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Effectiveness of a structured teaching programme on knowledge regarding multi-modal nursing interventions to enhance the well-being among patients undergoing hemodialysis in a selected hospital at Mangaluru

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Abstract
Background of the study: According to the Pan American Health Organization and WHO, CKD is the 8th leading cause of mortality and the 10th cause of years of life lost and disability. More than 850 million people worldwide suffer from some form of kidney disease; among them, 5.3 and 10.5 million people require dialysis or transplantation. Patients on hemodialysis struggle with many complications. Multi-modal nursing intervention is an essential element to combat these complications and helps to improve the general well-being of the patients.
Methodology: The research design selected for the present study was pre-experimental with one group pre-test and post-test design 60 samples were obtained by probability simple random sampling technique. Structured knowledge questionnaires were used to collect the data analysis and interpretation done by using descriptive and inferential statistics
Result: The study results revealed that among 60 patients, 43(72%) had adequate knowledge, 12(20%) had moderate knowledge and 43(72%) had inadequate knowledge. The pre-test mean score with standard deviation was 8.61 +4.84 and mean percentage score was 31.61% and the post-test mean score with standard deviation was 21.87+7.04 and mean percentage score was 73.25%. The obtained 't' value was 53.02 which was greater than the table value at $p<0.05$ level of significance.
Conclusion: The study concluded that structured teaching program was very effective in the improvement of knowledge regarding multi-modal nursing intervention among hemodialysis patient's knowledge was increased from inadequate level to a moderate and adequate level. The information booklet regarding multi-modal nursing intervention was distributed to patients to enhance the well-being among patients undergoing hemodialysis and for further reference.

Keywords: Evaluate, effectiveness, multi-modal nursing intervention, structured teaching programme, well-being

Introduction

Inside the core of a special intricate system lie the kidneys, the body's natural filtration unit [1], working tirelessly to filter out waste and excess substances from the blood, much like a high-tech water purifier [2]. Every heartbeat, the kidneys receive blood from the body and effectively move in to remove waste particles such as excess hydrogen, potassium, uric acid, and water, along with other metabolic breakdown products. Concurrently, the kidneys preserve optimal levels of vital substances like proteins, glucose, bicarbonate, and electrolytes by balancing these within the body despite external influences, consequently maintaining homeostasis [3]. The filtration of excess waste and fluid is measured by an indicator called GFR. Normal healthy adults will be composed of the GFR at the level of 120 ml/min/1.73 m^2. Lack of blood supply to the tiny blood vessels of the kidney impairs the function. Eventually, diminishing the glomerular filtration rate [4].

According to ISN (International Society of Nephrology) data 2022, more than 850 million people worldwide suffer from some form of kidney disease. Worldwide the prevalence of CKD is 10.4% among men and 11.8% among women. Each year, 13.3 million people experience acute kidney injury, and 5.3 and 10.5 million people require dialysis or transplantation [5].

Hemodialysis is an important treatment for patients with chronic kidney disease (CKD).

Effective hemodialysis can significantly improve patients' quality of life, but complications during the session can range from minor to life-threatening. The prevalence of these complications is still high, ranging from 10 to 70% among them acute complications reported worldwide, the most common is hypotension (25–55%), followed by intradialytic hypertension (8–30% of sessions), cramping in the muscles (5–20%), itching (22-48%), headaches (27–73%), restless leg syndrome (6.6–62%), and other complications that can be severe and raise the risk of patient death. Better patient outcomes require early detection and treatment of complications in addition to preventive measures.

Managing hemodialysis complications involves regular exercise, proper nutrition, and meticulous care of the AV fistula or graft. Regular exercise, including walking, cycling, and light weightlifting, improves cardiovascular health, muscle strength, and overall well-being while reducing stress. Nutritional care focuses on a balanced diet, limiting sodium, potassium, and phosphorus, and adhering to fluid restrictions to manage blood pressure and maintain health. AV fistula care includes daily inspections, hygiene, and avoiding pressure or strain on the arm to prevent infection and ensure functionality. A proactive, well-rounded approach can make a world of difference in the management of dialysis challenges and enhance quality of life [6].

Materials and methods

The researcher selected quantitative approach with pre-experimental one group pre-test and post-test design to conduct study. The total sample consisted 60 patients undergoing hemodialysis in a selected hospital. Probability simple random sampling technique - lottery method was used to recruit the required number of samples. The knowledge level on the multimodal nursing intervention was assessed through a self-prepared semi-structured knowledge questionnaire and the information booklet regarding multi-modal nursing intervention was distributed to reduce the complications of hemodialysis and further reference.

Results

Frequency and percentage distribution were used to analyze the demographic variables.

Distribution of Patients Undergoing Hemodialysis with Selected

Socio-Demographicvariables

Socio-demographic variables	Frequency (No)	Percentage (%)
Age in years		
<30years	10	17
30-40years	16	27
40-50years	8	13
>50years	26	43
Gender		
Male	36	60
Female	24	40
Transgender	-	-
Socio-demographic variables	Frequency (No)	Percentage (%)
Religion		
Hindu	48	80
Muslim	10	17
Christians	2	3
Specify if any other	-	-
Marital status		
Married	48	80
Unmarried	9	15
Widow/widower	3	5
Separated/divorced	-	-
Educational qualification		
No formal education	9	15
Primary	7	12
Secondary	21	35
Graduated	23	38
Employment		
Unemployed	34	57
Self-employed	18	30
Socio-demographic variables	Frequency (No)	Percentage (%)
Employed	6	10
Retired	2	3
Family income		
Rs. ≤5000to10000/-	15	25
Rs.11000 to20000/-	16	27
Rs.21000 to 30000/-	14	23
Rs.31000 to 40000/-	15	25
Type of family		
Nuclear	32	53
Joint	26	43
Extended	1	2
Specify if any other	1	2
Personal habits		
Betel chewing	5	8
Smoking	9	15
Drug abuse	10	17
No significant unhealthy habit	36	60
Food pattern		
Vegetarian	9	15
No vegetarian	9	15
Mixed	42	70
Socio-demographic variables	Frequency (No)	Percentage (%)
Family history of CKD		
Yes	17	28
No	43	72

Duration of hemodialysis		
<3yrs	51	85
3-4yrs	6	10
≥5yrs	3	5
Source of information regarding hemodialysis		
Media	39	65
Newspaper	9	15
Family	7	12
Peer /neighbors	5	8
Co-morbidity		
Hypertension	31	52
Diabetes mellitus	20	33
CAD	7	12
Lung disease	2	3

Assessment of pre-test knowledge regarding multi-modal nursing interventions among patients undergoing hemodialysis.

Distribution of patients undergoing hemodialysis according to overall pre-test knowledge score.

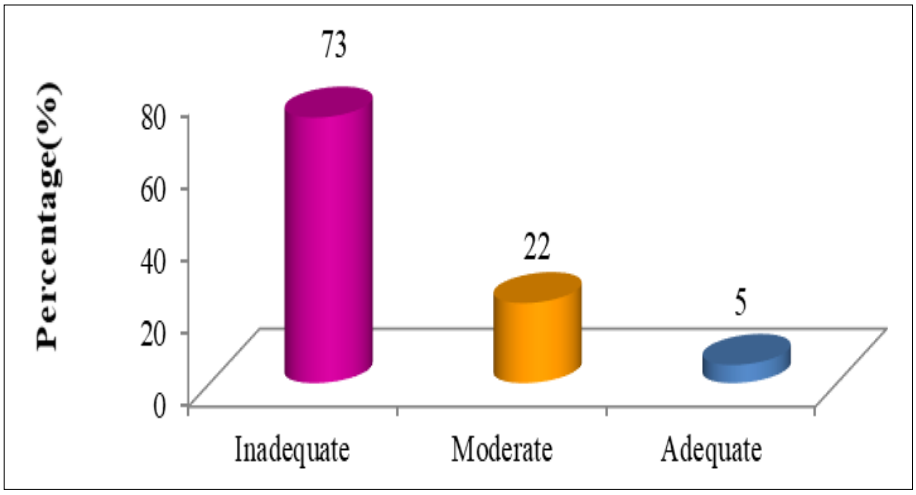

Fig1: revealed that the majority of the patients 44(73%) had inadequate knowledge regarding multi-modal nursing intervention.

Area-wise distribution of pre-test knowledge regarding multi-modal nursing interventions among patients undergoing hemodialysis.

The data presented in Table 2.2 indicates that among 60 patients the area-wise pre-test mean and standard deviation for general information on hemodialysis was 1.73±0.85 and the mean score percentage was 43.28%. The mean and standard deviation for general Guidelines for exercise is 2.2 ±1.74 with a mean score percentage of 22%. The mean and standard deviation for knowledge regarding diet is 3.35± 1.67 with a mean score percentage of 27.91%. The mean and standard deviation for knowledge regarding AV fistula care is 1.33± 0.58 with a mean score percentage of 33.25%. The majority of the patients did not have adequate knowledge regarding multi-modal nursing intervention. The investigator felt the need to demonstrate the exercise's and distribute the information booklets.

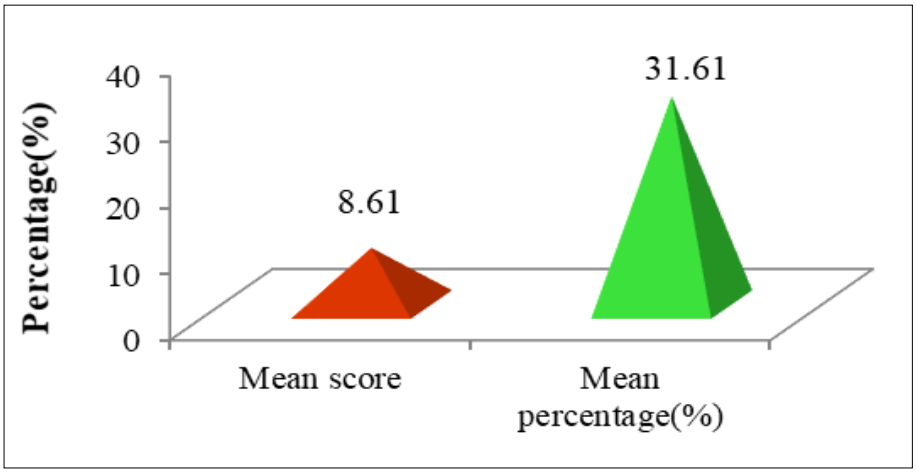

Fig 2: represents that area-wise overall pre-test mean score and standard Deviation was 8.61 ±4.84, and the mean score percentage was 31.61%.

Distribution of samples according to item-wise knowledge score

revealed that in the item wise of post-test knowledge scores on each item among 60 sample. The 18(30%) patients understood the meaning of CKD, 21(35%) understood the risk factors for kidney failure, 20(33%) were able to mention the meaning of hemodialysis, 20(33%) specified the complications of hemodialysis.

Item-wise post-test knowledge scores with enhancement scores on each item among 60 sample regarding general guidelines of exercises. Among them 21(35%) got awareness on body temperature to avoidance of exercise, 28(47%) got awareness on restriction of exercise, 27(45%) patients got aware on contraindication of exercise, 25(42%) aware on improvement of joint mobility,33(55%)recognized the importance of exercises, 33(55%)understood the time duration for warming up, 40(67%) understood the concentrated part while exercise, 30(50%) duration to hold the stretch, 43(72%) Muscle strengthening exercises, 33(55%) duration to hold the stretch, 40(67%) Concentrated part of muscle while exercise, 43(72%) Muscle strengthening exercises, 29(48%) Functional capacity of hemodialysis.

Item-wise post-test knowledge scores with enhancement scores on each item among 60 sample regarding general guidelines of diet. Among them 15(25%) determined the nutritional requirements, 29(48%) revealed the importance of protein, 29(48%) understood the causes for phosphorus elevation, 11(18%) patients found out the symptoms associated with elevated phosphorus, 34(57%) identified the cause of itching, got aware on contraindication of exercise, 25(42%) determine the sources of potassium, 29(48%) found the complications of hemodialysis, 30(50%) patients spotted the control measure of high blood pressure, 22(37%)were knowing the fluid requirement, 33(55%) indicated the method for consumption oral medication, 28(47%) determined the alternate method of fluid intake, 28(47%) understood the method of measurement of fluid intake.

Item-wise post-test knowledge scores with enhancement scores on each item among 60 sample regarding general guidelines of AV fistula care, 26(43%) patients understood the meaning of AVF, 21(35%) identified the best approach for functioning of AV fistula, 27(45%) identified the complication of scratching of fistula, 23(38%) aware on benefit of Squeezing a soft rubber ball.

Effectiveness of structured teaching programme on knowledge regarding multi-modal nursing intervention among patients undergoing hemodialysis

The pre-test score with standard deviation was 8.61±4.84 and mean percentage score was 31.61% and the post-test mean score with standard deviation was 21.87±7.04 and the mean percentage score was 73.25% whereas the percentage score difference was 41.64%. The obtained 't' value was 53.02 which was greater than the table value at $p<0.05$ level of significance, after a structured teaching programme on multi-modal nursing intervention. The study concluded that a structured teaching programme on multi-modal nursing intervention was found to be effective in improving the knowledge among patients undergoing hemodialysis. Hence, the research hypothesis H_1 was accepted.

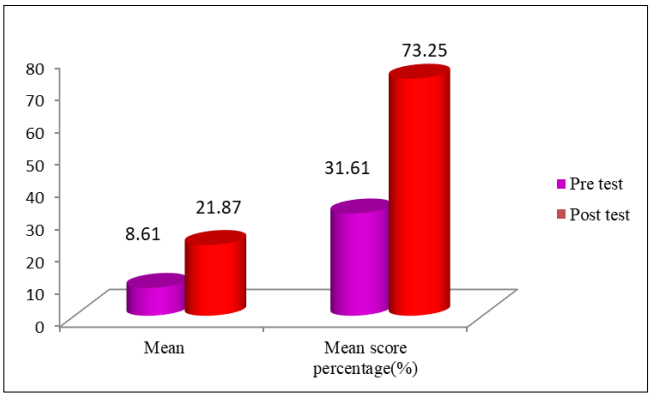

Fig 3: Mean and mean score percentage of effectiveness of structured teaching programme

Discussion

The study aimed to evaluate the effectiveness of a Structured teaching program on knowledge regarding multi-modal nursing interventions to enhance the well-being among patients undergoing hemodialysis in a selected hospital at Mangaluru. The study findings had been discussed according to the objectives and hypothesis, along with the results of other studies.

The present study is supported by an institutional-based cross-sectional study conducted to assess the prevalence of chronic kidney disease and its associated factors among diabetes mellitus patients in Dessie Referral Hospital, South Wollo, Ethiopia. 267 samples were selected for the study. The result revealed that among 267 samples, 104 (39%) were females, 204 (76.4%) were between the age groups of 18-60, 233 (87.3%) were married, 187 (70%) were residents of urban populations, and 133 (48.1%) were hypertensive. The overall prevalence of chronic kidney disease in this study was 83 (31.5%). The study concluded that the majority of the study samples were related to old age and hypertension as a contributing factor.

The present study is supported by a cross-sectional study conducted to assess the knowledge on dietary management of chronic kidney disease among patients undergoing hemodialysis at a tertiary care hospital in south India. 86 samples were selected by the purposive sampling method. The result revealed that among 86 samples, 6 (7%) had adequate knowledge, 74 (86%) had moderate knowledge, and 6 (7%) had inadequate knowledge regarding dietary management of chronic kidney disease. The study concluded that the majority of the CKD patients undergoing hemodialysis exhibit moderate knowledge of dietary management; comprehensive education and support are required to improve the well-being of hemodialysis patients.

The present study, supported by a quasi-experimental study, was conducted to assess the effect of a structured teaching program on knowledge and self-management behaviours among hemodialysis patients at hemodialysis unit Qena General Hospital, Egypt. 100 samples were selected by convenient sampling technique. The result revealed that 17 (17%) of patients had adequate level of knowledge in the pretest and 93 (93%) in the post-test. A significant enhancement was observed in the mean and standard deviation of the pre-test (7.88 ± 1.93) and post-test value (21.87±7.04). The study concluded that a structured teaching program on knowledge and self-management

behaviours was found to be effective, and continuous education was required to enhance the general wellbeing of the patients The present study is supported by a quasi-experimental study conducted to evaluate the effectiveness of a structured teaching program on self-care of arteriovenous fistula in terms of knowledge and practice among patients with end-stage renal disease at a selected hospital in New Delhi. The purposive sampling technique was used to select 40 samples, and the pre- and post-test mean score was 8.35±15.65 after the intervention. There was a significant positive association found between the post-test knowledge score of the sample and the number of days that the patient is receiving hemodialysis in a week, obtaining a chi value of 9.14, which was greater than the table value of 7.815 at the 0.05 level of significant. The study concluded that there was significant improvement in knowledge level after the structured teaching program.

Conclusion

The structured teaching programme significantly improved hemodialysis patient's knowledge regarding multi-modal nursing interventions, which included selected physical exercises (stretching and muscle strengthening), dietary management, and AV fistula care. Enhanced knowledge helps to improve well-being among hemodialysis patients. Future studies should focus on broader patient groups and explore long-term knowledge retention.

References

1. Rodgers AB. Alzheimer's disease unrevealing the mystery. National Institute of Aging, 2008, 9–18.
2. Carey A, Parodi-Rullan R, Vazquez-Torres R, Canepa E, Fossati S. Homocysteine potentiates amyloid-induced death receptor 4- and 5-mediated cerebral endothelial cell apoptosis, blood brain barrier dysfunction and angiogenic impairment. Aging Cell,2024:23(5):1–2.
3. Villemagne VL, Burnham S, Bourgeat P, Brown B, Ellis KA, Salvado O. *et al*. Amyloid ß deposition, neurodegeneration, and cognitive decline in sporadic Alzheimer's disease. A prospective cohort studies. Lancet Neurology,2013:12(4):357–367.
4. Ahmad FB, Cisewski JA, Xu J, Anderson RN. Provisional Mortality Data - United States, 2022. Morbidity and Mortality Weekly Report,2023:72(18):488–492.
5. Jack CR, Lowe VJ, Weigand SD, Wiste HJ, Senjem ML, Knopman DS. *et al*. Serial PiB and MRI in normal, mild cognitive impairment and Alzheimer's disease: Implications for sequence of pathological events in Alzheimer's disease. Brain,2009:132:1355–1365.
6. Reiman EM, Quiroz YT, Fleisher AS, Chen K, Velez-Pardos C, Jimenez-Del-Rio M. *et al*. Brain imaging and fluid biomarker analysis in young adults at genetic risk for autosomal dominant Alzheimer's disease in the presenilin 1 E280A kindred. A case-control study. Lancet Neurology,2012:11(2):1048–1056.
7. Villemagne VL, Burnham S, Bourgeat P, Brown B, Ellis KA, Salvado O. *et al*. Amyloid ß deposition, neurodegeneration, and cognitive decline in sporadic Alzheimer's disease. A prospective cohort studies. Lancet Neurology,2013:12(4):357–367.
8. Hunt K. Mediterranean diet linked with reduced risk of developing dementia. CNN Health, 2023.
9. Keys A, Menotti A, Karvonen MJ, Aravanis C, Blackburn H, Buzina R. *et al*. The diet and 15-year death rate in the seven countries study. American Journal of Epidemiology,1986:124:903–915.
10. Solfrizzi V, Panza F, Capurso A. The role of diet in cognitive decline. Journal of Neural Transmission,2003:110:95–110.
11. Agarwal P, *et al*. Association of Mediterranean-DASH intervention for neurodegenerative delay and Mediterranean diets with Alzheimer disease pathology. Neurology, 2023.
12. Gaforio JJ, Visioli F, Alarcón-de-la-Lastra C, Castañer O, Delgado-Rodriguez M, Fitó M. *et al*. Virgin olive oil and health: Summary of the III international conference on virgin olive oil and health consensus report, JAEN Spain 2018. Nutrients,2019:11(9):2039.
13. Willett WC, Sacks F, Trichopoulou A, Drescher G, Ferro-Luzzi A, Helsing E. *et al*. Mediterranean diet pyramid. a cultural model for healthy eating. American Journal of Clinical Nutrition,1995:61:1402–1406.
14. Deligiannis A, D'Alessandro C, Cupisti A. Exercise training in dialysis patients: impact on cardiovascular and skeletal muscle health. Clinical Kidney Journal, 2021.
15. Singh HM, Patel H. A study to assess the effectiveness of intradialytic exercise on muscle strengthening of hemodialytic patients in selected hospitals of Gandhinagar. International Journal of Advanced Research,2022:10:568–573.
16. National Kidney Foundation. NKF nutrition couch, 2023.
17. Ko GJ, Obi Y, Tortorici AR, Kalantar-Zadeh K. Dietary protein intake and chronic kidney disease. Current Opinion in Clinical Nutrition and Metabolic Care,2017:20(1):77–85.
18. Ernstmeyer K, Christman E. Open Resources for Nursing Open RN. Nursing Fundamentals. Chippewa Valley Technical College, 2021.
19. Patel Y, Joseph J. Sodium intake and heart failure. International Journal of Molecular Sciences,2020:21(24):9474.
20. Udensi UK, Tchounwou PB. Potassium Homeostasis, Oxidative Stress, and Human Disease. International Journal of Clinical and Experimental Physiology,2017:4(3):111–122.
21. Wong K. High phosphorus, hyperphosphatemia. American Kidney Fund, 2024.
22. Burrowes D. Nutrition in Kidney Disease. New York University, 2019.
23. Aboserea M, El-Maghawry H, Mohamed M. Effect of Specific Nutritional Program on Patients with Chronic Renal Failure on Hemodialysis on El-keman Village Luxor Governorate. The Egyptian Journal of Hospital Medicine,2019:77(2):5060–5067.
24. National Health Service. How it is performed – dialysis, 2021.
25. Castro JE. The Treatment of Renal Failure. Springer Dordrecht, 2012.
26. Ataaallah A, Ramzy H, Atalla A, Hamdy G, El S, Sallam S. *et al*. Effectiveness of Nursing Intervention Regarding Newly Placed Arteriovenous Fistula Self-Care on Level of Knowledge, Practice, and Attitude among Hemodialysis Patients, 2021.

27. Cleveland Clinic. Kidneys: anatomy, function, health conditions. Archived from the original on 2023 Jun 29. Retrieved, 2023.
28. Sandilands EA, Dhaun N, Dear JW, Webb DJ. Measurement of renal function in patients with chronic kidney disease. British Journal of Clinical Pharmacology,2013:76(4):504–515.
29. Better Health Channel. Kidney health, 2020.
30. Centers for Disease Control and Prevention. Chronic Kidney Disease in the United States, Atlanta, GA US Department of Health and Human Services, Centers for Disease Control and Prevention, 2023.
31. Venkatesan B, Krishnamoorthy K, Senthil R. Knowledge, attitude, and perception regarding chronic kidney disease among caregivers of hemodialysis patients in Puducherry: a cross-sectional study. CHRISMED Journal of Health and Research,2024:10:360–364.
32. Temple Health. Kidney – transplant, 2024.
33. Cleveland Clinic Organization. Dialysis, 2021.
34. Daugirdas JT, Black PG, Ing TS. Handbook of dialysis. Philadelphia, PA Lippincott Williams Wilkins, a Wolters Kluwer Business, 2007.
35. Alyaseen F. The patient care and complications of hemodialysis procedure for renal failure patients. A descriptive study at Al Nasiriya city, South of Iraq. Journal of Global Information Management,2019:10:356–365.
36. Hanna R, Chen JLT, Malik S, Nguyen DV, Crowley ST, Kovesdy CP. *et al*. Plant-dominant low-protein diet for conservative management of chronic kidney disease. Nutrients,2020:12(7):1931.
37. Samuel Raj VV, Mangalvedhe PV, Shetty MS, Balakrishnan DC. Impact of exercise on fatigue in patients undergoing dialysis in a tertiary care hospital. Cureus,2023:15(2):35004.
38. Delgado C, Johansen KL. Barriers to exercise participation among dialysis patients. Nephrology Dialysis Transplantation,2012:27(3):1152–1157.
39. Piccoli GB, Lippi F, Fois A, Gendrot L, Nielsen L, Vigreux J, *et al*. Intradialytic nutrition and hemodialysis prescriptions: A personalized stepwise approach. Nutrients,2020:12(3):785.
40. Gulyassy PF, Peters JH, Lin SC, Ryan PM. Hemodialysis and plasma amino acid composition in chronic renal failure. American Journal of Clinical Nutrition, 1968, 367–375.
41. Papper S. Renal failure. Medical Clinics of North America, 1971, 335–337.
42. Joder EW. Dietary management of hemodialysis patients. Dietetics Service, Veterans Administration Hospital, Tucson, Arizona, 1974, 6(2).
43. Fearing M. Aluminum hydroxide gel Amphojel ingestion in dialysis patients. Vinculum, 1972, 2–4.
44. Jayroe H, Foley K. Arteriovenous fistula. In StatPearls. Treasure Island FL. StatPearls Publishing, 2024.
45. Shreekumar D. What are research objectives and how to write them, 2023.
46. Fink A. From Conducting Research Literature Reviews. From Internet to Paper. 2nd ed. Thousand Oaks. Sage Publications, 2005.
47. Dsouza B, Kamath R, Prabhu R, Unnikrishnan, Kamath S. Knowledge of disease management among maintenance hemodialysis patients in coastal Karnataka – A cross-sectional pilot study. Indian Journal of Public Health Research and Development,2018:9(11):33.
48. Anagarajah S, Velraja S, Arambakkam HJ. Knowledge, attitude, and practices of renal diets among hemodialysis patients. Biomedical and Biotechnology Research Journal,2022:6:86.
49. Montazeri RS, Sharifi N. Evaluation of nutritional knowledge in terms of dietary sources of protein, phosphorous, potassium, and fluids restriction in hemodialysis patients. Jentashapir Journal of Cell and Molecular Biology, 2014, 5(4).
50. Moustakim R, Mziwira M, Mohammed E, Belahsen R. Assessment of nutritional status, dietary intake and adherence to dietary recommendations in hemodialysis patients. GSC Advanced Research and Reviews,2020:3:009–019.