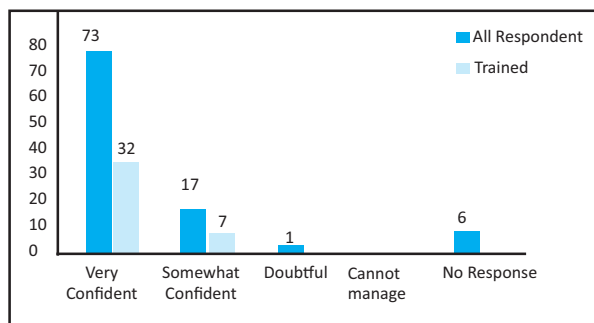


Figure 3. Frequencies of responses on confidence in managing complications..

Table 2. Frequencies of counseling by participants.

	Always		Often		Seldom		Never	
	Total n (%)	Trained n (%)	Total n (%)	Trained n (%)	Total n (%)	Trained n (%)	Total n (%)	Trained n (%)
Fluid intake	71 (78)	29 (76.3)	12 (13.2)	6 (15.8)	4 (4.4)	1 (2.6)	4 (4.4)	2 (5.3)
Regular HD	86 (91.5)	37 (95.9)	8 (8.5)	2 (5.9)	-	-	-	-
Renal Transplant	42 (41.7)	20 (51.3)	44 (46.8)	18 (46.2)	7 (7.4)	1 (2.5)	-	-
Hepatitis B vaccination	76 (81.7)	34 (87.2)	17 (18.3)	5 (12.8)	-	-	-	-
Influenza vaccination	48 (51.1)	19 (48.7)	42 (44.7)	18 (46.2)	3 (3.2)	2 (5.1)	1 (1.1)	-
Pneumococcal vaccination	47 (50)	19 (48.7)	40 (42.5)	17 (43.5)	5 (5.3)	3 (7.7)	2 (2.2)	-
Diet	91 (96.8)	39 (100)	3 (3.2)	-	-	-	-	-

Table 3. Frequencies of knowledge and practice on HD service.

	Know		Uncertain		Do not know	
	Total n (%)	Trained n (%)	Total n (%)	Trained n (%)	Total n (%)	Trained n (%)
Importance of hand washing	94 (100)	39 (100)	-	-	-	-
Wearing gloves before dealing with each patients	92 (97.8)	39 (100)	2 (2.2)	-	-	-
Using sterile techniques during insertion of catheter	94 (100)	39 (100)	-	-	-	-
Check for vascular access site for infection	89 (94.7)	37 (94.9)	4 (4.2)	2 (5.1)	1 (1.1)	-
Check for vascular access site for functioning	92 (97.8)	39 (100)	2 (2.2)	-	-	-
Importance of BP check	94 (100)	39 (100)	-	-	-	-
Deal with patients on CAPD	31 (33)	10 (25.6)	36 (38.3)	18 (46.2)	27 (28.7)	11 (28.2)
Component of dialysate	80 (85.1)	33 (84.6)	12 (12.7)	5 (12.8)	2 (2.2)	1 (2.5)
Importance of measuring patient weight	93 (98.9)	39 (100)	-	-	1 (1.1)	-

Table 4. Frequencies of knowledge on complications during HD.

	Know		Uncertain		Do not know	
	Total n (%)	Trained n (%)	Total n (%)	Trained n (%)	Total n (%)	Trained n (%)
Deal with changes in BP	91 (96.7)	39 (100)	2 (2.2)	-	1 (1.1)	-
Correct air embolism	73 (77.7)	32 (82.1)	10 (10.6)	5 (12.8)	11 (11.7)	2 (5.1)
Clotted dialysers	88 (93.6)	37 (94.9)	3 (3.2)	2 (5.1)	3 (3.2)	-
Treatment of muscle cramp	89 (94.7)	39 (100)	4 (4.2)	-	1 (1.1)	-
Chest pain and SOB	89 (94.7)	37 (94.9)	4 (4.2)	2 (5.1)	1 (1.1)	-

DISCUSSION

There were altogether 116 participants and after excluding non-dialysis nurses and technicians, 94 participants were included in the study. As the respondents were from different hospitals of Kathmandu valley and also from different regions of Nepal, we can generalize our findings in the context to Nepal. Our study shows many new facets in relation to the practice of HD nurse. In this study, we had a very good response rate of >96%. Age distribution of our study population was similar to the dialysis staff nurses in Nellore, India.⁴ This may indicate that younger nurses are attracted to be trained in one specialized sector of the nursing field. In Nepal, 100% of the nursing service is provided by females. In a study done in nursing students in Nepal, 100% were females.⁵ It was similar to places like Sudan whereas in Baghdad and Kirkuk there were about half male nurses.⁶⁻⁸

We observed a low level of formal training in dialysis nurses especially in government sector. It may be because of the hierarchical system in government. The trained dialysis nurses were hired more in private sector but were on a contract basis. This may be one of the major factors that most of the trained nurses settle later in abroad as is happening in Nepal now. As per the study done by Baral et al, personal ambition, lack of job and career opportunities and job dissatisfaction in Nepal were the main causes of migration among Nepalese nurses.^{9,10}

The counseling of patients was almost satisfactory regarding the diet, fluid intake and importance of regular hemodialysis. The counseling for renal transplantation was nearly 50% which needs to be increased as the best treatment modality available till now for ESKD is renal transplantation. The vaccination for hepatitis B should be 100% in all patients and only 81% of our Hemodialysis nurses counseled for vaccination against hepatitis B.¹¹

The dialysis nurse is the key personnel in assessing and monitoring the patient during dialysis treatment.¹² It

is recommended by Center for Disease Control (CDC) that before working in HD units, the personnel should have adequate knowledge and training.¹³ Most of the hospital acquired complications can be prevented by hand washing.^{14,15} In our study all the respondents irrespective of training status in dialysis knew the importance of hand washing which is comparable with the study done in BPKIHS.¹⁶ In Kuwait, only 33% in secondary level hospitals and 47% in a university hospital knew that they need to maintain hand hygiene but none of them even washed hands before and after hemodialysis procedure.^{17,18} In a study done in Iran, the findings were similar to our study.¹⁹ In Sudan, 98% stated that hand hygiene in HD centers was necessary to prevent infection but only 70% were adherent to hand hygiene before access manipulation.⁶ In a study done in Nepal on nursing students they mentioned that only 35% washed their hands before the procedure but 92% washed their hands after the procedure.⁵ Almost all respondents wore gloves which was similar to the study done in Agartala where 94.0% used sterile gloves at all the times while in a study done on nursing student, 81.8% claimed that they wore gloves during the time of injection.^{20,5} In Sudan they found difference, though non significant, in adherence to hand hygiene and the use of gloves in different educational status which was not seen with our study.⁶ In a study done by Abdelsatir S, most nurses (98%) evaluated HD access function before connection but only 52% evaluated it for signs of infection. While in our study, we found that around 98% inspected access for the function and 95% assessed for infection.⁶

Almost 100% had knowledge and 83% were very confident on managing the complications whereas in a study by Al-Mawsheki et al, dealing with complications was unsatisfactory in 82%. In the same study they also found that they had unsatisfactory practice in managing hypotension and muscle cramp.¹² In our study 96% and 94% of the respondents knew about dealing with BP change and muscle cramp during HD respectively.

It seemed that the dialysis nurses are not trained in

CAPD. Only 33% of the nurses even after dialysis training could handle CAPD patients. In a country where CAPD can be a good bridge between transplant and dialysis due to its geographical terrain, it was unsatisfactory to know that we have fewer personnel to deal with CAPD. This may be because of the fact that while training a nurse for dialysis they are trained for HD only. We have a better workforce who can manage overall complications of hemodialysis as compared to a similar study done in Iraq.⁸

On the basis of this study we can recommend that dialysis nursing training should be given as a formal course and the duration of it should be standardized and course of study should be prepared in consensus. It is now high time that nephrology be recognized as a specialized field in nursing sector. Every HD unit should have a standard of protocol so that the patients under dialysis will be benefited.

Our study had few limitations. We studied for the subjective parameters without any scoring system and did not test the skills of the respondents.

CONCLUSIONS

We can conclude from the study that dialysis nurses do have good knowledge on sterile techniques but need more training on handling of CAPD patients. They know about dealing with the BP changes and muscle cramps but need to improve their ability to deal with other complications. The dialysis nurses do regular counseling on fluid intake and diet but need to improve counseling on renal transplantation and vaccinations. They practiced adequately in sterile practice and checked vascular access for function and infection.

Conflict of Interest: None.

REFERENCES

- Hada R, Khakurel S, Agrawal RK, Kafle RK, Bajracharya SB, Raut KB. Incidence of end stage renal disease on renal replacement therapy in Nepal (1990-1999). *Kathmandu Univ Med J*. 2009;7(27):301-5. [[PubMed](#)]
- Ghimire M, Pahari B, Das G, Sharma SK, Das GC. Prevalence of peripheral arterial disease in end stage renal disease patients on hemodialysis: a study from central Nepal. *Kathmandu Univ Med J*. 2014;12(47):181-4. [[PubMed](#)]
- Barbosa GS, Valadares GV. Becoming proficient: knowledge and practice of hemodialysis nurses. *Esc Anna Nery*. 2014;18(1):163-6. [[Full Text](#) | [DOI](#)]
- Antony L, Paramjyothi, Indira S. A study to assess the knowledge regarding care of patients undergoing hemodialysis among staff nurses and nursing students in Narayana Medical College Hospital, Nellore. *Imperial Journal of Interdisciplinary Research*. 2016;2(6):623-6. [[Full Text](#)]
- Paudel DP, Prajapati PK, Paneru DP. Preventive practices against hepatitis B. A cross-sectional study among nursing students of Kathmandu. *Nepal J Sci Soc*. 2012; 39(3):109-13. [[Full Text](#) | [DOI](#)]
- Abdelsatir S. Evaluation of nurses awareness and practice of hemodialysis access care in Khartoum state, Sudan. *Arab Journal of Nephrology and Transplantation*. 2013;6(2):119-21. [[PubMed](#)]
- Bakey SJ. Evaluation of nurses' practices throughout hemodialysis treatment for patients in hemodialysis unit at Baghdad teaching hospitals. *Kufa Journal for Nursing Sciences*. 2014;2(2):1-16. [[Full Text](#)]
- Mussa YM. Awareness of nurses concerning the procedure of hemodialysis and related complications. *Kufa Journal for Nursing Sciences*. 2013;3(1):93-9. [[Full Text](#)]
- Adhikari R. The dream-trap: brokering, study abroad and nurse migration from Nepal to the UK. *European Bulletin of Himalayan Research*. 2009-2010;35-36:122-38. [[Full Text](#)]
- Baral R, Sapkota S. Factors influencing migration among Nepalese nurses. *Journal of Chitwan Medical College*. 2015;5(12):25-9. [[Full Text](#) | [DOI](#)]
- Karkar A, Bouhaha BM, Dammang ML. Infection control in hemodialysis units: a quick access to essential elements. *Saudi J Kidney Dis Transpl*. 2014;25(3):496-519. [[PubMed](#)]
- Al-Mawsheki E, Ibrahim MH, Taha NM. Nurses knowledge and practice regarding care for the patients during hemodialysis. *Med J Cairo Univ*. 2016;84(1):1135-41. [[Full Text](#)]
- Al-Ghamdi S. Nurses knowledge and practice in hemodialysis units: comparison between nurses in units with high and low prevalence of hepatitis c virus infection. *Saudi J Kidney Dis Transplant*. 2004;15(1):34-40. [[PubMed](#)]
- Larson E. APIC guideline for hand washing and hand antisepsis in health care settings. *Am J Infect Control*. 1995;23:251-69. [[PubMed](#)]
- Maheshwari V, Kaore NC, Ramnani VK, Gupta SK, Borle A, Kausha R. A study to assess knowledge and attitude regarding hand hygiene amongst residents and nursing staff in a tertiary health care setting of Bhopal city. *Journal of Clin and Dia Res*. 2014;8(8):4-7. [[PubMed](#) | [DOI](#)]
- Paudel IS, Ghosh V, Adhikari P. Knowledge, attitude and practice of nursing students regarding hand hygiene in western region of Nepal. *JCMS Nepal*. 2016;12(4):169-73. [[Full Text](#) | [DOI](#)]
- Al Wazzan B, Salmeen Y, Al Amiri E, Alaa A, Bouhaimed M, Al Taiar A. Hand hygiene practices among nursing staff in public secondary care hospitals in Kuwait: self-report

- and direct observation. *Med Princ Pract.* 2011;20:326-31. [[PubMed](#) | [DOI](#)]
18. Abou El Eneina NY, El Mahdy HM. Standard precautions: a KAP study among nurses in the dialysis unit in a university hospital in Alexandria, Egypt. *Journal of the Egyptian Public Health Association.* 2011;86:3-10. [[PubMed](#) | [DOI](#)]
19. Asadollahi M, Bostanabad MA, Jebraili M, Mahallei M, Rasooli S, Abdolalipour M. Nurses knowledge regarding hand hygiene and its individual and organizational predictors. *Journal of Caring Sciences.* 2015;4(1):45-53. [[PubMed](#) | [DOI](#)]
20. Reang T, Chakraborty T, Sarker M, Tripura A. A study of knowledge and practice regarding hepatitis b among nursing students attending tertiary care hospitals in Agartala city. *Int J Res Med Sci.* 2015;3(7):1641-9. [[Full Text](#) | [DOI](#)]