A Project Report

Determination of dietary knowledge among dialysis patients depends on demographic factors

BY

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APPROVAL

This project, "Association of dietary compliance of dialysis patients," has been turned in by **Abida Sultana Etu** to the Department of Nutrition and Food Engineering at Daffodil International University. It has been accepted as a partial fulfillment of the requirements for the degree of B.Sc. in Nutrition and Food Engineering and approved for its style and content. The date of the presentation was January 2024.

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The project was completed under the supervision of **Ms. Tasmia Tasnim, Assistant Professor**, Department of NFE at Daffodil International University. I also confirm that neither this project nor any portion of this project has been submitted elsewhere for the purpose of earning a degree or certificate.

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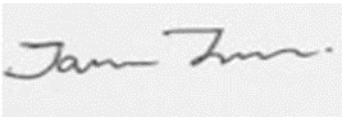

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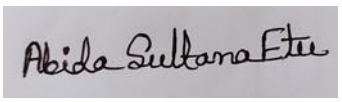

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ABSTRACT

Introduction:

Renal replacement therapy, which includes hemodialysis is required for patients with end stage renal disease (ESRD), which is characterized by a progressive impairment of renal function. Most waste products can be eliminated quickly with hemodialysis. But this process also causes the body to lose important nutrients. In order to keep dialysis stable, dietary management is necessary. These patients need to consume enough calories, protein, and water, as well as the appropriate amounts of sodium, potassium, and phosphorus . Diet therapy is implemented to increase survival rates in hemodialysis patients and improve dialysis adequacy.

Method:

A hospital-based cross-sectional study was conducted to evaluate the association of dietary compliance of dialysis patients with their at the department of kidney,National Institute of Kidney Diseases and Urology (NIKDU) ,DHAKA from September 2023 to December 2023 . Data was collected by dialysis related questionnaire. Data were collected by reviewing patients' medical records and asking questions. The data was analyzed using the SPSS statistics software.

Result:

100 patients data was collected .All the dialysis patients are from the CKD stage 5. Male are 55 and females are 45 Males had lower knowledge scores than females regarding the sodium and potassium restriction diets but phosphorus restriction knowledge is not much different .Patients with low levels of education are less aware of phosphorus, potassium, and sodium restrictions .Furthermore, according employment status employed dialysis patients have most dietary knowledge restrictions among sodium, potassium & phosphorus .

Conclusion:

In general, Female dialysis patients have more knowledge than males. Educated and employed dialysis patients are mostly knowledgeable about sodium, potassium & phosphorus restriction .To improve the survival rate of Bangladeshi hemodialysis patients, gender-specific strategies and higher education for increasing dietary knowledge are urgently needed.

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CHAPTER ONE
INTRODUCTION

1.1 Importance of dietary restriction for patients on dialysis

Patients receiving dialysis for maintenance purposes are impacted by quite a number of dietary restrictions which must be followed consistently and in the past (Kalantar-Zadeh et al., 2015). According to current studies, phosphorus-restricted diets may result in reduced nutrition levels and quality of life. People on dialysis might be eating more atherogenic diets due to potassium-based dietary limitations, which may restrict them from healthy heart diets. The advantages of dietary sodium restrictions for longevity have not been widely known (Kalantar-Zadeh et al., 2015). Dialysis is currently used to treat over 2 million people worldwide in order to extend their lives; however, this may only account for 10% of the total population(Couser WG et al., 2011). According to the Kidney Foundation Hospital and Research Institute in Bangladesh, between 22,300 and 23,800 patients had access to dialysis services in 149 active dialysis facilities (DFs) with 77% of patients receiving it twice a week, 22% thrice a week, and 1% once or four times a week (Ripon et al., 2023). A registered dietitian who can offer dietary monitoring and counseling to all dialysis patients must be on staff at an outpatient dialysis clinic. Patients are often prescribed dietary restrictions by dietitians and nephrologists based on dietary phosphorus, potassium, sodium, and fluid intake Throughout the US(United States). Dietary professionals might recommend losing weight efforts for morbidly obese patients who are not yet eligible for kidney transplants on waiting lists, and they also underscore the important role of a high protein consumption for those on dialysis. The topic of consuming food during hemodialysis treatment is a further cause of disagreement. in the US, many dialysis hospitals prohibit patients from eating during therapies, but in different countries, dialysis patients typically get food (Kalantar-Zadeh et al., 2015).

1.2 Significance of the study in assessing the knowledge of sodium, potassium, and phosphorus restrictions

Dialysis only removes a small amount of phosphorus from the blood, people with chronic kidney disease (CKD) have limited access to foods high in phosphorus (Suki et al., 2016). Phosphorus levels can become excessive if dietary phosphorus intake is not restricted and phosphorus binders are not taken on a regular basis.Itching, weak and brittle bones, and calcium deposits in blood vessels and organs, such as the heart and lungs, can all be made worse by this. While phosphorus can be found in nearly every food, the highest concentrations are found in whole grain foods, dairy products, nuts, seeds, dried beans, peas, and chocolate(Suki et al., 2016).

Those receiving hemodialysis should limit their intake of foods high in potassium because potassium can accumulate between dialysis treatments and lead to issues like weakness, cramping in the muscles, fatigue, irregular heartbeat, and even heart attacks. The main sources of potassium are fruits, vegetables, and dairy products (Yamada et al., 2021).

Potassium levels vary among fruits and vegetables; some have higher levels than others. But consuming a lot of a low-potassium food can raise the potassium levels to risky proportions. Recognize that most foods, including meat, poultry, bread, and pasta, contain some potassium. Only oils, butter, and margarine are considered potassium-free foods(Yamada et al., 2021).
Sodium intake is directly linked and restricted for dialysis patients.Important methods for achieving this include limiting interdialytic weight gain (IDWG) and developing a dialysis process capable of removing all IDWG while maintaining dry weight (Charra et al., 2003). IDWG is directly dependent on sodium intake and the resulting thirst, so sodium restriction is the most effective way to limit it. The sodium concentration of ultrafiltration and dialysate has an impact on sodium removal, ECV control, and blood pressure (BP). As a result, the dialysis session should be long enough to achieve dry weight while also being frequent enough to maintain normal blood pressure (Charra et al., 2003).

The unfavorable findings could be the result of reverse epidemiology, measurement bias (spot urine and/or single measurement), and inadequate diet compliance. Dialysis is still the only reliable way to reduce sodium intake from the diet in patients with end-stage kidney disease (ESKD)(Borrelli et al.,2020). The prognosis of ESKD patients is worsened by the mismatch between sodium intake and removal, which results in fluid overload, hypertension, and left ventricular hypertrophy. Despite the lack of studies demonstrating the effectiveness of this intervention in these patients, this forces the administration of an LSD. Thus, in all stages of chronic kidney disease, LSD is a reasonable and fundamental tool to treat hypertension and fluid overload. LSD should be administered according to a patient's unique needs, just like renal treatment, taking into consideration the true burden of hypertension as determined by measurements of ambulatory blood pressure and the volume status(Borrelli et al.,2020).

1.3 Objectives

- Globally, the number of people requiring dialysis has increased due to the rising prevalence of chronic kidney disease (CKD).
- In order to manage CKD and avoid complications, dietary restriction is essential. However, dialysis patients frequently find it difficult to follow the sodium, potassium, and phosphorus restrictions.
- In order to improve patient outcomes, this study intends to evaluate the awareness of these dietary restrictions among dialysis patients and pinpoint any knowledge gaps.

The following research questions serve as the study's main focus:

- How much do dialysis patients know about phosphorus, potassium, and sodium restrictions?
- Does having more or less knowledge depend on any clinical or demographic factors?

CHAPTER TWO
Literature Review

Dialysis patients must adhere to strict dietary guidelines, and many of them have been found to have poor compliance. A sample of 41 dialysis patients had a number of psychosocial variables examined for potential effects on dietary compliance. 58% of the sample met the clinical criteria for dietary abuse, indicating problems. Clinical abuse scores were substantially correlated with self-reported compliance. Patients were less likely to report dietary compliance the longer they had been receiving dialysis. Specific self-reported compliance items were significantly correlated with health locus of control and family support, but not with overall compliance scores. Clinical dietary abuse scores were substantially correlated with acceptance of the limitations imposed by illness. The procedure through which constructive modification and appropriate food management may be achieved is discussed.

Dialysis patients face a significant challenge in finding acceptable food options, as many of the dietary guidelines are extremely restrictive. Numerous dietary limitations, such as a low potassium diet run opposed to the most recent guidelines for a diet that promotes heart health. It is not exaggeration to state that one of the strictest diets is the dialysis regimen, and many patients may become frustrated by these restrictions, which can result in less than ideal adherence and compliance. A few of those diet guidelines and Crucial limitations are examined in this manuscript, along with suggestions for further research and an analysis of how they affect the outcomes of dialysis patients.

Dietary guidelines, restrictions, and their effects on dialysis patients:

Names of dietary restrictions.	Suggested Range	Proof	Observations
Sodium	More than 2.5g per day	The majority of sodium data are based on opinions.	Reducing sodium intake could be challenging to implement.
Potassium	More than 3 gram regularly	Latest research suggests a link between higher potassium consumption and mortality.	Foods high in potassium are generally heart-healthy.
Phosphorus	Greater than eight hundred mg regularly	The association between serum phosphorus levels and morality is primarily based on studies.	Reduced phosphorus intake may result in insufficient protein consumption.

In the United States and many other countries, one of the most time-consuming jobs for dietitians working in dialysis clinics is probably counseling patients on dietary phosphorus and keeping track of their intake. Although that decades old assumption was captivated through idea limiting dietary protein intake through conventional tactics could inevitably lead to less Consumption of protein and therefore the latest research suggests that there is a higher possibility of protein energy loss and mortality investigating effects of the consequences of phosphorus diet advising on dialysis services outcome for patients has called into question the wisdom of this approach. The effect of dietary phosphorus restrictions prescribed by doctors on the impact on longevity was investigated a new investigation with 1,751 patients receiving dialysis(Lynch et al.). These theoretical frameworks were used for account the diagonal correlation. A more liberal prescription for dietary phosphorus was found to be associated with incrementally greater survival; specifically, individuals who received a prescription for >1000 mg/day or no dietary restriction had a 27% and 29% greater survival rate, respectively. The study also found that more restrictive prescriptions for dietary phosphorus were linked to worse indices of nutritional status.

Shinaberger et al. (2014) conducted a study on 30,075 hemodialysis patients who were commonly treated in the United States. The study found that patients who had lesser phosphorus levels in their blood but higher dietary protein intake had a 10% higher chance of surviving, while individuals with higher phosphorus but lower dietary protein or with lower phosphorus and dietary protein intake at the same time had lower mortality rates of 11% and 6%, correspondingly, in contrast to those with higher serum phosphorus and dietary protein intake across the course of six months.

A low serum phosphorus level, such as less than 3.5 mg/dL, has been linked to an increased risk of death, regardless of age 16 and other variables, according to a fair amount of recent and historical data. Thus, it can be difficult to target the level of phosphorus in serum even lower than 03.5 milligrams per deciliter in dialysis patients in order to comply with KDIGO's recommendations for "normalization" of serum phosphorus.

Therefore, dietary phosphorus restriction that is prescribed may not be linked to a better life expectancy of patients on dialysis and causes insufficient consumption of protein. Moreover, more severe phosphorus restriction on diet is linked to a higher survival rate that is, there may be a greater dangerous circumstances of managing phosphorus in blood serum levels in dialysis patients limiting their protein consumption than there are benefits.

Do current research findings indicate that dialysis patients should no longer be subject to any kind of dietary phosphorus restriction?

There's no denying that hyperphosphatemia is linked to worse outcomes in chronic kidney disease.20 With a greater emphasis on comprehending as well as figuring out where extra phosphorus comes from in refined foods, as well as realizing how poorly absorbed ecological phosphorus is for example 40%–60% of phosphorus is found in protein from livestock, less than 40% from herbal protein typically taken up by the gastrointestinal system the previously mentioned research present significant prospects refocus efforts to provide nutritional guidance in the proper path. In contrast, phosphorus is nearly hundred percent absorbable. Therefore, it is not a good idea to freak out dialysis patients in order to steer them away from natural protein sources that might also contain a lot of phosphorus such as pulses and natural dairy products.

Dietitians ought to invest more time and energy in teaching dialysis patients how to: Recognize and steer clear of processed foods that have added phosphorus .Select natural protein sources like egg whites that have least proportion of protein to phosphorus Take phosphorus binders as directed, making sure not to take them when not eating (for example, right prior to food) and adjusting the dosage according to the potency of the binder, especially taking into account the approximate phosphorus content of each meal.

It is true that many healthcare professionals who treat dialysis patients use the incorrect approach of prescribing blind phosphorus binders to individuals who take a set amount of medication with no educating them the distinct forms of phosphorus in food, how to use phosphorus binders properly. This practice needs to be reexamined. Further research, encompassing randomized controlled trials, ought to investigate the safety and efficacy of non-dietary phosphorus control.

The study conducted by Noori et al. with a cohort of 224 hemodialysis patients over a 5-year period, is noteworthy for the following reasons: In this investigation, individuals who consumed meals having a phosphorus-to-protein ratio of less than fourteen milligrams or gram were linked to a death risk that was 80% and 99% higher. Nineteen Accordingly, the type of protein consumed such as egg whites which is less ratio may have an impact on survival.

In the early stages of chronic kidney disease (CKD), when patients are not yet dependent on dialysis, dietary potassium restrictions are frequently imposed. These restrictions are further reinforced in most patients who move to end-stage renal disease (ESRD), especially those on hemodialysis. According to a recent 3-year cohort study involving 81,013 commonly treated hemodialysis patients, serum potassium the amount below 4.0 or above 5.6 milliequivalents per liter were linked to higher passing out, while the ideal pre-hemodialysis range was linked to the best survival (4.6 to 5.3 mEq/L).27, This study also revealed a clinically significant finding: serum potassium

exhibited a strong correlation utilizing dietary elements, indicating the patient with higher consumption of protein also likely have higher serum potassium levels.

10,468 peritoneal dialysis patients and 111,651 hemodialysis patients participated to a research looked at the hyperkalemia survival rate. The latter group had a higher risk of death (51% and 52% higher) and was three times as likely to have reduced the amount of potassium in the the bloodstream (<4.0 mEq/L).28, For this reason, regardless of the type of dialysis used.

In a recent five year the group of two hundred twenty four Southern California patients receiving hemodialysis, (Noori et al.)investigated the association between dietary potassium consumption and the Food Frequency Survey thirty. According to the study, patients with higher potassium consumption also had higher pre-dialysis serum phosphorus and potassium levels and greater diet strength. When nutritional parameters like bloodstream potassium and phosphorus concentrations were taken into account, lifespan estimates , higher dietary potassium intake was linked to higher mortality. Specifically, the death risk was 2.4, 2.2, and 1.4 times higher in the three higher quartiles of dietary potassium intake than in the lowest quartile. Therefore, there is a gradual correlation between increased mortality, independent of potassium levels in the blood concentrations.

severe nutritional limits have been justified in patients on dialysis based on these and other data. However, it's crucial to recognize that a variety of foods high in potassium are regarded as the healthiest core with grains, legumes, fruit. Therefore, a low-potassium diet deviates from what is typically advised as a healthy diet and lifestyle, and multiple studies have found that this type of dietary restriction may increase the burden of cardiovascular disease in the population of patients with chronic kidney disease. To ensure that patients get the most out of a diet that contains moderate amounts of potassium, we advise the patients about various acknowledge of potassium with giving them the power to choose options that are "heart healthy" and steer clear of other sources. Therefore, in this instance, a more reasonable and balanced approach to such extreme restrictions the potassium limitations diet would entail selecting advantageous potassium origin, can be accomplished by a concentrated learning campaign .This strategy might be made easier by newly developed resins.

Elevated blood pressure (BP) is a common finding in patients with chronic Kidney Disease (CKD) and is conventionally thought to be a direct result of their sodium sensitivity. It's true that fluid and sodium retention, which results in hypervolemia, causes hypertension to arise

in CKD patients.Research examining the long-term impact of a low-sodium diet (LSD) on the prognosis of the heart and kidneys revealed conflicting results. The negative results could be the result of reverse epidemiology, spot urine and/or single measurement measurement bias, and poor dietary adherence. Dialysis remains the only practical way to reduce sodium intake from diet in end-stage kidney disease (ESKD). Patients with ESKD have a worse prognosis because of the imbalance between sodium intake and removal, which causes fluid overload, hypertension, and left ventricular hypertrophy. This forces the administration of an LSD to these patients even though there aren't any studies showing how effective this treatment is for them. Therefore, LSD is a sensible and fundamental tool to treat hypertension and fluid overload in all stages of chronic kidney disease. LSD should be administered according to a patient's unique needs, just like renal treatment, taking into consideration the true burden of hypertension as determined by measurements of ambulatory blood pressure and volume status.

Natriuresis declines, sodium builds up, and extracellular volume (ECV) excess occurs in end-stage renal failure. When Scribner (1962) wrote about the first maintenance hemodialysis (HD) patient, he noted that normalization of blood pressure (BP) was a result of ECV control achieved through ultrafiltration and a low-salt diet. Consequently, the idea of dry weight—the optimal post-dialysis weight that permits a steady, normal blood pressure—was developed. A low-salt diet, sufficient ultrafiltration, and a negative diffusive sodium balance are all necessary to reach dry weight. Regretfully, today's low-salt diet is frequently disregarded. Using low-sodium dialysis and a low-salt diet, 90% of HD patients were able to achieve BP control in the late 1960s. As the duration of HD decreased over time, there was a decline in BP control and an increase in morbidity and morality as a result.

The effects of lowering sodium in the diet, dialysate, or both have been the subject of interventional studies in recent years. They all demonstrate how important a low-salt diet is to controlling blood pressure in HD patients. Surprisingly, neither the K/DOQI Guidelines nor the European Best Practice Guidelines address salt restriction, despite the fact that a reasonably low-salt diet (5 g of NaCl) is recommended for the healthy population.

In the current scenario, with a short HD duration and a frail population, achieving dry weight requires lowering the interdialytic weight gain. More than ever, a low-salt diet is essential.

CHAPTER THREE
METHODOLOGY

3.1 Study design ;
A hospital-based cross-sectional study was carried out to assess the dietary compliance of dialysis patients in Bangladesh .

3.2 Study setting
The Department of Kidney at National Institute of Kidney Diseases and Urology (NIKDU) ,DHAKA conducted this cross-sectional study between September to December 2023.

3.3 Study population
Data was gathered from 100 patients in total. Six of the patients are teenagers (aged 14-19 years), 72 are adults (20-59 years), and 20 are elderly (aged 60 and above 65 years).

3.4 Research tools
A standard tool and a verified questionnaire were used to collect the data.

3.4.1 Features of the sociodemographic
Participants gave demographic information about their age, gender, level of education, economic standing, marital status, and employment status.

3.4.2 Anthropocentric measurement
The patient's height and weight were measured on a weighing scale with a height rod. The Body Mass Index (BMI) was calculated by multiplying a person's weight in kilograms by their height in meters squared.

3.4.3 Biochemical parameter
Dialysis Reuser, Types of dialysate bufer use,Types of dialyzer membrane

3.4.4 Clinical features
The kidney disease's (CKD) current stage, type of dialysis, hemodialysis vintage, hemodialysis duration, and frequency of dialysis of the patients were obtained from their medical records.

3.4.5 Coexisting conditions
By reviewing the patient's medical records, the prevalence of comorbidities underlying diseases such as diabetes, hypertension was noted. Isomnia , Fatigue, Appetite informations are recorded by asking patients questions.

3.4.6 Measurement tool
Information was taken from hospital records about the patient's age, sex , underlying cause of renal failure, and date of dialysis initiation. Dialysis duration is measured in months and is

determined by dividing the total time between the assessment date and the dialysis start date. Moreover, demographic information was acquired, including marital status, financial standing, level of physical performance, mode of ambulation, and the existence of hunger, exhaustion, and insomnia. A self-report questionnaire was used to gather data on drinking, smoking, and the frequency of eating three meals a day and exercising frequently.

I assessed these patients' dietary knowledge using a slightly altered version of a questionnaire created by Kim et al. All of the knowledge questions about potassium, phosphorus, and sodium restriction diets were closed-ended and based on the content of the dietary leaflet distributed to patients.

3.5 Dietary data collection procedure

Dietary information was collected by using a questionnaire developed by Kim et al. for assessing dialysis patients' level of dietary knowledge that has been slightly modified .The following 26 foods were listed: ham, sausages, canned food, frozen food, salted fish , sugar, vinegar, garlic, onion, canned fruit, raw fruits, bananas, apples, grapes, vegetables, seaweed, spinach, potatoes, sweet potatoes, corn, rice, peanuts, almonds, walnuts, and snacks . It was determined what foods the participants ate.

3.6 Steps of data collection

The facility for gathering data was approved by the hospital directors. Following that, every Saturday to Friday from 12 a.m. to 4 p.m., data was gathered from renal patients who had been admitted to the hospital's indoor department for dialysis. In this case, information about (demographics, medical records, and dietary data) was obtained through a face-to-face, 10 minute conversation with each patient using the intended questionnaire, with the patient's permission.

3.7 Statistical analysis

The IBM SPSS STATISTICS program was used to organize, clean up, and code the data in order to analyze them. Descriptive statistics, such as frequency, percent, mean, and standard deviation, were used to summarize the patients' clinical characteristics and baseline socioeconomic information.

CHAPTER FOUR
Result & Discussion

4.1 Result
4.1.1 Socioeconomic characteristics

Table 4.1.1 Socioeconomic characteristics

Variables	Category	Frequency(n)	Percentage(n%)
Education	Literate	72	72
	Illiterate	28	28
Sex	Male	55	55
	Female	45	45
Marital status	Married	74	74
	Unmarried	22	22
	Separated by death	4	4
	Divorced	0	0
Economic status	Good	8	8
	Middle class	88	88
	Bad	4	4
Employment status	Employed	41	41
	Unemployed	59	59

This table displays the socioeconomic and demographic characteristics of the 100 dialysis patients who participated in the data collection. In the sex category, male patients accumulated 55% of the total (n = 55), while female patients comprised 45% of the total (n = 45). It is evident that there are more male patients than female patients in the present case.

In terms of education , 72% of patients are educated of the total (n = 72), and 28% of patients are illiterate of the total (n=28). We can see most of the dialysis patients are educated.

Comparing the participants' marital status, those who were single made up 22% of the total (n = 22), while those who were married made up 74% of the total (n = 74), separated by death were 4% of the total (n=4) & there are no divorced patients.

Regarding financial standing 4% of the total (n=4) are experiencing a financial crisis, 88% of the total (n=88) are middle class, and 8% of the total (n=8) are in good financial standing.

Regarding work status, 59% of the total (n=59) dialysis patients were found to be unemployed . 41% of the total (n=41) dialysis patients were employed. Here unemployment status is more than employment status of the dialysis patients .

4.1.2 Clinical characteristics of DIALYSIS patients

Table 4.1.2 Clinical characteristics of DIALYSIS patients

Variables	Category	Frequency(n)	Percentage(n%)
Stage of CKD	Stage 1& 2	00	0%
	Stage 3	00	0%
	Stage 4	00	0%
	Stage 5	100	100%
Types of dialysis	Hemodialysis	100	100%
	Peritoneal dialysis	00	0%
Family history	yes	13	13%
	No	87	87%

The clinical characteristics of patients with chronic kidney disease are shown in table 4.1.2. Every patient has chronic kidney disease (CKD), with all of them being in stage 5 .There are no dialysis patients in stages 1 through 4. Every patient is in the fnal stage of kidney failure, which is stage 5.
In total of 100 patients,100% patients took hemodialysis . There are no patients with peritoneal dialysis.

13 dialysis patients with chronic kidney disease were found to have a family history of the condition, while 87 dialysis patients , or approximately 87 percent of all patients, did not.

4.1.3 Coexisting conditions of dialysis patients

Table 4.1.3 Coexisting conditions of dialysis patients

Variables	Category	Frequency(n)	Percentage(n%)
Underlying Disease	Diabetes mellitus	26	26%
	Hypertension	35	35%
	Chronic glomerulonephritis	00	0%
	Polycystic kidney disease	01	1%
	Diabetes mellitus, hypertension	10	10%
	Diabetes mellitus, chronic glomerulonephritis	00	0%
	Hypertension, chronic glomerulonephritis	00	0%
	Unknown	28	28%
Physical performance status	Ambulation	00	0%
	Walk	64	64%
	Cane	10	10%
	Wheelchair	26	26%
Having 3 regular meals a day	Yes	78	78%
	No	22	22%
Appetite	Yes	70	70%
	No	30	30%
Fatigue	Yes	86	86%
	No	14	14%
Insomnia	Yes	46	46%
	No	54	54%

26 dialysis patients out of 100 dialysis patients have diabetes mellitus , 35 have hypertension,1 have Polyeystic Kidney diseases,10 dialysis patients suffer from diabetes mellitus with hypertension,28 dialysis patients did not know about their underlying diseases .Here we see most of the dialysis patients have hypertension.

Out of 100 dialysis patients 64 patients can walk by themselves or by the help of their family members but 10 dialysis patients use a cane and 26 are used wheelchairs .We can see the majority of dialysis patients can walk.

78 dialysis patients can eat their 3 regular meals a day out of 100 dialysis patients .But 22 did not eat their 3 regular meals .They have some problems while having their meal.

Within 100 dialysis patients 70 have appetite and 30 have no appetite.

86 have fatigue out of 100 dialysis patients and 14 did not have any fatigue.
Insomnia is in 46 patients of 100 dialysis patients and 54 have no insomnia.

4.1.4 Dietary knowledge of sodium , potassium and phosphorus restriction

Table 4.1.4 Dietary knowledge of sodium , potassium and phosphorus restriction

	Variables	**Category**	**Frequency(n)**
Dietary Knowledge	Dietary knowledge of sodium restriction	Yes	87
		No	13
	Dietary knowledge of potassium restriction	Yes	65
		No	35
	Dietary knowledge of phosphorus restriction	Yes	62
		No	38

Based on the data collected from all 100 patients, 87 dialysis patients were aware of sodium restriction, while 13 patients were unaware of it .Conversely, regarding dietary knowledge about potassium restriction, 35 patients are unaware of it while 65 patients are aware of it. The amount of information regarding phosphorus restriction in dietary regimens is less than that of other dietary restrictions. Within the dialysis patients, 38 are unaware of phosphorus restriction, while 62 are aware of it.It is evident that the awareness of dietary sodium restriction is greater than that of dietary potassium and phosphorus restriction in dialysis patients .Knowledge of potassium is less than both of the other two factors.

Here, we can observe that both educated male and female dialysis patients have higher levels of knowledge regarding sodium, potassium, and phosphorus restriction .However, patients with less education are less aware of dietary restrictions. Thus, it can be concluded that the most crucial factor in dietary knowledge regarding sodium, potassium, and phosphorus limitation is education.

However, compared to male dialysis patients, female dialysis patients have more dietary knowledge about sodium ,potassium & phosphorus restriction.

4.1.5 Dietary knowledge about sodium, potassium and phosphorus restrictions and their correlation with Gender

Table 4.1.5 Dietary knowledge about sodium, potassium and phosphorus restrictions and their correlation with Gender

Variables	Male(n=55)	Female(n=45)	*P* Value
Dietary knowledge of sodium restriction	0.800	0.956	0.021
Dietary knowledge of potassium restriction	0.545	0.778	0.015
Dietary knowledge of phosphorus restriction	0.582	0.667	0.390

The table shows that there was a statistically significant difference between male and female dialysis patients' p-values for dietary knowledge of sodium restrictions (0.021) & potassium restrictions (0.015) . According to the p-value, which is less than 0.05. Based to the p-value of 0.390 for dietary knowledge of phosphorus restrictions, there is no statistically significant difference between male and female dialysis patients. Because the p-value exceeds 0.05.

4.1.6 Dietary knowledge about sodium, potassium and phosphorus restrictions and their correlation with Education

Table 4.1.6 Dietary knowledge about sodium, potassium and phosphorus restrictions and their correlation with Education

Variables	Educated (n=72)	Uneducated (n=28)	*P* Value
Dietary knowledge of sodium restriction according to education	0.958	0.643	< .001
Dietary knowledge of potassium restriction according to education	0.806	0.250	< .001
Dietary knowledge of phosphorus restriction according to education	0.792	0.179	< .001

The p-value for dietary knowledge about phosphorus, potassium, and sodium restrictions is <.001, as this table shows. which is less than 0.05. This suggests a highly identifiable significance between the two groups.

4.1.7 Dietary knowledge about sodium, potassium and phosphorus restrictions and their correlation with Employment status

Table 4.1.7 Dietary knowledge about sodium, potassium and phosphorus restrictions and their correlation with Employment status

Variables	Employed (n=41)	Unemployed (n=59)	*P* Value
Dietary knowledge of sodium restriction according to employment status	0.951	0.814	0.045
Dietary knowledge of potassium restriction according to employment status	0.780	0.559	0.022
Dietary knowledge of phosphorus restriction according to employment status	0.805	0.492	0.001

The table shows that between employed and unemployed dialysis patients, there was a statistically significant difference in the p-values for dietary knowledge of sodium restrictions (0.045), potassium restrictions (0.022), and phosphorus restrictions (0.001). Because The knowledge p-value for each of the three dietary restrictions is less than 0.05.

4.2 Discussion

To the best of my knowledge, this is the first study to compare the dietary knowledge of male and female dialysis patients and who have received an education against those who have not. It was discovered that OHPs were less educated than YHPs. Additionally, I discovered that both males and females had almost same knowledge scores regarding the phosphorus restriction diets. However , among potassium and sodium males has the lowest knowledge score than female .The employment accomplishment and knowledge scores of employed were observed to be higher than those of unemployed concerning the diets restricting sodium, phosphorus and potassium.

My findings correlate with a research that indicated older, less educated patients with reduced cognitive function and just started dialysis had the lowest factual knowledge of the procedure(Badzek et al.,1998).Only conscious and able-to-communicate outpatients were interviewed. The knowledge scores for sodium restriction diets did not differ between groups, suggesting that mental ability had no impact on our patients' dietary knowledge, even though HPs' intellectual perform was not assessed. Contrary to claims that a major contributing factor to patient noncompliance may be depression(DeOreo P. B. et al., 1997).

CHAPTER FIVE
Conclusion

Finally, the dietary knowledge about sodium, potassium, and phosphorus restriction are determined. And having more or less knowledge depends on demographic factors like Gender , Education & Employment status. Dialysis patients impacted by dietary knowledge scores .It is crucial for dialysis patients to understand dietary restriction in order to enhance their general health. The medical professional should consider the patient's dietary knowledge regarding sodium, potassium, and phosphorus restriction .To improve the survival rate, males in Bangladesh require greater dietary education.

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Appendices

Apendix 01: Synopsis

Dialysis is necessary for patients with end-stage renal disease (ESRD), commonly known as kidney failure. If someone has kidney failure, the kidneys are unable to filter disposals and surplus fluid derived to bloodstream as needed by the rest of the body. They may become ill from the waste and excess fluid accumulation. As a result of the longer intervals between treatments, waste and fluid accumulation in the body will require strict limit potassium, sodium, and phosphorus. possibly adhere to a diet that restricts sodium, potassium, and phosphorus.

Apendix 02: Abbreviation

CKD = Chronic kidney disease
BP = Blood pressure
ESKD = End stage kidney disease
LSD = Low sodium diet
HD = Hemodialysis
patient

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