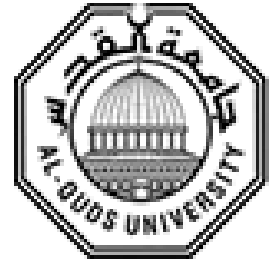**Al-Quds University**

Deanship of Graduate Studies

Living with Medicines and its Impact on Quality of Life in Dialysis Patients in West Bank, Palestine.

Reem Hasan Abdel Majeed Natsheh.

M.Sc. Thesis

Jerusalem - Palestine.

1445/ 2023

Living with Medicines and its Impact on Quality of Life in Hemodialysis Patients in West Bank, Palestine.

Prepared by:

Reem Hasan Abdel Majeed Natsheh.

B.Sc. Pharmacy, Hebron University, Palestine.

Supervised by: Maher Khdour, Ph.D.

This thesis is submitted in partial fulfillment to requirements for the degree of Master of Pharmaceutical Science in the Faculty of Pharmacy, Al-Quds University.

1445/2023

Al-Quds University

Deanship of Graduate Studies

Pharmaceutical Sciences Program

Thesis Approval

Living with Medicines and its Impact on Quality of Life in Hemodialysis Patients in West Bank, Palestine.

Prepared by: Reem Hasan Abdel Majeed Natsheh.
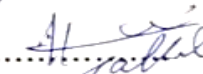
Registration No: 22011920.

Supervisor: Prof. Maher Khdour.

Master thesis submitted and accepted, Date: 19/8/2023.

The name and signatures of the examining committee member are as follows:

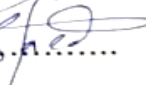1. Head of committee: Prof. Maher Khdour   Signature: ....

2. Internal examiner: Dr. Hussein Hallak   Signature: ....

3. External examiner: Prof. Sa'ed H. Zyoud   Signature: ....
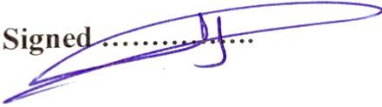

Jerusalem, Palestine

1445/2023

Dedication:

I dedicate my master's thesis to my recently deceased father, who has always been my pillar of support and strength. To my beloved mother for her endless motivation, she was there for me all the time. To my life partner, Omar, the source of encouragement and love. To my darling son, Zaid. To my brothers and sisters for their backing and advice.

Declaration

I certify that this thesis is submitted to the degree of Master, is the result of my own research, except where otherwise acknowledged, and that this study (or any part of the same) has not been submitted for a higher degree to any other university or institution.

Signed ....

Reem Hasan Abdel Majeed Natsheh.

Date: 23/8/2023

ACKNOWLEDGEMENT

First and foremost, I want to offer my sincere thanks to Allah the Almighty for His blessings bestowed upon me during my studies and in completing this master's thesis. A special thanks to my supervisor, Prof. Maher Khdour. I value the insights and guidance you provide, and I sincerely appreciate your assistance.

I wish to express my gratitude to all of the patient's receiving hemodialysis who participated in the study. You are really the strongest, and I will never forget your cooperation and beautiful smiles. I hope that my research will be a reason for improving your quality of life.

I also would like to express my special thanks to my family and friends, who encourage me all the time. To anyone who ever taught me even a single word. To my lovely parents, I appreciate all of the sacrifices that they have made for me. To my dear husband, Omar, for your love, affection, and care. Finally, to my lovely son Zaid, thank you for every bright little smile you gave me.

Abstract

Background: End-stage renal disease (ESRD) is the final stage of chronic kidney disease (CKD), characterized by an irreversible loss of kidney function. Globally, the prevalence of ESRD is increasing, resulting in a significant economic and health burden for patients and the health system. This study aims to investigate the impact of medication burden and adherence on health-related quality of life (HR-QOL) for patients who received hemodialysis in the West Bank, Palestine.

Methods: A cross-sectional study was conducted to assess HR-QOL through the KDQOL-36TM questionnaire, medication-related burden through the LMQ-3 scale, and medication adherence using the ARMS questionnaire in 120 hemodialysis (HD) patients. The sample was recruited from two dialysis units at the Ministry of Health Hospital (the Palestinian Medical Complex (PMC) in Ramallah and the Hebron Governmental Hospital in Hebron).

Results: The majority of HD patients were between 50 and 69 years old (30.8%), resided in villages (62.5%), were married (83.3%), and had a relatively even distribution between males (47.5%) and females (52.5%). The overall HR-QOL global score was 1958.5 (IQR= 2007.50) out of a possible 3600, indicating a moderate level of quality of life. Among the HR-QOL dimensions, symptoms and problems of kidney disease had the highest mean score, while burdens of kidney disease had the lowest. The majority of HD patients (45.8%) experienced a moderate burden. Patient-doctor relationships, effectiveness, and cost-related burden have been shown to be the most significantly influencing factors in medication burden. According to the ARMS scale, the majority of participants (73.3%) had low adherence to their medicine. Correlation tests revealed significant negative relationships between medication-related burden and HR-QOL (R= -0.431, p-value < 0.05), indicating higher medication-related burden is associated with poorer quality of life.

Additionally, a positive relationship between medication-related burden and non-adherence (R= 0.61, p-value < 0.05) indicates that higher medication-related burden is associated with higher non-adherence.

Conclusion: This study reveals significant insights about the HR-QOL, medication burden, and adherence of HD patients in the West Bank. The study shows that among HD patients, medication burden significantly lowers HR-QOL and increases medication non-adherence. The findings highlight the importance of addressing medication burden as a component of comprehensive treatment to improve patients' quality of life and enhance medication adherence among HD patients.

List of abbreviations

CKD   Chronic Kidney Disease

GFR   Glomerular Filtration Rate

KDIGO   Kidney Disease Improving Global Outcomes

ACR   Albumin-to-Creatinine Ratio

PCR   Protein-to-Creatinine Ratio

SCN   Sickle Cell Nephropathy

WBC   White Blood Cell

ACE-I   Angiotensin-Converting Enzyme Inhibitors

ARB   Angiotensin Receptor Blockers

RRT   Renal Replacement Therapy

ESRD   End Stage Renal Disease

RTT   Renal Transplant Therapy

RT   Renal Transplantation

HD   Hemodialysis

PD   Peritoneal Dialysis

NSAIDs   Non-Steroidal Anti-Inflammatory Drugs

PTH   Parathyroid Hormone

AV   Arteriovenous

CVC   Central Venous Catheter

HR-QOL   Health Related Quality of Life

QOL   Quality of Life

KDQOL   Kidney Disease Quality of Life

LMQ   Living with Medicines Questionnaire

ARMS   Adherence to Refills and Medications Scale

PCS   Physical Component Summary

MCS   Mental Component Summary

BKD   Burden of Kidney Disease

SPKD   Symptoms and Problems of Kidney Disease

EKD   Effects of Kidney Disease

T2DM   Type 2 diabetes Mellitus

PMC   Palestinian Medical Complex

MRB   Medication Related Burden

Contents

CHAPTER ONE

CHAPTER TWO

CHAPTER THREE

CHAPTER FOUR

CHAPTER FIVE

CHAPTER SIX

List of Tables

List of figures

List of appendixes

CHAPTER ONE

_____

1. **Introduction**

   1.1. **Background**

Chronic kidney disease (CKD) is a major health problem linked with higher rates of morbidity, mortality, hospitalization, health care costs, dialysis, and kidney replacement therapy [1]. CKD is a progressive loss of kidney structure and functions lasting longer than three months [2]. Kidney abnormalities are identified by glomerular filtration rate (GFR) <60ml/min/1.73m2, thresholds of albuminuria, and duration of injury [3].

Every year, the burden of CKD increases dramatically. In 2017, there were 697.5 million people with all-stage CKD, which is more than the number of patients with diabetes, osteoarthritis, or other pulmonary diseases [1]. Between 1990 and 2017, the prevalence of CKD increased by 44% in high-income countries, 50% in middle-income countries, and 14% in low-income countries [4]. In the Middle East in 2021, the prevalence of CKD varied from 5.2% in low-income countries to 10.6% in upper-middle-income countries. [5]. In Palestine, the incidence of CKD in diabetic patients is 23.6% [6].

Patients with CKD are more likely to develop serious complications, such as an increased risk of cardiovascular disease, metabolic bone disease, anemia, and hyperlipidemia. Therefore, early identification of the health impact of CKD is crucial to provide patients with a superior treatment plan, prevent disease prognosis and complications, and improve quality of life [7,8].

1.1.1. Detection and staging of CKD.

The categories of chronic kidney disease were considered by the Kidney Disease Improving Global Outcomes (KDIGO), an organization that develops clinical practice guidelines based on scientific evidence for kidney disease [9].

The main criteria used to define CKD are a GFR of less than 60 ml/min/1.73 m^2 body surface area, renal damage characterized by albuminuria, and duration of kidney disease in order to differentiate chronic from acute kidney disease. Other indicators include abnormal renal imaging findings (ultrasound, MRI, or CT scan), serum electrolyte or acid-base derangements, kidney biopsy and urine sediment abnormalities [10].

1.1.1.1. Glomerular filtration rate (GFR)

GFR is the best quantitative indicator used to evaluate kidney function [11]. The endogenous marker used to estimate GFR is serum creatinine, which has no plasma protein binding, is freely filtrated through the glomerulus, and is excreted primarily by filtration only [12]. Exogenous markers such as iohexol, iothalamate, diethylene triamine pentaacetic acid, EDTA, and diethylene triamine pentaacetic acid result in it being difficult, expensive, and complex to measure clearance in regular clinical settings [13]. A normal GFR in a young adult is greater than 90 mL/min/1.73m^2 based on body size, age, and sex. The mean GFR values decrease as people get older. [11].

Early-stage CKD patients have a preserved fluid and electrolyte balance as well as a normal urinalysis. Thus, the decrease in GFR may be the earliest and sole clinical indicator of renal disease. Reduced GFR causes CKD complications and problems and thus may lead to end-stage renal disease after a gradual decline in kidney function [14].

The GFR categories for CKD are G1 (GFR $\geq$ 90 mL/min/1.73 m$^{2)}$, G2 (GFR 60-89 mL/min/1.73 m^2), G3a (45-59 mL/min/1.73 m^2), G3b (30-44 mL/min/1.73 m^2), G4 (15-29 mL/min/1.73 m^2), and G5 (<15mL/min/1.73 m^2) as shown in figure (1) [15].

Figure (2): CKD stages by GFR and albuminuria category [14].

1.1.1.2.Albuminuria

Albumin is a significant plasma protein. The glomerular filtration and renal tubular processing determined its urinary excretion where the typical levels of albumin in the urine are less than 30 mg/g. Increased albumin excretion may result from the failure of both mechanisms [16]. Since the method for evaluating total urine protein is unable to be standardized due to its complex composition, quantifying albumin is favored over total protein [17].

Albuminuria, is characterized as having higher levels of albumin in the urine, is a powerful independent biomarker of CKD progression, acute kidney injury, cardiovascular disease, and

mortality [18]. Because the albumin-to-creatinine ratio (ACR) has greater precision at lower levels of albuminuria than the urine protein-to-creatinine ratio (PCR), most guidelines recommend using ACR to stage CKD [19,20].

KDIGO proposed albuminuria in three categories: A1 (urine ACR 300 mg/g), A2 microalbuminuria (30-300 mg/g), and A3 macroalbuminuria (>300 mg/g) [15].

1.1.2. Risk factors and etiology of CKD

The most common risk factors for CKD are diabetes mellitus (30–50%) and hypertension (27.2%) [21]. Other factors are genetic factors, primary and secondary glomerulonephritis, hereditary or cystic diseases, plasma cell dyscrasias or neoplasms, chronic tubulointerstitial nephritis, sickle cell nephropathy (SCN), hyperlipidemia, obesity, and smoking [22]. Moreover, sociodemographic factors include non-white race (especially African Americans and Pacific Islanders), low levels of education, poor financial status, and a lack of food [20].

In regard to CKD stage G3, women have a greater probability than men of being impacted by CKD. The impact of longer lifespans on the age-related reduction in glomerular filtration rate (GFR), as well as potential overdiagnosis of CKD, may contribute to the greater incidence of CKD in women [23].

1.1.3. Clinical presentation; Signs and symptoms of CKD

Patients that have a GFR > 30 mL/min/1.73 m2 (stage G1- G3b) typically have asymptomatic disease without outward signs of reduced renal function. Therefore, the cause of CKD can be determined by physical assessment and past medical history [24]. Even though the majority of people with CKD are asymptomatic (especially those with hypertension and diabetes), some

people have signs and symptoms such as cognitive dysfunction, fatigue, lethargy, uremic pruritus, symptoms of neuropathy, peripheral edema, depressive symptoms, sleep disturbances, restless legs, and gastrointestinal symptoms like taste disturbance anorexia, nausea, [25,26].

1.1.4. Diagnosis of CKD

CKD results from the gradual damage of the renal parenchyma and disappearance of functioning nephrons leads to initiate molecular and cell- mediated processes as a result of compensatory development of the remaining nephrons [27]. Early diagnosis, especially in stages 1-3, can reduce progression and complications of CKD [8,27]. Screening tests for CKD include estimation of GFR using an equation thar based on serum creatinine, measurement of serum creatinine, measurement of urine albumin/creatinine ratio, and Urinalysis for high levels of proteinuria only ($\geq$ 300 mg /24 hours) [28].

A conventional dipstick test is used to identify proteinuria and hematuria, which are the simplest screening test for CKD. The best overall diagnostic test of the CKD stage is glomerular filtration rate (GFR) [29]

Analysis of urine sediment is known as a "liquid biopsy" because it provides a window into the kidney. Pathognomonic signs of kidney injury include renal tubular cells, white blood cell (WBC) casts, coarse granular casts, and broad casts [30].

The diagnosis of CKD is made solely on laboratory and clinical information because there are no particular imaging characteristics for the condition. When major structural abnormalities last for more than three months, patients are thought to have CKD [15].

1.1.5. Management and treatment of Patients with CKD.

It is crucial to closely monitor CKD patients to identify disease progression, determine whether they require kidney replacement therapy, and, if so, when dialysis should start. Numerous times, nonprogressive CKD can be managed without a nephrologist's intervention.

Usually, Referral to a nephrologist is recommended for patients with acute renal failure, inability to achieve treatment targets, persistent estimated glomerular filtration rate <30 mL/min/1.73 m^2, ratio of urine protein to creatinine >100 mg/mmol (about 900 mg/24 h), progressive decline of kidney function, urine albumin to creatinine ratio > 60 mg/mmol (about 500 mg/24 h , or rapid changes in kidney function [31].

Patients with advanced CKD experience a variety of symptoms. The nephrologist must therefore determine if these symptoms are caused by the progression of CKD, the consequences of aging, the impact of various comorbidities, or the drugs given [32].

The typical therapy of CKD involves delaying its progression. Angiotensin-converting enzyme inhibitors (ACE-I) or angiotensin receptor blockers (ARB) have been used for patients with proteinuria greater than 500 mg per 24 hours. Blood pressure must be less than 130/80 mmHg, hemoglobin A1c must be less than 7% for diabetic patients, a restricted protein diet and encouragement for the cessation of smoking are also part of the standard management of CKD. treating pathology-related consequences include cardiovascular disease, anemia, hydro-electrolytic disorders, mineral and bone diseases, and metabolic acidosis, establish a schedule for vaccinations, particularly against hepatitis B, and get the patient ready for renal replacement therapy (RRT) [2].

Dialysis is commonly started after stage 5 CKD developed in which eGFR of <15 mL/min [33] but before renal function ceases to avoid complications of uremia such as pulmonary edema, pericarditis, neurologic problems, and/or metabolic abnormalities (such as severe hyperkalemia) [32].

This study will focus on the fifth and final stage of CKD which is known as end stage renal disease (ESRD) or kidney failure.

1.1.6. End stage renal disease (ESRD) definition and prevalence

ESRD is the last stage of CKD according to KDIGO classifications. It defines as an irreversible loss of kidney function in which the estimated GFR is less than 15mL/min/1.73 m^2 [9]. The main fundamental renal transplant therapy (RRT) for ESRD patients are renal transplantation (RT), hemodialysis (HD), and peritoneal dialysis (PD).

In the United States, over 500,000 people diagnosed with ESRD with approximately 110,000 to 120,000 patients initiating RRT every year [34]. In 2021, there were a total of 214,779 HD in the West Bank. Furthermore, the number of patients receiving HD services in hospitals on a regular basis in the West Bank was 1,567 [35].

The prevalence of ESRD is growing globally resulting in increasing the economic and health burden on patients, caregivers, and supporters such as extended hospitalizations, the necessity for survivors to receive chronic dialysis, and the cost of medication and management of comorbid diseases (e.g., diabetes and hypertension) [36].

1.1.7. ESRD etiology

In ESRD the kidney function is lost in which it is unable to filtrate the waste product and excess water from the blood. ESRD has multiple etiology. The main causes of ESRD are diabetes mellitus, hypertension, and glomerulonephritis. The other causes are cystic kidney diseases, urinary tract obstruction or dysfunction, vascular disease, recurrent kidney stone disease, glomerular disease (primary or secondary), unrecovered acute kidney injury, tubulointerstitial disease, certain medications, including non-steroidal anti-inflammatory drugs (NSAIDs), calcineurin inhibitors, and antiretrovirals and congenital defects of the kidney or bladder [34].

1.1.8. Risk factors of ESRD

One of the best indicators of the development of ESRD is the extent of proteinuria on a daily basis. Especially in patients with proteinuria, hypertension is a significant independent risk factor for developing ESRD. Age additionally influences the possibility of developing ESRD; compared with patients under 65, those over 65 have a four- to five-fold higher risk. Diabetes mellitus, hyperuricemia, drug abuse, tobacco use, a history of chronic renal insufficiency, ethnicity, obesity, a family history of kidney problems, a lower socioeconomic status, inflammation, cardiovascular disease, male gender, and some genetic disorders are other risk factors associated with ESRD [37].

1.1.9. Clinical presentation; Signs and symptoms of ESRD.

The early stages of CKD when GFR greater than 30 mL/min/1.73 m^2 (stage G1- G3b) are asymptomatic most of the time. The symptoms start when kidney damage occurs at stages 4 and 5 because many solutes accumulate in the body at a toxic level. The ESRD patients faced significant

physical and mental symptoms including fatigue, pain, pruritus, dry skin, nausea, dizziness, loss of appetite, muscle cramps typically worse at night, numbness, chest pain, shortness of breath due to fluid overload, anemia or cardiomyopathy, difficulty with sleep, sexual dysfunction, bone pain, depression, and impairments in quality of life. [38, 26].

1.1.10. Diagnosis of ESRD

ESRD is diagnosed by nephrologists using biochemical, clinical, and imaging techniques. The clinical manifestation of ESRD resembles other kidney disorders therefore a differential evaluation must be considered. The main diagnostic tools for ESRD are GFR and albumin as described in detail in section 1.1.

The other tools include a urine sediment test, renal ultrasound which is the preferred imaging technique, kidney biopsy but invasive, blood test, especially for creatinine, urea, minerals, hormones especially parathyroid hormone, and urinalysis for albumin level. A regular check-up is necessary in order to monitor the diagnosis of the disease [26].

Chronic kidney damage can be detected using kidney ultrasound imaging, which reveals little kidneys with decreased cortical thickness, scarring, or numerous cysts and increased echogenicity. Kidney vascular flow can be accessed via Doppler ultrasonography. Renal scans can provide enough details regarding the kidney's structure and functionality [39].

1.1.11. Management and treatment of Patients with ESRD

Renal damage in ESRD is irreversible. The fundamental treatment of ESRD is renal transplant therapy (RRT) which includes mainly hemodialysis (HD), peritoneal dialysis (PD), and renal

transplantation (RT). In addition to lifestyle and diet modification, treatment of the underlying causes and comorbid disease.

1.1.11.1.   Diet and lifestyle modifications

In order to avoid and control ESRD, nutritional support and education are recommended. Nutritional considerations and diet counseling are very important in order to maintain serum albumin, electrolytes, and minerals (e.g., potassium and calcium), reduce protein waste, and control blood pressure and glucose levels thus decreasing morbidity and mortality among patients [40].

Dietary regimes with low sodium, potassium, phosphorus, and high protein intake are recommended. Protein requirement in patients with ESRD is greater because of massive loss during dialysis. A recommended dietary protein intake of a dialysis patient is 1 -1.2 g/kg body weight to reduce mortality and morbidity linked to malnutrition [41].

The main causes of hypertension in HD are high sodium intake and volume expansion. The nutritional guidelines recommended sodium and fluid restrictions because high intakes cause weight gain associated with swelling and shortness of breath, hypertension, fluid overload, and heart failure. The recommended daily fluid amounts for patients on dialysis are 700 -1000 mL, in addition to their urine output [42].

ESRD patients are unable to eliminate potassium leading to hyperkalemia that causes muscle cramps, weakness, and irregular heartbeat. Therefore, they should avoid a high-potassium diet such as heart-healthy fruits, bananas, tomatoes, chocolate, nuts and peanut butter, spinach, avocadoes, etc. [43].

The kidney plays a crucial function in converting vitamin D to its active form, which is necessary for phosphorus metabolism, calcium absorption, and bone health. Thus, ESRD patients have a risk of hyperphosphatemia, bone disease, in addition to calcification of soft tissue due to the deposition of calcium and phosphorous salts. Phosphate binds to calcium and thus reduces serum calcium levels, which result in elevation of parathyroid hormone (PTH) synthesis and osteoporosis due to excessive absorption of calcium from the bone. Hyperphosphatemia is treated by dietary phosphate restriction and phosphate binders such as calcium acetate and sevelamer carbonate. Calcium and vitamin D supplements are recommended for ESRD patients [40, 44].

Dietary recommendations for people with ESRD might be perceived as complex; effective management of diets involves cautious planning and routine intake evaluations. The fact that people with ESRD frequently have serious comorbid diseases such as cardiovascular disease, hypertension, diabetes, hyperlipidemia, and obesity that require dietary change is a major factor in the complexity of dietary and nutritional therapy in CKD [44].

Anorexia is also linked to depression, which is a condition that is frequently encountered in ESRD patients. Age, inactivity, and socioeconomic level are additional risk factors for the development of malnutrition in ESRD patients. Moreover, some medications, such as iron supplements and phosphate binders, are connected to gastrointestinal complications and, thus, malnutrition. The most widely used technique to assess malnutrition in ESRD patients is serum albumin. Daily protein intake can also be used to measure nutritional conditions [45].

1.1.11.2.   Hemodialysis (HD).

HD is a life-sustaining treatment. HD is a procedure that uses an extracorporeal circulatory machine in which the blood is drawn from the patient then filtrates by a membrane called a dialyzer or artificial kidney and finally returned to the body. HD removes excess water, solutes, and toxins from the blood. Thus, the main purpose of HD is to restore homeostasis of the body [46]. HD is often performed three times per week and takes three to four hours each time.

HD performs via three different access methods which are: arteriovenous (AV) fistula, AV graft, and central venous catheter (CVC). AV Fistula is the preferred choice because it does not include external tools and is safe and effective. However, it is performed by surgical creation of an arteriovenous connection (fistula) that takes several weeks to months before first use [47]

The second option is a dialysis graft that is performed when the formation of a fistula is difficult. Graft requires introducing a prosthetic tube between the vein and artery so can be utilized immediately but it has a high risk of complication. AV graft must be nonimmunogenic, positioned conveniently, non-thrombotic, quickly accessible, robust, and inexpensive. AV graft complications are graft thrombosis, infections and limb ischemia, venous hypertension [47].

A Y-shaped plastic tube known as a central venous catheter is placed into a huge, central vein, typically in the neck. One of the most frequent complications is catheter-related thrombosis which increases morbidity and mortality. Central venous catheters are designed to be used temporarily until other long-term access builds up [48].

Arteriovenous (AV) fistula hemodialysis access is related to decreased mortality, reduced medical problems and complications, and is less expensive compared to an arteriovenous graft or CVC. But AV graft or CVC may be chosen in some cases, such as in elderly people or those with

inadequate AV access. Education for HD patients is crucial in order to learn more about ESRD, weigh potential therapies, preserve a sense of control, and communicate information to family members and/or caregivers. Early education and supporting HD patients during and after dialysis is linked to decreased mortality and better quality of life among HD patients [49].

Failure to establish vascular access is an ultimate contraindication to hemodialysis. Other possible contraindications include coagulopathy, needle phobia, difficult vascular access and recurrent access problems, cardiac failure, and prolonged internal bleeding [46].

1.1.11.3.   Peritoneal dialysis (PD)

PD employs the peritoneal lining membrane (peritoneum) as the dialysing interface to interchange water, a waste product, and solutes are transferred via a catheter tube between the blood in the peritoneal capillaries and the injected solution in the peritoneal cavity (dialysate). PD advantages include the ability to perform in a hospital or at home (outpatient) and need a less restrictive diet since its continuous therapy, more cost-effective, possible increase QOL, and preserve the remaining renal function. Compared to HD, there is a greater ability to travel and less need for medical and nursing services. However, the patient can suffer from structural changes in the peritoneal membrane with time and PD should be implemented daily [50].

In order to administer PD, an abdominal wall catheter that enables bidirectional dialysis fluid flow must be implanted. The catheter is an extensible tube made of silicone with numerous pores on its distal end, and it should preferably be placed loosely in the pelvic region. The Tenckhoff catheter, which has a linear shape, is the one that is most widely used. It is recommended that patients wait

for at least two weeks, often known as "break-in," between catheter placement and the start of dialysis therapy in order to prevent peri catheter dialysate leaking [51].

The rates of PD have been declining globally in recent years. The reason for this decline is due to the increase in hemodialysis units, inadequate patient education, the absence of local manufacturing facilities, and physician bias. Over time, the peritoneal membrane's changes in structure and potential problems with metabolism might both emerge [52].

The contraindications to utilizing PD include the disability to conduct the procedure due to physical or mental impairment, diminished peritoneal function, or numerous peritoneal adhesions; morbid obesity; ischemic intestinal disease; inflammatory intestinal disease; recent ventriculoperitoneal shunts, and surgical disorders that are not treatable, such as severe hernias, or bladder exstrophy [51]

1.1.11.4. Renal transplantation (RT)

RT is a surgical procedure in which a kidney is transplanted to an ESRD patient from a healthy donor. RT is a treatment of choice in renal failure in which dialysis is no longer needed. RT complications are a rejection of the donor organ, bleeding and blood clots, and infection. Renal transplantation improves survival, quality of life, and lowers medical cost compared to dialysis. Moreover, fewer diet restrictions are needed [53].

Renal transplantation is regarded as the best RRT option because an allograft offers multiple advantages over dialysis, such as increasing health-related quality of life and decreasing morbidity and mortality. However, RT has a three- to five-times higher risk of cardiovascular disease [54].

The advantages of RT outweigh the potential risks especially when CKD is exacerbated by fluid overload, symptoms of uremia like encephalopathy, refractory hyperkalemia, and metabolic acidosis. Early RT restores and preserves acid-base balance, prevents accumulation of fluid, and minimizes susceptibility to the metabolic risks associated with untreated acute renal injury. Patients on the transplant waiting list had a 49% reduced probability of death than the overall group undergoing dialysis [55].

The ideal time to start RT in CKD is unknown. The early introduction of RT could expose patients to the risks of RT with little or no benefit. However, late initiation of RT might increase morbidity as a result of the consequences of fluid and toxin accumulation [55].

1.1.12. Health-Related Quality of Life (HR-QOL)

Quality of Life (QOL) has been defined as ''an overall general well-being that comprises objective descriptors and subjective evaluations of physical, material, social, and emotional well-being together with the extent of personal development and purposeful activity, all weighted by a personal set of values'' [56]. The terms QOL and health status were used before HR-QOL was established. HR-QOL solely contains items of an individual's health; non-health items of QOL, such as economic and political components, are not included [57].

HR-QOL is a useful measure of CKD burden and may additionally be employed to assess therapy effectiveness and expect the risk for adverse consequence. HR-QOL evaluates how disease and treatment impact a patient's health. The individual experience of disease has multiple effects on a patient's HR-QOL in a variety of dimensions, including physical capability, psychological and

mental functioning, symptoms, side effects of medical treatment, role functioning, fulfillment and comfort of treatment and care, and financial status [58].

The Kidney Disease Quality of Life (KDQOL) questionnaire, which is a kidney specialize measure of HR-QOL, consists of five domains: physical items; mental items that contain details about overall well-being, activity restrictions, capacity to complete desired tasks, level of depression and anxiety, and social interactions; disease burden, which includes topics regarding the extent to which kidney damage impacts life in general, consumes time, frustrates the respondent, or causes them to feel like a burden; symptoms items cover questions regarding how concerned a respondent experiences about symptoms such as aching muscles, cramps, pain in the chest, feeling drained, dry skin, shortness of breath, diminished appetite, numbness in the extremities, nausea, or issues with dialysis access; Finally, the effects of renal disease on everyday activities include items concerning how the participant feels about hydration limitations, dietary limitations, their capability to travel or do tasks at home, their dependence on medical professionals, stress or anxieties, their sexual life, and their appearance [56].

Early evaluation of HR-QOL among ESRD patients will help in making a modification that led to better quality life and improve health outcomes.

1.1.13. Living with Medicines (Medication Burden)

Longer lifespans, an increasing number of chronic diseases, and the rising use of medications to treat these diseases lead to polypharmacy, in which the individual takes numerous medications every day. Understanding a patient's perspective, including any challenges and worries, is essential to maximizing medication use in that patient. The term "problematic polypharmacy" refers to the

incorrect prescription of several medications or situations in which the patient receives no benefit from the medication as intended [59].

People who suffer from several diseases and take several medications simultaneously (polypharmacy) are more likely to have a problem with not taking medications, which can lead to drug-drug interactions, unfit prescribing, drug side effects, an increased level of hospitalization, morbidity, and mortality, as well as increased medication burden and nonadherence [60]. Understanding a patient's experience, including any difficulties or concerns, is the key element in improving the use of medication [61]. Medication burden has a detrimental effect on patients' lives and is associated to adverse medication events. The Living with Medicines Questionnaire (LMQ-3), which was created and validated by Krska et al., is the sole instrument that assesses the burden associated with taking medications [61, 62].

LMQ provides a broader range of domains than most other tools and was developed from the patient's perspective [39]. The tool covers a wide range of issues, like inadequate efficacy, worry about adverse effects, problems with the use of medicines, poor relationships with healthcare providers regarding medicines, and significant impact on daily life [63].

The LMQ Version 3 (LMQ-3) has undergone psychometric evaluation, been translated into a number of languages, and has been applied in cross-sectional and intervention research in a number of countries. The tool could be used to determine people who are most at risk for medication-related difficulties and problems [64].

1.1.14. Medication Adherence

Medication adherence is defined as "the extent to which the patient's behavior matches agreed recommendations from the prescriber" [65]. Medication adherence is a fundamental factor in achieving treatment goals. Nonadherence problems are significant among CKD patients as a result of consuming multiple medications and the difficulty of the medicine regimen [66].

Awareness and surveillance of medication adherence are strongly recommended for ESRD patients because of the great benefit to health outcomes. The expanded research on medication nonadherence among ESRD patients reveals that it's a significant issue. Quantitative studies have been interested in the prevalence of adherence and determining the potential risk factors that lead to non-adherence. [65].

Kripalani and colleagues developed the Adherence to Refills and Medications Scale (ARMS) which is an effective medication adherence instrument for patients with chronic diseases like coronary heart disease, hypertension, or ESRD. Additionally, multiple studies demonstrated that the ARMS may improve comprehension of adherence to customized therapies for nonadherent behaviors; it may be able to recognize a range of difficulties or barriers in medication-taking behaviors. [67].

1.2. Problem statement

According to the Palestinian Ministry of Health annual report for 2021, there was a sum of 1,567 patients undergoing HD therapy on a regular schedule, [35]. Therefore, it's critical to focus on preserving and improving patients' quality of life and medication adherence in order to minimize the burden on patients and the healthcare system and prevent any further health deterioration and complications.

Some studies have assessed HR-QOL, medication burden, or adherence among Palestinian HD patients, but no previous study has focused on all of these issues at the same time and created a relationship between them. Creating a link between these three concerns will give us a more accurate and comprehensive view of the problems that patients face. Thus, our study will facilitate the identification of obstacles and the development of a more accurate plan to enhance patient quality of life through decreased medication burden and increased adherence, and as a result, it may reduce therapeutic failure, hospitalization needs, complications, and even death.

Patients with ESRD keep suffering from significant problems in health-related quality of life, and the rates of mortality for ESRD patients continue to be significantly greater compared to those of control groups without ESRD of the same age [68].

Poor adherence to medication is linked to more frequent relapses, higher costs, higher resource use in the healthcare system, and lower patient outcomes than those seen in adherent patients. As a result, it's critical to determine the causes of non-adherence among HD patients, and it's important to continue researching the impact of non-adherence.

1.3.Significance of the study

ESRD is a significant global public health problem that is widely recognized as a major source of suffering and burden, bad quality of life, and an increasing rate of morbidity in addition to mortality. Here in the West Bank, the numbers of ESRD patients on HD have grown significantly [20]. Therefore, it is important to focus on studying and researching the HD impact on quality of life, medicine burden, and adherence.

Identification and determining the HR-QOL of HD patients provide useful information to health care practitioners as they can be used to screen and monitor patients for a variety of issues, estimate the burden of medication, and provide valuable knowledge about the connections between HR-QOL and risk factors.

Medication burden creates a fundamental role in determining HR-QOL of the patients. Medication burdens have an important effect on the health as well as patients attitudes towards medicines. Comprehending medication burden and adherence gives the care providers an overview of medication problems and thus helps them put individualized care and therapeutic plans to increase adherence, quality of life, and health outcomes [69].

There are no previous studies using the LMQ and ARMS tools to evaluate the burden of medicine and adherence across Palestinian HD patients. As a result, there is a strong need for in-depth assessment and evaluation of barriers and factors that have direct effect on HD patient's adherence and health, and thus repairing it.

1.4. Objective of the study

1.   To quantify and assess the magnitude of HR-QOL using the KDQOL™ questionnaire and their association among HD patients in West Bank.

2.   To utilize the LMQ-3 questionnaire to measure the medication-related burden among HD patients and to recognize which particular groups have an increasing burden.

3.   To measure medication adherence using a 12-item ARMS questionnaire.

4.   To examine the association between HD patients' characteristics and medication burden along with HR-QOL

5.   To find out the relationship between HR-QOL, medication burden and adherence of HD patient.

CHAPTER TWO

_____

2. **Literature Review**

There are several recent studies that shed light on health-related quality of life (HR-QOL), medication burden, and adherence in ESRD.

- In 2023, Nassef et al. conducted a study to measure HR-QOL of 271 HD patients in Palestine using the Arabic version of KDQOL-SFTM questionnaire. They reported that the mean scores for the MCS were 59.86, PCS were 47.10, and KDCS were 41.15. The PCS had the lowest domain score. Participants over the age of 40 and those with lower incomes had lower KDC scores. Patients over 40, those with lower levels of education, and participants with lower incomes had lower PCS and MCS scores. [70].

- In 2021, Samoudi et al. performed a cross sectional study to measure the HR-QOL of ESRD patients undergoing HD in Palestine. The results demonstrated that patients under 60 years old, participants with low pain severity scores, and those with reduced pain interference scores all showed significantly higher QOL scores. In ESRD patients receiving HD, pain significantly reduces QOL [71].

- In 2018, Khatib, et al. conducted a cross-sectional study to measure the QOL among diabetes patients receiving hemodialysis in Palestine. The results of this study indicate that patients who were female, uneducated, unemployed, single, and who had multiple chronic

diseases had significantly lower HR-QOL scores. Patients employed and married status have a positive relationship with QOL [72].

- In 2018, Mousa, et al. conducted a cross-sectional study in Palestine examined how the effects of dialysis on patients' levels of self-efficacy and quality of life. This study revealed that patients with an inadequate level of education, a low degree of self-efficacy, and had a significant number of co-morbid diseases had the worst HR-QOL [73].

- In 2016, Zyoud, et al. performed a cross-sectional study in Palestine examined factors that influence patients' quality of life among hemodialysis patients. The results showed that age, the overall number of chronic co-morbid diseases, and medication had a strong negative correlation with HR-QOL. However, HR-QOL had a substantial positive correlation with education level, male gender, and living in village [74].

- In 2019, Cohen et al. conducted a study to measure HR-QOL among HD patients in the United States through the KDQOL-36TM questionnaire. 413,951 adult HD patients receiving four distinct types of dialysis were included in the study. The mean domain scores on the physical component summary (PCS) were 36.6, the mental component summary (MCS) was 49.0, the burden of kidney disease (BKD) was 51.3, the symptoms and problems of kidney disease (SPKD) were 78.1, and the effects of kidney disease (EKD) subscales were 73.0. Additionally, scores were equivalent between dialysis modes. For SPKD, ceiling effects were seen [75].

- In 2020, Ajeebi et al. conducted a study to evaluate HR-QOL of 254 HD patients in Saudi Arabia through the Arabic version of the KDQOL-36^{TM} instrument and the influence of socio-demographic, medical, and social aspects on patients' quality of life was also examined. The mean age was 58.2 years; over half were male (61%), and 20.1% of the population was employed. The domain mean scores on the PCS were 49.4, MCS were 38.7, BKD 52.6were, and EKD were 37. The MCS score was significantly less than the PCS score (P = 0.0001). The subscale measuring the "burden of kidney disease" had the greatest score, while the subscale measuring the "effects of kidney disease" had the lowest score [76].

- In 2021, Al-Mansouri et al. conducted a study to assess HR-QOL and treatment burden in HD and pre-dialysis chronic kidney disease patients in Qatar. The KDQOL-36TM questionnaire was used to quantitatively assess the HR-QOL for 280 patients. They ultimately reached the conclusion that patients on HD had poorer HR-QOL scores than those on pre-dialysis. In addition, in comparison with pre-dialysis patients, HD patients exhibited a considerably higher treatment burden and poorer HR-QOL [77].

- In 2020, kharshid et al. conducted a study to evaluate the HR-QOL in CKD patients. They measured HR-QOL for 526 CKD patients who were not getting dialysis. The result of the study demonstrates that patients with advanced stages of CKD had lower HR-QOL scores. The degree of severity of CKD has a large effect on the scores. Furthermore, worse HR-QOL was linked to older age. All scales except the pain (P) scale showed a lower HR-QOL for females [78].

- In 2013, Kim, et al. performed a study to measure the HR-QOL among hemodialysis (HD) and peritoneal dialysis (PD) patients in Korea through the KDQOL-36 instrument and its relationship to their medication satisfaction and self-efficacy. A total of 237 patients from two university hospitals were undergoing HD and PD treatment. A multiple linear regression approach was used to evaluate the links between self-efficacy, treatment satisfaction, and HR-QOL. The results showed that the mean domain scores of PCS, MCS, SPKD, EKD, and BKD were 39.1 ± 8.5, 44.6 ± 6.8, 67.6 ± 17.1, 58.5 ± 19.6, and 41.1 ± 28.4, respectively. Only the SPKD domain might significantly differentiate PD from HD individuals. The study concluded that HR-QOL may be affected by patients' self-efficacy and treatment satisfaction [79].

- In 2018, Hall et al. conducted a study to assess the Relationship between mortality, adverse outcomes and hospitalization in elderly people undergoing hemodialysis and the Kidney Disease Quality of Life short form (KDQOL-36). This is a long-term study on 3500 HD patients aged 75 or older in the United States who got dialysis in 2012 and 2013. Since the KDQOL-36's completion in 2012, there have been 880 (28.1%) deaths and 2023 (64.6%), had a minimum of one hospitalization above median follow-ups of 512 and 203 days, respectively. Participants in the group who had a PCS score on the SF-12 in the smallest quintile had a higher adjusted mortality risk and hospitalization compared to those in the group with scores in the highest quintile. Compared to the group with MCS scores in the highest quantile, adults in the lowest quintile had a higher probability of hospitalization. No correlation between the subscales measuring the SPKD, EKD, and BKD with the time to first hospitalization or death [80].

- In 2018, Vo, et al. performed a study to determine the HR-QOL of CKD patients in Vietnam as well as the relationships between various sociodemographic characteristics and the patient's HR-QOL. A number of 316 individuals participated in the study, in which 194 patients (61.4%) had Stage 5 CKD, and their average age was 54.2 years. The result showed that the overall mean HR-QOL scores of the CKD patients were under average (42.9±9.7) and the lowest score was in BKD domain (21.2±17.3). In all subscales, with the exception of the EKD and MCS, patients with Stage 1-4 CKD scored superior to those with Stage 5 CKD. These subscales included the SPKD, BKD and PCS. In this population, a number of socio-demographic factors have an impact on HR-QOL [81].

- In 2020, Ademola, et al. performed a cross-sectional study to measure HR-QOL among CKD patients in the Aminu Kano teaching hospital in Nigeria. The research study was completed by 150 people with CKD and 150 participants in the control group, with 77 men and 73 women in each group. The results showed that the mean± SD age of the CKD group was 52.83 ± 14.21 and that of the controlled group was 52.43 ± 14.50. Both the physical and mental composite summary (PCS and MCS) scores were higher in the controlled group than they were in the CKD group. Finally, with advancing CKD stages, CKD individuals reported continuous deterioration in all HR-QOL domain scores [82].

- In 2016 Chen, et al. conducted a review article that was intended to emphasize the most prevalent symptoms associated with low HR-QOL as well as the contribution regular monitoring of those symptoms makes to raising HR-QOL in the dialysis population. The Center for Medicare and Medicaid Services recommends that dialysis patients' HR-QOL be assessed every year. KDIGO suggests that the treatment be shifted toward a patient-

centered care approach and that the symptoms be evaluated on a regular schedule. The quality of life (QOL) may be enhanced by appropriate symptom interventions. Improvements in ESRD outcomes may be possible through the evaluation of patient-reported outcomes. It may be burdensome to measure symptoms and quality of life frequently. Finally, the key message of the review was that the employment of a team of professionals and improved communication are two strategies for raising HR-QOL in ESRD [83].

- In 2019, Ware, et al. conducted a study to measure the health-related quality of life (HR-QOL) using the kidney-specific CKD-QOL and KDQOL-36 questionnaire in 485 patients in various treatment groups (stage 3-5 CKD non-dialysis patients, patients on dialysis, or patients post-transplant). The results showed that compared to generic SF-12v2 tests, the KDQOL-36 and CKD-QOL scores frequently offered better discrimination. In general, as compared to the KDQOL-36, the new method for analyzing the impact of CKD-specific QOL was particularly better in several validity tests. Static surveys were less effective than CAT surveys [84].

- In 2021, Chand, et al. performed a study to assess the effects of chronic kidney disease on patients' QOL and to establish a link between HR-QOL and sociodemographic and clinical factors. By using nonprobability sampling, 255 CKD patients were undergoing treatment at the nephrology unit of Jinnah Hospital, Lahore. Patients with CKD were examined between the ages of 21 and 80. The results demonstrated that 56.5% of participants were male and 43.5% were female. Gender, education level, and age had a significant relationship to higher scores on HR-QOL, which includes psychological and physical well-

being, although the presence of comorbidities, being unemployed, and late-stage CKD were significantly linked to lower scores [85].

- In 2016, Aggarwal, et al. performed a Cross-sectional study to assess HR-QOL in patients with various stages of CKD and to look into potential influences and related factors. 200 Indian patients with CKD stages 1 to 5 have their HR-QOL evaluated using KDQOL SF36 along with biomarkers. Among levels of renal function and stages of CKD, HR-QOL scores in all aspects were significantly and gradually deteriorated. Patients with CKD stages 1 to 5 showed a significantly larger decline in both their PCS and MCS. The scores on overall HR-QOL domains were substantially lower in patients with eGFR less than 30 ml/min/1.73 m^2, cardiovascular disease, erythrocyte sedimentation rate $\geq$20, Diabetes Mellitus, C-reactive protein (CRP) $\geq$5 mg/l, mean arterial pressure $\geq$ 100 mm hg and Hemoglobin $\leq$ 90 g/l. The most significant predictors of decreased HR-QOL among these were elevated CRP, decreased GFR, and CVD [86].

- In 2023, Gebrie, et al. conducted a cross-sectional study to assess HR-QOL in Ethiopian patients with ESRD receiving maintenance hemodialysis and to discover the factors influencing HR-QOL. The study was conducted by face-to-face interview with 481 patients at 11 randomly chosen public and private hospitals/dialysis facilities in the Ethiopian town (the response rate was 96%; the mean age was 45.34 $\pm$ 14.67). Higher scores indicate greater health. The subscales' mean scores ranged from 25.6 to 66.68 (range 0-100). Female sex, older age, poor medication adherence, lower body mass index ($\leq$18.5), a lack of formal education, inadequate social support, more than two hemodialysis sessions per week, and

a longer duration of hemodialysis treatment (≥12 months) were all related to low HR-QOL [87].

- In 2020, Küçük, et al. performed a study to evaluate and compare the mental health, HR-QOL, and level of sleep among different stages of CKD patients who were receiving various renal replacement treatments, and the factors influencing these parameters were examined. The study involves 140 CKD patients with a mean age of 43 years. The participants in the research were divided into four groups, which included controls and CKD patients undergoing pre-dialysis, hemodialysis (HD), peritoneal dialysis, and renal transplantation (RT). The participants were assessed by the KDQOL SF-36, Short Form Health Survey-36 (SF-36), Pittsburgh Sleep Quality Index (PSQI), and General Health Questionnaire-12 (GHQ-12). The results showed that the RT group had the best results in terms of mental health and QOL as well as sleep, with the greatest scores in the physical and mental subscales of the SF-36 and KDQoL-36 assessments but the lowest scores in the PSQI and GHQ-12 examinations. The HD group had substantially lower KDQOL-SF36 subscale scores in the SPKD and BKD domains [88].

- In 2022, Deng conducted a systematic review of 30 articles, either qualitative or quantitative, to examine the symptom burden in people with CKD through the Palliative Outcome Symptom-Scale Renal (POS-r)-13, the KDQOL-SF36 instrument, and the Dialysis Symptom Index (DSI)-10. The most frequent symptoms associated with CKD were weakness, discomfort and pain, fatigue, itchy skin, and sleeping difficulties [89].

- In 2019, Tordoff et al. conducted a study to estimate the burden of medications on New Zealand individuals, utilizing the LMQ-3, and to determine if any particular groups had a high burden. According to the study, the majority of New Zealand individuals had a medium or severe medication burden, and low burden (high LMQ-3 overall scores) has been correlated to individuals who were 18–29 years old, unemployed, using five or more medications, or taking medications three or less times per day ($p<0.01$) [90].

- In 2022, Alqallaf, et al. conducted a cross-sectional study to evaluate the medication-related burden among Bahrain's older population in connection to their medication consumption habits along with other sociodemographic factors and to determine from the responses any special problems that require attention. The study was performed on 500 Bahrainis aged 65 years or older through the LMQ-3 instrument. The findings showed that Bahraini participants experienced a wide range of burdens, from intermediate burden in almost a third of cases to high burden in over two-thirds of cases. The main causes of the burden were worries about medications, how they affected everyday activities, and the adverse events they caused. Higher LMQ-3 scores were linked to individuals who had graduated from technical institutions, were over 75 years old, used nine or more medications, or consumed their medications four times per day. The most common medications for elderly people were anti-diabetics. Thus, the study concluded that the primary attention of physicians and pharmacists should be on patients who have a high medication-related burden [91].

- In 2022, Bekalu, et al. performed a cross sectional study on 423 diabetes patients who received treatment in the FHCSH DM clinic in 2020. The Living with Medicines Questionnaire version 3 (LMQ-3) was used to assess the burden associated with medications consumption. The results showed that the mean score given by the LMQ-3 was 126.52 (17.39). The vast majority of the respondents had a burden ranging from moderate to high (58.9%, 95% CI: 53.9-63.7 and 26.2%, 95% CI: 22.5-30.0, respectively). Almost fifty percent of the patients (44.9%) were non-adherent to their chronic medications [92].

- In 2018, Krska et al. performed a cross sectional study to measure the different problems that individuals encounter with their medications and evaluate the sociodemographic and medical variables that are linked to poor experiences with medication usage as well as elevated levels of medication burden. The study involves patients who regularly use at least one medication and dispense prescriptions from pharmacies, visit GP offices, or visit outpatient facilities to fill out the Living with Medicines Questionnaire (LMQ-3). LMQ3 scores demonstrated a significant positive correlation with VAS scores. Elderly age groups had lower LMQ3 and VAS burden levels; however, both increased with greater prescription drug use and dose frequency. In most domains, the elderly reported a lower burden. Inadequate support, frequent dosage, and unemployment were all factors that were substantially linked to high LMQ-3 scores [64].

- In 2023, Baah-Nyarkoh, et al. conducted a cross sectional study to examine the apparent medication-related burden across participants with type 2 diabetes mellitus (T2DM) and

hypertension and to analyze the relationship between the apparent burden and adherence to medication treatment. The overall number of respondents was 329 having a median age of 57.5 years. The total burden score was 99 (IQR: 93-113), which substantially differed by sex, monthly expenditure on medications, family history of T2DM, monthly income, and frequency of daily dose of medications. A moderate to high burden was noted in 30.7% of participant and was linked to uncontrolled diastolic blood pressure, elevated glucose level, and lack of a family history of T2DM, while 36.8% reported drug adherence that was linked to uncontrolled diastolic blood pressure, at least a five-year period since hypertension being diagnosed, and moderate to high medication-related burden [93].

- In 2020, Awad, et al. performed a cross-sectional study to assess the frequency of medication adherence and the relationship between burden and adherence, as well as the incidence of medication-related burden across geriatrics in Kuwait. The study was conducted on 450 patients at primary healthcare facilities using the LMQ-3 and ARMS questionnaires. The results showed that a large number of participants reported a minimal (35.4%) to moderate (62.0%) medication burden. The LMQ's overall median score was 112, which showed a moderate burden. The overall results of the LMQ-3 showed a significant tendency toward increased reported burden for participants who were non-Kuwaitis, male, older than 75 years, requesting assistance utilizing medications, paying prescription fees, using oral and nonoral formulations, and living in the governorates of Al-Farwaniyah and Al-Jahra. Over half of the participants showed medication non-adherence, for which the ARMS overall score was 20. Finally, the LMQ-3 and ARMS scores showed a significant positive correlation, demonstrating that medication adherence decreases as medication burden increases [56].

- In 2022, Noori, et al. performed an observational study to study the sociodemographic and clinical characteristics associated with negative medication use experiences and elevated levels of burden, as well as to quantify the types of medication concerns that diabetes patients have that affect total burden in Iraq. 193 individuals with diabetes mellitus were enrolled in the study. The results showed that the mean age was 50 years old. Over half of the patients were female and had at least one other chronic disease. The overall LMQ-3 mean score was (122.8±15.5). The study found that the majority of DM patients (72.5%) had a moderate medication-related burden. The medication burden was significantly higher in patients with uncontrolled blood glucose, neuropathy, or retinopathy [94].

- In 2022, Zheng, et al. conducted a cross-sectional study that aimed to determine the current state of polypharmacy and medication-related burden among 185 Chinese patients from two HIV clinics who had antiretroviral therapy and were aged 50 and older, in addition to the connection between medication-related burden and treatment adherence. The results showed that a higher level of medication-related burden was reported among females who had a lower monthly income and used more drugs. The outcomes indicate that in order to decrease medication-related burden in older patients receiving antiretroviral medication, greater focus should be given to the concerns of polypharmacy [95].

- In 2021, Wnag, et al. conducted a cross-sectional study to estimate the medication-related burden among older patients in China who have been diagnosed with chronic diseases using the Chinese version of the LMQ-3 and to assess the key demographic features of specific populations with high medicine burdens. The study was conducted on 450 elderly individuals with chronic diseases who were over 60 and using five different medications.

The results demonstrated that the mean age was 73.57 years old. The majority of the participants were female, and 38.5% had only completed middle school. According to regression analysis, those with lower levels of education, who are 60–69 years old, use 11 or more medications, take medication three times per day, have an income of fewer than 3,000 RMB per month, and take more than 300 RMB in self-paid medication per month had higher C-LMQ-3 scores. Finally, cost-related burden, concerns regarding medications, and a lack of control over medication regimens were the top causes of medication burden [96].

- In 2022, Chen, et al. performed a cross-sectional study to determine the key variables that predict the HR-QOL and medication- related burden. 119 adult participants with age of 18 and older, who had used a minimum of two prescription medications, were asked to complete the questionnaires for the study. The findings showed that the participants' mean age was 63 years. Participants' current health status, the total burden of treatment, and having high blood pressure were all significant predictors of reported medication- related burden. In the same manner, participants' present level of health and overall treatment burden were significant predictors of reported Health [97].

- In 2015, Dharmapuri, et al. conducted a cross-sectional study to evaluate the connection between medication adherence and health literacy levels among adolescents. The Adherence to Refills and Medications Scale (ARMS) was used to assess medication adherence, and the Rapid Estimate of Adult Literacy in Medicine-TEEN (REALM-TEEN) was used to measure health literacy. The results demonstrated that the mean age was 16

and that the majority of participants were African American and female. The ARMS median score was 21. Poorer adherence (higher ARMS scores) and self-report of a learning impairment were found to be positively correlated, as well as ARMS scores and having a chronic condition. Independent of health literacy levels, over a quarter of teenagers indicated that they had a learning impairment and had worse drug adherence. This data shows that there may be other cognitive aspects that affect drug adherence [98].

- In 2021, Radojević, et al. conducted a cross-sectional study to investigate the patients' adherence to their antiparkinsonian drugs and identify potential factors that might impact PD patients' drug adherence in 112 Parkinson's disease (PD) patients through the ARMS questionnaire. The results showed that the majority of PD patients experienced lower drug adherence. Individuals in the lower adherence group showed significantly higher UPDRS (Unified PD Rating Scale) ratings and were younger when their PD was first diagnosed. Finally, depression was identified as the most significant independent factor contributing to decreased adherence [99].

- In 2021, Khan, et al. conducted a cross-sectional study to measure the eye drop medication adherence of 199 patients suffering from corneal diseases using the ARMS questionnaire and the 3-question Voils' Medication Adherence Scale (VMAS). The result showed that the mean age was 59 years old. The percentage of those who were considered non-adherent by the ARMS and the VMAS was 72% and 33%, respectively. Old age was linked to greater adherence by both the ARMS and the VMAS. Sex, education, race, the primary cornea diagnosis, or the total number of doses of eye drugs did not correlate significantly with adherence [100].

- In 2021, Kurdi, et al. performed a quantitative cross-sectional study to develop a better understanding of the factors that contribute to the non-adherence of patients with chronic conditions to their prescriptions in Saudi Arabia through ARMS questionnaire. The statistical evaluation for the current study included a total of 385 patients. Based to the ARMS scale, 96.62% of people suffered from medication non-adherence [101].

- In 2017, Murali, et al. conducted a systemic review. The goal of the study was to examine how discontinuation of drugs and medication adherence were assessed and examine cardiovascular or mortality consequences in patients undergoing dialysis. 642 randomized clinical trials (RCTs) published between 2005 and 2015 were found using electronic database searches. The findings revealed that 19,322 participants from 22 trials (12 of which were placebo-controlled) met the eligibility requirements. With a mean of 81% throughout the intervention arm and 84.5% across the control arm, medication adherence was observed in five trials. 100% of the trials that evaluated adherence showed negative research findings for the intervention. In 21 studies, study-drug discontinuation was documented. In certain studies, non-adherence was cited as a factor in treatment discontinuation [102].

- In 2018, Jaam, et al. conducted a cross-sectional study that aimed to examine the features and barriers between patients with high and low medication adherence, as well as find out the prevalence of medication adherence among patients with uncontrolled diabetes in Qatar through ARMS questionnaire. The study covered 260 patients in which nearly two- thirds had non-adherence to their medications. Nearly all of the predicted barriers to medication adherence were reported by non-adherent patients, with forgetfulness representing a

particularly often-mentioned barrier. HbA1c, age, education, ethnicity, and income level have been shown to be independently associated indicators of adherence [103].

- In 2014, Jamous, et al. performed a cross-sectional study in Palestine to examine medication adherence, attitudes that individuals with chronic illnesses have about medications, and if attitudes affect medication adherence. The majority of participants (79.5%) strongly agreed with their present medical condition requiring them to take their medication. Even so, 57.8% of participants expressed concern about needing to regularly take their medications, and 57.8% expressed worry about developing a drug dependence. Neither of the clinical nor demographic factors had a strong correlation with drug adherence. Thus, medication adherence is significantly influenced by beliefs about medicines [104].

- In 2018, Zidan et al. conducted a study in Qatar to evaluate patients with various non-communicable diseases (NCDs)' perceptions of medication-related burden and to gain insight into the relationship between reported burden and adherence to medication. In addition to the ARMS questionnaire, they used the LMQ questionnaire to assess medication burden and adherence in patients with diabetes, whether or not they also had other comorbid conditions. The study has 293 patients in it. The findings revealed that the vast majority of the participants reported minimal to moderate burden (66.8% to 24.1%). The scores of the LMQ that represents medication burden and ARMS that represents medication adherence were strongly (positive), rs (253) = 0.317, p < 0.0005 [105].

- In 2020, Tesfaye et al. performed a study to examine HR-QOL, medication burden, and adherence in 464 adults with pre-dialysis chronic kidney disease (GFR less than 30 mL/min/1.73 m2) in Australia. However, different measurement tools were used than our study tools. According to the four-item Morisky-Green-Levine Scale (MGLS) and the Tool for Adherence Behavior Screening (TABS), the study found that 43% and 60% of participants experienced medication nonadherence. Non-adherence was linked to a greater burden of medication. Over time, nonadherence was linked to a decline in physical HR-QOL [106].

CHAPTER THREE

_____

3. Methodology

3.1. Study Design and sampling procedure

A cross-sectional study of 120 HD patients was conducted. The sample was recruited from two dialysis units of the Ministry of Health Hospital in the West Bank (Palestinian Medical Complex (PMC) in Ramallah and Hebron Governmental Hospital in Hebron) during the period from February to March 2023. The sample was collected via a face-to-face interview.

3.2. Sample size

The sample size was calculated using a cross-sectional study sample size calculation technique with a 95% confidence level and a 5% margin of error. The minimum effective sample size required was 120 patients undergoing HD. The total number and distribution of patients at PMC and Alia hospitals served as the basis for the sample of all HD patients.

3.3. Inclusion and exclusion criteria

The inclusion criteria include the patients who were willing to participate, provided informed consent, and were on hemodialysis and were frequently evaluated for the treatment of the ESRD. Patients who under 18 years old, on dialysis less than 6 months, pregnant, had cancer, hepatitis, or mental illness, and people with previous transplants were excluded from the study.

3.4. Study tools and questionnaire

The questionnaire of the study consisted of four sections: demographic characteristics (Appendix I), the KDQOL questionnaire (Appendix II), which assesses the HR-QOL, the LMQ-3 (Appendix

III), which measures the medication related burden, and finally the ARMS questionnaire (Appendix IV), which evaluates medication adherence.

The first part (Appendix I) represented demographic characteristics (Appendix I) related to age, gender, residency, marital status, district, employment status, educational level, income per month, smoking status, medication routine, effect of medicine on health, and discovery of disease.

3.4.1. Health-Related Quality of Life (HR-QOL) questionnaire.

The second part (Appendix II) covered the Kidney Disease Quality of Life (KDQOL) questionnaire which is a kidney specialized quantitative measure of HR-QOL (subjective assessment). The HR-QOL approach focuses on how health status affects life quality. The 36-item KDQOL-36™ is the most appropriate instrument that includes 36 questions, of which 12 are generic parts (SF-12) and the remaining 24 are CKD-specific parts [54].

The KDQOL-36™ included five domains on a 100-point subscale: the Physical Component Summary (PCS), Mental Component Summary (MCS) (questions 1-12), Burden of Kidney Disease (BKD) (questions 13-16), Symptoms and Problems of Kidney Disease (SPKD) (questions 17-28b), and Effects of Kidney Disease (EKD) (questions 29-36).

The Information about HR-QOL was obtained through Face-to-Face interview. Each question was given a score between 0 and 100, with 100 representing the maximum degree of functioning. The overall score is from 0 to 3600 which represents better quality of life.

3.4.2. Living with Medicines Questionnaire (LMQ)

The third part (Appendix III) was the Living with Medicines Questionnaire (LMQ) that measured the medication-related burden. LMQ-3 is a qualitative, generic, and comprehensive questionnaire developed to summarize the problems of patients taking long-term medication in a potentially useful tool [39].

The questionnaire consists of 42 statements (8 domains) with a 5-point Likert-type scoring system and requests respondents to choose whether they agree or disagree with each statement, as 1 represents "strong agreement," 2 "agree," 3 "neutral," 4 "disagree," or 5 "strong disagreement.". For the purpose of determining the final score, the items with negative wording were reverse-coded. Additionally, the questionnaire included a free text space where patients could add other comments or themes that weren't already included [40].

The domains are practical difficulties (seven items), patient-doctor relationships and communication about medicines (five items), side-effect burden of prescribed medications (four items), attitudes or general concerns about medicines (seven items), cost-related burden (three items), interferences with day-to-day life (six items), lack of effectiveness (six items), and control or autonomy of medicine use (three items).

The total LMQ-3 score ranged from 41 to 205. Higher scores demonstrate a greater burden or worse experience related to medication use. Based on the total score on the LMQ, the degree of burden is divided into the following categories: no burden at all (41- 73), minimum burden (74-106), moderate burden (107- 139), high burden (140-172), and extremely high burden (173-205).

3.4.3. Adherence to Refills and Medications Scale (ARMS)

Part four (Appendix IV) was an ARMS questionnaire that consisted of 12-items to assess the medication adherence. It had two domains: adherence to taking medicines, consisting of eight items, and adherence to filling medications, consisting of four items [55].

A Likert scale with four points is used for evaluating every answer, as 1 represents "none", 2 "some", 3 "most", and 4 "all". For the purpose of calculating the score, the statements with negative wording were reverse-coded. Higher scores on the ARMS indicate poorer adherence; they can range from 12 to 48. A cutoff value of 20 (low adherence $\geq$ 20 and high adherence < 20) was used to categorize the overall ARMS score [56].

We used a validated and Arabic-translated version of KDQOL-36 [107], LMQ-3 [108] and ARMS [109] questionnaire in our study.

3.5. Statistical analysis:

Data was entered, cleaned, and analyzed using IBM SPSS version 25.0 (SPSS Inc., Chicago, IL, USA) as well as modeling with structural equations (Smart-pls3). Answers to each question from the questionnaires were transformed to scale scores and then summarized to obtain raw scores.

Independent sample t-test, ANOVA and other analysis was used to determine the relationship between different attributes and to compare the different HR-QOL and medication burden and adherence domains with respect to different clinical and demographic variables.

Data were summarized as means, SD, and percentages of agreement responses values. Correlation coefficient, Cronbach's alpha, Pearson's chi-squared, one-way ANOVA and t-tests were employed

in statistical analyses. If the P-value is equal to or less than 0.05, the result is considered significant with 95%, confidence interval.

3.6.   Ethical considerations

For the ethical use of human subjects in the study, approval had been obtained from the Research Ethics Committee in Al-Quds University (Appendix V).

For the purpose of data collection, approval to perform the study was obtained from the Palestinian Ministry of Health in Ramallah (Appendix VI). Prior to each participant's admission to the study, their written consent to participate was obtained (Appendix VII).

CHAPTER FOUR

_____

4. Results

4.1. Reliability statistics

The reliability statistics were verified for the field scale to calculate the coefficient of stability through the equation (Cronbach's Alpha). The overall questionnaire consists of 90 items without demographic section. In table 4.1, the HD Patients were filled out 36 items about HR-QOL in Section I. The HR-QOL questionnaire reliability was $\alpha = 0.95$. In section II, 42 items about living with medicine were answered by the participants and the reliability of the LMQ-3 questionnaire was 0.898. Finally, in section III, 12 items about medication adherence were filled out using ARMS questionnaire with reliability $\alpha = 0.898$

The value of the stability factor on the overall fields according to the equation Cronbach's Alpha was 0.931, which is greater than the acceptable value 0.60, that meets the statistical requirement for the instrument.

Table 4.1: Cronbach's Alpha coefficient of consistency for the Tool

Field	No. of Items	Cronbach's Alpha
Health-Related Quality of Life (HR-QOL)	36	0.95
Living with Medicines Questionnaire (LMQ-3)	42	0.898
Adherence to Refills and Medications Scale (ARMS)	12	0.898
Overall	**90**	**0.931**

4.2. Sociodemographic characteristics

A total of 130 patients undergoing HD were asked to participate in this study; 120 of them agreed to participate, while the remaining refused, yielding a response rate of 92.3%. The demographic data for patients is presented in Table 4.2 in detail. 23.3% of HD patients were between 50- 59 years, and 30.8% were between 60 - 69 years. There were 57 males (47.5%) and 63 females (52.5%). The majority of participants were living in Village (62.5%) and the remainder lived in City 45 (37.5%), and more than two-thirds were married (83.3%). Furthermore, about 41.7% of the participants had a primary education, and 26.7% were uneducated. More than half (65.8%) were unemployed, while only 13.3% were employed and 20.8% were retired. In addition, 45.8% had no income.

The majority of patients never smoked (70.0%), take medication regularly (86.7%), and feel that the drug has a positive effect on their health (75.0%). Finally, regarding the history of the disease, 65.8% of HD patients were diagnosed early, within the first year of the appearance of symptoms.

Table 4.2: Sociodemographic characteristics of the study sample

Variable		Total (n=120)	Perc. %
Age	Up to 35	15	12.5%
	36-49	26	21.7%
	50-59	28	23.3%
	60-69	37	30.8%
	70+	14	11.7%
Gender:	Male	57	47.5%
	Female	63	52.5%
Residence:	Camp	0	0.0%
	Village	75	62.5%
	City	45	37.5%
Marital status:	Married	87	83.3%
	Single	20	16.7%
Educational level:	No education	32	26.7%
	Primary	50	41.7%

Variable		Total (n=120)	Perc. %
	Secondary	29	24.2%
	College/University	9	7.5%
Employment status:	Unemployed	79	65.8%
	Employed	16	13.3%
	Retired	25	20.8%
Income per month:	No income	55	45.8%
	Less than 2000	29	24.2%
	2000-4000	36	30.0%
	More than 4000	0	0.0%
Smoking status:	Never smoker	84	70.0%
	Former smoker	31	25.8%
	Current smoker	5	4.2%
Take medication regularly:	Yes	104	86.7%
	Some time	15	12.5%
	No	1	0.8%
Medicine has positive effect on your health	Yes	90	75.0%
	Some time	26	21.7%
	No	4	3.3%
Discovered disease	Early within the first year of the appearance of symptom	79	65.8%
	Late after one year of the appearance of symptom	41	34.2%

**4.3. Description of health-related quality of life among the HD patients**

Figure 4.1. shows the main indicators for each item in the HR-QOL dimension, consisting of (Physical Component Summary (PCS), Mental Component Summary (MCS), Burdens of Kidney Disease (BKD), Symptoms and Problems of Kidney Disease (SPKD), and Effects of Kidney Disease (EKD). The percentages represent the level of agreement on the item. The mean HR-QOL results were as follows: PCS score was 49.7±0.52; MCS, 62.1±1.02; BKD, 44.3±1.25; SPKD, 62.2±1.32; and EKD, 45.5±1.52.

The higher KDQOL-36™ score indicates better quality of life. Table 4.3 shows that the SPKD had the highest mean score 746 (IQR=775) of the 5 domains on the KDQOL-36™, and the BKD had the lowest mean score 177.1 (IQR= 150). The KDQOL-36™ global score among the participants was 1958.5 (IQR= 2007.5) versus the highest possible global score of 3600.

Table 4.4 indicates that "dietary restriction" is the highest issue that a HD patient was bothered by, with a rate of 31.0% (M= 2.24, SD= 1.085), and the second issue is "the ability to work around the house," 31.3% (M= 2.25, SD= 1.176). While the lowest evaluation for HR-QOL is for problems with access sites 83.5% (M= 2.36, SD= 1.017). In the PCS domain, the issues that are considered to have the most negative impact on quality of life are "the patients accomplished less than they would like as a result of physical health" and "limited in the kind of work or other" with a rate of 32.5% (M= 1.33, SD= 0.47). For the MCS domain, "During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities?" is the most major problem in the domain that negatively affects the quality of life with a rate of 49.8% (M= 3.01, SD= 1.28). For the BKD domain, the issue is "too much of my time is spent dealing

with my kidney disease," (34.4%). Finally, for SPKD, the major issue is "Itchy skin," with a rate of 47.7% (M= 2.91, SD= 1.28).
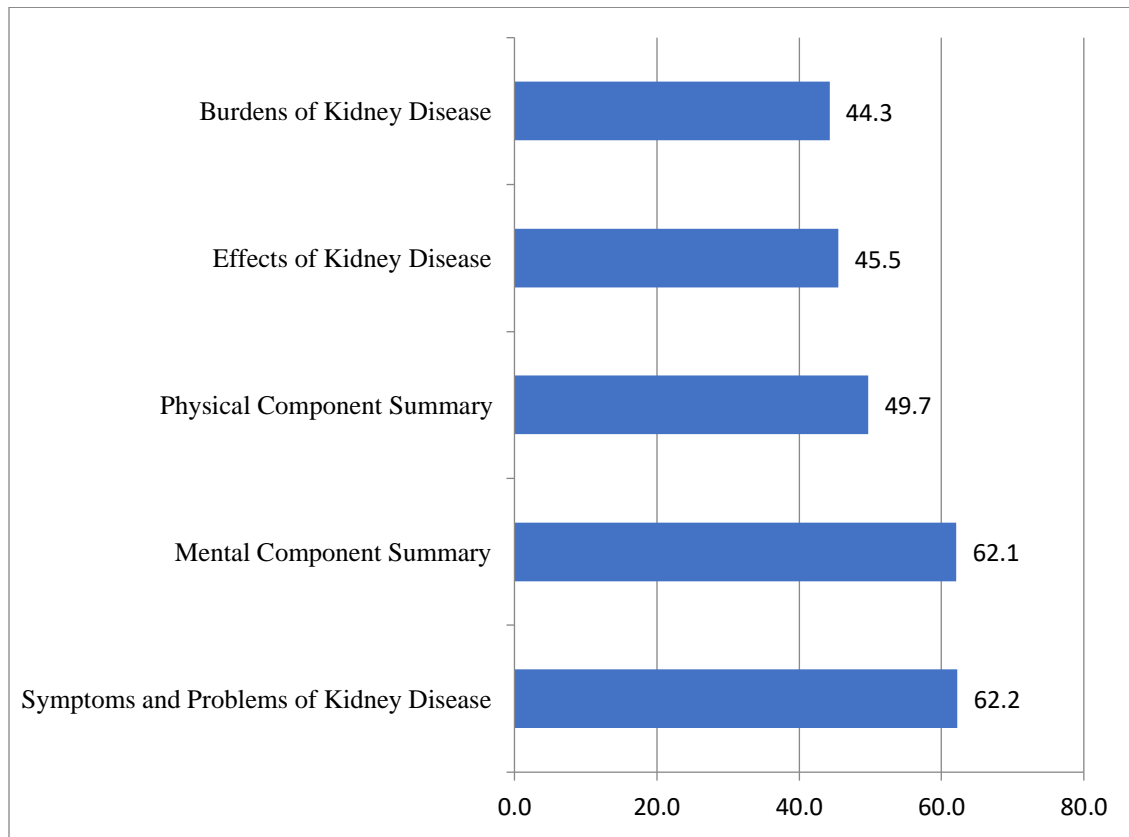
Figure 4.1: Illustrate level of agreement in the HR-QOL domains.

Table 4.3: Analysis of five domains of KDQOL-36™ instrument scores.

	Mean	**Median (IQR)**
KDQOL-36™ global score	1958.5	2007.50
Physical Component Summary (PCS)	298.3	250.0
Mental Component Summary (MCS)	372.5	417.5
Burdens of Kidney Disease (BKD)	177.1	150.0
Symptoms and Problems of Kidney Disease (SPKD)	746.7	775.0

Effects of Kidney Disease	363.9	350.0

Table 4.4: level of evaluation of Health-Related Quality of Life dimensions (Percentage)

*Item	Percentage (%)
Physical Component Summary (PCS)	**49.7**
q1.1 Overall your health assessment	77.7
q1.2 Difficulty doing Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling	50.4
q1.3 Difficulty climbing several flights of stairs	47.5
q1.4 Accomplished less than you would like	32.5
q1.5 Were limited in the kind of work or other	32.5
q1.8 During the past 4 weeks, how much did pain interfere with your normal work	57.7
Mental Component Summary (MCS)	**62.1**
q1.6 Accomplished less than you would like	55.0
q1.7 Didn't do work or other activities as carefully as	53.3
q1.9 Have you felt calm and peaceful	74.7
q1.10 Did you have a lot of energy	73.5
q1.11 Have you felt downhearted and blue	66.2
q1.12 During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities	49.8
Burdens of Kidney Disease (BKD)	**44.3**
q1.13 My kidney disease interferes too much with my life	38.5
q1.14 Too much of my time is spent dealing with my kidney disease	34.4
q1.15 I feel frustrated dealing with my kidney disease	50.0
q1.16 I feel like a burden on my family	54.2
Symptoms and Problems of Kidney Disease (SPKD)	**62.2**
q1.17 Soreness in your muscles	52.3
q1.18 Chest pain	57.9
q1.19 Cramps	52.1
q1.20 Itchy skin	47.7
q1.21 Dry skin	53.1
q1.22 Shortness of breath	60.8
q1.23 Faintness or dizziness	75.4
q1.24 Lack of appetite	69.8
q1.25 Washed out or drained	65.4
q1.26 Numbness in hands or feet	52.3
q1.27 Nausea or upset stomach	76.3
q1.28.1 (Hemodialysis patient only) Problems with your catheter site	83.5

*Item	Percentage (%)
Effects of Kidney Disease (EKD)	**45.5**
q1.29 Fluid restriction	36.5
q1.30 Dietary restriction	31.0
q1.31 Your ability to work around the house	31.3
q1.32 Your ability to travel	54.4
q1.33 Being dependent on doctors and other medical staff	47.5
q1.34 Stress or worries caused by kidney disease	31.9
q1.35 Your sex life	80.2
q1.36 Your personal appearance	51.3

* Copyright © 1993, 1994, 1995 by RAND and the University of Arizona [110].

4.4. Description of medicine burden among the HD patients using LMQ-3

Figure 4.2 shows the main indicators for each item in the Living with Medicines Questionnaire dimension, collected from the reality of the survey. The percentages represent the level of agreement on the item within eight domains. Patient-doctor relationships which had a rate of 84.1% (M= 1.8, SD= 0.51), effectiveness 76.5% (M= 2.17, SD= 1.00), and cost-related burden 69.4% (M= 3.47, SD= 1.57) received the three highest percentage domain scores.

Table 4.5. shows that in the patient-doctor relationships and communication about medicines domain, over four-fifths of the participants trust their doctor's medical decisions with a rate of 86.7% (M= 1.67, SD= 0.75), 87.0% their doctors listen to their opinions about medicines (M= 1.65, SD= 0.67) , 80.7% they get enough information about their medicines (M= 1.97, SD= 0.88), and 88.2% the health professionals providing them with care about disease and medicines (M= 1.59, SD= 0.49). The autonomy of medicine use shows the lowest percentage domain score with a rate of 28.4% (M= 4.58, SD= 0.61). Only 29.3% of participants can vary the dose of their medicines (M= 4.53, SD= 0.93), 26.0% decide whether or not to take their medicines (M= 4.7, SD= 0.68), and 29.8% can change the times they take their medications (M= 4.51, SD= 0.78). The

remaining domain percentages of agreement were as follows: 56.5% practical difficulties (M= 2.31, SD= 0.84), 54.1% side-effect burden of prescribed medications (M= 2.70, SD= 1.18), 66.1% attitudes or general concerns about medicines (M= 3.30, SD= 1.03), and 41.6% interferences with day-to-day life (M= 2.08, SD= 1.04).

The cost-related burden was high among participants. Over two-thirds of them were worried about paying for medicines with a rate of 72.0% (M= 3.60, SD= 1.60), 66.7% had to choose between buying basic essentials or medicines (M= 3.33, SD= 1.71), and 69.5% had to pay more than they could afford for medicines (M= 3.48, SD= 1.71).

Table 4.6. shows that the majority of HD patients faced a moderate burden (45.8%), while 5.0% had no burden at all, 40.0% had a minimum burden, and 9.2% had a high burden.
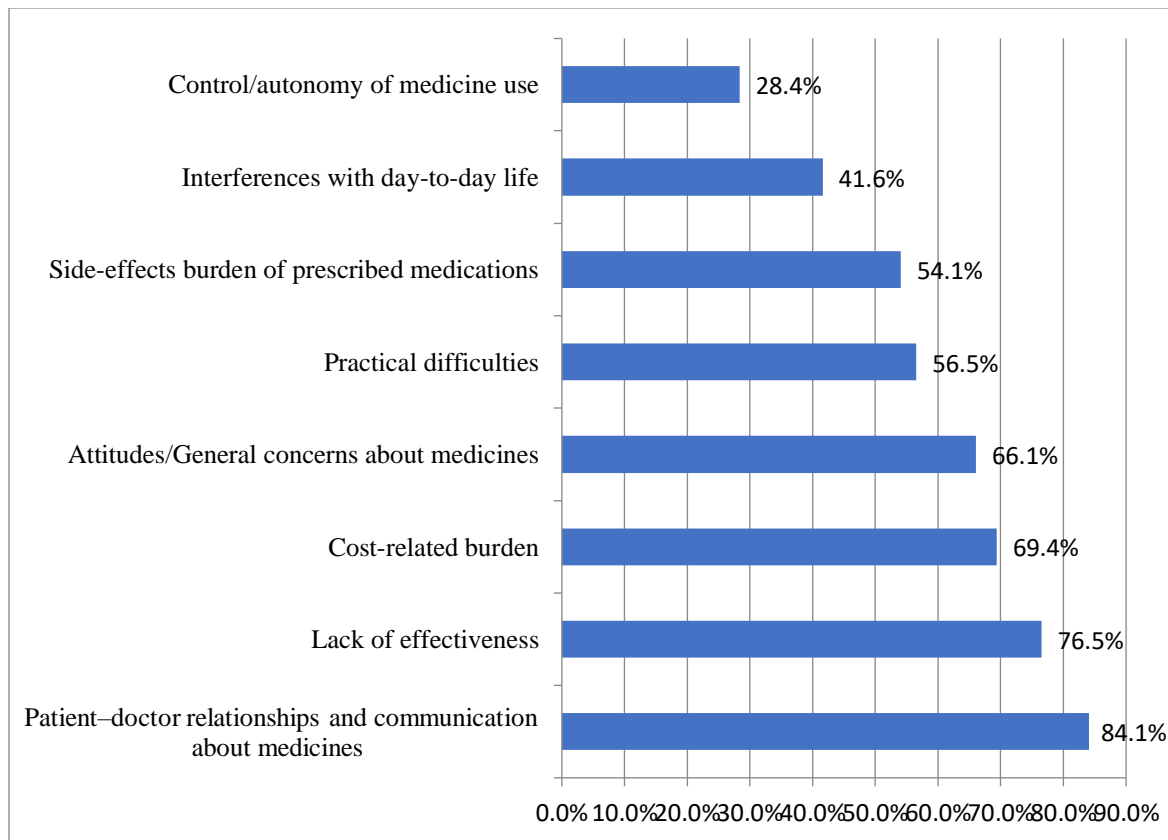
Figure 4.2: Illustrate level of agreement in Living with Medicines domains.

Table 4.5: Mean, Standard Deviation and percentage of Living with Medicines dimension.

*Item	Mean	S. D	Percentage
Patient–doctor relationships and communication about medicines	**1.80**	**0.51**	**84.1%**
q2.7 I trust the judgement of my doctor(s) in choosing medicines for me.	1.67	0.75	86.7%
q2.14 My doctor(s) listen to my opinions about my medicines.	1.65	0.67	87.0%
q2.20 My doctor(s) takes my concerns about side effects seriously.	2.10	1.07	78.0%
q2.24 I get enough information about my medicines from my doctor(s).	1.97	0.88	80.7%
q2.34 The health professionals providing my care know enough about me and my medicines.	1.59	0.49	88.2%
practical difficulties	**2.31**	**0.84**	**56.5%**
q2.1 I find getting my prescriptions from the doctor difficult.	1.76	1.32	35.2%
q2.2 I find getting my medicines from the pharmacist difficult.	2.18	1.49	43.7%
q2.4 I am comfortable with the times I should take my medicines.	2.02	1.02	79.7%
q2.10 I am concerned that I may forget to take my medicines.	3.58	1.50	71.7%
q2.23 I have to put a lot of planning and thought into taking my medicines.	2.20	1.42	44.0%
q2.27 It is easy to keep to my medicine's routine.	2.18	1.12	76.5%
q2.29 I find using my medicines difficult.	2.26	1.45	45.2%
cost-related burden	**3.47**	**1.57**	**69.4%**
q2.5 I worry about paying for my medicines.	3.60	1.60	72.0%
q2.31 I sometimes have to choose between buying basic essentials or medicines.	3.33	1.71	66.7%
q2.33 I have to pay more than I can afford for my medicines.	3.48	1.71	69.5%
side-effects burden of prescribed medications	**2.70**	**1.18**	**54.1%**
q2.21 The side effects I get are sometimes worse than the problem for which I take medicines.	3.27	1.50	65.3%
q2.22 The side effects I get from my medicines interfere with my day-to-day life (e.g., work, housework, sleep).	2.27	1.44	45.3%
q2.30 The side effects I get from my medicines are bothersome.	2.64	1.54	52.8%
q2.38 The side effects I get from my medicines adversely affect my well-being.	2.64	1.40	52.8%
Lack of effectiveness	**2.17**	**1.00**	**76.5%**
q2.3 I am satisfied with the effectiveness of my medicines.	2.32	1.26	73.7%
q2.15 My medicines prevent my condition getting worse.	2.16	1.24	76.8%
q2.25 My medicines live up to my expectations.	2.30	1.12	74.0%
q2.32 My medicines allow me to live my life as I want to.	2.23	1.10	75.5%
q2.39 My medicines are working.	2.11	1.05	77.8%
q2.40 The side effects are worth it for the benefits I get from my medicines.	1.93	0.94	81.3%
Attitudes/General concerns about medicines	**3.30**	**1.03**	**66.1%**
q2.6 I worry that I have to take several medicines at the same time.	3.95	1.24	79.0%

*Item	Mean	S. D	Percentage
q2.8 I would like more say in the brands of medicines I use.	2.90	1.51	58.0%
q2.9 I feel I need more information about my medicines.	3.68	1.37	73.7%
q2.12 I am concerned about possible damaging long-term effects of taking medicines.	3.13	1.65	62.7%
q2.16 I am concerned that I am too reliant on my medicines.	3.73	1.43	74.7%
q2.17 I am concerned that my medicines interact with food.	2.48	1.50	49.5%
q2.18 I worry that my medicines may interact with each other.	3.25	1.56	65.0%
Interferences with day-to-day life	**2.08**	**1.04**	**41.6%**
q2.19 My medicines interfere with my social or leisure activities.	2.37	1.56	47.3%
q2.28 Taking medicines affects my driving.	1.43	1.01	28.5%
q2.35 My medicines interfere with my social relationships.	2.30	1.41	46.0%
q2.36 Taking medicines causes me problems with daily tasks (such as work, housework, hobbies).	2.23	1.39	44.7%
q2.37 My medicines interfere with my sexual life.	1.83	1.02	36.7%
q2.41 My life revolves around using my medicines.	3.18	1.46	63.7%
control/autonomy of medicine use	**4.58**	**0.61**	**28.4%**
q2.11 I can vary the dose of the medicines I take.	4.53	0.93	29.3%
q2.13 I can choose whether or not to take my medicines.	4.70	0.68	26.0%
q2.26 I can vary the times I take my medicines.	4.51	0.78	29.8%

*Adapted from Krska et al. [62].

Table 4.6: Frequencies of Medication Related Burden and LMQ-3 Index

Indicator		LMQ-3 Range	Number	Percentage
Medication Related Burden	No burden at all	(41- 73)	6	5.0%
	Minimum burden	(74-106)	48	40.0%
	Moderate burden	(107- 139)	55	45.8%
	High burden	(140-172)	11	9.2%
	Total	**41-205**	**120**	**100.0%**

Even though this questionnaire had a section with a free text space where patients could add other comments or themes that weren't already included, none of the participants filled it out.

4.5. Description of medicine adherence among the HD patients using ARMS

Table 4.7 shows the main indicators for each item in the ARMS questionnaire dimension, collected from the reality of the survey. The percentage represents the level of adherence to medication. The results showed that item 11, "How often do you put off refilling your medicines because they cost too much money?" has the highest average of non-adherence to medication (M = 2.23 out of 4, SD = 1.027), with a percentage of 55.8%. While item 5, "How often do you skip a dose of your medicine before you go to the doctor?" reflects the highest adherence to medication among the ARMS scale. Item 12 had reverse coded.

Table 4.8 shows that 73.3% of participants had low adherence to their medicine (a score of ≥ 20) and 26.7% had high adherence (a score of < 20). The ARMS scale mean was 18.7 (SD = 0.5).

Table 4.7: Mean and Standard Deviation of Adherence to Refills and Medications Scale dimension.

*Item	Mean	S. D	Percentage
q3.1 How often do you forget to take your medicine?	1.53	0.635	38.1%
q3.2 How often do you decide not to take your medicine?	1.47	0.788	36.7%
q3.3 How often do you forget to get prescriptions filled?	1.43	0.632	35.8%
q3.4 How often do you run out of medicine?	1.38	0.597	34.6%
q3.5 How often do you skip a dose of your medicine before you go to the doctor?	1.15	0.442	28.8%
q3.6 How often do you miss taking your medicine when you feel better?	1.27	0.546	31.7%
q3.7 How often do you miss taking your medicine when you feel sick?	1.23	0.514	30.8%
q3.8 How often do you miss taking your medicine when you are careless?	1.43	0.683	35.8%
q3.9 How often do you change the dose of your medicines to suit your needs (like when you take more or less pills than you 're supposed to)?	1.28	0.549	31.9%
q3.10 How often do you forget to take your medicine when you are supposed to take it more than once a day?	1.64	0.696	41.0%
q3.11 How often do you put off refilling your medicines because they cost too much money	2.23	1.027	55.8%
q3.12 How often do you plan ahead and refill your medicines before they run out	2.34	0.794	41.5%

*Adapted from Kripalani et al [67].

Table 4.8: Frequencies ARMS Index.

Indicator		ARMS Range	Number	Percent
ARMS Index	Low adherence	≥ 20	88	73.3%
	High adherence	< 20	32	26.7%
	Total		**120**	**100.0%**

4.6. Association between HR-QOL, medication burden and adherence of HD patient.

As shown in table 4.9, there is a difference attributed to the age variable in the field of the HR-QOL, and this does not appear in the MRB or ARMS. Both the HR-QOL and MRB fields show a difference attributable to the gender variable; however, the ARMS is not similar. Both HR-QOL and ARMS display a difference attribute in the residence variable, whereas the MRB does not. Moreover, there is a statistically significant relationship between marital status and MRB, district with both HR-QOL and MRB, educational level with HR-QOL, employment status with HR-QOL, taking medication regularly with ARMS, and the positive effect of medicine on patients' health with MRB. However, there isn't a statistically significant relationship between income per month and smoking status in HR-QOL, MRB, or ARMS.

Table 4.9: Socio demographic characteristics of patients with MRB, ARMS and HR-QOL.

Variable		P-value		
		MRB	ARMS	HR-QOL
Age	Up to 35	0.26	0.818	**0.001**
	36-49			
	50-59			
	60-69			
	70+			
Gender:	Male	**0.042**	0.24	**0.014**
	Female			
Residence:	Camp	0.986	**0.000**	0.029
	Village			
	City			
Marital status:	Married	**0.028**	0.2	0.419
	Single			
District:	North	**0.023**	1	**0.000**
	Middle			
	South			
Educational level:	No education	0.064	0.255	**0.020**
	Primary			
	Secondary			
	College/University			
Employment status:	Unemployed	0.224	0.105	**0.004**
	Employed			
	Retired			
Income per month:	No income	0.202	0.236	0.239
	Less than 2000			
	2000-4000			
	More than 4000			
Smoking status:	Never smoker	0.286	0.38	0.145
	Former smoker			
	Current smoker			
Take medication regularly:	Yes	0.084	**.000**	0.509
	Some time			
	No			
Medicine has positive	Yes	**0.027**	0.17	0.307
	Some time			

Variable		P-value		
		MRB	ARMS	HR-QOL
effect on your health	No			
Discovered disease	Early within the first year of A the appearance of symptom	0.06	0.08	0.054
	Late after one year of the appearance of symptom			

A Pearson Correlation test (table 4.10) showed a significant correlation between generic measure of HR-QOL and LMQ including Practical difficulties (Correlation Coefficients = -0.427, with p-value <.01), cost-related burden (Correlation Coefficients = -0.477, with p-value <.01), side-effects burden of prescribed medications (Correlation Coefficients = -0.525, with p-value <.01), lack of effectiveness (Correlation Coefficients = -0.482 , with p-value <.01), interferences with day-to-day life (Correlation Coefficients = -0.465, with p-value <.01) ,and control/autonomy of medicine use (Correlation Coefficients =+0.259 , with p-value <.05). While there is no significant relationship with items: Patient–doctor relationships and communication about medicines and attitudes/General concerns about medicines.

The negative correlation coefficient sign means the low score of LMQ goes towards the high score of generic measure of HR-QOL.

Table 4.10: Pearson Correlation test, generic measure of HR-QOL and LMQ

LMQ		**generic measure of HR-QOL**
Patient–doctor relationships and communication about medicines	Pearson Correlation	-0.137
	Sig. (2-tailed)	0.176
Practical difficulties	Pearson Correlation	-.427**
	Sig. (2-tailed)	0.000

Cost-related burden	Pearson Correlation	-.477**
	Sig. (2-tailed)	0.000
Side-effects burden of prescribed medications	Pearson Correlation	-.525**
	Sig. (2-tailed)	0.000
Lack of effectiveness	Pearson Correlation	-.482**
	Sig. (2-tailed)	0.000
Attitudes/General concerns about medicines	Pearson Correlation	0.188
	Sig. (2-tailed)	0.062
Interferences with day-to-day life	Pearson Correlation	-.465**
	Sig. (2-tailed)	0.000
Control/autonomy of medicine use	Pearson Correlation	.259**
	Sig. (2-tailed)	0.010

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

A Pearson Correlation test (table 4.11) showed a significant correlation between HR-QOL and LMQ overall score, all the items of HR-QOL having (Correlation Coefficients between -0.54 to -0.4, with p-value <.05). The negative correlation coefficient sign means the low score of LMQ goes towards the high score of HR-QOL.

Table 4.11: Pearson Correlation test, HR-QOL and LMQ overall score.

HR-QOL		**LMQ overall score**
Physical Component Summary	Pearson Correlation	-.437**
	Sig. (2-tailed)	0.000
Mental Component Summary	Pearson Correlation	-.504**
	Sig. (2-tailed)	0.000

Burdens of Kidney Disease	Pearson Correlation	-.538**
	Sig. (2-tailed)	0.000
Symptoms and Problems of Kidney Disease	Pearson Correlation	-.457**
	Sig. (2-tailed)	0.000
Effects of Kidney Disease	Pearson Correlation	-.461**
	Sig. (2-tailed)	0.000

**. Correlation is significant at the 0.01 level (2-tailed).

A Spearman's rho test (table 4.12) showed a significant correlation between ARMS index and MRB (Correlation Coefficients = + 0.452, with p-value <.05). The moderate positive correlation coefficient sign means the level of medication adherence decreases as the medication-related burden increases. Because a higher ARMS score reflects poorer adherence and a higher LMQ score reflects a higher burden.

Table 4.12: Spearman's rho test ARMS index and MRB

Spearman's rho		**MRB**
ARMS index Correlation		.452**
	Sig. (2-tailed)	.000
	N	120

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4.13 presents the hypotheses and outcomes about relationships between different questionnaires. The results shows that the medication burden had a positive effect on Adherence, (R = 0.61, p-value < 0.001). A negative effect for medication burden on HR-QOL (R = -0.431, p-value < 0.01). While there is no effect of adherence on HR-QOL, (R = -0.161, p-value < 0.05). Finally, no indirect effect of burden cross adherence on QOL was observed, (R = -0.098, p-value < 0.05).

Table 4.13: Hypotheses conclusions (Path Coefficients Direct-Indirect Effects**)**

Hypo.	Relationship	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Decision
H1	Adherence-> HR-QOL	-0.161	-0.161	0.106	1.516	0.130	Not Supported
H2	Burden-> Adherence	0.61	0.610	0.059	10.369	0.000	Supported **
H3	Burden-> HR-QOL	-0.431	-0.431	0.092	4.674	0.000	Supported **
H4	Burden-> Adherence-> QOL	-0.098	-0.098	0.065	1.52	0.129	Not Supported

Significant at P** =< 0.01, p*<0.05

CHAPTER FIVE

_____

5. Discussion

To our knowledge the present study is the first that has been performed in Palestine which attempts to quantify, evaluate, and combined the extent of HR-QOL, medication burden, and adherence among HD patients in the West Bank. The study also investigated the relationships between HR-QOL, medication burden, and adherence at the same time. Also, the sociodemographic characteristics of the participants provided crucial insight into these concepts among study populations.

Understanding the impact of HD treatment on patients' general health depends critically on the assessment of HR-QOL. Healthcare professionals can create focused interventions to enhance patient outcomes and quality of life by having a better understanding of the various factors that affect HR-QOL. Additionally, medication-related burdens are related to physical, psychological, side effects, general concept, financial, and other factors. Assessing medication burden is critical to understanding the difficulties and possible risks linked to the drug regimens of HD patients. On the other hand, adherence describes the degree to which patients adhere to their recommended drug regimen. Poor adherence can result in inadequate treatment outcomes and higher medical costs.

The present research examines sociodemographic characteristics. The findings offer useful insight into the participants' demographics. In terms of age distribution, the current results indicate that the vast majority of HD patients are middle-aged or older (23.3% fell within the age range of 50–59 years, while 30.8% were between 60–69 years). It is similar to the upward rise in the prevalence

61

of ESRD reported worldwide, with one out of two patients beginning hemodialysis after age 65 [111]. The gender distribution showed relatively equal representation with a slight bias towards females, with 57 males (47.5%) and 63 females (52.5%). Regarding the HD participants' residence, the vast majority lived in villages (62.5%), while the remaining 37.5% resided in cities. It is important to keep in mind that geographical location may affect their ability to access medical services and sources, transportation, and social support systems, which can have implications for treatment and overall patient outcomes. Two-thirds of the participants were married (83.3%), and 41.7% had a primary education, while 26.7% were uneducated. These results emphasize the significance of patient education programs in order to improve general health. Over three-fifths (65.8%) of HD patients were unemployed, so financial stability, access to medical care, and emotional well-being may all be negatively affected by unemployment. Finally, the data also revealed that a large majority of patients (86.7%) reported taking medication regularly and perceived a positive effect of the drug on their health (75.0%).

In the present study, the overall HR-QOL score, as measured by the KDQOL-36™ instrument, was 1958.5 (IQR= 2007.50), which is considered moderate quality of life. As a higher KDQOL-36™ score indicates better quality of life, we report higher scores in the SPKD domain and lower scores in the BKD domain. The SPKD domain had the highest mean score 746.7 (IQR= 775.0), suggesting that participants had relatively low levels of kidney disease-related symptoms and problems, and this finding is supported by Cohen et al. [75] and Kim et al. [79]. On the other hand, the BKD domain received the lowest mean score of 177.1 (IQR= 150.0), suggesting a higher burden associated with kidney disease, which is similar to Vo et al. finding [81]. Moreover, The HD patient's MCS score 372.5 (IQR= 417.5) was higher than their PCS score 298.3 (IQR= 250.0). This finding was also reported by Cohen et al. [75], Nassef et al. [70], Kim et al. [79], Vo et al.

[71], and Van et al. [112]. This shows that, despite the possibility of their physical health worsening, HD patients appear to have stable and good mental health. Dietary restriction emerged as the most bothered issue, so this suggests that adherence to dietary restrictions can significantly have a positive impact on quality of life for HD patients. Additionally, these results are consistent with all the studies conducted in Palestine [70-74], which have shown that the HR-QOL was poor among HD patients.

The current study seems to be the first in the West Bank to measure medication related burden among HD patients using the LMQ-3 instrument. The majority of HD patients reported a minimum (40.0%) to moderate (45.8%) burden. These findings demonstrate that a significant number of HD patients experience a certain level of burden from their drug regimen, which may affect their adherence to therapy and overall health. There are no studies currently available for comparison to the present study on HD patients. Only other chronic diseases, such as diabetes, are within the scope of current studies, and these studies demonstrate that patients with chronic diseases suffer from moderate to high burden [91–93]. A higher medication-related burden is linked to higher scores. The patient-doctor relationships domain, effectiveness, and cost-related burden achieved the highest burden scores. Enhancing patient-doctor relationships through improved communication, building confidence, and patient-centered care strategies can help reduce this burden and promote better healthcare experiences. Several HD patients experienced burdens related to the effectiveness of their treatment. This can be a consequence of insufficient symptom alleviation, poor disease management, or inadequate therapy outcomes. In addition, patients experience significant financial difficulties due to their low-income levels, the expensive and high price of medicines, or, in certain circumstances, the absence of those medications.

The findings from the ARMS questionnaire aspect provide substantial insight into the participants' levels of medication adherence. A high percentage of participants suffered from low adherence (73.3%). Low adherence may result in a negative impact on effectiveness of treatment, disease management, and overall patient outcomes. A significant proportion of participants 55.8% (M=2.23, SD= 1.027) reported delaying or avoiding medication refills due to financial restrictions. Financial limitation on getting medications can have a significant impact on adherence and result in suboptimal treatment outcomes.

The studied population's HR-QOL, medication burden, and adherence are significantly influenced by a number of socio-demographic characteristics. It has been found that age is related to HR-QOL differences. It indicates that older patients receiving hemodialysis may have a different quality of life than younger patients. Age-related diseases, an increase in multiple disorders, or alterations in physical and psychological health associated with aging might all serve as contributing factors. Additionally, gender is found to have a considerable impact on both HR-QOL and MRB. Other factors that emphasize variations in HR-QOL and MRB include residence and district due to geographic location and living environment differences. Educational level and employment status also show associations with HR-QOL. Higher levels of education and employment may lead to general well-being, which improves the quality of life for such patients. Conversely, participants with lower levels of education and unemployment may encounter additional difficulties that have a detrimental impact on their HR-QOL. Regular medication use is significantly associated with medication adherence, as evaluated by the ARMS scale. Compared to patients with low adherence, patients with high adherence are more likely to experience better outcomes.

The findings reveal that there is a significant negative correlation between HR-QOL and various aspects of medication burden. This indicates that higher levels of medication burden are associated with lower HR-QOL scores. Thus, HR-QOL tends to decrease as the medication burden increases. Patients who take numerous medicines may have greater challenges with managing their medications, which may have a negative impact on their general health and quality of life. The findings further demonstrate that several domains of medication burden, including practical difficulties, cost-related burden, side-effect burden of prescribed medications, lack of effectiveness, interferences with day-to-day life, and control/autonomy of medicine use, are significantly associated with HR-QOL (P-value < 0.05). Furthermore, no significant relationship is observed between patient-doctor relationships and communication about the medicine domain, as well as attitudes attitudes/General concerns about the medicine domain and HR-QOL. This result is supported by Al-Mansouri et al. [77], who suggested that HD patients exhibited a considerably higher treatment burden and poorer HR-QOL.

A study found that there is a significant correlation between medication adherence and medication burden, with a substantial positive association between these two variables (rs = +0.452, p < 0.05). The positive correlation coefficient indicates that as the level of medication-related burden increases, medication adherence tends to decrease. On the other hand, individuals who have a lower medication burden are more likely to show improved medication adherence. This suggests that reducing the burden related to drug administration may improve medication adherence in HD patients. This result is supported by Zidan et al. [105], who suggested that the medication-related burden and adherence scores of the LMQ and ARMS, respectively, are significantly correlated (rs = 0.317 and p< 0.0005).

Finally, the findings shed light on the impact of medication burden on adherence and HR-QOL, as well as the direct and indirect effects of these factors on patients' quality of life. The results confirmed a significant positive effect of medication burden on adherence and a significant negative effect of medication burden on HR-QOL again. On the other hand, the study demonstrates that adherence had no significant effect on HR-QOL (rs = -0.161 and a p-value > 005). This shows that patients' compliance and adherence with their treatment plan do not directly affect their HR-QOL. Additionally, the analysis reveals no indirect effect of burden cross-adherence on HR-QOL (rs = -0.098 and a p-value > 0.05). This suggests that the combined influence of medication burden and adherence does not have a significant indirect effect on patients' quality of life. While both factors individually affect HR-QOL, their combined impact does not result in a significant additional effect. This finding is in contrast to Tesfaye et al. [106], who concluded that non-adherence was linked to a greater burden of medication. Over time, nonadherence was linked to a decline in physical HR-QOL. However, it should be noted that the questionnaires used in his study are different from the ones used in our study.

5.1. Limitations

This study has several limitations that need to be reported. First, the findings may not be generalized to other demographics or healthcare settings. The study focuses specifically on hemodialysis patients in two dialysis units of the Ministry of Health Hospital in the West Bank, which could subsequently display unique social, economic, cultural, and healthcare system features. Second, self-reported data were used in the study, which could have resulted in answer biases or recollection inaccuracies. Third, some medical information was missing, such as the

number of medications, the duration of dialysis, and other comorbidities. Fourth, A long-term research strategy may be more suitable for a more accurate evaluation of the association between HR-QOL, medication-related burden, and adherence, as well as potential changes over time in HD patients.

CHAPTER SIX

_____

6.1. Conclusion

This study reveals significant insights about the HR-QOL, medication burden, and adherence of HD patients in the West Bank. The research demonstrates that among patients undergoing hemodialysis, medication burden has a significant negative impact on HR-QOL and a considerable positive impact on medication adherence. This means that as medication-related burden increases, HR-QOL tends to decrease, and medication non-adherence increases. Acknowledging and controlling the medication burden as part of comprehensive treatment might assist patients' quality of life and drug adherence.

6.2. Recommendations

- Healthcare practitioners need to take a patient-focused strategy and acknowledge the negative effects of medication burden and non-adherence on HR-QOL. Also, encouraging patient's role in decision making

- Routinely evaluating HR-QOL, medication-related burden and adherence levels in order to monitor changes and improvement over time.

- Decreasing the medication burden within HD patients requires the application of appropriate treatment regime and simplifying it, providing precise instructions, and solving major challenges to medication adherence such cost issues and side effects.

- More research is required to identify further factors that can affect HR-QOL, medication-related burden, and adherence and to provide specialized interventions that would improve patient outcomes.

References

[1] Bikbov, Boris, et al. "Global, regional, and national burden of chronic kidney disease, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017." The lancet 395.10225 (2020): 709-733.

[2] Ammirati, Adriano Luiz. "Chronic kidney disease." Revista da Associação Médica Brasileira 66 (2020): s03-s09.

[3] Delanaye, Pierre, et al. "An age-calibrated definition of chronic kidney disease: rationale and benefits." The Clinical Biochemist Reviews 37.1 (2016): 17.

[4] Morton, Rachael L., and Karan K. Shah. "Kidney health in the context of economic development." Nature Reviews Nephrology 17.1 (2021): 5-6.

[5] Amouzegar, Atefeh, et al. "International Society of Nephrology Global Kidney Health Atlas: structures, organization, and services for the management of kidney failure in the Middle East." Kidney International Supplements 11.2 (2021): e47-e56.

[6] Nazzal, Zaher, et al. "Prevalence and risk factors of chronic kidney disease among Palestinian type 2 diabetic patients: a cross-sectional study." BMC nephrology 21.1 (2020): 1-8.

[7] Levin, Adeera, and Paul E. Stevens. "Early detection of CKD: the benefits, limitations and effects on prognosis." Nature Reviews Nephrology 7.8 (2011): 446-457.

[8] Verhelst, David. "Characteristics and epidemiology of chronic kidney disease." Soins; la revue de reference infirmiere 63.826 (2018): 14-16.

[9] Levey, Andrew S., et al. "The definition, classification, and prognosis of chronic kidney disease: a KDIGO Controversies Conference report." Kidney international 80.1 (2011): 17-28.

[10] Gaitonde, David Y., David L. Cook, and Ian M. Rivera. "Chronic kidney disease: detection and evaluation." American family physician 96.12 (2017): 776-783.

[11] Vidal-Petiot, Emmanuelle, and Martin Flamant. "Measurement and estimation of glomerular filtration rate." Nephrologie & therapeutique 13.7 (2017): 560-568.

[12] Agarwal, Rajiv, and Pierre Delanaye. "Glomerular filtration rate: when to measure and in which patients?." Nephrology Dialysis Transplantation 34.12 (2019): 2001-2007.

[13] Stevens, Lesley A., et al. "Assessing kidney function—measured and estimated glomerular filtration rate." New England Journal of Medicine 354.23 (2006): 2473-2483.

[14] Schwartz, George J., and Susan L. Furth. "Glomerular filtration rate measurement and estimation in chronic kidney disease." Pediatric nephrology 22.11 (2007): 1839-1848.

[15] Eknoyan, G., et al. "kidney disease: improving global outcomes (KDIGO) acute kidney injury work group. KDIGO clinical practice guideline for acute kidney injury." Kidney Int Suppl 2 (2012): 1-138.

[16] Butt, Linus, et al. "A molecular mechanism explaining albuminuria in kidney disease." Nature Metabolism 2.5 (2020): 461-474.

[17] Levey, Andrew S., Cassandra Becker, and Lesley A. Inker. "Glomerular filtration rate and albuminuria for detection and staging of acute and chronic kidney disease in adults: a systematic review." Jama 313.8 (2015): 837-846.

[18] Inker, Lesley A., et al. "Estimated GFR, albuminuria, and complications of chronic kidney disease." Journal of the American Society of Nephrology 22.12 (2011): 2322-2331.

[19] Guh, Jinh- yuh. "Proteinuria versus albuminuria in chronic kidney disease." Nephrology 15 (2010): 53-56.

[20] Chen, Teresa K., Daphne H. Knicely, and Morgan E. Grams. "Chronic kidney disease diagnosis and management: a review." Jama 322.13 (2019): 1294.

[21] Lunyera, Joseph, et al. "CKD of uncertain etiology: a systematic review." Clinical journal of the American Society of Nephrology 11.3 (2016): 379-385.

[22] Vaidya, Satyanarayana R., Narothama R. Aeddula, and Chaddie Doerr. "Chronic Renal Failure (Nursing)." (2021).

[23] Carrero, Juan Jesus, et al. "Sex and gender disparities in the epidemiology and outcomes of chronic kidney disease." Nature Reviews Nephrology 14.3 (2018): 151-164.

[24] Drawz, Paul, and Mahboob Rahman. "Chronic kidney disease." Annals of internal medicine 150.3 (2009): ITC2-1.

[25] Cabrera, Valerie Jorge, et al. "Symptom management of the patient with CKD: the role of dialysis." Clinical Journal of the American Society of Nephrology 12.4 (2017): 687-693.

[26] Webster, Angela C., et al. "chronic kidney disease." The lancet 389.10075 (2017): 1238-1252.

[27] Rysz, Jacek, et al. "Novel biomarkers in the diagnosis of chronic kidney disease and the prediction of its outcome." International journal of molecular sciences 18.8 (2017): 1702.

[28] Gaitonde, David Y., David L. Cook, and Ian M. Rivera. "Chronic kidney disease: detection and evaluation." American family physician 96.12 (2017): 776-783.

[29] Amaresan, M. S., and R. Geetha. "Early diagnosis of CKD and its prevention." JAPI 56 (2008): 41-6.

[30] Perazella, Mark A. "The urine sediment as a biomarker of kidney disease." American journal of kidney diseases 66.5 (2015): 748-755.

[31] Levin, Adeera, et al. "Guidelines for the management of chronic kidney disease." Cmaj 179.11 (2008): 1154-1162.

[32] Cabrera, Valerie Jorge, et al. "Symptom management of the patient with CKD: the role of dialysis." Clinical Journal of the American Society of Nephrology 12.4 (2017): 687-693.

[33] Kanda, Hirotsugu, et al. "Perioperative management of patients with end-stage renal disease." Journal of cardiothoracic and vascular anesthesia 31.6 (2017): 2251-2267.

[34] Hashmi, Muhammad F., Onecia Benjamin, and Sarah L. Lappin. "End-Stage Renal Disease." StatPearls. Treasure Island (FL): StatPearls Publishing (2022).

[35] Ministry of Health, Palestinian Health Information Center. Health Annual Report, Palestine 2021. (2022)

https://site.moh.ps/Content/Books/Hqgu4D5vfT6bDhDUtl36GHhx9oYlCS9JplXYDfOMKrnDt6YoDPkPdl_I6mhnD3xb5MaPpX1mx6k6J4WowTnGUc1135KRHMmuMwEi1Zh1QUmFY.pdf

[36] Wang, Virginia, et al. "The economic burden of chronic kidney disease and end-stage renal disease." Seminars in nephrology. Vol. 36. No. 4. WB Saunders, (2016).

[37] Abbasi, Maaz Ahmed, Glenn M. Chertow, and Yoshio N. Hall. "End-stage renal disease." BMJ clinical evidence 2010 (2010).

[38] Abdel-Kader, Khaled, Mark L. Unruh, and Steven D. Weisbord. "Symptom burden, depression, and quality of life in chronic and end-stage kidney disease." Clinical Journal of the American society of Nephrology 4.6 (2009): 1057-1064.

[39] Vaidya, Satyanarayana R., and Narothama R. Aeddula. "Chronic renal failure." StatPearls [Internet]. StatPearls Publishing, 2021.

[40] Clinical practice guidelines for nutrition in chronic renal failure. K/DOQI, National Kidney Foundation. Am J Kidney Dis. 2000;35(6 Suppl 2):S1-140.

[41] Ikizler, T. Alp, et al. "KDOQI clinical practice guideline for nutrition in CKD: 2020 update." American Journal of Kidney Diseases 76.3 (2020): S1-S107.

[42] Borrelli, Silvio, et al. "Sodium intake and chronic kidney disease." International journal of molecular sciences 21.13 (2020): 4744.

[43] Putcha, Nirupama, and Michael Allon. "Management of hyperkalemia in dialysis patients." Seminars in dialysis. Vol. 20. No. 5. Oxford, UK: Blackwell Publishing Ltd, 2007.

[44] Anderson, Cheryl AM, and Hoang Anh Nguyen. "Nutrition education in the care of patients with chronic kidney disease and end-stage renal disease." Seminars in dialysis. Vol. 31. No. 2. (2018).

[45] Nazar, Chaudhary Muhammad Junaid. "Significance of diet in chronic kidney disease." Journal of nephropharmacology 2.2 (2013): 37.

[46] Murdeshwar, Himani N., and Fatima Anjum. "Hemodialysis." (2020).

[47] Elliott, Denise A. "Hemodialysis." Clinical techniques in small animal practice 15.3 (2000): 136-148.

[48] Gunawansa, Nalaka, Dinesha Himali Sudusinghe, and Dilushi Rowena Wijayaratne. "Hemodialysis catheter-related central venous thrombosis: clinical approach to evaluation and management." Annals of vascular surgery 51 (2018): 298-305.

[49] Chan, Christopher T., et al. "Dialysis initiation, modality choice, access, and prescription: conclusions from a Kidney Disease: Improving Global Outcomes (KDIGO) Controversies Conference." Kidney international 96.1 (2019): 37-47.

[50] Andreoli, Maria Claudia Cruz, and Claudia Totoli. "Peritoneal dialysis." Revista da Associação Médica Brasileira 66 (2020): s37-s44.

[51] Zimmerman, Anna M. "Peritoneal dialysis: increasing global utilization as an option for renal replacement therapy." Journal of global health 9.2 (2019).

[52] Andreoli, Maria Claudia Cruz, and Claudia Totoli. "Peritoneal dialysis." Revista da Associação Médica Brasileira 66 (2020): s37-s44.

[53] Garcia, Guillermo Garcia, Paul Harden, and Jeremy Chapman. "The global role of kidney transplantation." Kidney and Blood Pressure Research 35.5 (2012): 299-304.

[54] Devine, Paul A., Aisling E. Courtney, and Alexander P. Maxwell. "Cardiovascular risk in renal transplant recipients." Journal of Nephrology 32 (2019): 389-399.

[55] STARRT-AKI Investigators. "Timing of initiation of renal-replacement therapy in acute kidney injury." New England Journal of Medicine (2020).

[56] Felce, David, and Jonathan Perry. "Quality of life: Its definition and measurement." Research in developmental disabilities 16.1 (1995): 51-74.

[57] Karimi, Milad, and John Brazier. "Health, health-related quality of life, and quality of life: what is the difference?." Pharmacoeconomics 34.7 (2016): 645-649

[58] Webster, Angela C., et al. "chronic kidney disease." The lancet 389.10075 (2017): 1238-1252.

[59] Molokhia, Mariam, and Azeem Majeed. "Current and future perspectives on the management of polypharmacy." BMC Family Practice 18 (2017): 1-9.

[60] Gnjidic, Danijela, Mary Tinetti, and Heather G. Allore. "Assessing medication burden and polypharmacy: finding the perfect measure." Expert review of clinical pharmacology 10.4 (2017): 345-347.

[61] Katusiime, Barbra, Sarah A. Corlett, and Janet Krska. "Development and validation of a revised instrument to measure burden of long-term medicines use: the Living with Medicines Questionnaire version 3." Patient related outcome measures 9 (2018): 155.

[62] Krska, Janet, Barbra Katusiime, and Sarah A. Corlett. "Validation of an instrument to measure patients' experiences of medicine use: the living with medicines questionnaire." Patient preference and adherence 11 (2017): 671.

[63] Krska, Janet, et al. "Measuring the impact of long-term medicines use from the patient perspective." International journal of clinical pharmacy 36.4 (2014): 675-678.

[64] Krska, Janet, Barbra Katusiime, and Sarah A. Corlett. "Patient experiences of the burden of using medicines for long-term conditions and factors affecting burden: A cross-sectional survey." Health & social care in the community 26.6 (2018): 946-959.

[65] Mechta Nielsen, Trine, et al. "Adherence to medication in patients with chronic kidney disease: a systematic review of qualitative research." Clinical kidney journal 11.4 (2018): 513-527.

[66] Tangkiatkumjai, Mayuree, et al. "Association between medication adherence and clinical outcomes in patients with chronic kidney disease: a prospective cohort study." Clinical and experimental nephrology 21.3 (2017): 504-512ز

[67] Kripalani, Sunil, et al. "Development and evaluation of the Adherence to Refills and Medications Scale (ARMS) among low-literacy patients with chronic disease." Value in Health 12.1 (2009): 118-123.

[68] Manns, Braden J., et al. "Dialysis adequacy and health related quality of life in hemodialysis patients." ASAIO journal 48.5 (2002): 565-569.

[69] Mohammed, Mohammed A., Rebekah J. Moles, and Timothy F. Chen. "Medication-related burden and patients' lived experience with medicine: a systematic review and metasynthesis of qualitative studies." BMJ open 6.2 (2016): e010035.

[70] Naseef, Hani H., et al. "Quality of Life of Palestinian Patients on Hemodialysis: Cross-Sectional Observational Study." The Scientific World Journal 2023 (2023).

[71] Samoudi, Aseel F., et al. "The impact of pain on the quality of life of patients with end-stage renal disease undergoing hemodialysis: a multicenter cross-sectional study from Palestine." Health and quality of life outcomes 19.1 (2021): 1-10.

[72] Khatib, Sohaib T., et al. "Quality of life in hemodialysis diabetic patients: a multicenter cross-sectional study from Palestine." BMC nephrology 19.1 (2018): 1-9.

[73] Mousa, Ibrahim, et al. "Dialysis-related factors affecting self-efficacy and quality of life in patients on haemodialysis: a cross-sectional study from Palestine." Renal Replacement Therapy 4.1 (2018): 1-12.

[74] Zyoud, Sa'ed H., et al. "Factors affecting quality of life in patients on haemodialysis: a cross-sectional study from Palestine." BMC nephrology 17.1 (2016): 1-12.

[75] Cohen, Dena E., et al. "Use of the KDQOL-36™ for assessment of health-related quality of life among dialysis patients in the United States." BMC nephrology 20.1 (2019): 1-9.

[76] Ajeebi, Abdulaziz, et al. "A study of quality of life among hemodialysis patients and its associated factors using kidney disease quality of life instrument-SF36 in Riyadh,." Saudi Journal of Kidney Diseases and Transplantation 31.6 (2020): 1225-1233.

[77] Al-Mansouri, Asmaa, et al. "Assessment of treatment burden and its impact on quality of life in dialysis-dependent and pre-dialysis chronic kidney disease patients." Research in Social and Administrative Pharmacy 17.11 (2021): 1937-1944.

[78] Kharshid, Abeer Mohammad, Syed Azhar Syed Sulaiman, and Mohamed Jamal Saadh. "Health-Related Quality Of Life in Chronic Kidney Disease Patients: A Cross-Sectional Study." Systematic Reviews in Pharmacy 11.7 (2020): 188-192.

[79] Kim, Jong-Yeon, et al. "Health-related quality of life with KDQOL-36 and its association with self-efficacy and treatment satisfaction in Korean dialysis patients." Quality of Life Research 22 (2013): 753-758.

[80] Hall, Rasheeda K., et al. "Association of Kidney Disease Quality of Life (KDQOL-36) with mortality and hospitalization in older adults receiving hemodialysis." BMC nephrology 19 (2018): 1-9.

[81] Vo, Trung Quang, et al. "Impact of chroni kidney disease on health-related quality of life: a prospective observational study using the KDQOL-36 instrument." J Clin Diagn Res 12.6 (2018): LC66-LC71.

[82] Ademola, B. L., P. N. Obiagwu, and A. Aliyu. "Assessment of health-related quality of life of chronic kidney disease patients in aminu kano teaching hospital, Kano." Nigerian Journal of Clinical Practice 23.7 (2020): 906-911.

[83] Chen, Shan Shan, Saleem Al Mawed, and Mark Unruh. "Health-related quality of life in end-stage renal disease patients: how often should we ask and what do we do with the answer?." Blood Purification 41.1-3 (2016): 218-224.

[84] Ware, John E., et al. "Improving CKD-specific patient-reported measures of health-related quality of life." Journal of the American Society of Nephrology 30.4 (2019): 664-677.

[85] Chand, Sohail, and Gull Rukh Khan. "Evaluation of Health-Related Quality of Life in Patients with Chronic Kidney Disease." Asian Journal of Allied Health Sciences (AJAHS) (2021): 10-18.

[86] Aggarwal, H. K., et al. "Health-related quality of life in different stages of chronic kidney disease." QJM: An International Journal of Medicine 109.11 (2016): 711-716.

[87] Gebrie, Mignote Hailu, et al. "Health-related quality of life among patients with end-stage renal disease undergoing hemodialysis in Ethiopia: a cross-sectional survey." Health and Quality of Life Outcomes 21.1 (2023): 1-11.

[88] Küçük, O., et al. "Comparison of mental health, quality of sleep and life among patients with different stages of chronic kidney disease and undergoing different renal replacement therapies." Hippokratia 24.2 (2020): 51.

[89] Deng, Rebecca. "Exploring the Evidence: Symptom Burden in Chronic Kidney Disease." Nephrology Nursing Journal 49.3 (2022): 227-255.

[90] Tordoff, June M., et al. "Exploring medicines burden among adults in New Zealand: a cross-sectional survey." Patient preference and adherence (2019): 2171-2184.

[91] Alqallaf, Sayed Mahmood, et al. "Medication-related burden from the perspective of the elderly." Medicine and Pharmacy Reports 95.3 (2022): 320.

[92] Bekalu, Abaynesh Fentahun, et al. "Medication-related burden and associated factors among diabetes mellitus patients at Felege Hiwot Comprehensive Specialized Hospital in northwest Ethiopia." Frontiers in Clinical Diabetes and Healthcare 3 (2022).

[93] Baah-Nyarkoh, Emmanuella, et al. "Medicated-related burden and adherence in patients with co-morbid type 2 diabetes mellitus and hypertension." Heliyon 9.4 (2023).

[94] Noori, Ayman Jamal, Dheyaa Jabbar Kadhim, and Muqdad Abdulhasan Al-Hilal. "Medication-related burden among patients with diabetes mellitus and its relation to diabetic control parameters: an observational study." F1000Research 11.1112 (2022): 1112.

[95] Zheng, Chunyuan, et al. "Polypharmacy, medication-related burden and antiretroviral therapy adherence in people living with HIV aged 50 and above: A cross-sectional study in Hunan, China." Patient preference and adherence (2022): 41-49.

[96] Wang, Yongli, et al. "Exploring polypharmacy burden among elderly patients with chronic diseases in Chinese community: a cross-sectional study." BMC geriatrics 21.1 (2021): 308.

[97] Chen, Won Sun, et al. "Factors associated with patient experiences of the burden of using medicines and health-related quality of life: A cross-sectional study." Plos one 17.4 (2022): e0267593.

[98] Dharmapuri, Sadhana, et al. "Health literacy and medication adherence in adolescents." The Journal of pediatrics 166.2 (2015): 378-382.

[99] Radojević, Branislava, et al. "Adherence to Medication among Parkinson's Disease Patients Using the Adherence to Refills and Medications Scale." International journal of clinical practice 2022 (2022).

[100] Khan, Mariam, et al. "Medication Adherence Among Patients With Corneal Diseases." Cornea 40.12 (2021): 1554-1560.

[101] Kurdi, Sawsan, et al. "Evaluation of medication adherence among patients with chronic diseases in Saudi Arabia." International Journal of Clinical Practice 75.7 (2021): e14253.

[102] Murali, Karumathil M., et al. "Medication adherence in randomized controlled trials evaluating cardiovascular or mortality outcomes in dialysis patients: A systematic review." BMC nephrology 18.1 (2017): 1-11.

[103] Jaam, Myriam, et al. "Assessing prevalence of and barriers to medication adherence in patients with uncontrolled diabetes attending primary healthcare clinics in Qatar." Primary care diabetes 12.2 (2018): 116-125.

[104] Jamous, Raniah Majed, Waleed Mohamad Sweileh, and Adham Saed El-Deen Abu Taha. "Beliefs about medicines and self-reported adherence among patients with chronic illness: a study in Palestine." Journal of family medicine and primary care 3.3 (2014): 224.

[105] Zidan, Amani, et al. "Medication-related burden among patients with chronic disease conditions: perspectives of patients attending non-communicable disease clinics in a primary healthcare setting in Qatar." Pharmacy 6.3 (2018): 85.

[106] Tesfaye, Wubshet H., et al. "Medication adherence, burden and health-related quality of life in adults with predialysis chronic kidney disease: a prospective cohort study." International journal of environmental research and public health 17.1 (2020): 371.

[107] Elamin, Sarra, et al. "Arabic translation, adaptation, and validation of the kidney disease quality of life short-form 36." Saudi Journal of Kidney Diseases and Transplantation 30.6 (2019): 1322-1332.

[108] Zidan, Amani, et al. "The Living with Medicines Questionnaire: translation and cultural adaptation into the Arabic context." Value in health regional issues 10 (2016): 36-40.

[109] Alammari, Ghaida, et al. "Validation of an Arabic Version of the Adherence to Refills and Medications Scale (ARMS)." Healthcare. Vol. 9. No. 11. MDPI, 2021.

[110] Hays, Ron D., et al. "Kidney Disease Quality of Life Short Form (KDQOL-SF™), version 1.3: a manual for use and scoring." Santa Monica: Rand (1997): 7994.

[111] Harford, Rubette, et al. "Relationship between age and pre-end stage renal disease care in elderly patients treated with hemodialysis." Nephrology nursing journal: journal of the American Nephrology Nurses' Association 43.2 (2016): 101.

[112] Van, Khanh Ngo, et al. "Examining the health-related quality of life of people with end-stage kidney disease living in Hanoi, Vietnam." Renal Society of Australasia Journal 8.3 (2012): 140-145.

Appendix I

1. استبيان الصفات الاجتماعية والديمغرافية للمرضى

1. العمر:	_____		
2. الجنس:	☐ذكر	☐أنثى	
3. مكان الإقامه:	☐مخيم	☐قرية	☐مدينه
4. الحاله الاجتماعيه:	☐متزوج	☐أعزب	☐مطلق	☐أرمل
5. المقاطعه:	☐الشمال	☐الوسط	☐الجنوب
6. المستوى التعليمي:	☐غير متعلم	☐إعدادي	☐ثانوي	☐جامعي
7. الحالة الوظيفية:	☐ غير موظف	☐موظف	☐متقاعد
8. الدخل الشهري:	☐لا يوجد دخل	☐ أقل من 2000 ₪	☐ 2000- 4000 ₪	☐أكثر من 4000 ₪
9. التدخين	☐غير مدخن	☐مدخن سابق	☐مدخن
10. هل تأخذ الدواء بانتظام؟	☐نعم	☐أحياناً	☐لا
11. هل للأدوية تأثيرات جيدة على صحتك:	☐نعم	☐أحياناً	☐لا
12. تاريخ اكتشاف المرض:	☐ مبكرا خلال السنة الاولى من ظهور الاعراض.	☐متأخرا بعد سنة من ظهور الاعراض

2. **استبيان دراسة نوعية حياة مرضى الفشل الكلوي**

يحتوي هذا الاستبيان على أسئلة متنوعة عن صحتك وحياتك. نحن مهتمون بمعرفة شعورك تجاه كل من المواضيع التالية:

1. **بصورة عامة، يمكنك أن تقول أن صحتك : (وضع علامة x في المربع الذي يصف إجابتك بشكل أفضل)**

| ☐ | سيئة جدا | ☐ | سيئة | ☐ | مقبولة | ☐ | ممتازة |

الفقرات التالية تتعلق بأنشطة من الممكن أن تمارسها خلال يوم عادي. هل تمنعك صحتك الآن عن ممارسة هذه الأنشطة ؟ وإذا كانت تمنعك فإلى أي درجة (ضع علامة x في مربع واحد من كل سطر).

لا لا تمنعني	نعم تمنعني أحيانا	نعم تمنعني كثيرا	
☐	☐	☐	2. **الأنشطة المعتدلة، مثل: تحريك الأثاث ، ومسح الغبار والحركة داخل المنزل ....**
☐	☐	☐	3. **الصعود على السلم لعدد من الطوابق ...**

خلال الأسابيع الأربعة الماضية، هل واجهتك أي من المشاكل التالية عند أدائك لعملك أو أنشطتك اليومية نتيجة لصحتك الجسدية ؟

لا	نعم	
☐	☐	4. **انجزت أقل مما كنت تريد ....**

5. كنت مقيدا في نوع العمل أو النشاط الذي تؤديه

☐   ☐

خلال الأسابيع الأربعة الماضية، هل واجهتك أي من المشاكل التالية عند أدائك لعملك أو أنشطتك اليومية نتيجة لأي مشكلة نفسية (كالشعور بالاكتآب أو القلق)؟

لا	نعم

6. انجزت أقل مما كنت تريد ....

☐   ☐

7. لم تقم بعملك أو نشاطاتك اليومية بالجودة المعتادة ....

☐   ☐

8. خلال الأسابيع الأربعة الماضية، إلى أي مدى أثر الألم في أدائك لأعمالك العادية (بما يشمل العمل خارج المنزل والأعمال المنزلية)؟

تأثير كبير جدا	تأثير كبير	تأثير متوسط	تأثير قليل	لم يؤثر
☐	☐	☐	☐	☐

تدور الأسئلة التالية حول شعورك وكيف كانت أحوالك خلال الأسابيع الأربعة الماضية. لكل سؤال من فضلك أعط الإجابة الأقرب إلى الطريقة التي كنت تشعر بها.

كم من الزمن خلال الأسابيع الأربعة الماضية.......

لم يحدث ابدا	في قليل من الأوقات	في بعض الأوقات	في كثير من الأوقات	معظم الوقت	طول الوقت	
☐	☐	☐	☐	☐	☐	9. شعرت بالهدوء والسكينة؟

10. كنت مليئا بالطاقة؟

□ □ □ □ □ □

11. شعرت بالحزن والكآبة؟

□ □ □ □ □ □

12. خلال الأسابيع الأربعة الماضية، كم من الوقت أثرت صحتك الجسدية أو مشاكلك النفسية على انشطتك الاجتماعية (مثل زيارة الأصدقاء والأقارب....الخ) ؟

لم يحدث ابدا	في قليل من الأوقات	أثرت أحيانا	معظم الوقت	طول الوقت
□	□	□	□	□

ما مقدار صحة أو خطأ كل من العبارات التاليه بالنسبة لك ؟

خاطئة تماماً	خاطئه في الغالب	لا أقدر أن أحدد	صحيحة في الغالب	صحيحة تماما	
□	□	□	□	□	13. يؤثر مرضي الكلوي على حياتي أكثر من اللازم .....
□	□	□	□	□	14. أقضي الكثير جداً من وقتي في التعامل مع مرضي الكلوي....
□	□	□	□	□	15. يشعرني التعامل مع مرضي الكلوي بالإحباط....
□	□	□	□	□	16. أشعر بأني عبء على أسرتي.......

خلال الأسابيع الأربعة الماضية إلى أي درجة ضايقك كل مما يلي ؟

ضيق كبير جدا	ضيق كبير	ضيق متوسط	ضيق قليل	لم يضايقني	
☐	☐	☐	☐	☐	17. الم في العضلات؟
☐	☐	☐	☐	☐	18. الم في الصدر؟
☐	☐	☐	☐	☐	19. تشنج في العضلات؟
☐	☐	☐	☐	☐	20. حكة في الجلد؟
☐	☐	☐	☐	☐	21. جفاف في الجلد؟
☐	☐	☐	☐	☐	22. ضيق في التنفس؟
☐	☐	☐	☐	☐	23. الدوار أو الدوخه؟
☐	☐	☐	☐	☐	24. فقدان الشهية؟
☐	☐	☐	☐	☐	25. الارهاق والفتور؟
☐	☐	☐	☐	☐	26. خدر في الأيدي والأرجل؟
☐	☐	☐	☐	☐	27. غثيان أو اضطراب في المعدة ؟
☐	☐	☐	☐	☐	28. أ. خاص بمرضى الاستصفاء الدموي "الغسيل الدموي" مشاكل في مكان التوصيل الفستولا أو القسطرة ؟
☐	☐	☐	☐	☐	28. ب. خاص بمرضى الديلزه الصفاقية "الغسيل البروتيني" مخرج القسطرة؟

يتضايق بعض الناس من تأثير المرض الكلوي على حياتهم اليومية في حين لا يتضايق البعض الآخر. إلى أي مدى يضايقك المرض الكلوي في كل من النواحي التالية؟

ضيق كبير جدا	ضيق كبير	ضيق متوسط	ضيق قليل	لم يضايقني	
☐	☐	☐	☐	☐	29. التقليل من السوائل؟
☐	☐	☐	☐	☐	30. القيود على الأكل؟
☐	☐	☐	☐	☐	31. قدرتك على أداء أعمالك المنزلية؟
☐	☐	☐	☐	☐	32. قدرتك على السفر
☐	☐	☐	☐	☐	33. اعتمادك على الاطباء وبقية أفراد الطاقم الطبي؟
☐	☐	☐	☐	☐	34. الاجهاد أو القلق الذي تسببه أمراض الكلى؟
☐	☐	☐	☐	☐	35. حياتك الجنسية؟
☐	☐	☐	☐	☐	36. مظهرك الشخصي؟

Appendix III

<div align="center">

الأدوية و حياتك اليومية، إستبيان التعايش مع الأدوية

</div>

تغطي الجمل التالية الجوانب المختلفة لاستخدام الأدوية.

الرجاء قراءة كل جملة بعناية، و وضع علامة في مربع الإجابة الأقرب إلى رأيك الشخصي، يرجى اختيار مربع واحد فقط لكل جملة.

لا أوافق بشدة	لا أوافق	رأي محايد	أوافق	أوافق بشدة	
☐	☐	☐	☐	☐	1. أجد أن الحصول على وصفات دوائي من الطبيب صعبًا
☐	☐	☐	☐	☐	2. أجد أن الحصول على أدويتي من الصيدلي صعبًا
☐	☐	☐	☐	☐	3. أنا راضٍ عن فعالية أدويتي
☐	☐	☐	☐	☐	4. إنني أتقبل أن أتناول الأدوية في الأوقات المحددة لها
☐	☐	☐	☐	☐	5. يقلقني أن أدفع لقاء أدويتي

لا أوافق بشدة	لا أوافق	رأي محايد	أوافق	أوافق بشدة	
☐	☐	☐	☐	☐	6. يقلقني تناول عدة أدوية في نفس الوقت
☐	☐	☐	☐	☐	7. أثق برأي طبيبي في اختيار أدويتي
☐	☐	☐	☐	☐	8. أود أن يكون لي دور أكبر في اختيار الاسم التجاري للدواء الذي استخدمه
☐	☐	☐	☐	☐	9. أشعر أحيانًا بالحاجة للحصول على معلومات أكثر عن أدويتي
☐	☐	☐	☐	☐	10. ينتابني القلق من أنني قد أنسى تناول أدويتي

أوافق بشدة	لا أوافق	رأي محايد	أوافق	أوافق بشدة		
☐	☐	☐	☐	☐	يمكنني تغيير جرعة الأدوية التي أتناولها وفق حاجتي	11.
☐	☐	☐	☐	☐	ينتابني القلق إزاء الآثار الضارة المحتملة من تناول الأدوية على المدى البعيد	12.
☐	☐	☐	☐	☐	أستطيع الاختيار بين تناول أدويتي أو عدم تناولها	13.
☐	☐	☐	☐	☐	يستمع طبيبي إلى آرائي بشأن أدويتي	14.
☐	☐	☐	☐	☐	تمنع أدويتي حالتي الصحية من أن تسوء	15.
☐	☐	☐	☐	☐	يقلقني إعتمادي التام على أدويتي	16.
☐	☐	☐	☐	☐	يقلقني احتمال تفاعل أدويتي مع عاداتي الغذائية	17.

أوافق بشدة	لا أوافق	رأي محايد	أوافق	أوافق بشدة		
☐	☐	☐	☐	☐	يقلقني أن تتفاعل أدويتي مع بعضها البعض	18.
☐	☐	☐	☐	☐	تؤثر أدويتي على نشاطاتي الاجتماعية أو الترفيهية	19.
☐	☐	☐	☐	☐	يهتم طبيبي بما يقلقني حول التأثيرات الجانبية للدواء	20.
☐	☐	☐	☐	☐	الأثار الجانبية لدواء تكون أحيانًا أسوأ من المشكلة الصحية التي أتناول الدواء من أجلها	21.
☐	☐	☐	☐	☐	الأثار الجانبية الناتجة عن أدويتي تؤثر على حياتي اليومية (مثل: العمل، الأعمال المنزلية، النوم)	22.
☐	☐	☐	☐	☐	يتطلب تناول أدويتي الكثير من التخطيط و التفكير مني	23.
☐	☐	☐	☐	☐	أحصل على معلومات كافية من طبيبي عن أدويتي	24.

أوافق بشدة	لا أوافق	رأي محايد	أوافق	أوافق بشدة		
☐	☐	☐	☐	☐	أدويتي تحقق توقعاتي منها	25
☐	☐	☐	☐	☐	أستطيع تغيير مواعيد تناول أدويتي إذا أردت ذلك	.26
☐	☐	☐	☐	☐	من السهل الحفاظ على روتين تناول أدويتي	.27
☐	☐	☐	☐	☐	تناول الأدوية يؤثر على قدرتي على قيادة السيارة	.28
☐	☐	☐	☐	☐	أجد استخدام أدويتي أمرًا صعبًا	.29
☐	☐	☐	☐	☐	الآثار الجانبية الناتجة عن أدويتي مزعجة	.30
☐	☐	☐	☐	☐	علي الإختيار أحيانًا بين شراء الحاجات الأساسية أو الأدوية	.31

أوافق بشدة	لا أوافق	رأي محايد	أوافق	أوافق بشدة		
☐	☐	☐	☐	☐	أدويتي تسمح لي بأن أعيش حياتي كما أريد	.32
☐	☐	☐	☐	☐	ما يتوجب على إنفاقه على شراء الأدوية يفوق مقدرتي	.33
☐	☐	☐	☐	☐	اختصاصيو الرعاية الصحية الذين يوفرون الرعاية لي يعرفون ما يكفي عني و عن أدويتي	.34
☐	☐	☐	☐	☐	تؤثر أدويتي على علاقاتي الإجتماعية	.35

☐	☐	☐	☐	☐	**36.** يسبب لي تناول الأدوية مشاكل مع أنشطتي اليومية (كالعمل، و الأعمال المنزلية و الهوايات)

<div dir="rtl">

الأدوية و حياتك اليومية، إستبيان التعايش مع الأدوية

الرجاء وضع علامة في مربع الإجابة الاقرب إلى رأيك الشخصي.

</div>

لا أوافق بشدة	لا أوافق	رأي محايد	أوافق	أوافق بشدة	
☐	☐	☐	☐	☐	**37.** أدويتي تؤثر على حياتي الجنسية
☐	☐	☐	☐	☐	**38.** الآثارالجانبية الناتجة عن أدويتي تؤثر سلبًا على صحتي
☐	☐	☐	☐	☐	**39.** أدويتي فعالة
☐	☐	☐	☐	☐	**40.** الفوائد التي أحصل عليها من الدواء تفوق الاثار الجانبية
☐	☐	☐	☐	☐	**41.** أدويتي تشغل حيزًا كبيرًا من حياتي

LMQ Version 3 ©University of Kent 2015

يهدف السؤال التالي لمعرفة رأيك الإجمالي عن كل أدويتك الموصوفة

الرجاء وضع علامة X في الموقع الأقرب الذي يدل على رأيك

1- بشكل عام، كيف تشعر بالعبء الذي تشكله أدويتك؟

```
  10  ├──┼──┼──┼──┼──┼──┼──┼──┼──┼──┤  0
لا تشكل عبئاً مطلقاً                              تشكل عبئاً كبيراً
       9    8    7    6    5    4    3    2    1
```
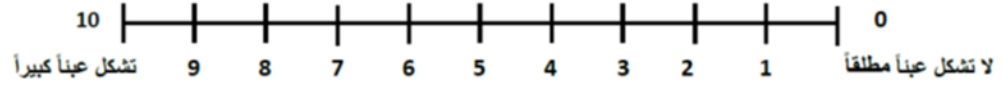
إذا كانت لديك أية أراء أخرى حول مدى تأثير أدويتك على حياتك اليومية، يرجى ذكرها هنا:

LMQ Version 3 ©University of Kent 2015

87

Appendix IV

4. The Adherence to Refills and Medications Scale (ARMS)

4. مقياس الإلتزام بتناول الدواء و إعادة التعبئة.

إنه لمن الشائع ان يفوت الناس تناول أدويتهم من وقت لأخر، أو أن لا يلتزموا التعليمات و الإرشادات العلاجية عند أخذهم لأدويتهم، أود أن أسألك عن طريقة تناول أدويتك، لا توجد إجابات صحيحة أو خاطئة، لكل سؤال، يرجى إختيار أحد الإجابات التالية" اطلاقا , بعض الأحيان , معظم الاحيان, أو دائماً.

دائمًا (4)	معظم الأحيان (3)	بعض الأحيان(2)	إطلاقًا (1)	
☐	☐	☐	☐	1.ما هو معدل نسيان تناولك للأدوية؟
☐	☐	☐	☐	2.ما هو معدل اتخاذ قرار التوقف عن تناول الأدوية؟
☐	☐	☐	☐	3.ما هو معدل نسيان تعبئة أدويتك؟
☐	☐	☐	☐	4. ما هو معدل نفاذ الأدوية لديك؟
☐	☐	☐	☐	5. ما هو معدل عدم تناول أدويتك دون الرجوع للطبيب؟
☐	☐	☐	☐	6.ما هو معدل عدم تناول أدويتك عند شعورك بالتحسن؟
☐	☐	☐	☐	7. ما هو معدل عدم تناول أدويتك عند شعورك بالمرض؟
☐	☐	☐	☐	8. ما هو معدل عدم تناول أدويتك نتيجة الإهمال؟
☐	☐	☐	☐	9. ما هو معدل تغيير درعات أدويتك لتناسب إحتياجاتك (مثلًا تقلل جرعة بعض أدويتك أو تزودها متجاورًا بذلك الجرعة الموصوفة لك)
☐	☐	☐	☐	10. ما هو معدل نسيان تناول أدويتك و التي من المفترض تناولها أكثر من مرة يوميًا؟
☐	☐	☐	☐	11. ما هو معدل تاجيل تعبئة أدويتك بسبب تكلفتها العالية؟
☐	☐	☐	☐	12. ما هو معدل تعبئة أدويتك قبل مدة من نفاذها؟

Appendix V

Al-Quds University
Jerusalem
Deanship of Scientific Research

بسم الله الرحمن الرحيم

جامعة القدس
القدس
عمادة البحث العلمي

Research Ethics Committee
Committee's Decision Letter

Date: May 28, 2022
Ref No: 233/REC/2022

Dears Dr. Maher Khdour, Ms. Reem Hasan Natsheh,

Thank you for submitting your application for research ethics approval. After reviewing your application entitled "Living with Medicines and its Impact on Quality of Life in Dialysis Patients in West Bank, Palestine" the Research Ethics Committee confirms that your application is in accordance with the research ethics guidelines at Al-Quds University.
We would appreciate receiving a copy of your final research report/ publication.

Thank you again and wish you a productive research that serves the best interests of your subjects.

PS: This letter will be valid for two years.

Sincerely,

Suheir Ereqat, PhD
Associate Professor of Molecular Biology

Research Ethics Committee Chair

Cc. Prof. Imad Abu Kishek - President
Cc. Members of the committee
Cc. file

Appendix VI

Ref.: ....

Date: ....

الرقـــم: ١٣٥/١٦٥٢ ح.ع

التاريخ: ٢٠٢٣/١/٤ ح.ع

عطوفة الوكيل المساعد المدير التنفيذي لمجمع فلسطين الطبي المحترم،،،

الأخ مدير عام الادارة العامة للمستشفيات المحترم،،،

تحية واحترام،،،

<u>الموضـــوع: تسهيل مهمة بحث</u>

مرفق طلب تسهيل مهمة الطالبة: ريم حسن نتشة– برنامج ماجستير الصيدلة/ جامعة

القدس، في عمل بحث بعنوان:

Living with Medicines and its Impact on Quality of Life in Dialysis Patients in "

"West Bank, Palestine

من خلال السماح للطالبة بالحصول على معلومات من خلال تعبئة استبانة من قبل المرضى

(بعد اخذ موافقتهم)، وذلك في:

– مجمع فلسطين الطبي

– مستشفى عاليه

على ان يتم الالتزام باساليب واخلاقيات البحث العلمي، ودون التعرض للمعلومات الشخصية للمشاركين.

على ان يتم الالتزام بجميع تعليمات واجراءات الوقاية والسلامة الصادرة عن وزارة الصحة بخصوص

جائحة كورونا، وتحت طائلة المسؤولية.

على ان يتم تزويد الوزارة بنسخة PDF من نتائج البحث، التعهد بعدم النشر لحين الحصول على موافقة
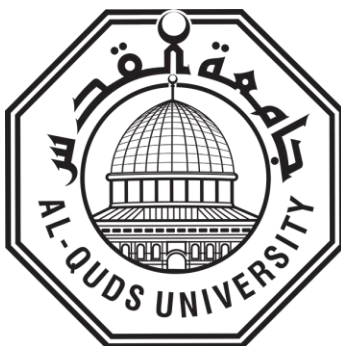
الوزارة على نتائج البحث.

مع الاحترام،،،

د. عبد الله القواسمي

رئيس وحدة التعليم الصحي والبحث العلمي

نسخة: عميد كلية الصيدلة المحترم / جامعة القدس

Telfax.:09-2333901   scientificresearch.dep@gmail.com   تلفاكس: 09-2333901

Appendix VII

<div align="center">موافقة على المشاركة في بحث علمي.</div>

عنوان الدراسة: التعايش مع الأدوية وأثرها على نوعية الحياة بين مرضى غسيل الكلى في الضفة الغربية ، فلسطين

اسم الباحث الرئيسي: ريم حسن عبد المجيد نتشه

اسم المشرف على البحث: د. ماهر الخضور

اخي\ اختي المتطوع(ة) هذا البحث هو احد الابحاث الطبية التي تقوم بها كلية الصيدلة في جامعة القدس للحصول على درجة الماجستير ويهدف الى تحسين نوعية حياة المرضى.

ارجو ان ابين ما يلي :

مشاركتك في هذا البحث طوعية تماما ، ومن شأنها افادة المجتمع وعملية البحث العلمي بشكل عام، وافادة مرضى غسيل الكلى بشكل خاص.

في حال مشاركتك بالبحث ، سيبقى اسمك طي الكتمان ، ويحق لك الانسحاب متى شئت من دون أي اثر يذكر عليك .

يجدر الاشارة ان لجنة البحث العلمي في جامعة القدس قد وافقت على اجراء البحث ، وتعتبر هي اللجنة المؤسسية والمرجعية للبحوث والدراسات.

موافقة المتطوع:

انا المتطوع...قرأت المعلومات المذكورة اعلاه وفهمتها ، وبناء عليه فإنني وافق على المشاركة في البحث.

التاريخ   التوقيع: