MEDICAL SCIENCE

Assessment of knowledge and attitude regarding self-care among patients undergoing hemodialysis

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ABSTRACT

Background: Chronic kidney disease is characterized by kidney impairment and a glomerular filtration rate lower than sixty milliliters per minute for more than three months. Furthermore, hemodialysis patients are at significant risk for a range of problems, which might result from kidney disorders or the hemodialysis operations themselves. The purpose of this study is to assess hemodialysis patients' knowledge and attitudes toward personalized care. *Methods:* A four-month cross-sectional study was conducted. The non-probability convenient method of sampling was used, and the sample size was 250 participants (dialysis patients). After removing individuals who did not respond to the survey), our final number of participants was 170 hemodialyses (HD) individuals, and the information was obtained utilizing an online/offline survey with a questionnaire. *Results:* This study included an overall sample of 170 people ranging in age from 18 to 85 years, with 62 (36.5%) females and 108 (63.5%) males. Diabetes mellitus was found to be the disease with the greatest incidence among the group of individuals (67.41%), followed by hypertension 50 (29.4%), cardiovascular disease 25 (14.7%), hepatic disease 10 (5.88%), and most commonly used treatment in our study was antidiabetic medications. *Conclusion:* When it came to renal diet, drugs, and modifications to their lifestyles, the individuals in this study exhibited low Knowledge, Attitude, and Self-Care. Our research showed that male individuals knew more about the side effects of hemodialysis than female subjects. The maintenance hemodialysis patients' comprehension and practice were enhanced by receiving guidance on diet, medication, and lifestyle adjustments.

Keywords: Chronic Renal Failure, Hemodialysis, Patient Knowledge and Awareness, Renal Complications, and Patients on maintenance hemodialysis.

1. INTRODUCTION

A disorder known as chronic kidney disease (CKD) develops when the kidneys are damaged and the glomerular filtration rate (GFR) drops to < 60ml/min for more than 3 months (Jha et al., 2013). Besides, the final phase of CKD is end-stage renal disease (ESRD), and its occurrence has increased in the past 30 years (Hallan and Vikse, 2008). Overall, the majority of the patients suffering from end-stage renal disease are undergoing hemodialysis (White et al., 2008). Hemodialysis (HD) is one of the treatments for end-stage renal disease. An instrument is used to pass the patient's blood over a dialyzer, filter the blood, and remove waste products. The blood is passing over a duct that sends it to the dialyzer. The blood flows through a narrow fiber that cleans wastes and additional fluid in the dialyzer's inner side. After that, the purified blood is returned to the patient. Approximately, a particle amount of blood is conducted every minute through the machine.

So, hemodialysis patients are at high risk for several problems, including those listed below can arise from renal disease, or the hemodialysis procedures themselves (Magee et al., 2016). Loss of renal function caused to high levels of urea results in malfunctions in a lot of organ systems. Renal failure patients also have complications with undergoing hemodialysis intradialytic hypotension, hypertension, cardiovascular events, infections, anemia, malnourished, fluid overload, headache, and finally insomnia (Himmelfarb, 2005). These complications affect a patient's life and give a worse prognosis, for example, a study showed that uremic patients comprised the immune system, and an increasing frequency of infection has been noticed. Hemodialysis tends to fix the immune, but dialysis patients still have an increase in infection (Kosecoff et al., 1990).

Pharmacotherapy for high blood pressure in dialysis patients consists of all classes of antihypertensive medications except diuretics. ACEIs and ARBs (angiotensin-converting enzyme inhibitors and angiotensin II receptor blockers) can decrease the severity of the disease and mortality by alleviating the mean arterial pressure (MAP), aortic pulse wave velocity, aortic systolic pressure increase, left ventricular hypertrophy (LVH), and possibility decreasing the C-reactive protein (CRP) and oxidant stress. But there are some side effects including hyperkalemia and anaphylactic reaction with ACE inhibitors (Andreucci et al., 2004).

A rigorous diet must be taken into consideration, especially the potassium levels, as the health care provider works to improve the quality of life for patients receiving maintenance hemodialysis (MHD). Increased potassium can harm the heart, whereas phosphorus and sodium can both raise blood pressure and fluid intake can cause edema and a rise in blood pressure. Therefore, they should all be restricted. Weight assessment throughout each dialysis season should be taken into consideration to evaluate interdialytic weight gain (IDWG). Additionally, bicycling, running on a treadmill, and participating in aerobics activities can all lower blood pressure and improve lipid profiles in hemodialysis patients while also increasing hematocrit and blood cell mass (Inaguma et al., 2006).

Patients on maintenance hemodialysis (MHD) are required to follow a challenging treatment schedule that includes a plethora of regular prescriptions and a 4-hour hemodialysis session twice or three times per week, as well as specific fluid and dietary limitations. As a result, the advice is that every MHD patient "receive extensive counseling based on a personalized regimen of care formulated before or at the period of MHD treatment initiation (Ozer-Etik et al., 2015). It, therefore, becomes critical to determine whether or not patients understand these constraints, exactly how they perceive them, and how effectively they succeed in implementing them to improve compliance in MHD patients. So, our study aimed to determine the knowledge and attitude regarding self-care among the patients undergoing hemodialysis in Jeddah, Saudi Arabia based on an online and offline survey.

2. MATERIALS AND METHODS

Cross-sectional research was carried out for the duration of four months from October 2022 to January 2023. The sampling technique was a non-probability convenient one, and the sample size was 250 subjects (hemodialysis patients). After excluding the patients who are not completed the questionnaire, our final sample size involved 170 patients on hemodialysis (HD), and the data was collected by using an online/offline questionnaire survey. Data collected by using a questionnaire (Online/offline survey) had inclusion criteria including renal failure patients receiving hemodialysis between the age of 18 to 80 years. Exclusion criteria with patients not interested in taking part in this study, and those lacking compliance and not having chronic kidney disease will be excluded from the study.

Based on a thorough review of the literature, the researcher created questionnaires that ask about socio-demographic factors like age, gender, and education as well as the history of weight loss in the previous six months, gastrointestinal symptoms like anorexia, nausea, vomiting, and diarrhea, dietary food intake, functional capacity, and comorbidities. The survey also included questions about the participant's knowledge of medications, the mineral content of restricted foods, water consumption, changes to their lifestyles, and the basic signs of renal failure. The survey asked participants their opinions on the suggested dietary modifications, over-the-counter medications, and medical assistance.

Similarly, to this, participants' practices were evaluated in terms of their ability to consume the restricted foods in the suggested amount, whether their families supported them in adhering to the "renal diet" and whether they followed it, and normal medication use along with alternative therapies. Also asked about how frequently they use over-the-counter medications and experienced anxiety or depression. Experts assessed the questionnaires for content validity, and a pilot study was carried out with chosen participants. The outcome of this study was mainly designed to evaluate knowledge, attitude, and practice in patients who are undergoing hemodialysis. SPSS software was used with the subroutine Chi-square analysis employed to examine the results. A P-value of <0.05 was considered statistically significant.

3. RESULTS

The study's objective was to assess the hemodialysis patient's knowledge, attitudes, and practice toward self-care in Jeddah, Saudi Arabia, based on an online/offline survey. The study involved 250 hemodialysis patients, but only 170 patients filled out the questionnaires ages between 18 to 80 years old.

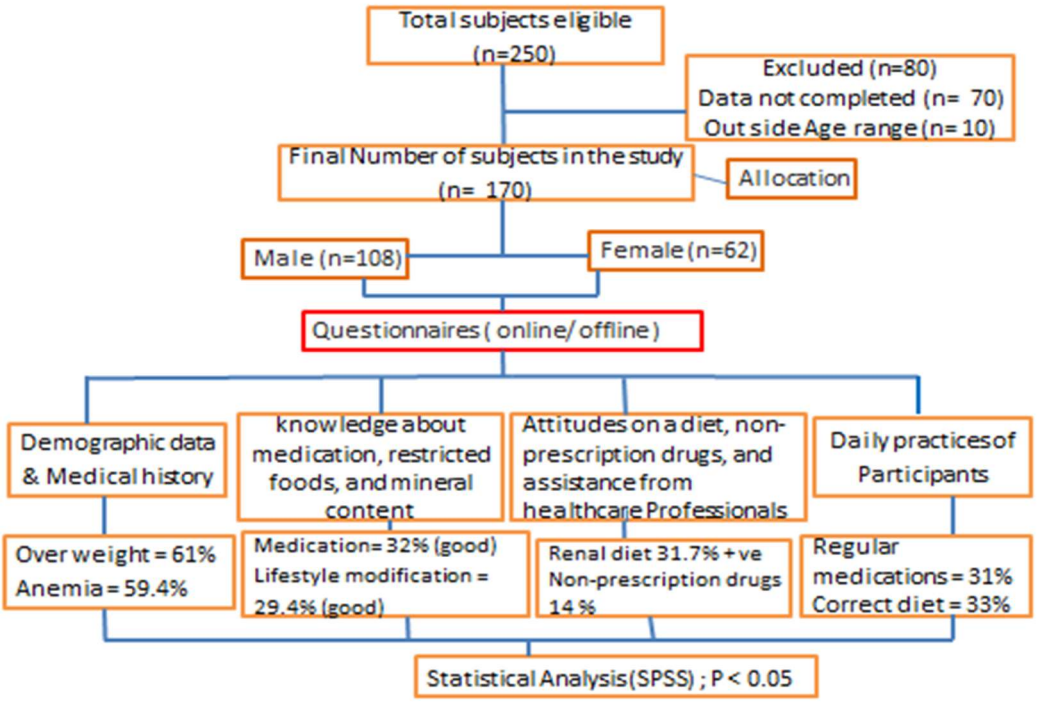


Figure 1 Consort Flow Diagram

Our results showed that patients with hemodialysis matched for age and gender were female 62 (36.5%) and male 108 (63.5%), approximately fifty-eight percent were educated up to primary education whereas thirty-eight percent were employed, and twenty-eight percent were retired persons (Table 1).

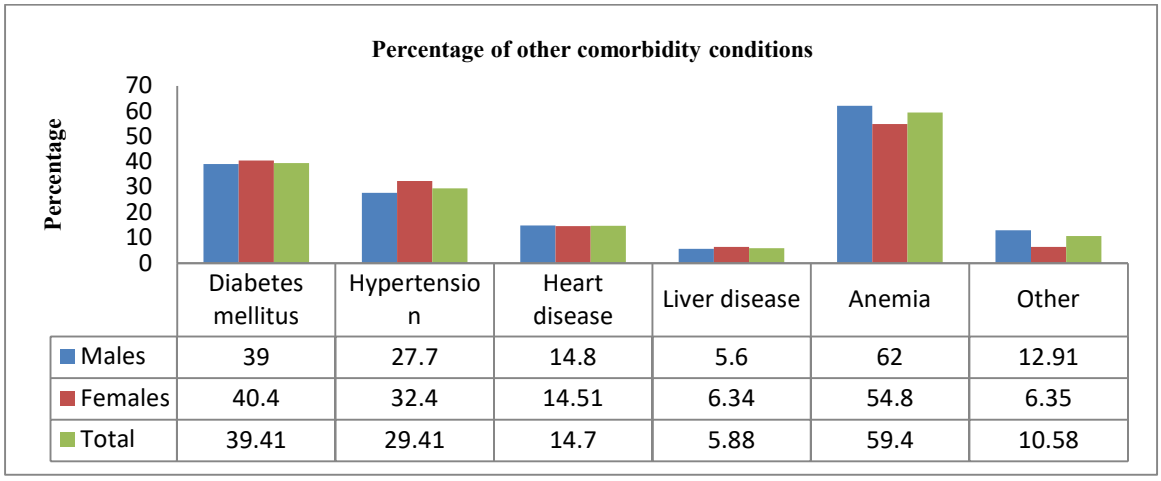
Table 1 The demographic data of the subjects

Parameters	Male (N=108)	Female (N=62)	Total (N= 170)	P-value
Age (years ± SD)	57 ± 11.2	53 ± 9.7	55.6 ± 10.6	0.01
Education, number (%)				
Primary	67 (62.0%)	32 (51.6%)	99 (58.2 %)	0.03
Secondary	32 (29.6%)	26 (41.9%)	58 (34.1%)	0.01
Graduation	9 (8.3%)	4 (6.4%)	13 (7.6%)	0.028
Employment, number (%)				
Employed	58 (57.3%)	08 (12.9%)	66 (38.8%)	0.047
Un-Employed	09 (8.3%)	48 (77.4%)	57 (33.5%)	0.045
Retired	41 (37.9%)	06 (9.7%)	47 (27.6 %)	0.05

A P-value of ≤ 0.05 was considered significant.

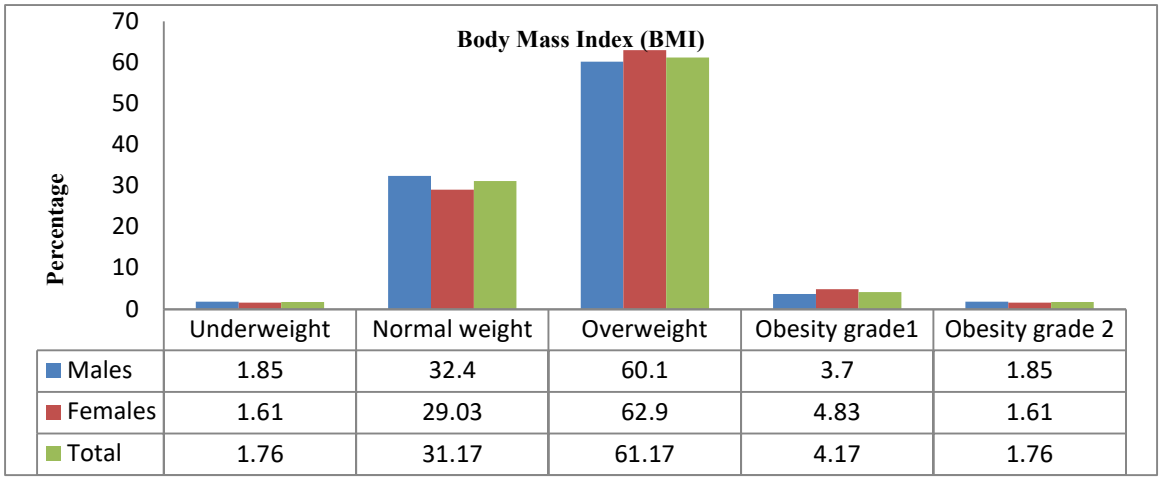
Out of 170 hemodialysis patients, the most frequent type of comorbid conditions was diabetes mellitus 67 (39.41%), hypertension 50 (29.41%), heart diseases 25 (14.7%) followed by liver disease 10 (5.88%), and other diseases 18 (10.58%) exhibit in (Figure 2). In another study, nearly one-third of those studied had either diabetes mellitus or hypertension, or both, as the etiology of end-stage renal disease (ESRD) (Amarasinghe et al., 2022). T2DM is the seventh greatest contributor to mortality worldwide (Zheng et al., 2018), and it causes a variety of consequences, one of which is chronic renal failure (CRF) (Idris et al., 2018).

Besides, the Body Mass Index (BMI) in patients undergoing hemodialysis was categorized as underweight, normal weight, overweight, and obesity grade 1 and 2. Being overweight was the most frequent in hemodialysis patients 104 (61.17%) and then normal weight subjects were reported approximately thirty-two percent apparent in (Figure 3). According to some research having a high BMI is one of the biggest risk factors for developing Chronic Kidney Disease (CKD) for the first time. It is believed that compensatory excessive filtration and elevated intraglomerular pressure, which ultimately result in kidney injury, are the causes of the link between obesity and CKD (Kovesdy et al., 2017). Contrary to popular belief, obesity is linked to increased longevity in patients receiving hemodialysis. It is known as the "obesity-survival paradox" for this phenomenon (Kovesdy et al., 2017).



	Diabetes mellitus	Hypertension	Heart disease	Liver disease	Anemia	Other
Males	39	27.7	14.8	5.6	62	12.91
Females	40.4	32.4	14.51	6.34	54.8	6.35
Total	39.41	29.41	14.7	5.88	59.4	10.58

Figure 2 Percentage of other comorbid conditions in subjects along with Renal failure



	Underweight	Normal weight	Overweight	Obesity grade1	Obesity grade 2
Males	1.85	32.4	60.1	3.7	1.85
Females	1.61	29.03	62.9	4.83	1.61
Total	1.76	31.17	61.17	4.17	1.76

Figure 3 Percentage of subjects' Body Mass Index (BMI)

Over the last six-month period, greater than fifty percent of participants 54.71% (n=93) lost between 5 and 10% of their body weight, while roughly 15.88% (n=27) lost more than 10%. In addition, research reveals that in people with diabetes, a decrease in weight of more than 10% has been linked to the quickest reduction in renal function (Bae et al., 2021).

Table 2 Medical history of subjects undergoing hemodialysis

Parameters	Male (N=108)	Female (N=62)	Total (N= 170)	P-value
Weight change (Overall change in past 6 months), number (%)				
No significant change	32 (29.63%)	18 (29.03%)	50 (29.41%)	0.05
5-10% weight loss	61 (56.48%)	32 (51.61%)	93 (54.71%)	0.05
10% or more sustained weight loss	15 (13.89%)	12 (19.35%)	27 (15.88%)	0.04
Dietary intake, number (%)				
No significant change	24 (22.22%)	16 (25.81%)	40 (23.53%)	0.04
Poor borderline, but declining	47 (43.52%)	32 (51.6%)	79 (46.47%)	0.05
Starvation, unable to eat	37 (34.26%)	14 (22.5%)	51 (30%)	0.03
Gastrointestinal symptoms (that persisted for > 2 weeks), number (%)				
None	28 (25.93%)	14 (22.5%)	42 (24.71)	0.03
Some Symptoms	38 (35.19%)	21 (33.87%)	59 (34.74)	0.04
Many Symptoms (Nausea, Vomiting, Diarrhea, Anorexia)	42 (38.89%)	27 (43.5%)	69 (40.6)	0.04
Functional capacity, number (%)				
No dysfunction	30 (27.78%)	18 (29.0%)	48 (28.24%)	0.027
Dysfunction: Mild	32 (29.63%)	23 (37.1%)	55 (32.35%)	0.029
Dysfunction: Severe	46 (42.59%)	21 (33.87%)	67 (39.41%)	0.03
Subjects on maintenance hemodialysis (MHD), number (%)				
MDH<12 months (and healthy Otherwise)	52 (48.15%)	19 (30.65%)	71 (41.76%)	0.02
MDH 1-2 yrs (Mild co-morbidity)	38 (35.19%)	28 (45.16%)	66 (38.82%)	0.04
MDH>4 yrs (severe co-morbidity)	18 (16.67%)	15 (24.2%)	33 (19.41%)	0.04
Smoking, number (%)				
Yes	28 (25.92%)	00	28 (16.47%)	0.02
No	80 (74.07%)	62 (100%)	142 (83.52%)	0.02

For patients on maintenance hemodialysis (MHD); A P value of ≤ 0.05 was considered significant.

A little more than one-third (n=51) of the respondents asserted to be unable to eat, and almost half (46.47%, n=79) claimed they had eaten poorly. Nearly 40% (n=69) of participants claimed to have experienced gastrointestinal symptoms like nausea, vomiting, diarrhea, and anorexia that continued for more than two weeks. 32.35% (n=55) reported having mild functional dysfunction, whereas 39.4% (n=67) reported having severe functional dysfunction. Around 20% (n=33) of participants were on maintenance hemodialysis (MHD), 41.76 (n=71) individuals had been doing so for less than a year and almost 20% (n=33) of the individuals had significant co-morbid conditions and had been receiving maintenance hemodialysis (MHD) for longer than 4 years. Around eighty-four percent of the subjects were non-smokers and only sixteen percent were smokers as in (Table 3). In a meta-analysis, it was found that people on hemodialysis who smoked had a 65% greater death risk (Liebman et al., 2011).

Nearly half (42.35%, n=72) of the participants had an inadequate understanding of foods that need to be restricted, compared to about 18% (n=30) of individuals who had strong knowledge. In contrast, a different study revealed that 54.7% of participants knew more about foods that should be avoided (Spies et al., 2021). Our study revealed only 10.59% (n=18) had good knowledge regarding the amounts of phosphate ions, potassium ions, and sodium ions in restricted and non-restricted diets, while 47.55% (n=81) had a poor understanding, but another study found that 74.7% of those surveyed had an inadequate understanding of the levels of phosphate in the meal, as well as K+, and Na+ contents (Spies et al., 2021).

Regarding the medication's daily use, around 32.35% (n=55) of participants had good knowledge, compared to 23% (n=40) exhibiting low understanding. In terms of participants' awareness of the amount of water individuals should be consuming, roughly 30% (n=50) had poor knowledge, while 26.5 (n=50) had excellent knowledge. A little over 30% (n=50) had a strong understanding, compared to 33% (n=57) who had inadequate knowledge about the necessary lifestyle change. 51.1% (n=87) of the participants demonstrated strong knowledge of the fundamental signs of renal failure as in (Table 3).

Table 3 Study participants' knowledge about medication, restricted foods, and mineral content

Parameters	Male=108	Female=62	Total Participants=170	P value
Understanding of the foods (types of foods) that need to be limited., number (%)				
Insufficient (<50% correct answers)	42 (38.89%)	30 (48.39%)	72 (42.35%)	0.01
Average (≥50–75% correct answers)	43 (39.81%)	25 (40.32%)	68 (40%)	0.01
Good (≥ 75% correct answers)	23 (21.3%)	7 (11.29%)	30 (17.65%)	0.01
Knowledge of the contents of phosphate ion, potassium ion, and sodium ion in restricted and non-restricted foods, number (%)				
Insufficient (< 50% correct answers)	60 (55.56%)	31 (50%)	81 (47.65%)	0.01
Average (≥50–75% correct answers)	34 (31.48%)	27 (43.55%)	61 (35.88%)	0.05
Good (≥ 75% correct answers)	14 (12.96%)	04 (6.45%)	18 (10.59%)	0.01
Knowledge regarding daily taking medication, number (%)				
Insufficient (< 50% correct answers)	25 (23.15%)	15 (24.19%)	40 (23.53%)	0.01
Average (≥50–75% correct answers)	45 (41.67%)	30 (48.39%)	75 (44.12%)	0.05
Good (≥ 75% correct answers)	38 (35.19%)	17 (27.42%)	55 (32.35%)	0.05
Knowledge regarding the quantity of water intake, number (%)				
Insufficient (< 50% correct answers)	29 (26.85%)	21 (33.87%)	50 (29.41%)	0.05
Average (≥50–75% correct answers)	38 (35.19%)	30 (48.39%)	58 (34.12%)	0.01
Good (≥ 75% correct answers)	35 (32.41%)	10 (16.13%)	45 (26.47%)	0.01
Knowledge regarding required lifestyle modification, number (%)				
Insufficient (< 50% correct answers)	37 (34.26%)	20 (32.26%)	57 (33.53%)	0.05
Average (≥50–75% correct answers)	40 (37.04%)	23 (37.10%)	63 (37.06%)	0.01
Good (≥ 75% correct answers)	31 (28.70%)	19 (30.65%)	50 (29.41%)	0.01
Knowledge regarding basic symptoms of renal failure, number (%)				
Insufficient (<50% correct answers)	21 (19.44%)	14 (22.58%)	35(20.59%)	0.05
Average (≥50–75% correct answers)	41 (37.96%)	27 (43.55%)	68(40%)	0.01
Good (≥ 75% correct answers)	46 (42.59%)	21 (33.87%)	87(51.18%)	0.01

A P-value of ≤ 0.05 was considered significant

Only thirty percent of contributors expressed support for the "renal diet". In a previous study, the majority of members (61.4%) showed lower compliance with the renal diet, indicating that even if someone has sufficient knowledge, if they have a negative attitude, they should get rapid nutrition education intervention (Spies et al., 2021). In our study, we found out of the two participants, one claimed that the renal diet is more expensive than the standard diet, and another study shows around 29.7% of participants felt that the cost of recommended diet was more costly than the typical/traditional food (Spies et al., 2021).

Table 4 Participants attitudes on a recommended diet, non-prescription drugs, and assistance from healthcare professionals

Parameters	Male (N=108)	Female (N=62)	Total (N= 170)	P value
Opinions on the renal diet, number (%)				
Positive	33 (30.56)	21 (33.87)	54 (31.76)	0.02
Negative	45 (41.67)	19 (30.65)	64 (37.65)	0.02
Neutral	30 (27.78)	22 (35.48)	52 (30.59)	0.03
The estimated expense of the renal diet' in comparison to a normal diet, number (%)				
A renal diet is cheaper	21 (19.44)	15 (24.19)	36 (21.18)	0.03
The renal diet is more expensive	55 (50.93)	23 (37.10)	78 (45.88)	0.04
Similar cost to normal	32 (29.63)	24 (38.71)	56 (32.94)	0.04
Reports of opinions and emotions concerning the particular foods permitted on the renal diet, number (%)				
I like it	19 (17.59)	13 (20.97)	32 (18.82)	0.05
I don't care for it	45 (41.67)	24 (38.71)	69 (40.59)	0.05

Neutral feeling	44 (40.74)	25 (40.32)	69 (40.59)	0.05
Are you aware of the side effects of non-prescription drugs				
Insufficient (< 50% correct answers)	52 (48.15)	28 (45.16)	80 (47.06)	0.01
Median (50–75% accurate responses)	44 (40.74)	22 (35.48)	66 (38.82)	0.01
Excellent (75 percent accurate responses)	12 (11.11)	12 (19.35)	24 (14.12)	0.01
Do you consult the Physician/ Pharmacist before using any non-prescription drugs				
Yes	45 (41.67)	22 (35.48)	67 (39.41)	0.050
No	63 (58.33)	40 (64.52)	103 (60.59)	0.03
Do you know some drugs which increase renal complications				
Insufficient (< 50% correct answers)	61 (56.48)	33 (53.23)	94 (55.29)	0.05
Median (50–75% accurate responses)	32 (29.63)	22 (35.48)	54 (31.76)	0.05
Excellent (75 percent accurate responses)	15 (13.89)	07 (11.29)	22 (12.94)	0.05
Do you believe that you are getting sufficient assistance from healthcare professionals				
Insufficient (< 50% correct answers)	22 (20.37)	15 (24.19)	37 (21.76)	0.04
Average (≥ 50–75% correct answers)	35 (32.47)	22 (35.48)	57 (33.53)	0.05
Good (≥ 75% correct answers)	51 (47.22)	25 (40.32)	76 (44.71)	0.04

A P-value of ≤ 0.05 was considered significant.

The present study shows that 40% of participants said they disliked the renal diet, stating that the foods were bland without salt, too many foods were banned including their preferred foods and regular/typical/traditional dishes, and that this made it difficult to communicate with others. Forty-seven percent of respondents did not know that non-prescription medications can cause renal failure. Before utilizing non-prescription medications, 40% of participants said they visit a doctor or pharmacist, in contrast, a different study on the incidence of self-medication in Saudi Arabia's urban individuals that visited community pharmacies found that 69% of those surveyed stated they kept their remaining medications on standby for later usage (Khan et al., 2020).

55% of individuals had inadequate knowledge regarding some medicines that promote renal problems, and another study on patients with chronic kidney failure revealed that 74% of the patients were unaware of which medications individuals who have CKD should avoid (Okoro et al., 2020). Nearly one out of every two participants thinks that they are receiving enough help from healthcare professionals as in (Table 4).

Table 5 Daily practices of participants

Parameters	Male (N=108)	Female (N=62)	Total (N= 170)	P value
Do you use any alternative medications along with regular medications				
No	78 (72.22)	40 (64.52)	118 (69.41)	0.02
Yes	30 (27.78)	22 (35.48)	52 (30.59)	0.02
Can you consume the suggested quantities of foods that are restricted				
Every time	34 (31.48)	18 (29.03)	52 (30.59)	0.01
Sometimes	30 (27.78)	20 (32.26)	50 (29.41)	0.01
Never	44 (40.74)	24 (38.71)	68 (40)	0.01
Does your family encourage you to eat healthfully				
Every time	32 (29.73)	24 (38.71)	56 (32.94)	0.02
Sometimes	48 (44.44)	16 (25.81)	64 (37.65)	0.03
Never	28 (25.93)	22 (35.48)	50 (29.41)	0.03
What type of medications do you take regularly.				
Antidiabetic	34 (31.48)	32 (51.61)	66 (38.82)	0.01
Antihypertensive	28 (25.93)	22 (35.48)	50 (29.41)	0.010
Pain killers	15 (13.89)	12 (19.35)	27 (15.88)	0.02
Other	22 (20.37)	15 (24.19)	37 (21.76)	0.02
Type of diet you take usually				
High protein diet	45 (41.67)	22 (35.48)	67 (39.41)	0.02

Low carbohydrate diet	21 (19.44)	18 (29.03)	39 (22.94)	0.01
Not follow any diet	42 (38.89)	22 (34.48)	64 (37.65)	0.05
How often do you take non-prescription drugs				
Daily	18 (16.67)	10 (16.13)	28 (16.47)	0.04
Weekly	45 (41.67)	22 (35.48)	67 (39.41)	0.04
Monthly	22 (20.37)	12 (19.35)	34 (20)	0.03
Not often, only when needed	23 (21.3)	18 (29.03)	41 (24.12)	0.03

A P-value of ≤ 0.05 was considered significant.

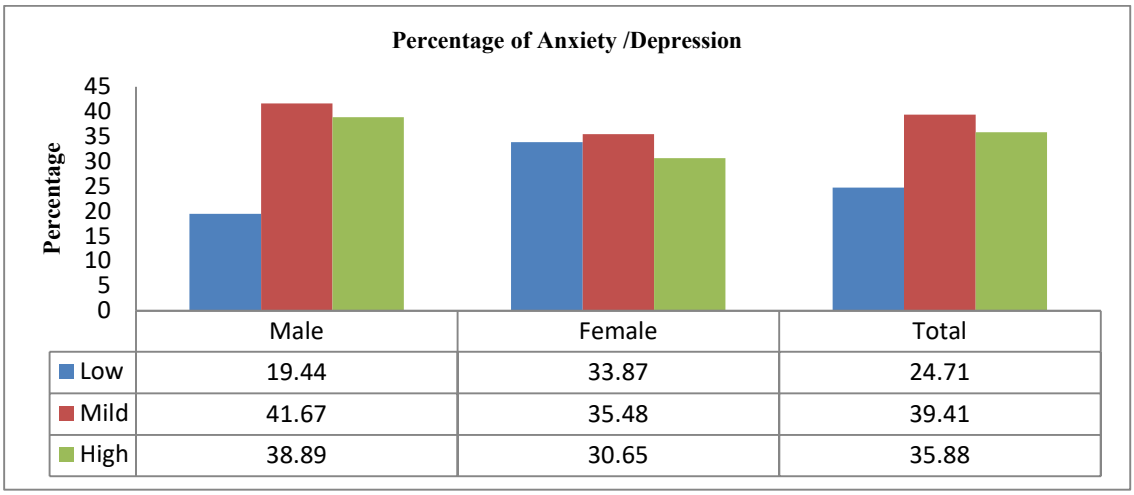


Figure 4 Percentage of subjects suffering from Anxiety/Depression

4. DISCUSSION

The majority of the participants (69.4%, n=118) stated that they did not take complementary medicines in addition to prescription drugs and only 30.59% (n=52) said they take alternative medications along with regular medications, comparable findings were discovered in a different study on dialysis treatment in individuals who have chronic kidney disease, that is twenty-six percent of individuals were discovered to be using complementary and alternative methods of treatment (Arjuna-Rao et al., 2016). Less than one-third of individuals said they could always eat the recommended quantities of restricted foods, it was found that higher compliance to dietary limitations was not linked to a greater understanding of the renal diet (Betz et al., 2021).

Thirty-three percent of those surveyed said that their families constantly encourage them to eat healthy food. Approximately forty percent of the individuals surveyed said they frequently utilize antidiabetic drugs, while thirty percent of participants said they regularly take antihypertensive drugs. A quarter of the participants admitted not following any diet, compared to 23% of those who typically follow a low-carbohydrate diet and 40% of those who typically consume a high-protein diet. One in four respondents claimed they rarely make use of non-prescription medicines but only use them when necessary. Nearly 40% of participants reported using non-prescription medications every week. One in four participants those interviewed reported having low levels of anxiety or depression and 36% of them replied that they have high rate of anxiety or depression respectively.

The study showed the responses to the questionnaire given by the study participants and the findings revealed that patients with hemodialysis matched for age and gender female 62 (36.5%) and male 108 (63.5%). Also, the indicated number of non-smokers was 142 (83.5%), and the number of smokers was 28 (16.5%). Based on the medical history of the subjective global assessment score classification one-third of patients as well-nourished, 41% of the respondents as mild to moderately malnourished, and twenty-nine percent were significantly malnourished. Malnutrition is frequent among hemodialysis patients and affects morbidity and mortality (Kalantar-Zadeh et al., 1998).

Nonetheless, hemodialysis patients' dietary status is routinely overlooked (Kalantar-Zadeh et al., 1998). The subjective global assessment score provides an established procedure for repeatedly assessing large numbers of patients by any dialysis care team member for the nutritional score method to be adequate in the nutritional assessment of individuals receiving dialysis, additional comparative and prospective investigations are required. This sort of evaluation aims to identify patients of such an assessment to identify individuals, who are at risk of problems and poor outcomes before occurring. A technique like this enables the deployment

of preventative measures like extra advice on nutrition, dietary supplements, or behavioral therapies. 31% of patients had an average body weight, 61% were overweight and 5% were obese. Only around 2% of patients were underweight (Figure 4).

Patients who are following a high protein diet 67 (39.4%) female 45 (41.6%), male 22 (35.5%) and the patient who's following a low carbohydrate diet 39 (22.94%) and it was in male 21 (19.44 %) more than the female 18 (29.03%) as in (Table 5). Dialysis should be started when the patients had renal failure and have at least one of the conditions listed including serositis, acid-base or electrolyte abnormalities, pruritus, inability to control blood pressure or volume status, steadily declining nutrient intake resistant to dietary intervention, mental retardation.

According to KDIGO, (2013) recommendations, this condition commonly occurs when the GFR is between 5 and 10 ml/min/1.73m^2. The KDIGO, (2013) initiative recommends that individuals with chronic kidney disease (CKD) progressing receive comprehensive medical care, including dietary counseling, information and guidance on various Renal Replacement Therapy (RRT) approaches, transplantation alternatives, vascular access surgery, and moral, emotional, and social assistance.

It is advised that hemodialysis patients should obtain professional dietary guidance and knowledge as part of an education initiative that is suited to the extent of their condition and their requirement to make adjustments, when necessary, with the consumption of salt, phosphate, potassium, and protein. It is also recommended that the families and the patients undergoing hemodialysis should consult a doctor or pharmacist before utilizing nonprescription drugs or dietary protein supplements and the Patients with CKD are warned against utilizing remedies made from herbs.

The hemodialysis patients as well as their families should have access to integrated care through primary health care or medical specialists, depending on the needs of the local community. The knowledge and abilities of the patients undergoing periodic hemodialysis can improve by acquiring advice on diet, medication, and modifications to their lifestyles.

5. CONCLUSION

Our study seeks to evaluate the Knowledge and Attitude Concerning Self Care among Patients Undertaking Hemodialysis in Jeddah, Saudi Arabia, based on a survey. The majority of individuals presented with an insufficient understanding of the various renal diet components, essential lifestyle changes, important signs of renal failure, and adverse effects of over-the-counter medications on the kidney. Most of the participants showed insignificance to negative opinions of the diet and other items that were permitted. They also thought that the renal dietary intake was difficult to follow due to cost and taste. It is necessary to create and interpret written, audio, video, and/or digital educational resources for end-stage renal disease (ESRD) patients in Saudi Arabian society.

However, patient attitudes towards the "renal diet", necessary lifestyle changes, basic symptoms of renal failure, and side effects of over-the-counter medications should be explored and taken into account. Additionally, patients should be taught and allowed to practice practical skills that will help them translate recommendations into compliant practice. Receiving instructions on nutrition, medication, and lifestyle changes improved understanding and practice among the patients on maintenance hemodialysis. Future studies should also look into how more frequent dietetic and lifestyle counseling affects individuals with End Stage Renal Disease (ESRD's) ability to control their metabolism.

Limitation

In our study, the main limitation was the small sample size.

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Author Contributions

Details of the contribution of each author regarding manuscript work & production.

Ethics approval and consent to participate

This study was approved by the Institutional Human Ethics Committee of Ibn Sina National College, Jeddah, Saudi Arabia (Protocol Identification Number: 017CPP17022020).

Informed consent

All individuals involved in the study gave their written and/or verbal consent after being fully informed. All individuals whose identifying information appears in this manuscript have given their further informed consent.

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Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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