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NUTRITIONAL STATUS OF PATIENTS ON HEMODIALYSIS AT NAKURU COUNTY REFFERAL AND TEACHING HOSPITAL, KENYA

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Abstract

Background: Patients on haemodialysis are faced with many challenges, including malnutrition. According to World Health Organization, the malnutrition rate varies significantly among patients attending haemodialysis, ranging from 18 to 75%. Malnutrition has been associated with increased adverse outcomes among patients, which prompts the need to control patient nutritional status. The common adverse outcomes include low quality of life, increased risk of infection, diseases, and slow wound healing. There has been less focus on malnutrition among patients attending Hemodialysis in Kenya, which forms the basis of this study. The purpose of this study was to investigate determinants of malnutrition in hemodialysis patients at Nakuru county Referral and Teaching Hospital.

Methodology: The study utilized analytical cross-sectional study design. A consecutive sampling technique will be used to recruit 61 patients attending haemodialysis will be recruited randomly at Nakuru Referral and Teaching hospital dialysis unit. Binary logistic regression was conducted to investigate predictors of malnutrition in patients attending Hemodialysis. A Statistical Package for Social Sciences (SPSS) version 25 was used to conduct data analysis. A 95% confidence level was be considered.

Results: The present study has established that majority of patients were male with an average age of 56.2 years. Almost a third of the patients had both diabetes and hypertension. The findings also revealed that the average length of duration at the facility was 52 months. The findings showed that the prevalence of malnutrition was 39.3%. Among these, 26.2%of the HD patients had moderate malnutrition while 13.1% had severe malnutrition. The independent determinants of malnutrition included being male, having both hypertension and diabetes, presence of anemia, and poor dietary intake were determinants of malnutrition among HD patients.

Conclusion and recommendations: The findings established that malnutrition among patients on hemodialysis was high which warrants the need to develop tailored management approaches based on presenting risks.

Keywords: *nutrition; patient; hemodialysis; Kenya*

INTRODUCTION

Chronic kidney disease (CKD) is an epidemic disease globally with an estimated 5 to 15 % prevalence rate (Oluseyi & Enajite, 2016). End-stage renal disease (ESRD) is becoming more common in patients who need dialysis (McClave et al., 2016). Hemodialysis patients die at significantly higher rate compared to general public. Hemodialysis patients have a higher mortality rate due to a number of risk factors. It is also worth noting that malnutrition has been one of the major contributors to increased mortality among patients on hemodialysis (Corkins et al., 2014).

Globally, hemodialysis malnutrition prevalence is approximately 10 to 60% (McClave et al., 2016). Hemodialysis patients are faced with different challenges especially considering that they are normally tasked to follow certain dietary and fluid intake levels based on their conditions. Compliance with dietary levels/plans has been low, which results in an increased risk of malnutrition. A study conducted in Iran identified that patients with mild to moderate malnutrition were 18% while 10.9% suffered severe malnutrition (Freitas et al., 2014).

Similarly, Nigerian south study confirmed 46% prevalence rate (Oluseyi & Enajite, 2016). And it is estimated to be 42% in Sub-Saharan African (Bl et al., 2015). Whereas in low-income countries malnutrition rates are still high.

Associated factors that have been identified across different studies include older age, hypertension, diabetes, gender, social problems, and financial challenges among patients (Bl et al., 2015)(McClave et al., 2016). Malnutrition in hemodialysis patients is difficult to detect. There is no single objective approach that can reliably diagnose malnutrition in HD patients (Costa et al., 2018).

In CKD patients, malnutrition lowers their quality of life, increases infection risk, diseases, as well as slows wound healing. It also leads to inadequate recovery, exhaustion, and lethargy in these patients and increased hospitalization and mortality. As a result, it's critical evaluate nutritional level to make an early diagnosis of malnutrition and start a supportive nutritional program. (Costa et al., 2018). In Kenya, there is no clear understanding of the determinants of malnutrition among hemodialysis patients and associated factors that this study is seeking to address.

Nutrition forms a fundamental part in improving healthcare wellbeing among HD patients. Thus, higher level of adherence is required to improve their overall development. The increased restrictions accorded to hemodialysis patients have resulted in increased malnutrition among these individuals. Past research has shown that malnutrition in hemodialysis patients is close to 50% in Sub-Saharan Africa. A study conducted in Nigeria found 46% malnutrition (Oluseyi & Enajite, 2016), while another study conducted in Benin found 42% malnutrition among hemodialysis patients (Agboton et al.,2015). This prevalence is high, which highlights the need to identify common measures that can help define improved individual wellbeing.

Few studies have effectively investigated underlying factors that influence nutritional status among patients on hemodialysis. The common

factors that have been identified include age, meal frequency, income, prescription adherence and attending dialysis sessions (Kiboi et al., 2016). Hemodialysis, there has been less focus on malnutrition and its determinants, which will be crucial in implementing better care approaches based on the identified risk factors. Determinants of malnutrition in hemodialysis patients have been grouped as either iatrogenic or non-iatrogenic factors, which need to be exhaustively investigated to inform hemodialysis care policy. There has been little information available on malnutrition among patients on Hemodialysis in Kenya, which prompts the need to investigate this essential aspect of hemodialysis care. Thus, this study seeks to assess the prevalence and determinants of and factors that effectively predict patient malnutrition among hemodialysis patients at Nakuru Referral and Teaching Hospital.

METHODS

This was analytical cross-sectional study- a quantitative, non-experimental design. Study was conducted at Nakuru County Referral and Teaching Hospital Nakuru county Kenya. The hospital has a750-bed capacity and serve more than 2000 people daily. The Hospital is equipped to offer diverse services, including Renal services. The hospital has 72 patients who attend weekly dialysis at the facility. This study site has been selected because it is one of the largest dialysis centers in the country.

The sample size was calculated using Taro Yamane formula with a precision € of 0.05 and total population (N) of 72. The sample size was 61 patients. A consecutive sampling technique was be utilized in this study. Study participants were recruited as they came for dialysis sessions on dialysis days.

The researcher together with two research assistants having nursing diploma qualification visited the renal unit every day in the morning and meet patients prior to start of their dialysis. The researcher elaborated study purpose and requested participants to consent. Only those who agreed were recruited into the study. This process was undertaken daily until the sample size was attained.

Independent variables included age, gender, and marital status, level of education, monthly income, BMI, creatinine level, and urea. The only dependent variable was nutritional status.

Nutritional status was assessed using Global Subjective Assessment (SGA) score. The nutritional assessment using this approach encompasses history and physical examination of the patients. The scale includes seven items that are assessed to investigate individual nutritional status. They include weight change, intake, functional status, metabolic demands,

fat storage, muscle store, oedema as well as a gastrointestinal symptom (Ko et al., 2018). Each of these components is scored from 1 to 7. The total SGA is summed to get the overall scores (Tan et al., 2016).

The study adopted a structured research questionnaire and a Subjective Global assessment tool. This tool was pretested at Moi Teaching referral hospital. The purpose of pretesting at the facility was mainly because they have a more accurate data collection process which made it easier to review the tool.

The questionnaire was researcher administered mainly aimed at maintaining internal consistency and validity of the results. Respondents were required to provide honest answers to the best of their knowledge. Demographic details such as age, gender, education level and income were obtained. Researcher together with study assistants measured height and weight of the respondents to document their body mass index level. Further, the Subjective global assessment was done to investigate malnutrition level among participants. After consent, the respondent provided demographic details. Weight and height were measured. The respondents also provided information as required on Subjective global assessment scale to determine nutrition level. Research assistants who were involved in data collection process were trained to ensure they are efficient in collecting information. Collected information was kept in a laptop with secured password and only accessible by study researcher.

Analysis of information consisted of descriptive and inferential components. Descriptive aspects involved both continuous with categorical variable assessments. Continuous variables were analyzed using mean and standard deviations as well as a median and interquartile range based on information distribution. Categorical variables were descriptively analyzed using frequencies as well as percentages. In determining the association between categorical and continuous variables involved, a binary logistic regression was also conducted to determine predictors of malnutrition in patients attending Hemodialysis. Data was analyzed by Statistical Package for Social Sciences version 25. The significance level was evaluated as 0.05.

The study sought ethical approval from Kenyatta University Research and Ethics Committee. Permit to conduct research was obtained from NACOSTI. An informed consent was administered. Privacy and confidentiality were considered in this study by ensuring that there no personal identifiers captured. All the questionnaires were anonymised and serialized. Participation in the study was voluntary with no coercion.

RESULTS

A total of 61 questionnaires were distributed among hemodialysis patients. All of the questionnaires were returned for analysis representing 100% response rate.

Characteristics of patients on hemodialysis

Demographic characteristics of patients on hemodialysis

Mean age was 56.16(SD± 16.2) years with 65.6% (n =40) were aged ≥50 years. Majority 60.7% (n =37) of the patients were male. The findings also showed that 78.7% (n =48) spend more than Ksh.10,000 per month on hemodialysis treatment medication and transport. The mean length of stay at the facility seeking hemodialysis was 52.1(SD±39.1) months. Most of the patients 95.1% (n =58) had two dialysis sessions per week and 93.4% (n =57) attended four hours for each session as shown in Table 1.

Table 1: Socio-demographic characteristics of patients on hemodialysis

Characteristics	Frequency	Percent
Age (Mean± SD)	**56.16±16.2**	
<50 years	21	34.4
≥50 years	40	65.6
Gender		
Female	24	39.3
Male	37	60.7
Level of education		
None	4	6.6
Primary	13	21.3
Secondary	29	47.5
Tertiary	15	24.6
Sources of funds for hemodialysis		
Business/Farming	23	37.7
Donations	3	4.9
Family contributions	14	23.0
Insurance	14	23.0
Salary	7	11.5
Amount spent on Hemodialysis monthly		
Less than Ksh.5,000	13	21.3
More than 10,000	48	78.7
Length of care at facility (**Mean± SD) months**	52.1±39.1	
Number of dialysis per week		
1	1	1.6
2	58	95.1
3	2	3.3
Duration of hemodialysis session (hours)		
3	4	6.6
4	57	93.4

Clinical characteristics of patients on hemodialysis at Nakuru county Referral hospital

All the patients had at least one comorbidity with 57.4% (n =35) had hypertension while 26.2% (n =16) of the patients both had diabetes and hypertension. Further, 54.1% (n =33) had anemia as shown in Table 2.

Table 2: Clinical characteristics of patients on hemodialysis

Characteristics	Frequency	Percent
Present comorbidities		
Diabetes	10	16.4
Diabetes and hypertension	16	26.2
Hypertension	35	57.4
HB levels (Mean± SD)	10.02±2.5	
Low	33	54.1
Normal	28	45.9
Creatinine (Mean± SD)	949.3±101.8	
Urea (Mean± SD)	25.5±18.12	
Body mass index		
Underweight	5	8.2
Normal	29	47.5
Overweight	18	29.5
Obese	9	14.8

***HB**: Hemoglobin levels, **SD**: Standard deviation*

Nutritional status among hemodialysis patients

To assess nutritional status of patients undergoing hemodialysis, one key approach was utilized: Subjective Global Assessment (SGA).

Subjective Global Assessment (SGA) approach

The Subjective Global Assessment (SGA) was employed as a clinical tool to evaluate malnutrition in hemodialysis patients. This method integrates several critical components, including weight change, gastrointestinal symptoms, functional status, underlying disease severity, and physical examination findings. Each of these parameters contributes to a holistic assessment of the patient's nutritional health, allowing for a more accurate identification of malnutrition and its potential impact on clinical outcomes.

Weight change and Gastrointestinal symptoms

The results established 88.5% (n =54) of patients had a weight decrease over the past two weeks, 86.9 % (n =53) had inadequate dietary intake. In investigating gastrointestinal symptoms, 9.8 % (n =6) had anorexia 1 – 2 times. Majority had nausea 1 -2 times 68.9 % (n =42) while 47.5 % (n =29) of the patients had vomiting for 1 -2 times as shown in Table 3.

Table 3: Weight change and Gastrointestinal symptoms

	Frequency	Percent
Weight change over the past two weeks		
Decrease	54	88.5
Increase	1	1.6
No change	6	9.8
Dietary intake		
No change(adequate)	8	13.1
No change(inadequate)	53	86.9
Gastrointestinal symptoms		
Anorexia frequency		
Never	55	90.2
1 - 2 times	6	9.8
Anorexia duration		
>2weeks	6	100.0
Nausea frequency		
Never	18	29.5
>2 times	1	1.6
1 - 2 times	42	68.9
Nausea duration		
Never	16	26.2
<2 weeks	4	6.6
>2 weeks	41	67.2
Vomiting frequency		
Never	31	50.8
>2 times	1	1.6
1 - 2 times	29	47.5
Vomiting duration		
<2 weeks	1	1.6
>2 weeks	29	47.5
Diarrhoea frequency		
Never	47	77.0
1 - 2 times	14	23.0
Diarrhoea duration		
Never	47	77.0
<2 weeks	2	3.3
>2 weeks	12	19.7

Functional capacity and disease state

In investigating functional capacity, 14.8 % (n =9) of the patients had change in function, most of the patients had hypertension 50.8 % (n =34). On physical examination, the findings showed that 86.9 % (n =53) had loss of subcutaneous fat, Muscle wasting, Oedema as shown in Table 4.

Table 4: Functional capacity and disease state

	Frequency	Percent
Functional capacity		
Change in function	9	14.8
Difficulty with activity	3	4.9
Difficulty with ambulation	4	6.6
No dysfunction	45	70.5
Disease state		
Primary diagnosis		
Diabetes	10	16.4
Diabetes//Hypertension	14	23.0
Diarrhoea	1	1.6
Hypertension	34	50.8
Disease Requirements		
Decreased requirement	4	6.6
Increased requirements	40	65.6
Normal requirements	2	3.3
Acute metabolic stress		
High	1	1.6
Low	28	45.9
Moderate	25	41.0
None	2	3.3
Physical examination		
Oedema	1	1.6
Loss of subcutaneous fat	2	3.3
Loss of subcutaneous fat, Oedema	1	1.6
Loss of subcutaneous fat, Muscle wasting	2	3.3
Loss of subcutaneous fat, Muscle wasting, Oedema	53	86.9
Muscle wasting	2	3.3
Loss of subcutaneous fat (below eye, triceps)		
No	5	8.2
Some areas	56	91.8
Muscle wasting		
No	5	8.2
Some areas	56	91.8
Oedema		
No	28	45.9
Some areas	33	54.1

The nutritional status of hemodialysis patients at Nakuru County Referral and Teaching Hospital

The nutritional status of hemodialysis patients was evaluated using the Subjective Global Assessment (SGA) tool. This assessment categorizes patients into three primary groups: (a) well-nourished, (b) moderately malnourished, and (c) severely malnourished, based on subjective scoring criteria. The results indicated that 61% of the patients were well-nourished. Additionally, 26.2% (n = 16) of the patients were classified as moderately malnourished, while 13.1% (n = 8) were identified as severely malnourished. These findings are illustrated in Figure 2.

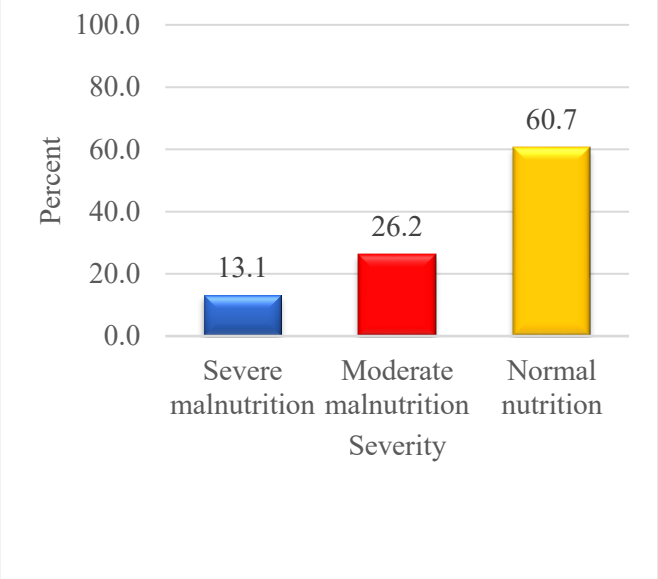

Figure 2: Severity of malnutrition among HD patients

The prevalence of malnutrition among hemodialysis patients

To further analyze the nutritional status, the three categories from the Subjective Global Assessment (SGA) were consolidated into two groups: well-nourished and malnourished (combining moderate and severe malnutrition). The findings revealed that the prevalence of malnutrition among the hemodialysis patients was 39.3% (n = 24), and well-nourished was 60.7 (n=) depicted in Figure 3.

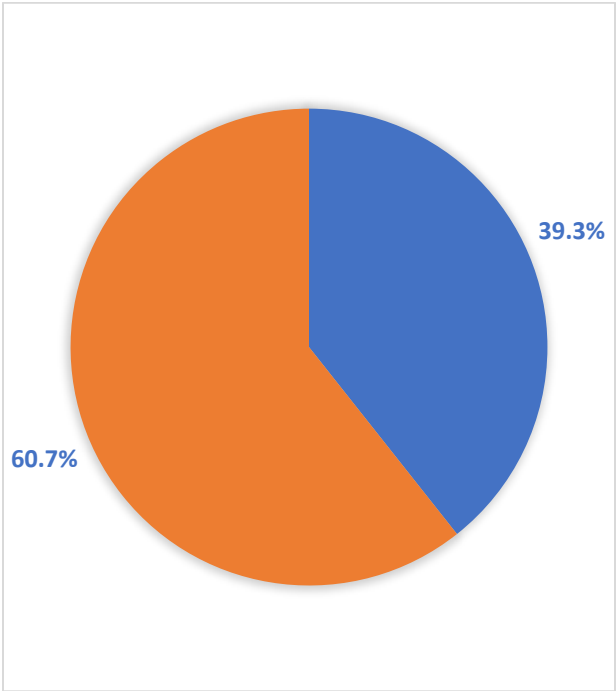

Figure 3: The prevalence of malnutrition among hemodialysis patients

Table 5: Bivariable analysis of determinants of malnutrition

Variables	Total (n)	Malnutrition			
		Yes n (%)	No n (%)	OR (95%CI)	P-value
Demographic factors					
Gender					
Male	32	18(56.3)	14(43.8)	4.93(1.58 - 15.38)	0.008
Female	29	6(20.7)	23(79.3)		
Age group					
<50 years	21	9(42.9)	12(57.1)	1.25(0.43 - 3.66)	0.785
≥50 years	40	15(37.5)	25(62.5)		
Education level					
Primary or lower	17	8(47.1)	9(52.9)	0.75(0.18 - 3.06)	0.688
Secondary	29	10(34.5)	19(65.5)	1.27(0.35 - 4.58)	0.719
Tertiary	15	6(40.0)	9(60.0)	Ref	
Iatrogenic factors					
Amount spent on hemodialysis monthly					
Less than Ksh.5,000	13	7(53.8)	6(46.2)	1.46(0.78 - 2.71)	0.233
More than 10,000	48	17(35.4)	31(64.6)		
None **Iatrogenic factors**					
Hypertension					
Yes	35	13(37.1)	22(62.9)	0.81(0.29 - 2.27)	0.793
No	26	11(42.3)	15(57.7)		
Diabetes					
Yes	10	3(30)	7(70)	0.61(0.14 - 2.64)	0.726
No	51	21(41.2)	30(58.8)		
Hypertension and diabetes					
Yes	17	14(82.4)	3(17.6)	15.87(3.79 - 66.47)	<0.001
No	44	10(22.7)	34(77.3)		
Dietary intake					
Poor	19	14(73.7)	5(26.3)	8.96(2.58 - 31.08)	<0.001
Good	42	10(23.8)	32(76.2)		
Laboratory characteristics					
Creatinine		757.3±242	1073.9±127	2.11(1.03 - 6.11)	0.451
Urea		28.37±20.1	23.7±13.5	6.21(0.34 - 19.11)	0.341
BMI		24.73±6.7	24.3±4.1	1.31(0.11 - 3.11)	0.451
HB levels					
Low	33	20(60.6)	13(39.4)	9.23(2.60 - 32.81)	<0.001
Normal	28	4(14.3)	24(85.7)		

Determinants of nutrition status among haemodialysis patients'

Binary logistic regression analysis was performed to investigate determinants of malnutrition among HD patients. The findings revealed that male HD patients were five times likely to have malnutrition compared to female HD patients, Odds Ratio (OR) = 4.93, 95%CI: 1.58 – 15.38, p =0.008). Those who had both hypertension and diabetes were 16 times likely to have malnutrition, OR = 15.87, 95%CI: 3.79 – 66.47, p<0.001. HD patients who had low HB levels were nine times likely to have malnutrition compared to those with normal HB levels, OR 23, 95%CI: 2.60 – 32.81, p<0.001. Patients who had poor dietary intake were nine times likely to have malnutrition compared to those with good dietary intake, OR =8.96, 95%CI: 2.60 – 32.81, p<0.001 as shown in Table 5.

Multivariable analysis of determinants of malnutrition

Significant variables from bivariable analysis (p<0.05) were subjected to a multivariable model and findings tabulated as shown in Table 6. The findings showed that being male, having both hypertension and diabetes, presence of anemia, and poor dietary intake were independent determinants of malnutrition among HD patients.

Table 6: Multivariable analysis of determinants of malnutrition among hemodialysis patients at Nakuru county Referral hospital

Variables	AOR (95%CI)	P-value
Gender		
Male	15.92(1.50 - 68.57)	0.022
Female	Ref	
Hypertension and diabetes		
Yes	11.13(3.28 - 45.80)	0.004
No	Ref	
Anemia		
Yes	5.04(2.88 - 18.12)	0.007
No	Ref	
Dietary intake		
Poor	12.18(2.56 - 33.16)	0.007
Good	Ref	

DISCUSSION

Demographic and clinical characteristics of patients on haemodialysis

The present study investigated the prevalence and determinants of malnutrition in hemodialysis patients at a tertiary facility in Kenya. The average age of the patients was 56.1 years with majority of them aged above 50 years. These findings are consistent with those from previous studies (Kereu et al., (2017); Alikari et al., (2018) which found that the average age of patients on haemodialysis was 58 years and 59 years respectively. Chronic kidney disease is highly prevalent in older adults. This is due to increased comorbidities such as high blood pressure, diabetes, prolonged use of over the counter drugs as well as kidney stones which are common in this age group (Kistler et al., 2021). The findings from a study in Tanzania revealed that the average age of patients on HD was 52 years (P. K. Bramania et al., 2020).

The findings from the present study also established that almost two thirds of patients on HD were male. These findings are consistent with those of study in Brazil by Nakoa et al. (2016). These is so because majority of women gives their health more priority than men by attend routine screening services hence predisposing risk factors are identified as early as possible and the required interventions are put in place in time unlike men who only report to health facility when the complications have already occurred. However, these findings were contrast to a study conducted in Egypt by Ibrahim et al. (2015) which reported that majority of the respondents, 62% were female. The National Kidney foundation affirms that more females than males have chronic kidney disease (CKD) although men are highly likely to progress kidney failure earlier than women which explains reasons why more men embrace haemodialysis which is more affordable (Cooper et al., 2019).

Education attainment levels among patients within the current study discovered that nearly half of patients were having secondary education. These results are in comparison to other studies with similar findings on secondary level education being the highest level of education among majority of those attending hemodialysis (Chan et al., 2014; Mukakarangwa et al., 2018).

Nutritional status of among hemodialysis patients

The present study revealed that the majority of hemodialysis patients had a normal nutritional status based on the Global Subjective Wellbeing assessment. This finding indicates that, according to GSW criteria, most patients undergoing hemodialysis are maintaining adequate nutritional health. The Global Subjective Wellbeing tool, which assesses various aspects of nutritional status including dietary intake, weight stability, and overall physical health, provides a comprehensive measure of patient wellbeing (Moussa et al., 2016). The result suggests that despite the complexities of hemodialysis treatment, a significant proportion of patients are effectively managing their nutritional needs and maintaining stable health outcomes.

The current study utilizing the subjective wellbeing tool established that the prevalence of malnutrition was 39.3 percent with 26.2 percent having moderate malnutrition and 13.1 percent having severe malnutrition. These findings are in agreement with a study by Agboton et al. (2015) in Benin pointing out the prevalence of malnutrition was 42 percent. However, these results are lower as compared with past studies showing malnutrition is significantly high among HD patients (Reza et al., 2018). Rezeq et al. (2018) found malnutrition burden among those under HD procedure as 47 percent in Palestine while in Bangladesh the prevalence of malnutrition was 87 percent (Reza et al., 2018). These findings underscore the multifaceted nature of malnutrition, influenced by factors such as geographic location, socioeconomic status, and healthcare infrastructure.

Further, the prevalence of malnutrition those undergoing HD in present survey was lower compared to other studies (Kadiri et al., 2011) (Moussa et al., 2016). Kadiri et al. (2011) in a study Saudi Arabia revealed that the prevalence of malnutrition was 29% while the findings from another study in Niger found that the prevalence of malnutrition was 29 percent (Moussa et al., 2016). The lower prevalence observed in the present study suggests potential variations in factors influencing malnutrition across different populations and geographical regions. These factors may include differences in healthcare access, socioeconomic status, dietary habits, comorbidities, and healthcare infrastructure. Additionally, variations in study methodologies, sample sizes, and patient demographics could contribute to differences in reported prevalence rates. While the prevalence in the present study is lower compared to these previous findings, it's essential to recognize that malnutrition remains a significant concern among HD patients. Even seemingly small differences in prevalence rates can have substantial implications for patient health and quality of life. Therefore, continued efforts to monitor and address malnutrition in HD populations are warranted to optimize patient outcomes and well-being.

Determinants of nutrition status among hemodialysis patients

The present study established that male patients on haemodialysis were 15 times more prone to getting malnutrition in comparison to female patients. These findings are consistent with those from a meta-analysis which established that that male patients (20.7%) had higher prevalence of malnutrition as compared to female patients (16.4%) all across the globe (Rashid et al., 2021). However, the findings are similar to those from Saudi Arabian study which found that the odds of malnutrition in comparison females were higher than males (Alharbi & Enrione, 2012). These differences could be due to varied factors such as physiologic differences, socio-economic factors and dietary habits. Biological disparities

between males and females, such as differences in muscle mass, hormonal profiles, and metabolic rates, could influence nutritional requirements and susceptibility to malnutrition. Socioeconomic factors, including access to healthcare, financial resources, and social support networks, may differ between male and female patients, impacting their ability to maintain adequate nutrition. Variations in dietary preferences, eating behaviours, and adherence to dietary recommendations among males and females could contribute to differences in nutritional status.

The present study also showed that patients who had hypertension and diabetes were 11 times likely to have malnutrition among patients on haemodialysis. Presence of comorbidities has been identified as major risk in development of malnutrition. These results are in line with Boaz et al. which established 58.8% risk of elevated malnutrition in individuals with diabetes versus 39.3% without diabetes (Boaz et al., 2021). Similarly, another study in Tanzania established that those who had underlying comorbidity such as diabetes had increased odds of malnutrition (P. Bramania et al., 2021). Both hypertension and diabetes are common causes of chronic kidney disease (CKD), which are likely to proceed to end-stage renal disease (ESRD) requiring haemodialysis. Impaired renal function in CKD and ESRD can disrupt homeostatic regulation of fluids and electrolytes as well as unwanted products, leading to malnutrition. Further, haemodialysis itself can lead to essential nutrients loss, like vitamins and amino acids, during the filtration process. Patients with hypertension and diabetes may already have compromised nutritional status due to factors like poor dietary habits, medication side effects, or malabsorption related to gastrointestinal issues commonly associated with these conditions. The combination of dialysis and pre-existing nutritional deficiencies can exacerbate malnutrition.

The present research showed that those who had anaemia were more at risk of getting malnutrition. This is comparable to Saudi Arabian study which found that extreme anaemia was linked to malnutrition among patients on haemodialysis (Kadiri et al., 2011). Anaemia in patients undergoing haemodialysis is often accompanied by reduced appetite, which can result from uremic toxins, metabolic disturbances, and dietary restrictions commonly prescribed to manage CKD-related complications. Inadequate dietary intake of iron, protein, and other nutrients necessary for erythropoiesis can contribute to both anaemia and malnutrition. Addressing both anaemia and malnutrition in patients on haemodialysis requires a comprehensive approach that includes optimizing dialysis treatment, managing underlying nutritional deficiencies, and addressing inflammation and other comorbidities. Nutritional interventions, such as oral or intravenous iron supplementation, erythropoiesis-stimulating agents (ESAs), and dietary counselling, are essential components of

anaemia management in haemodialysis patients and can help mitigate the impact of malnutrition on erythropoiesis and overall health.

Dietary intake was also associated with malnutrition among patients on haemodialysis in the current research survey. Those with poor dietary intake were more likely to have high odds of malnutrition among patients on haemodialysis. These results were in consistency with those of Sahathevan et al. (2020) who found dietary intake is a major risk of malnutrition. Patients undergoing haemodialysis often have restrictions on diet, such as limitations on protein, potassium, phosphorus, and sodium intake. Adherence to these restrictions can be challenging, leading to reduced dietary variety and inadequate nutrient intake, which predisposes patients to malnutrition. Haemodialysis places increased energy demands on the body due to the metabolic stress of dialysis sessions and the catabolic effects of uraemia and inflammation. Patients who fail to consume sufficient calories to meet these increased energy requirements are at risk of protein-energy malnutrition, characterized by muscle wasting, weight loss, and compromised immune function.

CONCLUSION

The results showed malnutrition prevalence malnutrition as 39.3%. Among these, 26.2%of the HD patients had moderate malnutrition while 13.1% (n =8) had severe malnutrition.

The findings showed that being male, having both hypertension and diabetes, presence of anemia, and poor dietary intake were determinants of malnutrition among HD patients.

RECOMMENDATIONS

The healthcare institutions should implement standardized nutritional screening tools and assessment protocols for all patients undergoing haemodialysis. Regular assessment of nutritional status should be conducted by healthcare providers, including registered dieticians, to detect those at risk for malnutrition early in order initiate relevant interventions.

Foster collaboration among healthcare professionals, including nephrologists, dieticians, nurses, and social workers, to provide comprehensive care for patients on haemodialysis.

Develop tailored nutritional interventions based on individual patient characteristics and identified risk factors for malnutrition.

There is need to perform a multi-centre study which will allow for a large sample size and identification of risk factors of malnutrition including personal, institutional and laboratory parameters.

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