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Graduate School of Health Sciences

Master of Science Thesis

EVALUATION OF QUALITY OF LIFE AND FLUID ACCUMULATION PROBLEM IN PATIENTS WITH RENAL FAILURE IN HOSPITAL DIALYSIS CENTERS IN DİYALA / IRAQ

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BY

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The Department of Nursing

The Degree of Master of Science

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ETHICS STATEMENT

The thesis entitled “Evaluation of quality of life and fluid accumulation problem in patients with renal failure in hospital dialysis centers in Diyala / Iraq” which was prepared and presented as a thesis, was written by myself and in accordance with the scientific, academic rules and ethical conduct. The idea/hypothesis of my thesis solely belongs to my supervisor and to me. The research pertaining to the thesis was conducted by myself and therefore, all of the used sentences and interpretations within the work belongs to me.

I declare the aforementioned issues to be correct.

Signature

/ /

Hayder Hussein Mohammed MOHAMMED

ABSTRACT

EVALUATION OF QUALITY OF LIFE AND FLUID ACCUMULATION PROBLEM IN PATIENTS WİTH RENAL FAILURE IN HOSPITAL DIALYSIS CENTERS IN DIYALA / IRAQ

Hayder Hussein Mohammed MOHAMMED

Master of Science in Nursing

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April 2023

Background: Renal failure is a global public health problem, and in Iraq, hospital dialysis centers are facing an increasing demand for services. Patients with renal failure often experience a decrease in their quality of life due to physical, psychological, and social factors. This study aimed to investigate the quality of life of patients with renal failure in hospital dialysis centers in Diyala, Iraq, based on demographic characteristics.

Methods: A cross-sectional design was used, and data on age, gender, education, work status, comorbidities, dialysis treatment, and diet were collected using a personal information form. The Kidney Disease Quality of Life Short-Form (KDQoL-SF) questionnaire was used to assess quality of life, consisting of 36 items organized into 5 sub-dimensions. The data were analyzed using descriptive statistics and One-Way ANOVA analysis. The study highlights the importance of understanding the relationship between demographic factors and the quality of life of patients with renal failure to develop targeted interventions to enhance their well-being.

Results: This study found significant associations between various demographic and treatment-related factors and the quality of life of patients with renal failure in hospital dialysis centers in Diyala, Iraq. Age, education level, income, frequency and duration of hemodialysis sessions, gender, marital status, and residence were identified as potential factors that can influence quality of life ($p<0.001$).

Conclusion: These findings highlight the need for tailored interventions that address the unique needs and challenges faced by different patient subgroups. However, the limitations of the cross-sectional design and potential confounding factors should be

acknowledged, and further research is needed to validate and expand on these findings in diverse populations.

2023, 67 pages

Keywords: Dialysis centers, Fluid accumulation, Kidney failure, Quality of life.

ÖZET

DİYALA / IRAK'TA HASTANE DİYALİZ MERKEZLERİNDE BÖBREK YETMEZLİĞİ OLAN HASTALARDA YAŞAM KALİTESİ VE SIVI BİRİKİMİ SORUNUNUN DEĞERLENDİRİLMESİ

Hayder Hussein Mohammed MOHAMMED
Hemşirelik, Yüksek Lisans
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Nisan 2023

Arka plan: Böbrek yetmezliği, dünya genelinde milyonlarca insanı etkileyen önemli bir halk sağlığı sorunudur. Irak'ta böbrek yetmezliği, hastane diyaliz merkezlerinde hizmetlere olan artan talep ile giderek büyüyen bir endişe kaynağıdır. Böbrek yetmezliği olan hastalar çeşitli fiziksel, psikolojik ve sosyal faktörlerden dolayı yaşam kalitelerinde azalma yaşayabilirler. Demografik faktörler ile böbrek yetmezliği olan hastaların yaşam kalitesi arasındaki ilişkinin anlaşılması, bu durumda hastaların iyilik hallerini artırmaya yönelik etkili müdahaleler ve politikaların geliştirilmesinde önemlidir. Bu çalışma, Diyala, Irak'taki hastane diyaliz merkezlerinde böbrek yetmezliği olan hastaların yaşam kalitesi açısından demografik özelliklerine göre farklılıkların araştırılmasını amaçlamaktadır. Bu çalışmanın bulguları, bu ortamda böbrek yetmezliği olan hastaların yaşam kalitelerini artırmaya yönelik hedeflenmiş müdahalelerin geliştirilmesine katkıda bulunabilir.

Yöntemler: Bu çalışma, Diyala, Irak'taki hastane diyaliz merkezlerinde böbrek hastalarının yaşam kalitesini araştırmak için kesitsel bir tasarım kullandı. Kişisel bilgi formu, yaş, cinsiyet, eğitim düzeyi, çalışma durumu, medeni durum, eşlik eden hastalıklar, diyaliz tedavisi ve diyet gibi demografik özelliklerle ilgili verileri toplamak için kullanıldı. Böbrek Hastalığı Yaşam Kalitesi Kısa Formu (BHYK-KF) anketi, böbrek hastalarının yaşam kalitesini değerlendirmek için kullanılmıştır. Daha önce doğrulanmış olan Arapça versiyonu 18-60 yaş arası hastalara uygulanmıştır. BHYK-KF anketi, fiziksel yaşam kalitesi, zihinsel yaşam kalitesi, böbrek hastalığı yükü, böbrek hastalığı sorunları ve böbrek hastalığının etkileri olmak üzere 5 alt boyuta ayrılmış 36 madde içerir. BHYK-

KF puanları 0 ile 108 arasında değişir ve yüksek puanlar daha kötü sağlıkla ilgili yaşam kalitesini gösterir. Veriler tanımlayıcı istatistikler One-Way ANOVA analizi kullanılarak analiz edilmiştir. Çalışma, Diyala Sağlık Müdürlüğü Kurumsal İnceleme Kurulu'ndan etik onay almıştır.

Bulgular: Bulgularımıza göre, 54-60 yaş aralığındaki bireylerin 45-53 yaş aralığındakilere ($p<0.001$) ve 45 yaşın altındakilere ($p<0.001$) kıyasla önemli ölçüde daha düşük bir yaşam kalitesine sahip oldukları açıktır. Ayrıca, lisans/doktora eğitimine sahip hastaların lise ($p<0.001$) ve ilkokul eğitimine sahip olanlara ($p<0.001$) kıyasla daha düşük bir yaşam kalitesine sahip oldukları görülmüştür. Yüksek ve orta gelirli hastalar arasında yaşam kalitesinde önemli bir farklılık yokken ($p=0.658$), yüksek ($p<0.001$) ve orta ($p<0.001$) gelirli hastaların düşük gelirli katılımcılara ($p<0.001$) kıyasla daha düşük bir yaşam kalitesine sahip oldukları görülmüştür. Ayrıca, haftada dört kez hemodiyalize giren hastaların haftada iki kez ($p<0.001$) veya üç kez ($p<0.001$) hemodiyalize girenlere kıyasla daha düşük bir yaşam kalitesine sahip oldukları, haftalık hemodiyaliz sürelerine göre yaşam kalitesi değerlerinin karşılaştırılmasıyla belirlenmiştir. Benzer şekilde, dört saat hemodiyalize giren hastaların iki saat ($p<0.001$) veya üç saat ($p<0.001$) hemodiyalize girenlere kıyasla daha düşük bir yaşam kalitesine sahip oldukları belirlenmiştir. Sonuçlar, cinsiyete göre yaşam kalitesinde önemli bir farklılık olduğunu ortaya koymuştur ve kadınların erkeklere kıyasla daha düşük bir yaşam kalitesi bildirdiği görülmüştür ($p<0.001$). Ayrıca, medeni duruma göre yaşam kalitesinde önemli bir farklılık gözlenmiştir ve evli bireylerin bekarlara kıyasla daha düşük bir yaşam kalitesi bildirdiği belirlenmiştir ($p<0.001$). Ayrıca, yerleşime göre yaşam kalitesinde önemli bir farklılık görülmüştür ve kırsal hastaların kentsel hastalara kıyasla daha düşük bir yaşam kalitesine sahip oldukları belirlenmiştir ($p<0.001$).

Sonuç: Çalışmamız, böbrek yetmezliği olan hastalarda demografik ve tedaviyle ilgili faktörler ile yaşam kalitesi arasındaki birçok önemli ilişkiyi belirledi. Bulgularımız, yaş, eğitim düzeyi, gelir, hemodiyaliz seanslarının sıklığı ve süresi, cinsiyet, medeni durum ve ikamet yeri gibi potansiyel faktörlerin bu popülasyonda yaşam kalitesini etkileyebilecekleri konusunda dikkat çekmektedir. Bu sonuçlar, böbrek yetmezliği olan hastalarda yaşam kalitesinin çok faktörlü doğasına ilişkin literatürdeki gelişmeye katkıda bulunmaktadır ve farklı hasta alt gruplarının benzersiz ihtiyaçlarını ve karşılaştıkları zorlukları ele alan özelleştirilmiş müdahalelere ihtiyaç duyulduğunu vurgulamaktadır.

Çalışmamız ayrıca klinik uygulamada ve politika yapımında demografik ve bağlamsal faktörlere dayalı yaşam kalitesi eşitsizliklerinin göz önünde bulundurulmasının önemini vurgulamakta ve böbrek yetmezliği olan hastaların genel refah ve yaşam kalitesini optimize etmek için yapılan müdahalelere ilişkin öneriler sunmaktadır. Ancak, çalışmamızın kesitsel tasarımı ve olası karıştırıcı faktörleri gibi sınırlamalarını kabul etmek önemlidir ve farklı popülasyonlarda bulgularımızın doğrulanması ve genişletilmesi için daha fazla araştırmaya ihtiyaç vardır. Genel olarak, çalışmamız, böbrek yetmezliği olan hastalarda demografik ve tedaviye ilişkin faktörler ile yaşam kalitesi arasındaki karmaşık ilişkinin anlaşılmasına katkıda bulunmaktadır ve bu hassas hasta popülasyonunun sonuçlarını ve refahını iyileştirmeye yönelik klinik uygulama ve politika müdahaleleri için önemli sonuçlar doğurmaktadır.

2023, 67 sayfa

Anahtar Kelimeler: Böbrek yetmezliği, Diyaliz merkezleri, Sıvı birikimi, Yaşam kalitesi.

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Hayder Hussein Mohammed MOHAMMED

Çankırı-2023

CONTENTS

LIST OF ABBREVIATIONS

AKI	Acute Kidney Injury
CKD	Chronic Kidney Disease
CRRT	Continuous Renal Replacement Therapy
CVD	Cardiovascular Disease
GF	Glomerular Filtration
GFR	Glomerular Filtration rate
HBF	Higher Body Fat
HD	Hemodialysis Therapy
HRQoL	Health-related QoL
KDQOL-SF	Kidney Disease Quality of Life Short-Form
LBM	Lean Body Mass
PD	Peritoneal Dialysis
QOL	Quality of Life
WHO	World health organization

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1. INTRODUCTION

Chronic kidney disease (CKD) is defined as a defective kidney structure or function that lasts more than three months (Hill *et al*. 2016). This can be established by either evidence of kidney injury (usually manifested by chronic albuminuria) or a reduced glomerular filtration rate (GFR)(KDIGO et al. 2009, Bayoumi et al. 2013). Because of the increasing development of common risk factors such as diabetes and hypertension, CKD has become a global public health issue. As a result, it will pose a significant threat to underdeveloped countries with inadequate resources (KDIGO et al. 2009).

With rising frequency, high prices, and poor results, the strain on the healthcare system is enormous.CKD is linked to an increased risk of cardiovascular morbidity and mortality, as well as a negative influence on the quality of life (QoL) (Wang et al. 2012). Cardiovascular disease (CVD) mortality is expected to be at least 8-10 times greater in CKD patients than in non-CKD individuals.The expenses of managing CKD co-morbidities are quite substantial, providing significant challenges to healthcare systems, particularly in low-income countries (Bohlke et al. 2008).

The kidneys play a very important role in health care. When a person is healthy, the kidneys regulate the body's internal water and mineral balance (sodium, potassium, chloride, calcium, phosphorous, magnesium, and sulfate). The kidneys also excrete acidic metabolic byproducts that the body cannot eliminate through respiration. The kidneys also produce erythropoietin, cholesterol, and renin as part of the endocrine system. Erythropoietin aids in the formation of red blood cells, while calcitriol aids in bone growth (Alexander et al. 2009). Hemodialysis is an ineffective treatment for altering kidney function because it does not treat damaged endocrine functions in the kidneys. Some of these functions are replaced by diffusion (waste removal), ultrafiltration (fluid removal), and hemodialysis treatments (Hamilton et al. 1999). Hemodialysis involves the use of ultrapure water (sometimes known as "ultrapure") (Davita et al. 2017). Dialysis is the process of removing excess water, solutes, and toxins from the blood of people whose kidneys can no longer produce them normally. This is known as kidney replacement therapy. In 1943, the first successful dialysis procedure was performed. Dialysis may be required when there is a sudden loss of kidney function known as acute kidney injury (AKI) (formerly known as acute kidney failure) or when the progressive decline in kidney

function, known as CKD, reaches stage 5. When the glomerular filtration rate is 10-15 percent of normal, the creatinine clearance is less than 10 mL per minute, and there is blood urination, the patient is in stage 5 of chronic renal failure. (AMGEN et al. 2008) Hemodialysis is used as a temporary treatment for people who have severe kidney damage or are waiting for a kidney transplant, as well as a permanent measure when transplantation is not recommended or possible (Pendse et al. 2008).

Fluid buildup is associated with poor outcomes in critically ill individuals. Fluid overload was defined as an increase in body weight greater than 10% from baseline in 618 individuals recruited in a prospective, multicenter control trial. Patients who consumed more fluids died at a higher rate over a much longer period of time than is recorded. After adaptation to the dialysis technique and intensity program, fluid accumulation was minimal at the start of dialysis compared to survivors (Waikar *et al*. 2006). Despite advances in critical care and hemodialysis, the survival of patients with AKI has only improved slightly over the last three decades (Waikar et al. 2006). Mortality rates in critically ill patients with acute renal failure range from 50 to 70% and are mainly attributable to various complications associated with AKI such as infections, bleeding, and fluid excess (Druml et al. 1994, Druml et al. 2004).

CKD affects an estimated 10% of the world's population, according to epidemiological data. This is due to an aging population and an increase in civilizational illnesses such as diabetes, high blood pressure, and obesity (Rutkowski et al. 2007, Nowicki et al. 2007, Król and Rutkowski et al. 2008, Heleniak et al. 2009) In Iraq, the number of patients attending dialysis centers ranges between 12000 and 15000 patients per wee (Al-Amili et al. 2022). Several recent studies have demonstrated the importance of fluid accumulation in adverse outcomes in critically ill patients. Randomized clinical studies reported that fluid-restricted delivery regimens were beneficial in terms of mechanical ventilation time and cardiovascular problems in acute respiratory distress syndrome, and after major surgery, respectively (Brandstrup et al. 2003, Wiedemann et al. 2006) in children on continuous renal replacement therapy (CRRT) in Pe groups. Observational studies have revealed a link between fluid accumulation and mortality (Foland et al. 2004, Gillespie et al. 2004).

1.1. Purpose of the study

The aim of this study is to investigate the difference between some demographic data and quality of life of patients with renal failure in hospital dialysis centers in Diyala, Iraq.

1.2. The Study problem

The study problem of this research is to investigate the relationship between demographic data and the quality of life of patients with renal failure in hospital dialysis centers in Diyala, Iraq. Specifically, the study aims to identify any significant differences in quality of life among patients with renal failure based on demographic factors such as age, gender, education, and income. By exploring this relationship, the study seeks to provide insights that could inform the development of interventions and policies aimed at improving the quality of life of patients with renal failure in this setting.

1.3. Hypotheses

H0: The quality of life of patients with renal failure in hospital dialysis centers in Diyala, Iraq is similar in all patients with different demographic characteristics.
H1: The quality of life of patients with renal failure in hospital dialysis centers in Diyala, Iraq differs across at least one demographic variable.

1.4. Limitations

Results are limited by sample duration and the fact that the data were based on self-reports from patients in the study.

2. GENERAL INFORMATION

2.1. Definition of kidney

In vertebrates, the kidneys are a pair of reddish-brown, bean-shaped organs that are situated on either side of the retroperitoneum. They receive blood from the renal arteries and veins and measure around 12 cm (4 + 12 inches) in length in adults. The kidneys manage numerous body fluids, electrolyte concentrations, acid-base balance, and toxin removal while filtering around one-fifth of the blood volume that enters them (Mescher et al. 2016). Hydrogen, ammonium, potassium, and uric acid are expelled, while solute-free substances such water, salt, bicarbonate, glucose, and amino acids are reabsorbed. The functional unit of the kidney is the nephron, and each kidney in an adult person has roughly 1 million of them. The kidneys also create the hormones erythropoietin, renin, and convert a precursor to the active form of vitamin D. With an estimated 13.4% prevalence and millions of patients in need of renal replacement treatment, chronic kidney disease is a serious global public health concern (Lv and Zhang et al. 2019).

There are a few distinct techniques that healthcare practitioners use to manage renal illness. Urinalysis, which involves analyzing urine chemically and microscopically, can be useful in determining several conditions. The estimated glomerular filtration rate (eGFR), which is determined using serum creatinine levels, is another crucial diagnostic technique. To assess aberrant anatomy, a CT scan or kidney biopsy may occasionally be required. Dialysis and kidney transplantation are two possible treatments for kidney failure. When renal function goes below 15%, one or both of these treatments are typically used. Renal cell carcinoma is frequently treated with nephrectomy, which entails removing all or part of the kidney. While nephrology is a medical speciality that deals with conditions that influence kidney function, renal physiology is the study of kidney function. Nephrology covers a wide range of illnesses, including pyelonephritis, acute kidney injury (AKI), nephritic and nephrotic syndromes, chronic kidney disease (CKD), and more. On the other hand, urology focuses on diseases like cancer, renal cysts, kidney and ureteral stones, and urinary system obstructions that are connected to the structure of the kidneys and urinary tract (Cotran et al. 2005).

2.2. Kidney functions

The body's balance depends on the kidneys in several ways. They control fluid balance, electrolyte equilibrium, and other vital elements that maintain the body's internal environment's stability and comfort. The kidneys not only filter waste products like urea and uric acid but also reabsorb essential nutrients like glucose, amino acids, bicarbonate, water, phosphate, chloride ions, sodium, magnesium, and potassium. Additionally, they control the body's amounts of bicarbonate, which aids in maintaining a steady pH level. The lungs and kidneys collaborate to keep the body's pH level balanced, which is essential for the normal operation of enzymes and proteins. The kidneys also secrete hormones that affect erythropoiesis, arterial aneurysms, calcium and phosphate absorption, blood pressure regulation, and salt chloride absorption. For the body to function properly, electrolyte and fluid balance must be kept in a healthy range, and the kidneys are crucial in preserving this balance. (Newman et al. 2021).

2.3. Chronic Kidney Disease (CKD)

The definition of CKD according to the US National Kidney Foundation is a defect in the structure of the kidneys or dysfunction of the kidneys, which is manifested by decreased kidney function or glomerular filtration in the kidneys for a period exceeding three months, as shown in Figure 2.1. According to its severity, the disease is classified into several stages. Often the main parameters are glomerular filtration (GF), proteins in the urine, and the clinical diagnosis of the disease. In addition to the decrease in GF, CKD is often accompanied by other disorders such as hematuria and anemia, primarily caused by erythropoietin deficiency, and the development of pathological changes that occur and depend on the etiology of the kidney pathogen. Glomerular filtration rate (GF) is a very good indicator of kidney damage **(**Taheri-Kharameh et al. 2016).

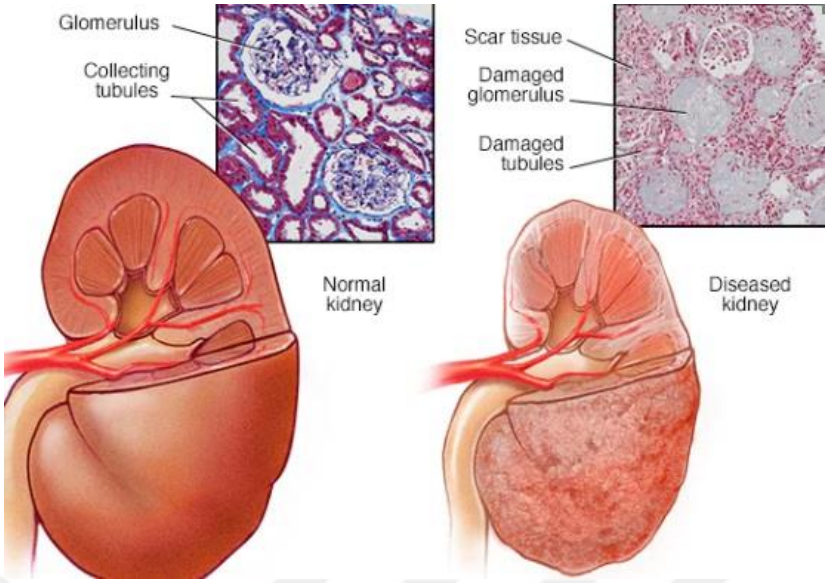

Figure 2.1. Kidney failure and normal kidney (Bentall et al. 2022)

2.4. Stages of kidney disease

CKD is defined by the stages of kidney damage. According to modern guidelines, it is divided into five stages, with the third stage being divided into two parts due to the complexity of the symptoms (Figure 2.2). Residual kidney function, that is, the simplest and most accurate stage of kidney damage, is determined by the glomerular filtration rate. Another important criterion in diagnosing the stage of renal disease is the albumin values, which are expressed in three stages. The presence of albumin in a patient's urine is caused by glomerular vascular disease. Excess urine albumin is a clear early sign of impaired renal function (Bokaie and Enjezabm et al. 2017).

Residual kidney function, that is, the stage of kidney damage, the simplest and most accurate is determined by the glomerular filtration value. Another important criterion in diagnosing the stage of renal disease is the albumin values, which are expressed in three stages. The appearance of albumin in the urine of patients appears as a result when they miss the glomerular vascular disease. Excess urine albumin is a clear early sign of impaired renal function (Bokaie and Enjezabm et al. 2017).

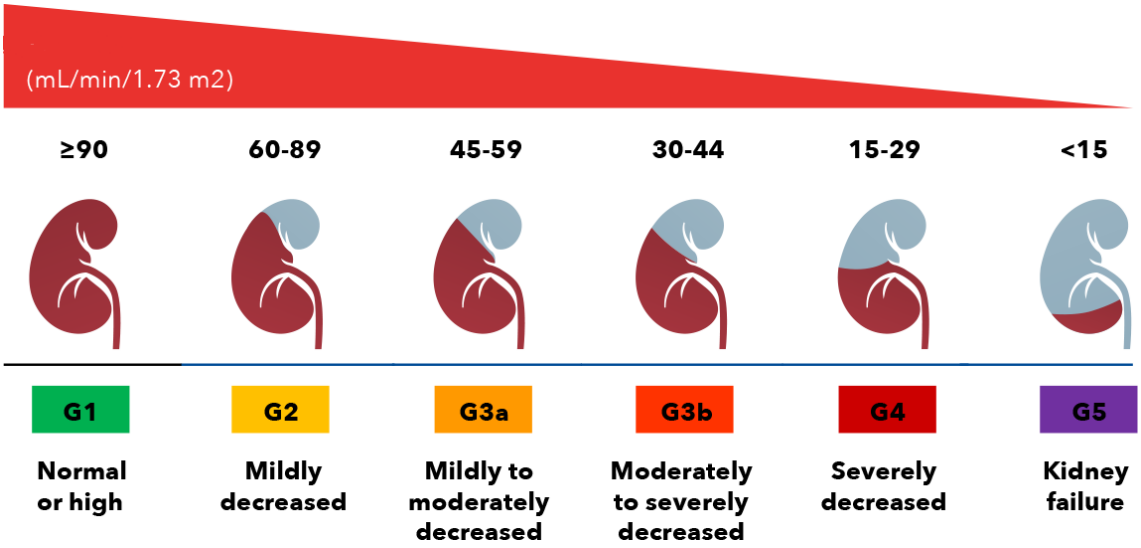

Figure 2.2. Kidney failure stages (Vifor Pharma et al. 2022)

2.4.1. Stage I

CKD stages 1 and 2 are usually discovered by chance, according to lab results and measurements. Stage I CKD is characterized by primary kidney damage (most commonly increased urine albumin or blood in the urine). Renal function remains normal and is maintained (glomerular filtration rate >90 mL/min/1.73 m^2) **(**Taheri-Kharameh et al. 2016). Patients with stages I and II usually control the course of the disease with the assistance of a family medicine specialist (SUM). When these changes in renal filtration occur, it is recommended that treatment includes a nephrologist. A family medicine specialist should perform targeted controls specifically, and the goal is to achieve appropriate blood glucose values as well as blood pressure. An important factor in the work of a family medicine physician is treatment attention to the medication the patient is taking, taking into account the nephrotoxic effect of the drugs taken, especially the uncritical use of a group of non-steroidal antirheumatic drugs. Long-term use of certain cytostatics, such as methotrexate and drugs containing lithium elements, can cause these side effects, an especially risky factor is the use of diagnostic methods that use contrast agents for radiography (Bokaie and Enjezabm et al. 2017).

2.4.2. Stage II

This stage indicates the beginning of a decrease in glomerular filtration rates to values 89-60 ml/min/1.73 m^2. The first and second stages pass without the appearance of physical symptoms to Stage III **(**Taheri-Kharameh et al. 2016).

2.4.2.1. Stage III-A

In the third stage of CKD, nitrogenous substances such as creatinine, urea, and uric acid are retained due to their inability to filter into the patient's blood. The disease at this stage gradually progresses into chronic renal failure. The most apparent changes relate to early metabolic complications such as anemia and disorders of calcium and phosphorous metabolism resulting in metabolic bone disease. The acid-base balance is disturbed. When this happens, it would be prudent to prepare the patient for procedures involving alternative treatment methods. In the case of surgical treatment of hemodialysis, it is possible to establish a vascular approach by creating an arteriovenous fistula (A-B fistula). The implantation of a catheter into the peritoneal cavity is the preferred method of peritoneal dialysis. At this stage, it is recommended that the patient undergo the operation. Clinical preparations for inclusion in the waiting list for kidney transplantation (Ferreira *et al.* 2017).

2.4.2.2. Stage III-B

At this point, depending on the cause of kidney disease, physical symptoms occur. Frequently, symptoms are observed in nocturnal urination (nocturia) resulting in decreased ability urine concentration. Fatigue, lethargy, decreased appetite, and impaired cognitive abilities, are also the initial signs of chronic renal failure (Cukor *et al.* 2008).

2.4.3. Stage IV

At this stage, glomerular filtration is severely reduced (15 - 29 ml/min / 1.73 m^2) (Cukor *et al.* 2008).

2.4.4. Stage V

Patients with glomerular filtration value less than 15 ml/min / 1.73 m^2. Exacerbation of arterial hypertension occurs, and progression increases anemia and acid-base imbalance. There are a number of complications that appear for many organ systems that involve most of the cardiovascular, and then endocrine, diseases, digestive system, and blood. This stage involves terminal kidney failure. The patient's life is in serious danger at this stage and cannot be tolerated without any of the alternative treatment methods mentioned above (Cukor *et al.* 2008).

For an easier visual display, a so-called 'heat map' was formed, which is used to regulate the CKD, and the albumin values that are dangerous to the patient are indicated in color. They are color-coded according to the usual criterion where green represents absence/low risk to patients, while the final degree of red indicates a clear risk that current intervention is required with the availability of modern diagnostic methods in modern medicine, today it is possible to recognize CKD in the early stages and thus try to stop the development of the disease. The treatment mainly focuses on the drastic changes in life habits, where nutrition plays a very important role (reducing foods and targeted diets). Applicable are some kidney-protective drugs that seek to preserve renal function. In this way, attempts are made to slow the course of the disease (Bokaie and Enjezabm et al. 2017).

2.5. Etiology of CKD

At the level of developed countries in the world and the European Union, which includes our country as a general factor (Ferreira *et al*. 2017) CKD weight gain has been reported for weight gain, diabetes, and arterial hypertension. Age, physical inactivity, sedentary lifestyle, smoking, and positive family anamnesis. Kidney diseases are not primarily caused by damage to the renal tissue but are the most common causes of frequent comorbidities present in such patients, of which diabetes mellitus stands out. There are certain diseases or conditions that gradually reduce and damage kidney function (Cukor *et al.* 2008). There are many common causes of CKD as shown in Table 2.1.

Table 2.1. The most common causes of CKD (Bokaie and Enjezabm et al. 2017).

Types
1. Diabetes
2. Arterial hypertension, vascular disease
3. Inflammatory kidney disease - glomerulonephritis
4. Interstitial nephritis
5. Polycystic Kidney Disease
6. Bacterial infections and pyelonephritis
7. Endemic nephropathy
8. Prolonged urinary tract obstruction - prostatic hypertrophy,
9. Kidney stones and some types of cancer

2.6. Symptoms of CKD

The onset of the disease is asymptomatic in most patients. Laboratory measurements routinely performed during systematic screening or random screening of blood tests show elevated urea and creatinine values, which are the first indicators of renal impairment (Cukor *et al.* 2008).

The physiological property of the kidneys is pronounced adaptability, which among other organs is almost the most pronounced.

The kidneys have always been capable of compensatory mechanisms to compensate for their impaired function. The highest degree of renal flexibility impairment is caused by symptoms of the disease only when there is significant impairment of renal function. They appear individually and depend on the patient's comorbidities. Some of the most common symptoms, which occurred in a common number of patients, are:

- Fatigue and lethargy
- Drowsiness
- Loss of appetite
- Nausea
- Vomiting
- Itching all over the skin

- Edema, especially of the lower extremities
- Change in the appearance of the face (dark circles under the eyes)
- Shortness of breath
- Cognitive impairment
- Bad breath
- High blood pressure (Cukor *et al.* 2008).

2.7. Stages of kidney failure

The presence of chronic renal failure, regardless of the diagnosis, should be determined by the extent of kidney damage and the level of renal function (glomerular filtration rate: GFR). Regardless of diagnosis, the stage of disease in patients with CKD should be determined based on the level of renal function established according to the National Kidney Foundation (K/DOQI) CKD renal outcome classification (National Kidney Foundation et al. 2017) as seen in Table 2.2

Table 2.2. Kidney failure Stages and GFR Values (National Kidney foundation et al. 2017).

Category	GFR ml/min/1.73 m^2	Terms
G1	≥90	Normal or higher
G2	60-89	Mildly decreased*
G3a	45-59	Mildly to moderately decreased
G3b	30-44	Moderately to severely decreased
G4	15-29	Severely decreased
G5	<15	Kidney failure

* Relative to young adult level. In the absence of evidence of kidney damage, neither GFR category G1 nor G2 fulfills the criteria for CKD.

2.8. Treatment of chronic renal failure

Treatment of patients with chronic renal failure refers to the development of the main goal in treatment refers to the elimination of the causes that exacerbate kidney function damage. The treatment measures taken are aimed at preventing the development of renal

function deficiencies and creating favorable conditions to support the remaining renal function (Cukor *et al.* 2008).

Treatment depends on the degree of kidney damage and can be carried out in two ways:

a) Medically - kidney protective drugs that protect the kidneys

b) Non-pharmacological methods that primarily include changes in the patient's lifestyle. Changes are implemented to achieve more movement, walking, and exercise in proportion to the possibilities, the introduction of new possibilities of activities into the daily routine, and a change in the diet adapted to the diet intended for people with renal insufficiency (Cukor *et al.* 2008).

2.8.1. Pharmacological methods

This method includes drugs to stimulate erythropoiesis - erythropoietin. The basis of the treatment consists of the use of recombinant human erythropoietin. This type of medicine is considered the biggest advance in the treatment of CKD in recent years. The drug can be used intravenously or subcutaneously (subcutaneously). The usual starting dose of epoetin is 25-50 ig/kg. The dose is repeated two to three times a week. It is used for anemia treatment purposes. American and European guidelines make recommendations for reference to the partial effect of correction of hemoglobin in the blood (anemia), which includes maintaining the value of hemoglobin in the blood in the range of 110-120 g/l. The values of hemoglobin to be achieved depend on other diseases additionally associated with renal failure (Alradaydeh and Khalil et al. 2018)

Clinical trials conducted in the past 10 years brought together the association of hemoglobin values greater than 130 g/L with higher mortality in hemodialysis patients. This is especially true for patients with severely impaired cardiac function and vascular damage. It is recommended to maintain the hemoglobin value up to 120 g/l and not increase it above these values. Moreover, the 2012 KDIGO Guidelines issue a recommendation not to increase the hemoglobin value above 115 g/L, which applies to a large number of patients (Ahmadifaraz *et al.* 2015).

According to the same guidelines, a certain group of patients associated with comorbidities will achieve higher hemoglobin (up to 130 g/L). For iron preparations for treating anemia, many iron preparations are available in the market, including iron-

dextran, iron gluconate, ferro-carboxymaltose, and others. All preparations in their composition contain iron, surrounded by a ring of carbohydrates. A membrane that makes the design suitable for parenteral administration. It needs all iron preparations. It is applied very carefully in the hospital (Cukor *et al.* 2008).

Raising calcium levels by applying vitamin D3 and treating high levels of phosphorous in its blood is another option. Applications include aluminum hydroxide and calcium carbonate. Metabolism Correction Acidosis is resolved by applying bicarbonate (Anjomshoa *et al.* 2014).

- Correction of potassium values.
- The use of drugs that stimulate the function of the heart.
- Antihypertensive drugs - to achieve appropriate blood pressure values. In use are the most common drugs that can act on the renin-inhibiting effect of the angiotensin system.
- Diuretics - drugs that are often required in most patients (Anjomshoa *et al.* 2014).

2.9. The role of the nurse in patient education

One of the most important factors in reducing the progression of CKD and improving the general clinical picture of the patient is proper nutrition. A nurse has a clear role where he must advance based on the individual capabilities of the patient by educating the patient and introducing him to a new diet that includes restrictive foods and liquid foods. It is very important to achieve cooperation with the patient, as this is reflected in the patient's adherence to the instructions given through the nutritional menu. A structured and approved diet plan for patients improves patients' QoL and has a positive impact on the economic costs of the patient's home budget and health system. A nurse uses brochures and tells patients what foods they can and can't eat. It will explain the reason and purpose of restricting the intake of certain foods to the patient. Therefore, nutritional education, assessment of eating habits, and monitoring of nutritional status should be carried out **(**Taheri-Kharameh et al. 2016).

2.10. The nurse's role in educating macronutrient and micronutrient intake

Nutrition is critical in chronic kidney dialysis patients and must be well balanced. Diet can play a significant role in disease development. The nurse gives effective nutritional advice to dialysis patients in order for them to follow the diet and consume the proper amount of calories, protein, sodium, potassium, calcium, phosphorus, and fluids. When a specialised team of nurses forbids certain foods, loss of appetite, and psychosocial factors such as loneliness, depression, and the inability to cook meals can lead to malnutrition in kidney patients, affecting their survival and quality of life (Fresenius Medical Care et al. 2018).in CKD, the most important thing is to educate the patient about the importance of maintaining a steady protein intake. The recommended minimum protein intake in the pre-final stage of CKD is 0.6 - 8.8 g/kg/day, so the nurse's role in this stage is to educate patients about the strict restrictions on protein intake. The patient needs to understand the importance of the reasons for the protein reduction. High dietary protein intake values indirectly work on the basic filtration unit (nephron) in the kidneys. The breakdown of proteins leads to the production of harmful products such as urea, so increased protein intake increases the chance of developing kidney disease (Ferreira et al. 2017).

2.11. The healing process

By the PD method because of the high permeability, the protein loses more and it can also be very high they need compensation. At a later stage, the patient with parkinson's disease(a brain disorder that causes unintended or uncontrollable movements, such as shaking, stiffness, and difficulty with balance and coordination) is recommended to take it protein intake of 1.2 - 1.5 g/kg/day for normal activities which is the minimum entry amount (Taheri-Kharameh et al. 2016).

The recommended protein for the patient is 0.8 g/kg/day. The nurse should warn patients how to do this eating less than recommended increases the risk of malnutrition. (Bokaie and Enjezabm et al. 2017).

Patients around high-value proteins, so that they can identify them (dairy products, eggs, fish fats) that contain phosphorous and should be careful when consuming them. It's necessary for the patient to learn to distinguish high-value proteins and applies them with

caution.yes, in eating habits, provide smaller meals that are spread out throughout the day. The nurse gives general recommendations to patients with CKD about choosing a Mediterranean diet such as the main option. This type of diet adapts to certain stages of disease development which was proven to be the best choice for CKD patients (Ferreira *et al.* 2017).

2.11.1. Carbohydrate and fat intake

According to the guidelines, the total energy intake during the day is based on 50-60% of the intake of carbohydrates (Ferreira *et al.* 2017).

2.11.2. Fluid intake

Excessive sodium intake in the diet increases the need for fluid intake. The patient's feeling of thirst increases during the day, which leads to edema and high blood pressure **(**Bokaie and Enjezabm et al. 2017).

2.11.3. Potassium intake

The patient should be educated to slightly reduce their daily potassium intake to 4000 mg (100 mmol) (Ferreira *et al.* 2017).

2.11.4. Phosphorus intake

Higher levels of phosphorous found in CKD can negatively affect the performance of the heart and the locomotor system and the occurrence of skin ulcers, so the patient needs to be advised to restrict foods containing phosphorous. Therefore, it is administered to the patient with meals, if necessary. Because phosphorous is not necessarily included in the nutritional table for a particular product, it is advised to additionally look at the table on the product to monitor its components, as the phosphorous value will be displayed (Bokaie and Enjezabm et al. 2017).

2.12. Definition of peritoneal dialysis (PD)

The peritoneal lining of the abdomen is used to filter the blood inside the body during peritoneal dialysis (PD), a therapy for kidney failure. A few weeks before starting PD, a surgeon inserts a soft tube called a catheter into the abdomen. A dialysis solution comprising salt and other additions passes through the catheter and into the abdomen during the procedure. While it is still inside the abdomen, the solution collects waste and extra fluid from the body. After the procedure, the bag is drained, and the catheter is protected with a cap so that people can resume their normal daily activities without being hindered. (National Institute of Diabetes and Digestive and Kidney Diseases et al. 2023).

2.13. Hemodialysis therapy (HD)

A patient may get hemodialysis therapy (HD) in an outpatient or inpatient environment. Patients often receive their hemodialysis treatment in a specific location, which could be a hospital or a separate clinic. Another option is for certain individuals to have hemodialysis at the convenience of their own home. While professional staff, like as nurses and technicians, oversee treatments in a clinical setting, patients who choose home hemodialysis can administer their own treatments or receive support from a trained caregiver, frequently a family member (National Kidney and Urologic Diseases Information Clearinghouse 2007).

2.14. Interventions and patient care

In a hospital dialysis unit, a specialized clinic, or a doctor's office, dialysis nurses are typically employed. Their main duty is to administer dialysis to people who have kidney disease or renal failure and need fluid infusions to mimic kidney function (Ferreira *et al.* 2017). Hemodialysis machines are operated by dialysis nurses. These devices take the patient's blood, clean it, and then give it back. They are also in charge of keeping an eye on vital signs, going over treatment plans with patients, determining how well treatments are working, and making sure the workplace is clean (Bokaie and Enjezabm 2017).

2.15. Defining the QoL

The World Health Organization defines quality of life (QoL) as a person's evaluation of their situation in life taking into account their culture and value systems, objectives, expectations, standards, and concerns (WHO 2022). Wealth, employment, physical and mental health, education, leisure activities, social interactions, religious views, safety, security, and freedom are all considered to be standard indices of QoL (Gregory *et al*. 2009). The evaluation of QoL can be used in a range of settings, such as international development, healthcare, politics, and employment. A special QoL metric called health-related quality of life (HRQoL) takes into account how a person's overall wellbeing is impacted by their health status (Bottomley et al. 2002).

3. MATERIAL AND METHOD

3.1. Type of study

This is a cross-sectional descriptive study**.**

3.2. Place and time of the research

Between April 15, 2022, and October 10, 2022, the research was conducted in Diyala City Hospitals, namely Baquba Teaching Hospital and Balad Rose General Hospital.

3.3. Research sample

Despite the desire for access to the entire population sample, statistical sample calculations for study reliability were performed using G. Power analysis. The total number of kidney patients in Diyala city was 300(according to the lists of patients present in the dialysis centers during the sample collection period), and the sample size was determined at 169 based on a 95% confidence interval and a 50% response rate.

- **Inclusion criteria**

- Dialysis patients in Diyala city.
- Agree to participate in the study.
- All participants must be between 18- 60 years old.
- All participants are of Arab nationality.
- All participants who does not have any changes in the level of consciousness.

- **Exclusion criteria**

- Participants with hearing or cognitive impairments was excluded.
- Participants who did not fill out the questionnaires was excluded from the study.

3.4. Data collection tools

The personal information form was used to determine the socio-demographic characteristics of kidney patients in Diyala City hospitals, such as patient's age, gender, educational level, work status, and marital status, suffering from fluid buildup, suffering from fluid buildup in the lungs, which leads to chest pain, suffering from muscle weakness due to an imbalance of fluids and electrolytes in the body - the body chemistry- and have questions about comorbidities, dialysis treatment, and diet.

3.4.1. Kidney Disease Quality of Life Short-Form (KDQOL-SF)

The KDQoL-SF model was used to assess the quality of life (QoL) of renal patients. The English version of KDQoL-SF, developed by Hays et al. in 1997 in the USA, was translated into multiple languages including Spanish, Italian, German, Japanese, French, Chinese, Dutch, and Turkish. The Arabic version, developed by El Wakil et al, was used for patients aged 18-60 years (El Wakil et al. 2012). This measure allows patients to self-report on their treatment effects and well-being, and is commonly used to monitor end-stage kidney disease (EKD) patients. The criterion for adequate internal consistency reliability in the Arabic version is a Cronbach's α value of 0.70 or higher, and in this study, the Cronbach's α value was 0.684. The scale consists of 36 items organized into 5 sub-dimensions: physical quality of life (PQoL) assessed by the first 12 items (High: less than 19.92, moderate: 20 to 27.84, low: 28-36), mental quality of life (MQoL) assessed by items 13-16 (High: less than 6.64, moderate: 6.64 to 9.28, low: more than 9.28 to 12), burden of kidney disease (BKD) assessed by items 17-27 (High: less than 16.6, moderate: 16.6.3 to 23.2, low: more than 23.2 to 30), problems of kidney disease (PKD) assessed by items 28a and 28b (High: less than 3.32, moderate: 3.32 to 4.64, low: more than 4.64 to 6), and effects of kidney disease (EKD) assessed by items 29-36 (High: less than 11.62, moderate: 11.62 to 16.24, low: more than 16.24 to 21). The scores on the Kidney Disease Short-Form Life Scale (KDQoL-SF) are based on the total of 36 items, with higher scores indicating poorer health-related quality of life. The scores are calculated by multiplying the number of items in the tool (36) by the Likert scale (3) for high, moderate, and low,

with a unified result of three for all questionnaires. Lower scores on the KDQoL-SF indicate better health-related quality of life, as reported by Elamin et al. in 2019.

3.5. The variables

- The dependent variable is KDQoL-SF.
- Independent variables: age, gender, and social economic level.

3.6. Statistical Analysis

The data obtained from the research was analyzed using the IBM SPSS(Statistical Package for the Social Sciences) Statistics 26.0 software package (SPSS Inc, Chicago, IL, USA). Descriptive values were expressed in numbers, percentages, mean, standard deviation, minimum and maximum. The level of statistical significance would be up>0.05.

Anova analysis of variance is a statistical method that basically is used to analyze the variance of the variables as a kind of random kind of variable in addition to being continuous in a subtle way. It is usually measured under a number of conditions that specifically are specific, through definitely many factors that basically are separate, specifically the most classification variables, which essentially is fairly significant, which specifically is characterized as often present with nominal levels as it is often. This analysis is used for a pretty much more accurate test for equality between a large number of comparisons called post hook a large number of means and through a number by comparing the variance between groups for to the kind of so-called variance within groups (random error) in a big way (Larson et al. 2008).

The T-test is a type of test that is used statistically to compare the number of two groups in addition to the two types of inference used by the statistician, including parametric methods or nonparametric methods. Parametric methods refer to a statistical technique in which one determines the probability distribution of a study sample and makes conclusions about several distribution parameters. In certain cases in which it is not possible to determine the probability distribution, non-parametric methods are used. T-tests are a type of parametric method, They can be used when samples meet the conditions

of normality, equal variance, and independence. In addition, it is possible to divide T-tests into two types. There is the independent t-test, which can be used when the two groups being compared are independent of each other, and the paired t-test, which can be used when the two groups being compared are dependent on each other (Kim et al. 2015). It is a method that scientists named the statistical method that is used in the case of inequality in the Bonferroni study sample. An extension of the method has also been proposed for confidence intervals by the scientist Olive Jane Dunn. The statistical hypothesis test also depends on rejecting the null hypothesis if the probability of the observed data under the null hypothesis is low (Mittelhammer *et al.* 2000).

3.7. The ethical dimension

On April 13, 2022, ethical approval was obtained from the Iraqi Ministry of Health, Bagdad Health Directorate, where the researcher provided a detailed description that includes the purpose and methodology of the study to obtain official permission, it was submitted to the Bagdad Health Directorate, whose approval facilitated the matter (Appendix 2). For hospitalization, participants were orally informed of the aims of the study and asked to participate voluntarily, with the assurance of non-disclosure. To ensure the confidentiality of the participants, no names were written during data collection and reporting. They were also informed that they could refuse to answer a specific question or withdraw from the study at any time without any penalty.

4. RESULTS

This chapter presents the finding of the data analysis in tables and their correspondence with the objectives of the study as shown below:

Table 4.1. Distribution of the socio-demographic data regarding patients with renal failure in hospital dialysis centers in Diyala / Iraq

Demographic data	Valid	Frequency (n)	Percent (%)
Age	Under 45 years	48	28.4
	45 to 53 years	36	21.3
	54 to 60 years	85	50.3
	Total	169	100.0
Gender	Male	108	63.9
	Female	61	36.1
	Total	169	100.0
Marital status	Single	71	42.0
	Married	98	58.0
	Total	169	100.0
Education level	Primary school or below	72	42.6
	High school	58	34.3
	Bachelors and Masters/PhD	39	23.1
	Total	169	100.0
Financial status	Low Income	89	52.7
	Moderate Income	71	42.0
	High Income	9	5.3
	Total	169	100.0
Resident	Urban	100	59.2
	Rural	69	40.8
	Total	169	100.0

The results revealed that the mean age of patients with renal failure was 47.7 ± 18 years, with the majority (50.3%) falling in the age group of 54 to 60 years. In terms of gender, the majority of patients with renal failure were male (63.9%). Furthermore, a large proportion of the patients were married (58%), had low education levels (primary and below: 42.6%), low income (52.7%), and resided in urban areas (59.2%).

Table 4.2. Distribution of medical information data regarding patients with renal failure in hospital dialysis centers in Diyala / Iraq

Information about disease	Valid	Frequency (n)	Percent (%)
Smoking	Yes	69	40.8
	No	100	59.2
	Total	169	100.0
Alcohol	Yes	20	11.8
	No	149	88.2
	Total	169	100.0
Suffering from fluid buildup	Yes	151	89.3
	No	18	10.7
	Total	169	100.0
Fluid buildup in the lungs and chest pain	Yes	155	91.7
	No	14	8.3
	Total	169	100.0
Suffering from muscle weakness due to an imbalance of fluids and electrolytes in the body	Yes	152	89.9
	No	17	10.1
	Total	169	100.0
Duration of Hemodialysis weekly	2 times	29	17.2
	3 times	100	59.2
	4 times	40	23.7
	Total	169	100.0
Mean= 3 times of hemodıalysıs weekly			
Duration of Hemodialysis hours	2 hours	33	19.5
	3 hours	99	58.6
	4 hours	37	21.9
	Total	169	100.0
Mean=3 hours per each haemodialysis			
The effect of your fluid buildup in the daily life	Yes	168	99.4
	No	1	0.6
	Total	169	100.0
The effect of your fluid buildup on walking	Yes	163	96.4
	No	6	3.6
	Total	169	100.0
Feel helpless because of your fluid buildup	Yes	160	94.7
	No	9	5.3
	Total	169	100.0
Is diet a major factor in managing kidney disorders?	Yes	120	71.0
	No	49	29.0
	Total	169	100.0
Hepatitis C Virus (HCV)	Negative	141	83.4
	Positive	28	16.6
	Total	169	100.0
Hepatitis B Virus (BsAg)	Negative	157	92.9
	Positive	12	7.1
	Total	169	100.0

The results revealed that the majority of patients with renal failure were nonsmokers (59.2%) and did not consume alcohol (88.2%). Most patients experienced fluid buildup (89.3%), with the highest occurrence in the lungs and chest leading to chest pain (91.7%). Weakness was a common symptom among the patients (89.9%). The mean frequency of hemodialysis per week was 3 times, with each session lasting for 3 hours. The study also found that renal failure had a significant impact on daily life (99.4%), including walking ability (96.4%), and feelings of helplessness (71.0%) due to fluid buildup. Moreover, the majority of patients (71%) had received information on managing kidney disorder through diet. The prevalence of negative hepatitis C (83.4%) and hepatitis B (92.9%) virus was also high among patients with renal failure.

Table 4.3. Distribution of the dimension of the quality of life regarding patients with renal failure in hospital dialysis centers in Diyala / Iraq

0	**Evaluation**	**Frequency (n)**	**Percent (%)**	**KDQOL-SF Mean±SD**
Physical quality of life (PQOL)	High	58	34.3	25.28± 10.12
	Moderate	41	24.3	
	Low	70	41.4	
	Total	169	100.0	
High: less than 19.92, moderate: 20 to 27.84 , low: 28-36				
Mental quality of life (MQoL)	High	81	47.9	7.79±3.26
	Moderate	29	17.2	
	Low	59	34.9	
	Total	169	100.0	
High: less than 6.64, moderate: 6.64 to 9.28 , low: more than 9.28 to 12				
Problems of kidney disease (PKD)	High	69	40.8	3.88± 1.6
	Moderate	40	23.7	
	Low	60	35.5	
	Total	169	100.0	
High: less than 3.32, moderate: 3.32 to 4.64 , low: more than 4.64 to 6				
Burden of kidney disease (BKD)	High	93	55.0	19.52 ± 8.54
	Moderate	12	7.1	
	Low	64	37.9	
	Total	169	100.0	
High: less than 16.6, moderate: 16.6.3 to 23.2 , low: more than 23.2 to 30				
Effect of kidney disease (EKD)	High	80	47.3	13.07± 5.22
	Moderate	34	20.1	
	Low	55	32.5	
	Total	169	100.0	
High: less than 11.62, moderate: 11.62 to 16.24, low: more than 16.24 to 21				
The Kidney Disease Quality of Life Short-	High	77	45.6	67.62 ± 27.52
	Moderate	30	17.8	
	Low	62	36.7	
	Total	169	100	

Form (KDQoL-SF) model				
High: less than 58.1, moderate: 58.1 to 81.2, low: more than 81.2 to 108				

The results of our study revealed that patients with renal failure experienced different aspects of quality of life. Specifically, 41.4% reported low physical quality of life, while 47.9% reported high mental quality of life. Additionally, 40.8% reported high problems related to kidney disease, 55.0% reported a high burden of kidney disease, and 47.3% reported a high effect of kidney disease on their daily life. Overall, 45.6% of patients reported a high total quality of life with kidney disease.

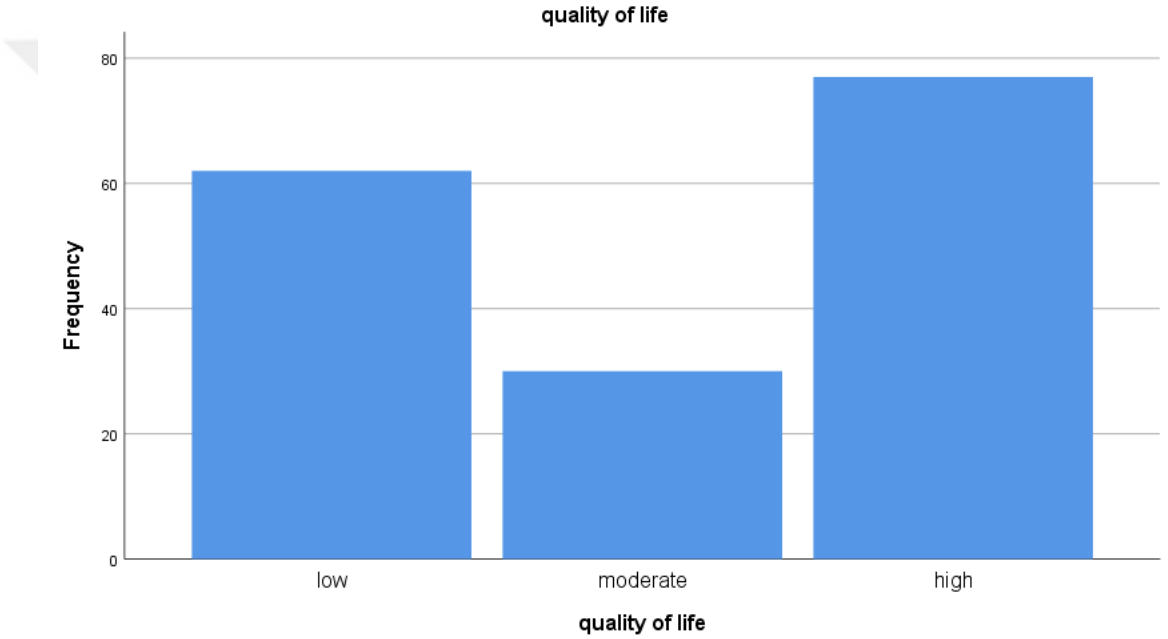

Figure 4.1. Distribution of the quality of life regarding patients with renal failure in hospital dialysis centers in Diyala / Iraq

The results of our study revealed that the quality of life among patients with renal failure in hospital dialysis centers in Diyala, Iraq was similar across different categories. Specifically, 45.6% of patients reported a high quality of life, while 17.8% reported a moderate quality of life, and 36.7% reported a low quality of life.

Table 4.4. The difference between some demographic data and the quality of life regarding patients with renal failure in hospital dialysis centers in Diyala / Iraq

Age	N	KDQOL-SF Mean±SD	F	P0	P1	P2	P3
Under 45 years	48	36.75±4.90	403.97	**<0.001**	**0.002**	**<0.001**	**<0.001**
45 to 53 years	36	51±6.63					
54 to 60 years	85	91.87±15.28					
Total	169	67.62±27.52					
Patient education level							
Primary school or below	72	40.43±7.09	613.40	**<0.001**	**<0.001**	**<0.001**	**<0.001**
High-school	58	76.37±14.39					
Bachelors and Masters/PhD	39	104.82±2.74					
Total	169	67.62±27.52					
Economic status							
Low Income	89	44.16±10.05	**376.7**	**<0.001**	**<0.001**	**<0.001**	0.658
Moderate Income	71	92.09±13.76					
High Income	9	106.55±0.72					
Total	169	67.62±27.52					
Duration of Hemodialysis weekly							
2 times	29	35.00± .00	**190.268**	**<0.001**	**<0.001**	**<0.001**	**<0.001**
3 times	100	62.27±19.68					
4 times	40	104.67±2.85					
Total	169	67.62±27.52					
Duration of Hemodialysis hours							
2 hours	33	35.03±0.17	**86.318**	**<0.001**	**<0.001**	**<0.001**	**<0.001**
3 hours	99	64.47±19.94					
4 hours	37	105.13±2.43					
Total	169	67.62±27.52					

Abbreviations: KDQOL-SF: The Kidney Disease Quality of Life Scale Short Form
Mean KDQOL-SF (High: less than 58.1, moderate: 58.1 to 81.2, low: more than 81.2 to 108)
F: distribution, p-value*:* significant at 0.05 n: Number, SD: standard deviation, [b]One way ANOVA, p1: posthoc test (Bonferroni correction) for pairwise comparison of the first and second groups, p2: posthoc test (Bonferroni correction) for pairwise comparison of the first and third groups, p3: posthoc test (Bonferroni correction) for pairwise comparison of the second and third groups.

Based on our findings, it was evident that individuals aged 54-60 had a significantly lower quality of life compared to those in the age groups 45-53 ($p<0.001$) and below 45 years old ($p<0.001$). Furthermore, patients with bachelor/PhD education exhibited a lower quality of life compared to those with high school ($p<0.001$) and primary school education ($p<0.001$). There was no significant difference in quality of life between high

and moderate-income patients (p=0.658), while both high (p<0.001) and moderate (p<0.001) income patients had a lower quality of life compared to low-income participants (p<0.001). Moreover, patients who underwent hemodialysis four times a week had a lower quality of life compared to those who underwent dialysis two times (p<0.001) or three times a week (p<0.001), based on the comparison of quality of life values according to the weekly hemodialysis durations. Similarly, patients who underwent hemodialysis for four hours had a lower quality of life compared to those who underwent dialysis for two hours (p<0.001) or three hours (p<0.001), based on the comparison of quality of life values according to the duration of hemodialysis hours.

Table 4.5. The difference between some demographic data and the quality of life regarding patients with renal failure in hospital dialysis centers in Diyala / Iraq

Demographic data	Valid	N	Mean KDQOL-SF	S. D	F	P-value
Gender	Male	108	49.12	14.35	405.230	**<0.001**
	Female	61	100.37	6.91		
Marital status	Single	71	40.19	6.85	266.917	**<0.001**
	Married	98	87.50	18.13		
Resident	Urban	100	46.75	12.05	243.568	**<0.001**
	Rural	69	97.88	9.52		

Abbreviations: KDQOL-SF: The Kidney Disease Quality of Life Scale – Short Form Mean KDQOL-SF (High: less than 58.1, moderate: 58.1 to 81.2, low: more than 81.2 to 108), F: distribution, p-value: probably, N: Number, SD: Standard deviation, significant at 0.05 independed samples t-test

The results revealed a significant difference in the quality of life based on gender ($p < 0.001$), with females reporting a lower quality of life compared to males ($p < 0.001$). Additionally, there was a significant difference in the quality of life based on marital status ($p < 0.001$), with married individuals reporting a lower quality of life compared to singles ($p < 0.001$). Furthermore, a significant difference in the quality of life was observed based on residence ($p < 0.001$), with rural patients reporting a lower quality of life compared to urban patients ($p < 0.001$).

5. DISCUSSION

The results of our study offer significant new information about the demographics of patients with renal failure. The patients' average age was 47.7 18 years, and more than half (50.3%) of them were in the 54–60 age range, suggesting that middle-aged and older people may get renal failure more frequently. This is in line with earlier studies that indicated an age-related increase in the risk of renal failure (Kaballo et al. 2007, Coca et al. 2010). Furthermore, our findings showed a large gender gap, with more male patients (63.9%) than female patients. This emphasizes the need for additional research into potential gender-specific renal failure risk factors and treatment options.

Our study revealed that a significant majority of patients with renal failure were married (58%), regardless of their marital status. This discovery might have effects on the social and mental health of renal failure patients as well as prospective caring obligations for their spouses. In addition, a sizeable percentage of patients (52.7%) and had low incomes (primary and below: 42.6%). This highlights the need for focused interventions to address health inequities in vulnerable communities and raises the possibility that socioeconomic status may influence the development and management of renal failure. Furthermore, our findings showed that the majority of renal failure patients (59.2%) lived in metropolitan regions. This conclusion underscores the significance of public health initiatives to address these risk factors in urban settings and may be related to the increased incidence of renal risk factors, such as diabetes and hypertension, in urban populations. Overall, this study offers important data on the demographics of renal failure patients that can help to better understand the disease burden and guide focused therapies to enhance patient outcomes (Yin et al. 2020).

The results of our study are consistent with previously published research on the clinical effects and effects of renal failure on patients' quality of life. According to our findings, a sizable majority of renal failure patients (59.2%) and nondrinkers (88.2%) did not smoke or drink. These results support earlier study that identified drinking alcohol and smoking as modifiable risk factors for renal failure, emphasizing the significance of lifestyle changes in the prevention and treatment of renal failure (Schrauben et al. 2022).

The high incidence of fluid buildup (89.3%) among our patients, with chest pain being the most often experienced symptom (91.7%), is in line with the well-established link between fluid imbalances and renal failure (Farha et al. 2020, Jabbar et al. 2021). This emphasizes the requirement for careful fluid status monitoring and treatment in patients with renal failure in order to avoid consequences including pulmonary edema and chest discomfort. The prevalence of weakness among our patients (89.9%) is also corroborated by earlier literature, which identified weariness and muscle weakness as common signs of renal failure (Caravaca et al. 2016). Anemia, electrolyte abnormalities, and decreased physical activity all of which are frequently observed in individuals with renal failure can be responsible for this (Johansen et al. 2012).

Our research also showed that hemodialysis, with a mean frequency of three times per week for three hours per session, was the most popular kind of renal replacement therapy. This is in keeping with the generally accepted recommendations for hemodialysis in patients with renal failure, which ensure appropriate waste product clearance and fluid balance (Ashby et al. 2019). It is consistent with earlier research that has highlighted the physical, emotional, and social challenges faced by patients with renal failure that the significant impact of renal failure on patients' daily life (99.4%), including walking ability (96.4%) and feelings of helplessness (71.0%) due to fluid buildup, is present. This emphasizes the necessity for all-encompassing care, which includes psychological and social assistance to meet the requirements of patients with renal failure holistically. The prevalence of patient education on treating kidney disorders through food (71%) further highlights the significance of patient education in the management of renal failure. Diet is a key component of managing renal failure, and educating patients on dietary requirements and adjustments can help them take an active role in their own care and have better results (Palmer et al. 2017). Finally, the significant incidence of negative hepatitis C virus (83.4%) and hepatitis B virus (92.9%) among our patients is consistent with the elevated risk of viral infections in patients with renal failure, particularly those on hemodialysis (Chandra et al. 2004). This demonstrates the need of using the right screening, immunization, and infection control techniques while managing patients with renal failure in order to avoid future complications. In conclusion, the results of our study are consistent with previous research and offer important new knowledge on the clinical

symptoms, impact on everyday life, and treatment of individuals with renal failure. These discoveries can advance our knowledge of the condition and guide the development of evidence-based strategies for the treatment of renal failure that will lead to better patient outcomes. To address the complicated multifactorial nature of renal failure and enhance the standard of treatment for people with this condition, more research and focused interventions are required.

The results of our study show the various facets of quality of life that renal failure patients at hospital dialysis clinics in Diyala, Iraq, experience. The findings show that patients struggle with their physical health, with 41.4% of patients experiencing a poor quality of life in this area. However, it is remarkable that a sizable majority of patients (47.9%) reported having a great mental quality of life, which may indicate that patients are still able to retain a positive mental well-being despite having physical restrictions. Furthermore, a sizeable percentage of patients (55.0%) and those who experienced problems as a result of their kidney disease (40.8%) reported having a high burden of the disease, demonstrating the enormous impact renal failure has on patients' quality of life. This emphasizes the complex nature of renal failure, which impacts patients' emotional and social well-being in addition to their physical health (Li et al. 2021). Furthermore, a substantial proportion of patients (47.3%) who said that kidney illness had a significant influence on their everyday lives implies that renal failure has a profound effect on patients' routines and daily activities. However, despite these difficulties, 45.6% of patients with kidney disease reported having a high overall quality of life. This finding suggests that some people can adjust and retain a generally satisfactory quality of life despite the difficulties brought on by renal failure. These results are in line with earlier research on the quality of life of renal failure patients, which has demonstrated that renal failure can have a multifaceted impact on a variety of patient life elements, including physical, mental, emotional, and social well-being (Dąbrowska-Bender et al. 2018). The results of our study add to the body of knowledge and highlight the significance of addressing the various requirements and difficulties that patients with renal failure encounter in order to enhance their overall quality of life. To maximize their general wellbeing and health outcomes, additional study and interventions targeting these specific

facets of quality of life in individuals with renal failure may be necessary. (Lim et al. 2023).

Our research found numerous noteworthy correlations between the quality of life of patients with renal failure and demographic and treatment-related characteristics. In particular, people in the 54–60 age range demonstrated lower quality of life than people in the 45–53 and under 45 age ranges, which is consistent with earlier studies that have showed age-related reductions in quality of life in patients with chronic conditions such renal failure (Mallappallil et al. 2014). This could be explained by the heavier weight of comorbidities and functional restrictions that frequently come with getting older, which can affect a variety of quality of life factors (Sharma et al. 2021). Additionally, compared to patients with lower educational backgrounds (high school and primary school), individuals with higher education levels (bachelor/PhD) reported a lower quality of life. Contrary to earlier research, this data indicates that patients with chronic conditions had better quality of life regardless of their education level (Megari et al. 2013, Ayele et al. 2022). It is crucial to remember that there might be many different cultural, societal, and economic elements that have an impact on the relationship between education and quality of life. (Braveman and Gottlieb 2014**).**

Both high and moderate-income patients had a lower quality of life than low-income participants, but there was no discernible difference in quality of life between high and moderate-income patients. As a result, it appears that income level may be a key factor in determining the quality of life for patients with renal failure. Patients with lower incomes may face more difficulties in accessing healthcare services, complying with treatment plans, and managing the financial burden of managing chronic diseases (Floria et al. 2022). Additionally, it was discovered that the frequency and length of hemodialysis sessions were related to quality of life. In comparison to patients who received hemodialysis two or three times per week, or for two or three hours each session, patients who underwent hemodialysis four times per week or for four hours each session reported a decreased quality of life. These results are in line with earlier studies that have demonstrated how hemodialysis treatment frequency and duration might affect patients' physical, mental, and social well-being, potentially resulting in a lower quality of life

(Sathvik et al. 2008, Mollaoglu et al. 2006). The limitations of our study, such as the cross-sectional design, potential confounding variables, and generalizability to other groups, should be taken into account when interpreting our results. However, our findings emphasize the need for tailored interventions that address the particular needs and difficulties faced by various patient subgroups in order to maximize their overall wellbeing and quality of life. These interventions must take into account demographic and treatment-related factors when assessing quality of life in patients with renal failure (Lerma et al. 2021).

Our research found that among patients with renal failure, quality of life was significantly influenced by gender, marital status, and place of residence. In line with earlier studies that have revealed gender differences in patients with chronic diseases, including renal failure, females reported a lower quality of life compared to males (Hockham et al. 2022, García et al. 2022, Tong et al. 2021).. This may be due to a number of variables, including gender-specific social duties, caregiving obligations, and hormonal implications on health outcomes, which may have different effects on women's physical, emotional, and social well-being than they do on men (Vlassoff C et al. 2007). Additionally, it was discovered that marital status was related to life quality, with married people rating their quality of life as being lower than unmarried people. This result contrasts with findings from some earlier studies that indicated married people had a higher quality of life than singles in the overall population (Purba et al.2021, Han et al. 2014). However, the caring obligations, financial burdens, and emotional difficulties connected with managing a chronic illness may potentially have a different influence on the quality of life of married people in the context of renal failure, possibly explaining the observed disparities (Alshammari et al. 2021). Additionally, it was discovered that domicile was related to quality of life, with rural patients having a lower level of quality of life than urban patients. This result is in line with earlier studies that have demonstrated that rural inhabitants experience particular barriers to receiving healthcare services, particularly specialist care like hemodialysis, which may have an impact on their general quality of life (Golembiewski et al. 2022, Coombs et al. 2022). Rural patients may experience logistical, financial, and geographic impediments to timely and effective healthcare, which could explain why they report a lower quality of life than their urban counterparts (Graves et al. 2022).

The limitations of our study, such as the cross-sectional design, potential confounding variables, and generalizability to other groups, should be taken into account when interpreting our results. Nevertheless, the significance of taking into account gender, marital status, and place of living as possible variables influencing quality of life in patients with renal failure is highlighted by our findings. These results highlight the need for thorough evaluations that consider a variety of contextual and demographic aspects in order to better understand and address the specific requirements and problems experienced by distinct patient subgroups in order to improve their general wellbeing and quality of life (Graves et al. 2022).

6. CONCLUSION AND RECOMMENDATIONS

6.1. Conclusion

The quality of life among patients with renal failure was found to be significantly correlated with a number of demographic and treatment-related characteristics, according to the study's conclusion. Our findings emphasize the significance of taking into account characteristics such as age, education level, income, frequency and length of hemodialysis sessions, gender, marital status, and place of living as potential influences on this population's quality of life. These findings add to the expanding body of research on the multidimensional character of quality of life in renal failure patients and highlight the need for customized therapies that cater to the particular requirements and difficulties that various patient subgroups encounter. In order to improve the general wellbeing and quality of life of patients with renal failure, our study also highlights the significance of taking into account potential discrepancies in quality of life based on demographic and contextual factors in clinical practice and policy-making. However, it is critical to recognize the limits of our study, such as its cross-sectional design and potential confounding variables, and that additional research is required to expand on and validate our findings across a variety of groups. In conclusion, our study contributes to our understanding of the complex relationship between demographic and treatment-related factors and quality of life in patients with renal failure and has implications for clinical practice and policy interventions aimed at enhancing the outcomes and wellbeing of this at-risk patient population.

6.2. Recommendations

According to our findings, a number of demographic and treatment-related characteristics were connected to patients' quality of life who had renal failure. Age, education, income, gender, marital status, and place of residence are some of these variables. More specifically, a lower quality of life was linked to older age, higher education level, lower income, female gender, married status, and living in a rural area. These findings emphasize the necessity for customized therapies that take into consideration the

particular requirements and difficulties that various patient subgroups encounter. When determining and treating the quality of life of patients with renal failure, healthcare professionals should take these elements into account. Implementing measures to deal with comorbidities, functional restrictions, social roles, caregiving duties, financial constraints, and healthcare access hurdles may be necessary to achieve this. The complicated and multifaceted nature of the relationship between education and quality of life should also be explored in further research and interventions, as well as the effects of domicile on healthcare access and quality of life in patients with renal failure. By taking these variables into account, medical professionals can improve the general health and quality of life of patients with renal failure, which will result in better patient outcomes and higher standards of care.

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APPENDICES

APPENDIX 1. Questionnaire

APPENDIX 2. Ethics committee in Iraq approval

APPENDIX 3. Editing Certificate

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