

Master of Science in Public Health



**Knowledge, Attitudes and Practices of Hypertensive
Patients Regarding Prevention and Early Detection of
Chronic Kidney Disease in Rawalpindi**

By

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Knowledge, Attitudes and Practices of Hypertensive Patients Regarding Prevention and Early Detection of Chronic Kidney Disease in Rawalpindi

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Declaration

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This dissertation is the result of an independent investigation. Where my work is indebted to others, I have made acknowledgments.

I declare that this work has not been accepted in substance for any other degree, nor is it currently being submitted in candidature for any other degree.

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Dedicated to all those who have been a constant source of support and encouragement for me in my research work

I couldn't be able to accomplish this task without your support.....

ABSTRACT

Background: Hypertension is a global public health problem, with a prevalence of 26% in Pakistan. It is a leading risk factor that leads to Chronic Kidney Disease (CKD) and End Stage Renal Disease. To develop health care policies for primary prevention of CKD, it is important to understand knowledge, attitudes and practices towards prevention and early detection of CKD.

Objectives: To assess the knowledge, attitudes and practices (KAP) of hypertensive patients towards prevention and early detection of CKD in public tertiary care hospital in Rawalpindi. The secondary objective was to determine the association between socio demographic factors and clinical factors with KAP of hypertensive patients towards early detection and prevention of CKD.

Methodology: A cross-sectional study was conducted by using close ended, structured and validated tool CKD screening index to determine the KAP of hypertensive patients from OPD and medicine wards of a tertiary care hospital in Rawalpindi. The tool was made of 3 scales. The knowledge scale consisting of 22 items was dichotomous, while both attitudes and practice scale had 8 items and were 3 point Likert scales. Chi square test of statistical significance was used for determining associations between demographics and clinical variables and KAP.

Results: A total of 296 hypertensive patients took place in study. Out of total participants (n=116; 39.2%) were males and (n=180; 60.8%) were females. Majority of participants, (n=143; 48.3%) were in age group > 45 years. The study revealed that (n=181; 61.1%) respondents had poor knowledge, (n=176; 59.5%) had poor attitudes and (n=187; 63.2%) had poor practices. Results of the Chi square analysis showed that knowledge was significantly associated with marital status (p value= 0.044) and educational status (p value<0.001). Attitude did not showed

significant associations with any independent variable. BMI (p value=.003) and other chronic diseases (p value= 0.026) were associated with practices.

Conclusion: According to our results hypertensive patients lack knowledge about CKD and have unsatisfactory attitudes and poor practices towards its prevention. Knowledge is associated with marital and educational status. We need to improve our educational system and integrate information about CKD in national health programs, to create awareness about this disease. Practices are significantly associated with BMI and other chronic diseases. Mediums like television, social media and newspapers can be used for dispersing information about practices which lead to a healthy lifestyle and prevention of CKD.

Keywords: Knowledge, attitudes and practices (KAP), chronic kidney disease (CKD), Hypertension, Early detection and prevention of CKD, Rawalpindi

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TABLE OF CONTENTS

Declaration	iii
ABSTRACT	v
ACKNOWLEDGEMENTS	vii
LIST OF TABLES	x
LIST OF FIGURES	xi
LIST OF ABBREVIATION	xii
CHAPTER I: INTRODUCTION	1
1.1. Rationale:.....	3
1.2. Objectives:.....	4
CHAPTER II: LITERATURE REVIEW	5
2.1. Research Gap	13
2.2. Importance of Research	14
2.3. Conceptual framework.....	14
2.4. Operational Definitions	15
CHAPTER III: METHODOLOGY	16
3.1. Research Design	16
3.2. Research Duration.....	16
3.3. Study Setting	16
3.4. Research Participants.....	16
3.4.1. Inclusion Criteria.....	16
3.4.2. Exclusion Criteria.....	16
3.5. Sample Size Calculation.....	17
3.6. Sampling Strategy	17
3.7. Data Collection Instrument.....	19
3.7.1. Questionnaire Design.....	19
3.7.2. Study Variables.....	20
3.8. Data Collection Process	20
3.8.1. Pilot Testing	20
3.8.2. Formal Data Collection	21
3.9. Data Analysis Procedure	21
3.9.1. Data Transformation	22
3.9.2. Descriptive Analysis	23

3.9.3. Inferential Analysis	23
3.10. Ethical Considerations:	23
CHAPTER IV: RESULTS.....	25
4.1. Socio demographic Characteristics.....	25
4.2. Clinical Characteristics of the Study Participants	27
4.3. KAP of Hypertensive patients	28
4.3.1. Knowledge related score of the patients	28
4.3.2. Attitude related score of the patients	30
4.3.3. Practice related score of the patients	32
4.4. Inferential Analysis	33
4.4.1. Association between independent variables and knowledge	34
4.4.2. Association between Attitudes and Independent variables	35
4.4.3. Association between Practices and Independent variables	37
CHAPTER V: DISCUSSION.....	40
5.1. Strengths	44
5.2. Limitations	45
5.3. Conclusion.....	45
5.4. Recommendations.....	47
References	49
ANNEXURE 1	55
Data Collection Tool	55
ANNEXURE 2	59
Informed Consent Form.....	59
ANNEXURE 3	60
IRB Letter	60

LIST OF TABLES

Table 1: Classification of stages of CKD	5
Table 2: Categories of Knowledge, Attitudes and Practices	23
Table 3: Socio demographics characteristics of study participants	26
Table 4: Clinical characteristics of study participants	27
Table 5: Responses to knowledge scale in CKS screening index.....	29
Table 6: Responses to attitude scale in CKD screening index	31
Table 7: Responses to practice scale in CKD screening index.....	33
Table 8: Association between knowledge and independent variables	34
Table 9: Association between attitudes and independent variables	36
Table 10: Association between practices and independent variables	37

LIST OF FIGURES

Figure 1: Conceptual framework of KAP for early detection and prevention of CKD	14
Figure 2: Non probability consecutive sampling strategy.....	18
Figure 3: Data Analysis Plan	22
Figure 4: Classification of study subjects on basis of gender.....	26
Figure 5: Classification of hypertensive patients on basis of duration of hypertension	27
Figure 6: Knowledge related score of respondents.....	28
Figure 7: Attitude related score of respondents	31
Figure 8: Practice related score of respondents	32

LIST OF ABBEREVIATION

HTN	Hypertension
CKD	Chronic kidney disease
eGFR	estimated Glomerular Filtration Rate
ESRD	End-stage renal disease
BMI	Body mass index
LMIC	Low middle income countries
SPSS	Statistical package for the Social Sciences
IRB	Institutional review board
AFCKDI	Asian forum for CKD initiatives
(K/DOQI)	Kidney Disease Outcome Quality Initiative
KAP	Knowledge, attitudes and practices
GP's	General practitioners
BP	Blood pressure
AKI	Acute chronic injury

CHAPTER I: INTRODUCTION

Hypertension is a global public health problem, with a higher prevalence in developing countries (Zhou et al., 2021). The prevalence of hypertension in Pakistani population is reported to be 26% (Shah et al., 2018). Hypertension affects the health of an individual in an adverse way. It increases the risk of myocardial infarction, heart failure, chronic kidney disease and stroke. It is a risk factor that leads to Chronic Kidney Disease and End Stage Renal Disease (Singh et al., 2017).

Chronic kidney disease refers to a condition when the kidneys of an individual are damaged to such an extent that they cannot filter the blood properly. A person is suffering from CKD, when the Glomerular Filtration Rate (GFR) is less than 60 mL/min per 1.73 m² for more than 3 months (Thomas et al., 2008).

Chronic kidney disease is a public health issue, affecting the health of a large number of people across the globe (McCullough et al., 2011). The incidence and prevalence of CKD varies from country to country as well as within countries. It is reported that the prevalence, incidence and progression of CKD is affected by social determinants of health and ethnicity. According to a study the global prevalence of CKD is about 13.4% and about 4.902 to 7.083 million individuals suffer from End Stage Kidney Disease (ESKD) (Lv & Zhang, 2019). The prevalence of CKD in Pakistan is estimated to be 23.3% (Hasan et al., 2018).

CKD affects the physical health, mental health, productivity and social life of a person. The symptoms of CKD include bone pain, anemia, fluid retention, hypertension, itch, peripheral neuropathy and sleep disturbance. These symptoms affect the daily activities and quality of life

of a patient. This disease and side effects of medicines can affect the wellbeing of a patient (Chen et al., 2020). It increases the risk of cardiovascular diseases. CKD patients are 5-10 times more likely to suffer and die from heart diseases (Matsushita et al., 2016).

Chronic Kidney Disease is asymptomatic in initial stages so it is difficult to diagnose it in its initial stages. As the patients have lack of awareness about the common risk factors of CKD, so majority patients are not recognized clinically and they remain undiagnosed (McCullough et al. 2010). There are insufficient screening programs for CKD in Pakistan, which leads to undiagnosed cases. Delayed treatment is another important factor which worsens the condition of CKD patients in our country. These factors lead to End Stage Kidney Disease (Ene-Iordache et al., 2016).

Secondly there is a sufficient knowledge gap in Pakistani physicians regarding management of diabetes and hypertension and prevention and diagnosis of CKD. Due to which CKD remains undetected in its initial stages, when it is a mild and easily treatable disease. The late diagnosis leads to the development of disease to advanced stages, and at advanced stages the patient cannot be cured with medications rather they need complex and costly treatments like renal replacement therapies and kidney transplant. These costly treatments pose a significant economic burden on the patients, their families and economy of our country (H.Jafar, 2004).

The budget allocated to health sector in our country by the government is meager. There is lack of resources to treat patients suffering from renal failure. As there is huge chunk of renal failure patients in our country but only 10% of those patients receive renal replacement therapy. The lack of access of patients to renal replacement therapy leads to premature deaths (Mbbs et al., 2015).

CKD is a global public health challenge with increasing incidence and prevalence. It is projected that CKD and End Stage Kidney Disease will reach to epidemic proportions over coming decades. Unfortunately, only a small proportion of countries have the infrastructure and financial conditions to meet the rising needs of patients of End Stage Renal Disease. There is a need to change the global approach to tackle the situation of CKD. The efforts should be focused on launching campaigns focusing primary and secondary prevention to control the CKD. There is a need to focus efforts on understanding risk factors of CKD, its prevention and early detection. There is a need to conduct research on interventions which aim at slowing the progression of CKD. A global approach should be launched to control the increasing prevalence of CKD in both developed and developing countries (Couser et al., 2011).

Knowledge, attitudes and Practices towards a particular practice and issue are evaluated by using KAP surveys since 1960. These surveys are used as a research tool in public health. This Survey can be used to collect the information about knowledge, attitudes and practices of hypertensive patients towards prevention and early detection of chronic kidney disease. The information generated from this survey can give us baseline knowledge of hypertensive patients regarding early detection and prevention of chronic kidney disease. It can help us in determining the extent to which people can adopt healthy behaviors. It can help in creating a program for prevention and early detection of chronic kidney disease (A. Khalil &Abdalahim, 2014).

1.1. Rationale:

Although CKD is a disease with dangerous consequences but unfortunately the disease is not investigated in middle and lower income countries of Asia. There is no systematic review about the actual burden of CKD in south Asian countries including Pakistan (Hasan et al., 2018). There is a literature gap about knowledge, attitudes and practices of hypertensive patients towards

prevention and early detection of chronic kidney disease in Pakistan . It's important to assess the baseline knowledge and attitudes of hypertensive patients towards CKD. The information gathered from study can be used to create prevention and screening campaigns for early detection and prevention of CKD. It's important to screen high risk hypertensive patients for early detection of CKD because in early stages inexpensive and less costly treatments can be used to slow down the progression of disease. Secondly our country lacks the infrastructure and resources required for catering the needs of patients of ESRD. So we should focus our efforts on early detection and prompt treatment for CKD to lower the increasing prevalence of this disease in coming years. Early detection and prompt treatment can lead to better health outcomes and reduced mortality.

1.2. Objectives:

The objectives of this study are following:

1. To assess the knowledge, attitudes and practices of hypertensive patients towards prevention and early detection of CKD in public tertiary care hospitals in Rawalpindi.
2. To determine the association of socio demographic factors, with knowledge, attitudes and practices towards prevention and early detection of CKD.
3. To determine the association of clinical factors, which affect knowledge, attitudes and practices towards prevention and early detection of CKD

CHAPTER II: LITERATURE REVIEW

Chronic Kidney Disease is regarded as a global public health problem, with 8% to 10% prevalence (Sahay et al., 2021). It is asymptomatic and regarded as a silent disease in most of cases. It is defined as a loss of kidney function. It is estimated from Glomerular filtration rate (GFR) of kidney. It is a state when the GFR level is equal to or less than 60 ml/min/1.73 m². CKD is classified into different stages on the basis of estimated Glomerular filtration rate (eGFR). There are 5 stages of CKD.

Table 1: Classification of stages of CKD

Stage	Description	GFR, ml/min/1.73 m ²
-	At increased risk	≥ 60
1	Kidney damage with normal or increased GFR	≥ 90
2	Kidney damage with mild decreased GFR	60-89
3	Moderately decreased GFR	30-59
4	Severely decreased GFR	15-29
5	Kidney failure	< 15 (or dialysis)

Reference: (Slee & D, 2012)

The National Kidney Foundation created guidelines for Kidney Disease Outcome Quality Initiative (K/DOQI) in 2002. The purpose of these guidelines is to aid general practitioners in early detection of CKD, management of CKD, timely referral to trained nephrologists, management of complications and help nephrologists in deciding about renal replacement therapies (Levey & Coresh, n.d.).

The epidemiology of Chronic Kidney Disease is not well understood in Pakistan. In recent years, the etiology of CKD has transitioned from infectious diseases to non-communicable disease like hypertension, obesity and diabetes mellitus (Sahay et al., 2021). Uncontrolled hypertension and diabetes are the leading causes of Chronic Kidney Disease and End stage renal disease (ESRD) in Pakistan (Jafar et al., 2016).

There are various factors which make us susceptible and initiate CKD. These factors include socio demographics, clinical and environmental factors. These are known as risk factors. They include lower birth weight, old age, family history of kidney disease and genetic predisposition to CKD. Diabetes mellitus, hypertension, obesity, smoking, high triglycerides and hyperlipidaemia have association with the development of CKD in general population. Excessive exposure to heavy metals, alcohol and nephrotoxins increase the progression of kidney damage (Kazanciog & Rumezya, 2013).

There are some external factors which lead to development of CKD, they are called aetiologic factors. These include factors like kidney poisoning due to nephrotoxins, excessive exposure to substances like lead, cadmium and melamine etc. Acute kidney injury (AKI) patients can also develop this disease. Some herbs are shown to be associated with electrolyte disturbance, AKI and CKD. Water is also associated with development of CKD in certain conditions. Like if water is contaminated with organic compounds and heavy metals, so people who are consuming the contaminated water for longer period of time, may develop kidney diseases. Dehydration is another factor which affects the kidneys adversely. All these factors can contribute to kidney damage and CKD (Kakitapalli et al., 2020).

The symptoms of CKD are anemia, shortness of breath, change in structure and function of kidneys, cognitive changes, gastrointestinal disturbance, cramps, itch, peripheral oedema,

hypertension and defect in glomerular capillary wall. The complications of this disease include accumulation of toxins in body, insulin resistance, deficiency of vitamin D, severe anemia, oxidative stress, reduction in exercise tolerance, wasting of lean body mass(LBM) and kidney failure. The patients who suffer from CKD have an increased risk of cardiovascular diseases and premature mortality. ‘Cardio-renal syndrome’, can occur, which means that dysfunction of cardiac and renal system can amplify and lead to progressive failure of these systems. Anorexia is another important complication, which means reduction in food intake. It leads to increased protein breakdown in body and decrease in LBM. In case of kidney damage the ability of kidneys to metabolize and process proteins decreases. So it is recommended that the patients of CKD should reduce their intake of dietary proteins. The reduction in dietary protein can help in lowering the uremic toxins (Slee, 2012).

The Asian forum for CKD initiatives (AFCKDI) has recommended some diagnosis tools for screening this disease in high risk individuals. The high risk individuals should be screened yearly for CKD by analyzing their urine for red blood cells and protein by using standard urine dipstick method. Glomerular filtration rate and serum creatinine levels should also be examined. These screening techniques will determine either a person is suffering from the disease or not. The patients who are diagnosed with it should be referred to nephrologists for further treatment and management. It is recommended that patients of this disease should also be subjected to analysis for cardiovascular diseases because CKD increases the risk of CVD’s (Li et al., 2011).

Disease management is an important aspect which affects the health and quality of life of patients. It is essential to control blood pressure of these patients to prevent further damage to kidneys. Blood pressure can be controlled with specific agents that are responsible for blocking renin-angiotensin pathway. The dietary protein and salt intake should be reduced. These patients

should be encouraged to adopt self management, control their BP, monitor their blood Hemoglobin levels, adopt healthy lifestyle, adhere to their treatment and visit their doctor for regular checkups. The patients should be educated to avoid nephrotoxins, NSAIDs and self medications. By following treatment and self management the progression of CKD can be controlled.

The quality of care for CKD includes four primary domains:

- After the disease is diagnosed the stage of CKD should be monitored and appropriate treatment should be started immediately.
- It is important to assess the cardiovascular risk management in diagnosed patients.
- It is essential to monitor the anemia and metabolic bone disease in patients.
- It is important to keep drug safety in consideration when making treatment plan for patients (Kakitapalli et al., 2020).

Hypertension is a chronic circulatory disease. Globally it's most common non communicable disease and serves as an attributable risk factor for mortality. Studies have been conducted on hypertension to determine its prevalence, associated risk factors, determinants, management and treatment. Some KAP studies have been conducted on Hypertension to understand the knowledge, attitudes and practices of individuals towards it. The purpose of these studies was to understand the actual situation of people and then make strategies towards improving the situation of increasing prevalence of hypertension.

Studies conducted in Kabul (Hassali & Azmi, 2019), Nigeria (Oc et al., 2017) and Srilanka (Ralapanawa et al., 2020) showed adequate knowledge and good practices towards hypertension. Other studies conducted in Baghdad (Sadeq & Lafta, 2017) and Bangladesh (Md Nahian

Rahman et al., 2018) showed majority had good knowledge and attitudes but few had good practices towards controlling hypertension. A study in Mumbai reported 83.42% had poor knowledge, 69.11% had poor attitudes and 73.24% had poor practices (Mahajan et al., 2012). In a study in Tanvè (Benin) 22.6% respondents had a good knowledge, 89.7% had good attitudes and only (5.2%) had good practices towards hypertension (Corine et al., 2020).

A study was conducted in Lahore on 129 males and females by using a structured validated questionnaire. The questionnaire had 4 sections which were demographics, knowledge, attitudes and practices. Only descriptive analysis was performed on collected data. Results indicated that majority of respondents had adequate knowledge but negative attitudes and unsatisfactory practices (Naseem et al., 2018). A cross sectional study conducted in Islamabad for determining knowledge about blood pressure and adherence to medications reported that 49.7% respondents had moderate knowledge regarding blood pressure. Multiple regression model was applied on the data to determine associations between knowledge and demographic variables. Age, education, duration of disease and occupation showed significant associations with knowledge (P Value<0.05). The study concluded that knowledge of respondents regarding hypertension is poor and unsatisfactory (Amer et al., 2021) .

In a similar study conducted in Rawalpindi 71% hypertensive patients had good knowledge, 42% had good attitudes and 51 % had good practices. The study reported that knowledge was significantly associated with educational status (p value=0.009). The chi square test results showed that attitudes and practice of respondents were significantly associated with the overall KAP score of participants (Dm et al., 2018). It can be seen that although hypertension is a common disease and respondents have adequate information about it but they don't adopt healthy practices for controlling it.

Uncontrolled hypertension can affect kidneys and is a risk factor of Chronic Kidney Disease. Several studies have been conducted globally to determine the knowledge of hypertensive patients about CKD. The purpose of those studies was to generate information about CKD from hypertensive patients. The generated information represented the actual scenario about awareness and practices of hypertensive patients. The information can be useful for the policy makers and public health practitioners to create awareness and behavior change program for this important public health issue.

A cross sectional study was conducted in Nablus Palestine to assess the KAP of hypertensive patients towards early detection and prevention of CKD. A Chronic Kidney Disease screening index questionnaire was used for analysis. The study concluded those patients who had higher score for knowledge and attitudes regarding prevention, they showed good preventive practices (Sa'adeh et al., 2018). A similar study was conducted in Gondar town, Ethiopia. The study determined that more than half of respondents had adequate knowledge regarding CKD and its risk factors. Despite having good knowledge the preventive practices were not practiced sufficiently by respondents (Asmelash et al., 2020).

A study was conducted in Jordan to analyze the KAP of chronic ill patients towards prevention and early detection of CKD. It was found that although majority of patients had good knowledge about CKD but most of them were unaware of importance of early diagnosis (A. Khalil & Abdalrahim, 2014). Studies which took place in Iran (Roomizadeh et al., 2014), Ethiopia (Goro et al., 2019) and Nigeria (Oluyombo et al., 2016) regarding awareness of hypertensive and diabetic patients about CKD and its risk factors highlighted that respondents had insufficient knowledge about CKD and its risk factors.

Studies have been conducted globally to determine the knowledge of general population about CKD. A study was conducted in a secondary hospital in Malaysia to determine the knowledge of patients about CKD. Consecutive sampling strategy was used to select respondents for the study. A total of 300 respondents were included in study. Self administered close ended structured questionnaires were given to the respondents to fill in their responses. Study concluded that the knowledge of patients about CKD is not adequate. There is a knowledge gap mostly among people from lower socioeconomic status, so special program to increase awareness regarding CKD should be introduced (Ng et al., 2016).

A study in America was conducted to determine knowledge of patients and healthcare providers about CKD. The results showed that both provider and patient level of knowledge is low. There is a need to conduct further studies in different populations to understand that which factors affect knowledge of patients and providers about CKD (Plantinga et al., 2010).

Sufficient studies have not been conducted on the prevalence and determinants of CKD in South Asian regions including Pakistan. Studies which were held in Pakistan from a public health perspective are discussed briefly. A study was conducted in Karachi, Pakistan to analyze the prevalence of CKD and determine the clinical and socio demographic variables which affect CKD. It also determined that how CKD patients manage their blood pressure. It was found that CKD is common in adult population and CKD patients have poor control of their blood pressure. There is a need to include the prevention and management of CKD in the primary care in Pakistan (Jessani et al., 2014).

A study was conducted in Karachi city, Pakistan in 2012. The primary objective of study was to determine the prevalence of CKD in Karachi and to check its association with risk factors like diabetes mellitus and hypertension. Free medical camps were set up at different sites in busy

shopping areas. The study population was asymptomatic adults more than 30 years of age and who were not diagnosed with CKD. Trained medical doctors checked the blood pressure, glycosylated hemoglobin and serum creatinine level of the subjects. The serum creatinine value was used to calculate the eGFR values of subjects. Out of total 301 subjects, 75(25.60%) subjects were diagnosed were CKD. The statistical analysis determined a significant relationship between mean Glomerular Filtration Rate and hypertension and diabetes mellitus. As sufficient study subjects were diagnosed with CKD, it is recommended that attention should be given to risk factor stratification and early screening (Imran et al., 2015).

There is a knowledge gap in our physicians regarding management of hypertension and prevention and diagnosis of CKD (H.Jafar, 2004). At times this knowledge gap leads to late diagnosis and referral of CKD patients to nephrologists. This factor is a major cause contributing to end stage renal disease and premature deaths. A cross sectional study was conducted in Shifa International hospital, Islamabad to determine the KAP of physicians regarding CKD on the basis of estimated Glomerular filtration rate and its referral to nephrologists. A questionnaire was used to assess the KAP of residents and consultants from various departments of hospital. The study found that although 84.21% study subjects knew the implications of late referral to nephrologists but 55.26% of them would not refer patients to nephrologists. It is suggested that there is a need to increase education and create awareness about management and referral to nephrologists among physicians (Tamizuddin et al., 2010).

There is a shortage of formally trained nephrologists in our country (H.Jafar, 2004). Mostly the general practitioners are the frontline care givers to CKD patients. A cross sectional study was conducted in Karachi in 2011 to determine the knowledge of General Practitioners about identification and risk factors of CKD. Majority of GP's were aware that diabetes and

hypertension are risk factors of CKD. Unfortunately 38% of GP's knew that eGFR was used for evaluating the CKD patients (Yaqub et al., 2013).

Another study was conducted in Lahore to assess the KAP of medical officers from different hospitals about kidney disease. The study highlighted that majority of doctors had insufficient knowledge about management of kidney diseases. The doctors claimed that attention should be given to nephrology. There is a need to train doctors regarding treatment and management of kidney diseases (Anees et al., 2014).

2.1. Research Gap

The incidence and prevalence of CKD is high but sufficient studies have not been conducted on understanding the knowledge of population regarding CKD (K. M. Chow et al., 2014). After conducting literature review and according to my knowledge, it is determined that sufficient studies have not been conducted on CKD from the perspective of public health approach in our country. Most studies have been conducted on clinical aspects of CKD. Few studies are conducted to assess the Knowledge, Attitudes and Practices of health care practitioners regarding CKD in Pakistan but no studies have been found to show the KAP of high risk or hypertensive patients regarding early detection and prevention of CKD. It is important to understand the KAP of high risk individuals about early detection and prevention of CKD. This will help us in creating an awareness campaign for prevention of CKD. The health care cost of CKD and ESRD is very high. As we are a struggling economy in which the budget allocated to health sector is meager. So it is important that we invest in cost effective preventive strategies for tackling with the situation of increasing incidence of CKD.

2.2. Importance of Research

CKD should be recognized as a public health issue. Public health measures should be implemented to increase awareness of both hypertensive patients and health care practitioners regarding prevention and early detection of CKD. A national policy should be created to educate the communities on importance of prevention and early detection of CKD. These measures will help in lowering the incidence and prevalence of CKD in coming decades (Eder & Tevfik, 2013).

2.3. Conceptual framework

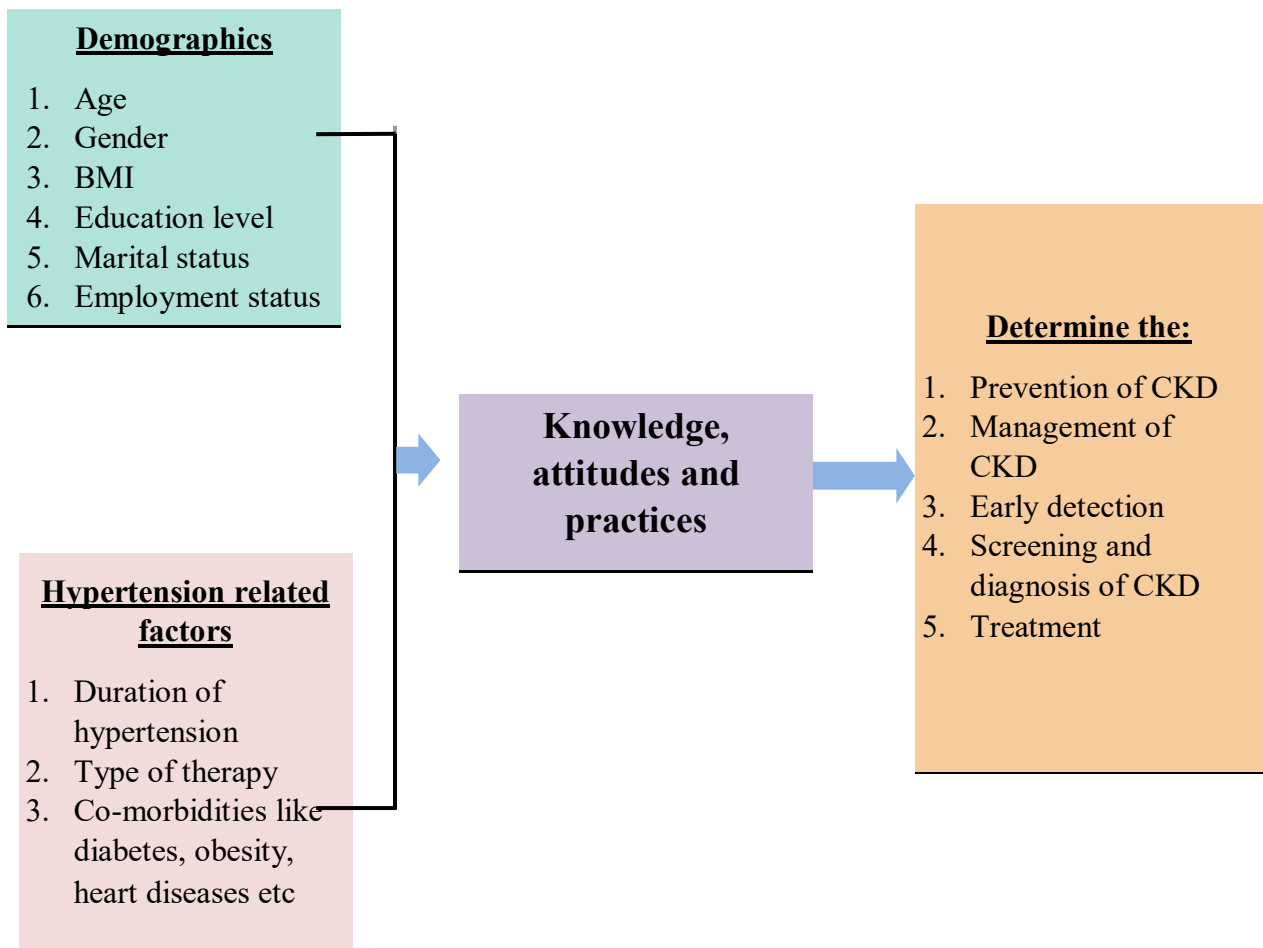


Figure 1: Conceptual framework of KAP for early detection and prevention of CKD

2.4. Operational Definitions

2.4.1. Hypertension: is defined as systolic BP level of ≥ 140 mmHg and/or diastolic BP level ≥ 90 mmHg.

2.4.2. Chronic kidney disease: is defined as a decrease in the GFR to less than 60 ml per minute per 1.73 m² — half the normal rate — or the presence of albuminuria for three or more consecutive months.

2.4.3. Knowledge: is the awareness of community about early detection and prevention of CKD. It is assessed by median score of 22 items of knowledge scale and categorized to good knowledge (if participants scored \geq median score of correctly answered questions) or poor knowledge (if participants scored $<$ median score of correctly answered questions).

2.4.4. Attitudes: means the certain way in people think and behave towards prevention and early detection of CKD. . Attitudes towards CKD will be assessed through 8 questions with 3 point Likert's scale. The individual answers to attitudinal scale were computed to get total score, then median score was calculated and categorized to good attitudes(if participants scored \geq median score) or poor attitude(if participant scored $<$ median score).

2.4.5. Practices: mean the actual application or use of an idea, belief or method to prevent CKD. It is assessed though 8 questions with 3 point likert scale. The individual answers to practice scale are computed and categorized on the basis of median score. The categories are good practices (if participant scored \geq median score) and poor practices (if participant scored $<$ median score).

CHAPTER III: METHODOLOGY

3.1. Research Design

A quantitative research approach using cross-sectional study design was used for the current study.

3.2. Research Duration

Study period for the current research was six months from October 2021-March 2022.

3.3. Study Setting

The study was carried out at OPD department and medicine wards of a tertiary health care center i.e. Benazir Bhutto Hospital in Rawalpindi.

3.4. Research Participants

The study was conducted on hypertensive patients who were visiting the hospital OPD for their checkup or they were admitted in the medicine wards. Sample was selected on the basis of inclusion and exclusion criteria.

3.4.1. Inclusion Criteria

1. Those who are 18 years and older and have been diagnosed with hypertension for at least a year.
2. Those who are currently under treatment for hypertension.
3. Those who are willing to participate in the study.

3.4.2. Exclusion Criteria

1. Hypertensive patients already diagnosed with CKD.
2. Those patients who refuse to participate.

3. Those patients who have a medical background.
4. Those patients who have a family history of hypertension and CKD.
5. Those who are diagnosed with cerebrovascular diseases affecting cognition.
6. Those who are suffering from mental illness affecting cognitive ability.

3.5. Sample Size Calculation

Sample size was calculated using proportion formula for sample size calculation in OpenEpi menu, Version 3 software. Previous prevalence of hypertension was taken as 26% as reported by a study conducted in Pakistan (Shah et al., 2018). Calculated sample size was 296 with 95% confidence interval (C.I) and 5% margin of error.

3.6. Sampling Strategy

Desired sample was collected using non-probability consecutive sampling strategy.

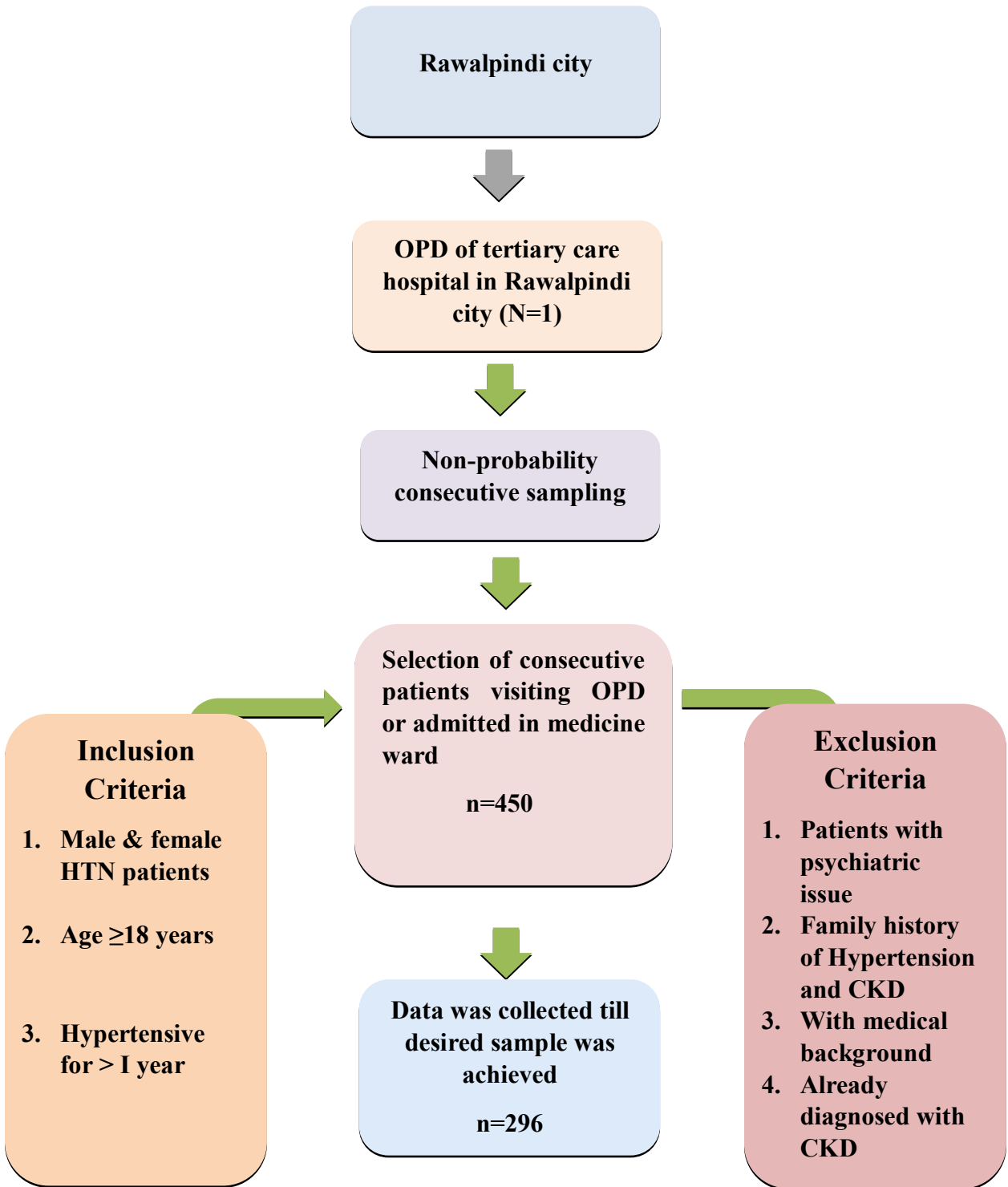


Figure 2: Non probability consecutive sampling strategy

3.7. Data Collection Instrument

3.7.1. Questionnaire Design

Data were collected using an interview-based questionnaire in which the researcher asked the questions from the respondents and recorded their responses accordingly. A validated structured questionnaire (A. A. Khalil et al., 2014) was adapted, pilot tested and used for data collection. The questionnaire consisted close ended questions. The questionnaire consisted three main sections.

- **First section:** It was the socio demographics section. This section had questions about gender, age, marital status, educational status, employment status and Body mass index (BMI). Age was a continuous variable which was then grouped into categories after data collection. Age was converted to 3 groups: under 25, 25-45 and more than 45.
- **Second Section:** this section of questionnaire had questions related to hypertension like duration of hypertension, co morbidities and type of therapy.
- **Third section:** The last section had questions related to CKD Screening Index. It had 3 different scales for measuring the knowledge, attitudes and practices regarding prevention and early detection of CKD. The knowledge was measured using a dichotomous scale consisting of 22 items. The items of knowledge scale included questions about CKD definition, its signs and symptoms, its risk factors and its complications. The knowledge score ranged from 0-22, higher score meaning better and good knowledge. The attitudes and practices were measured using 3 point Likert scales. The attitude scale consisted of 8 items which were used to analyze the patient attitude towards correctly choosing a way to seek help regarding their concerns. The attitude scale ranged from 8-24, higher score meaning good attitudes towards early detection and

prevention of CKD. The practice scale also had 8 questions related to their practices towards prevention of CKD. The score of practice scale ranged from 8-24, with higher score meaning better practices.

3.7.2. Study Variables

3.7.2.1. Outcome Variable

The major construct of the questionnaire was to assess the knowledge, attitudes and practices towards prevention and early detection of CKD. The outcome variable was KAP which was measured by using a validated questionnaire. The knowledge, attitudes and practices were divided into two categories i.e., good and poor on the basis of median scores.

3.7.2.2. Independent Variable

Data on independent variables were collected through a structured Performa which was constructed after international and national literature review. The Performa included socio demographic variables such as gender, age, education level, marital status, place of residence etc. it also included some clinical variables related to hypertension like duration of HTN and type of therapy etc.

3.8. Data Collection Process

3.8.1. Pilot Testing

Pilot testing was performed before starting the formal data collection procedure by including 10% of the actual sample size. Questionnaire was tested for any future changes. After pilot study, some questions were excluded from the attitude and practice section of the questionnaire. Data from pilot testing were not included in final analysis. Pilot testing showed that reliability of

knowledge scale was .807(22 items), attitude scale was .655(8 items) and practice scale was .710(8 items)

3.8.2. Formal Data Collection

Data were collected by the researcher herself and no data collectors were hired. All the hypertensive patients in OPD and medicine ward of the selected tertiary care hospital were approached. Consent was taken orally from all patients and only those patients were selected who agreed to take part in the research process and met the inclusion and exclusion criteria. After taking the consent, the patients were interviewed and their responses were recorded by the researcher. Data collection was completed in approximately two months. All filled questionnaires were kept protected in plastic files and no one had access to it other than researcher.

3.9. Data Analysis Procedure

Code book was developed and data were entered in Statistical Package for Social Sciences (SPSS) version 26. After careful data entry, data were checked for any error before proceeding to the further analysis. After data cleaning, data transformation was carried out for certain variables. Data analysis was done in two phases; descriptive analysis and inferential analysis.

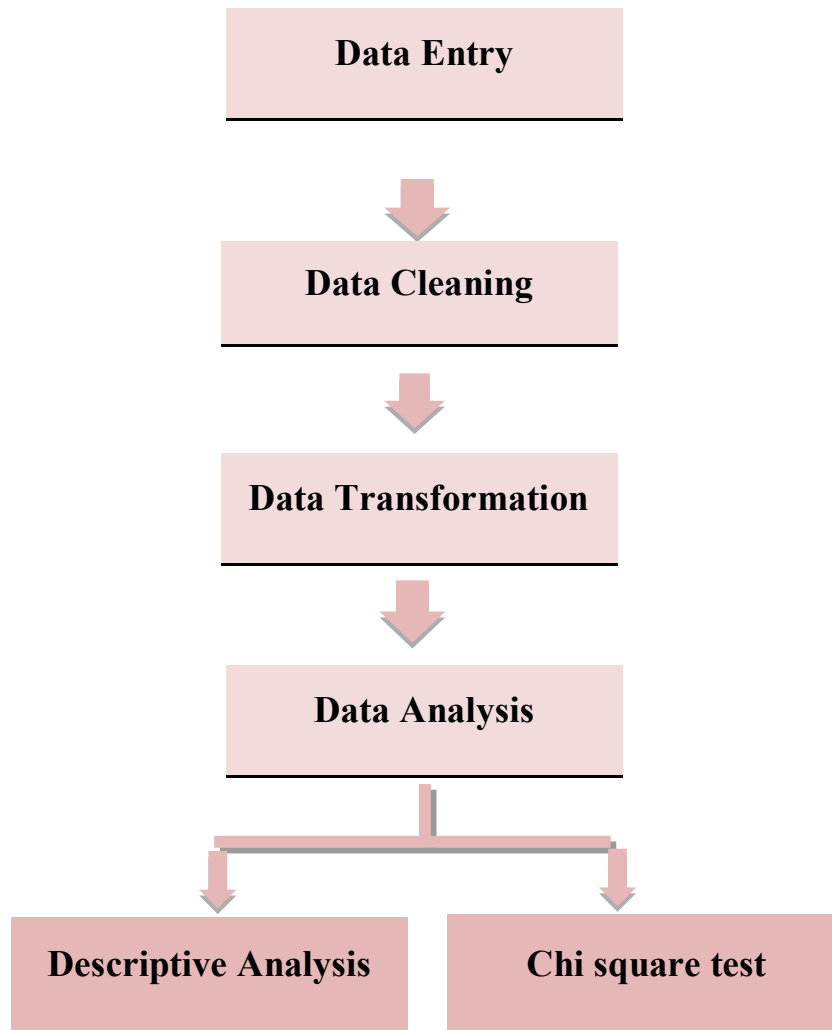


Figure3: Data Analysis Plan

3.9.1. Data Transformation

The data were entered into SPSS and after that the total scores for knowledge, attitude and practices were computed. After computation the knowledge, attitude and practices were converted to categories on the basis median score (Table=2). The KAP were converted to two categories i.e. good and poor.

Table 2: Categories of Knowledge, Attitudes and Practices

Variable	Categorization
Knowledge	2-11=poor knowledge
	12-22=good knowledge
Attitude	13-20=poor attitude
	21-24=good attitude
Practices	9-16=poor practices
	17-24=good practices

3.9.2. Descriptive Analysis

Descriptive statistics were generated for socio demographic characteristics and Hypertension related variables. For categorical variables, data was summarized in the form of frequencies and percentages and presented in table form, Bar chart and Pie chart. Frequencies and percentages were also reported for the knowledge, attitude and practices.

3.9.3. Inferential Analysis

Association of knowledge, attitude and practices with socio demographic and hypertension related characteristics were calculated using Pearson Chi Square test of Independence.

3.10. Ethical Considerations:

Before starting formal data collection, approval from Institutional Review Board (IRB) of Al-Shifa School of Public Health Rawalpindi, Pakistan was taken. Permission letter from the Head of Department of Al-Shifa School of Public Health was obtained regarding access to tertiary care hospital. Permission was also taken from the public sector tertiary care hospital of Rawalpindi city for conducting research. Patients were explained the purpose of the research and oral

consent was taken from each participant. Participants were assured for the confidentiality of their data. Data collected from the respondents was kept anonymous and was not shared with anyone. Data was entered in SPSS anonymously. After data entry, hard copies of collected were kept at a safe place.

CHAPTER IV: RESULTS

A summary of descriptive and inferential analysis is given below.

4.1. Socio demographic Characteristics

A total of 296 participants participated in the study. Out of total participants 39.2% were males and 60.8% were females. Majority of participants, (n=143; 48.3%) were in age group > 45 years. Majority of the participants (n=276; 93.2%) were married. Only a small chunk of hypertensive patients, (n= 20; 6.8%) were unmarried. Most of the patients, (n=124; 41.9%) were educated till primary school. Many study subjects were unemployed (n=176; 59.5%). Most of study subjects (n=154; 52%) had a normal BMI index, while (n=27; 9.1%) of patients were obese.

Table 3: Socio demographics characteristics of study participants

1	Variable	Category	Frequency (n)	Percentage (%)
1.	Age	Under 25 years	13	4.4
		25-45 years	140	47.3
		More than 45 years	143	48.3
2.	Marital status	Unmarried	20	6.8
		Married	276	93.2
3.	Educational status	Uneducated	84	28.4
		Primary school	124	41.9
		Intermediate	26	8.8
		Graduate	36	12.2
		Post graduate	26	8.8
4.	Employment status	Employed	70	23.6
		Self employed	50	16.9
		Unemployed	176	59.5
5.	BMI	Normal	154	52
		Overweight	115	38.9
		Obese	27	9.1

The majority of study subjects were females (n=180; 60.8%), while males were (n=116; 39.2%).

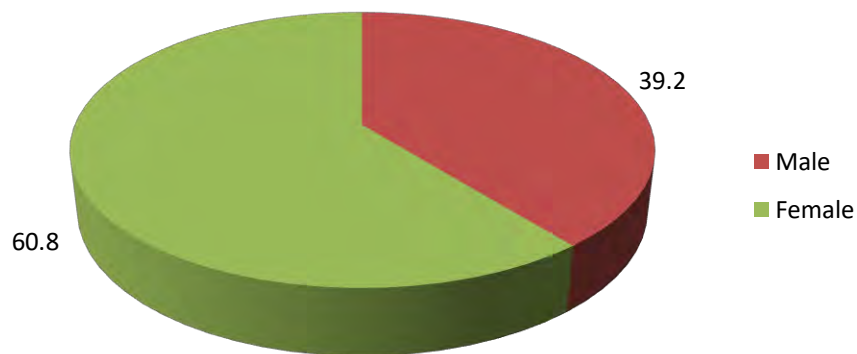


Figure 4: Classification of study subjects on basis of gender

4.2. Clinical Characteristics of the Study Participants

Hypertension was diagnosed for more than 5 years in the majority of the patients (n =105; 35.5 %), with a majority of them treated by one type of antihypertensive agent (n = 240; 81.1%). The majority of the participants did not had any other chronic diseases other than hypertension (n = 138; 46.6%).

Table 4: Clinical characteristics of study participants

S. No	Variable	Category	Frequency (n)	Percentage (%)
1.	Therapy type	Mono therapy	240	81.1
		Multi therapy	56	18.9
2.	Other chronic diseases	None	138	46.6
		1	113	38.2
		2	42	14.2
		3	3	1

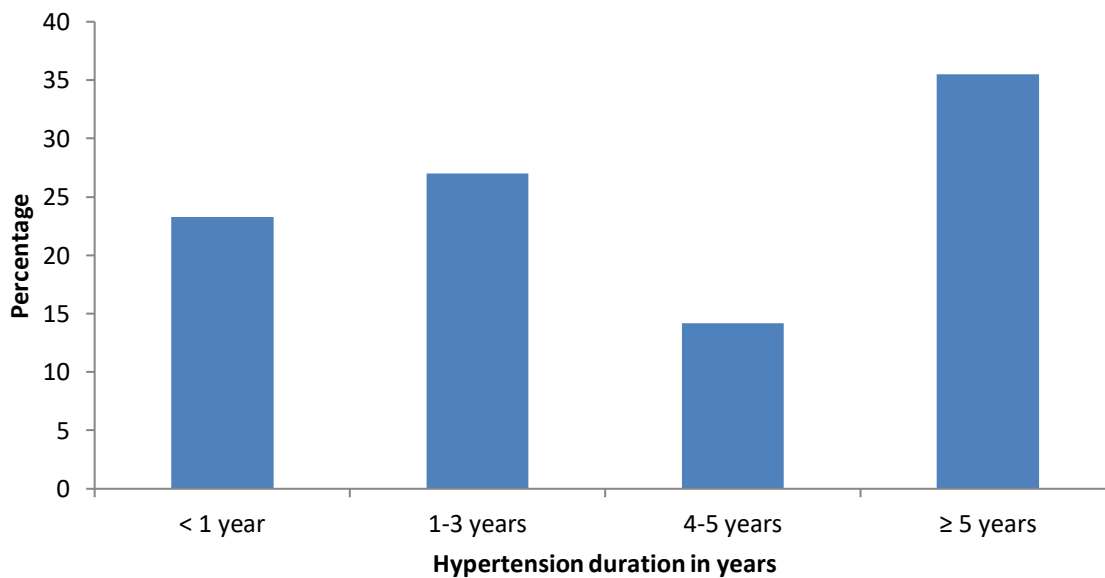


Figure 5: Classification of hypertensive patients on basis of duration of hypertension

4.3. KAP of Hypertensive patients

4.3.1. Knowledge related score of the patients

A CKD screening index scale was used to ask knowledge related questions from respondents about early detection and prevention of CKD. The knowledge scores were then computed and categorized into 2 categories i.e. “good knowledge” and “poor knowledge”.

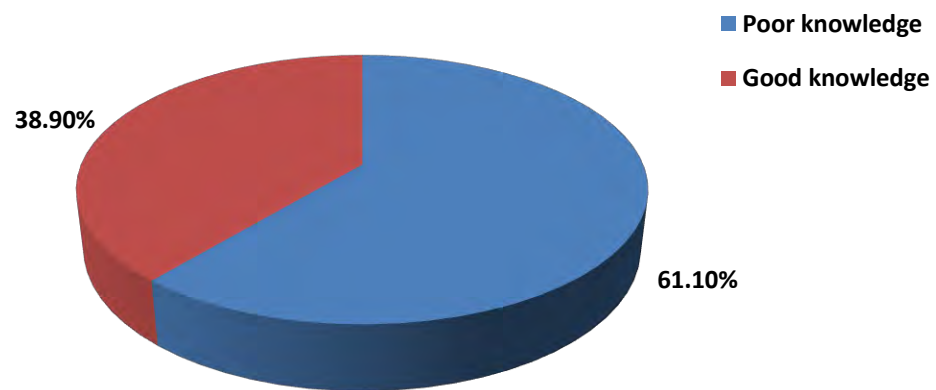


Figure 6: Knowledge related score of respondents

The study revealed that (n=181; 61.1%) respondents had poor knowledge while (n=115; 38.9%) had good knowledge.

Table 5: Responses to knowledge scale in CKD screening index

Items, I know that :	Responding “No” n (%)	Responding “Yes” n (%)
1. The kidneys regulate body water and chemicals in my blood such as sodium, potassium, phosphorus, and calcium	131(44.3)	165(55.7)
2.The kidneys remove drugs and toxins introduced into my body	139(47.0)	157(53.0)
3.The kidneys release hormones into blood to regulate blood pressure, produce red blood cells, and promote strong bones	256(86.5)	40(13.5)
4.CKD is a serious illness	204(68.9)	92(31.1)
5.CKD is an irreversible illness	205(69.3)	91(30.7)
6.Becoming an old person will decrease the function of my kidneys	100(33.8)	196(66.2)
7.Having increased blood pressure make me more likely to get CKD	124(41.9)	171(57.8)
8.Having diabetes mellitus make me more likely to get CKD	78(26.4)	218(73.6)
9.Having a family member with CKD will increase my chances of getting CKD	215(72.6)	81(27.4)
10.Having high lipid in my blood will increase my chances of getting CKD	178(60.1)	118(39.9)
11.Being a smoker increase my chances of getting CKD	97(32.8)	199(67.2)
12.Becoming an obese person (fatty) will increase my chances of getting CKD	106(35.8)	190(64.2)
13.Having untreated anemia will increase my chances of getting CKD	147(49.7)	149(50.3)
14.Having kidney stones and recurrent urinary tract infection increases my chances of getting CKD	73(24.7)	223(75.3)
15.Doing routine checkup of lab tests such as creatinine and serum urea nitrogen will decrease my chances of getting CKD	197(66.7)	99(33.4)
16.Having CKD gives me sleeping trouble	143(48.3)	153(51.7)
17.Having CKD gives me muscle cramps at night	175(59.1)	121(40.9)
18.Having CKD gives me swollen feet and ankles and Puffiness around the eyes in the morning	125(42.2)	171(57.8)
19.Having CKD gives me dry and itchy skin	233(78.7)	63(21.3)
20.CKD gives me more often urination	186(62.8)	110(37.2)
21.There are five stages for CKD, and every stage need management plan	275(92.9)	21(7.1)
22.People in the final stage of CKD need dialysis as a life-long treatment	111(37.5)	185(62.5)

Majority of participants had poor knowledge about Chronic kidney disease. Most of respondents were aware of the function of kidneys that kidneys regulate water in body (n=165; 55.7%) and they remove drugs from body (n=157; 53.0%). But only (n=40; 13.5%) knew that kidneys release hormones in our body. Majority of sample did not know that CKD is a serious illness (n=204; 68.9%) and it is an irreversible illness (n=205; 69.3%). Many respondents gave wrong answer regarding to risk factors of CKD, (n=81; 27.4%) knew that having family member with CKD increases chances of getting CKD and (n=118; 39.9%) knew that high lipid in blood increases chances of getting CKD. Other risk factors like old age, blood pressure, diabetes mellitus, smoking, obesity, untreated anemia and kidney stones were acknowledged in more than 50% of respondents as risk factors of CKD. (n=99; 33.4%) respondents responded that by having routine checkup of lab tests such as urea and creatinine will lower their chance of getting CKD. Most of study subjects did not know about symptoms of CKD like (n=121; 40.9%) knew that CKD gives muscle cramps, (n=63; 21.3%) knew CKD may cause itchy skin and (n=1110; 37.2%) knew that CKD gives more urination. Symptoms like trouble sleeping were known by (n=153; 51.7%) and swollen feet and puffiness around eyes were known by (n=171; 57.8%) of respondents. Only (n=21; 7.1%) respondents knew that there are five stages for CKD, and every stage need management plan. (n=185; 62.5%) respondents were aware that people in the final stage of CKD need dialysis as a life-long treatment.

4.3.2. Attitude related score of the patients

A CKD screening index scale was used to ask attitude related questions from respondents about early detection and prevention of CKD. The attitude scores were then computed and categorized into 2 categories i.e. “good attitude” and “poor attitude”.

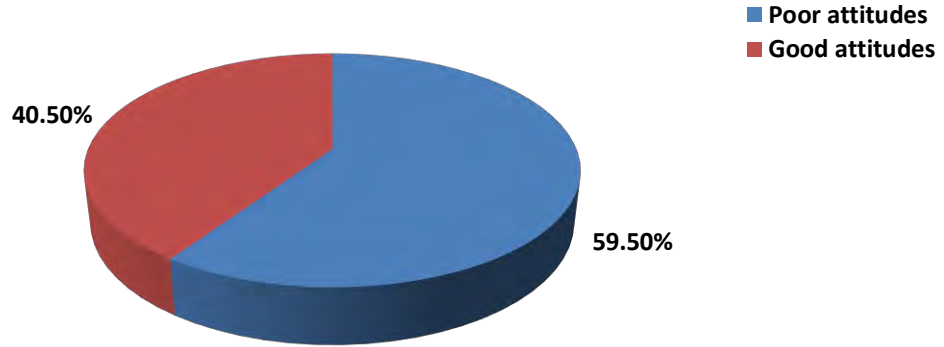


Figure 7: Attitude related score of respondents

The study revealed that (n=176; 59.5%) respondents had poor attitudes while (n=120; 40.50%) had good attitudes towards early detection and prevention of CKD.

Table 6: Responses to attitude scale in CKD screening index

I believe that:	Disagree n (%)	Unsure n (%)	Agree n (%)
I will be shocked if I get chronic kidney disease	47(15.9)	19(6.4)	194(65.5)
I will talk with my friends about chronic kidney disease	57(19.3)	19(6.4)	220(74.3)
I will talk with my family about chronic kidney disease	24(8.1)	9(3.0)	263(88.9)
Chronic kidney disease is an expensive disease to diagnose and treat	40(13.5)	128(43.2)	128(43.2)
Maintaining good health is extremely important	8(2.7)	13(4.4)	275(92.9)
I should search for new information to improve my health	149(50.3)	15(5.1)	132(44.6)
I feel I will get kidney problem in the future	102(34.5)	115(38.9)	79(26.7)
Doctors and nurses should have given me more information about chronic kidney disease	13(4.4)	10(3.4)	273(92.2)

The respondents mostly did not have good attitudes towards early detection and prevention of CKD. 59.5% of respondent showed poor attitudes towards CKD. About (n=194; 65.5%)

participants said that they would be shocked if they get CKD. (n=220; 74.3%) of respondents said that they will talk with their friends about kidney disease. A majority of respondents (n=263; 88.9%) said that they will discuss chronic kidney disease with their family. (n=128; 43.2%) respondents were unsure, while (n=128; 43.2%) respondents agreed that kidney disease is expensive to treat and diagnose. (n=275; 92.9%) respondents agreed that maintaining good health is important. Majority of respondents (n=115; 38.9%) were unsure that they will get kidney disease in future. A huge chunk of respondents (n=273; 92.2%) agreed to the statement that Doctors and nurses should have given me more information about chronic kidney disease.

4.3.3. Practice related score of the patients

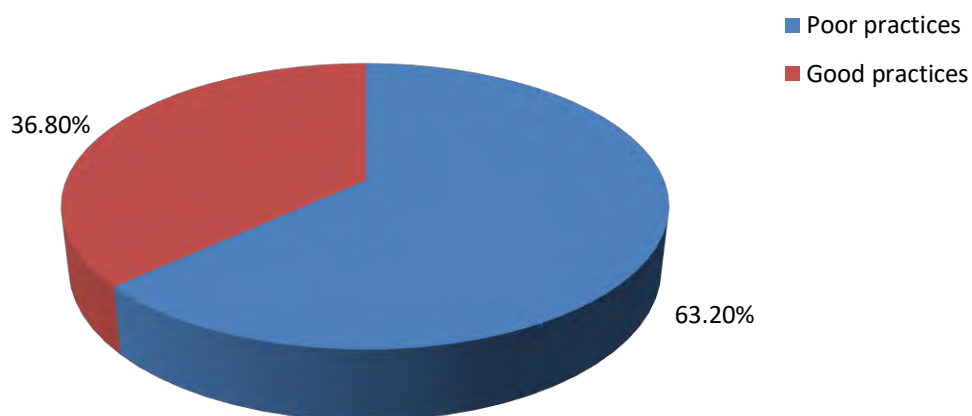


Figure 8: Practice related score of respondents

The study revealed that (n=187; 63.2%) respondents had poor practices while (n=109; 36.8%) had good practices towards early detection and prevention of CKD.

Table 7: Responses to practice scale in CKD screening index

Do you practice:	Not at all n (%)	Sometimes n (%)	Always n (%)
I eat well balanced meals	139(47.0)	56(18.9)	101(34.1)
I exercise regularly such as walking and jogging	173(58.4)	34(11.5)	89(30.1)
I have regular checkups even when I'm not sick	221(74.7)	17(5.7)	58(19.6)
I keep my weight within normal range	158(53.4)	33(11.1)	105(35.5)
I not smoke	55(18.6)	7(2.4)	234(79.1)
I take only the medication with prescription	94(31.8)	33(11.1)	169(57.1)
I follow my medications regimen	112(37.8)	73(24.7)	111(37.5)
I follow my food restrictions, such as low salt diet and diabetic diet	144(48.6)	33(11.1)	119(40.2)

The respondents (n=187; 63.2%) had poorer practices towards early detection and prevention of CKD. Only (n=104; 34.1%) respondents had well balanced meals. (n=173; 58.4%) respondents did not exercised regularly. (N=58; 19.6%) respondents had regular checkups even when they were not sick. The majority of respondents (n=234; 79.1%) did not smoke. (n=167; 57%) respondents always tool their medication with prescription. (n=111; 37.5%) respondents always follow their medication regimen, while (n=73; 24.7 %) respondents follow their medications regimen sometimes. (n=144; 48.6%) respondents never follow their food restrictions.

4.4. Inferential Analysis

Association of knowledge, attitudes and practices with demographic variables was determined using Pearson Chi Square Test of Independence after confirming the assumptions of the test. Association of demographic variables was tested independently with knowledge, attitudes and

practices using Chi Square test of Independence. All p-values below 0.05 were considered statistically significant.

4.4.1. Association between independent variables and knowledge

The categorization of knowledge was done i.e. poor knowledge and good knowledge. After categorizing knowledge into two categories, it was subjected to chi square test of statistical significance. The purpose of test was to find out the associations between independent variables and knowledge. The results of chi-square test are shown in table.

Table 8: Association between knowledge and independent variables

Variables	Poor knowledge n (%)	Good knowledge n (%)	Chi Square (df)	P-value
Gender				
Male	66(56.9)	50(43.1)	1.452(1)	.288
Female	115(63.9)	65(36.1)		
Age groups				
Under 25 years	6(46.2)	7(53.8)	2.046(2)	.359
25-45 years	83(59.3)	57(40.7)		
More than 45 years	92(64.3)	51(35.7)		
Marital status				
Married	173(62.7)	103(37.3)	4.038(1)	0.044
Unmarried	8(40.0)	12(60.0)		
Educational status				
Uneducated	69(82.1)	15(17.9)	40.7(4)	<0.001
Primary school	77(62.1)	47(37.9)		
Intermediate	15(57.7)	11(42.3)		
Graduate	15(41.7)	21(58.3)		
Post graduate	5(19.2)	21(80.8)		
Employment status				
Employed	35(50)	35(50)	7.834(2)	0.20

Self employed	27(54)	23(46)		
Unemployed	119(67.6)	57(32.4)		
BMI				
Normal	95(61.7)	59(38.3)	0.063(2)	.969
Overweight	70(60.9)	45(39.1)		
Obese	16(59.3)	11(40.7)		
Hypertension duration				
< 1 year	36(52.2)	33(47.8)	5.800(3)	.122
1-3 years	55(68.8)	25(31.3)		
4-5 years	29(69.0)	13(31.0)		
≥ 5 years	61(58.1)	44(41.9)		
Therapy type				
Mono therapy	143(59.6)	97(40.4)	1.308(1)	.253
Multi therapy	38(67.9)	18(32.1)		
Other chronic diseases				
None	79(57.2)	59(42.8)		
1	68(60.2)	45(39.8)	4.968(3)	.174
2	32(76.2)	10(23.8)		
3	2(66.7)	1(33.3)		

Results of the Chi square analysis show that knowledge is significantly associated with marital status (p value= 0.044) and educational status (p value<0.001). It is seen that gender, age groups, employment status. BMI, hypertension duration, therapy type and other chronic diseases do not show significant association with knowledge (p value>0.05).

4.4.2. Association between Attitudes and Independent variables

After categorizing attitudes into two categories, it was subjected to chi square test of statistical significance. The purpose of test was to find out the associations between independent variables and attitudes. The results of chi-square test are shown in table.

Table 9: Association between attitudes and independent variables

Variables	Poor Attitudes n (%)	Good Attitudes n (%)	P-value
Gender			
Male	72(62.1)	44(37.9)	.463
Female	104(57.8)	76(42.2)	
Age groups			
Under 25 years	9(69.2)	4(30.8)	.722
25-45 years	84(60.0)	56(40.0)	
More than 45 years	83(58.0)	60(42.0)	
Marital status			
Married	163(59.1)	113(40.9)	.601
Unmarried	13(65)	7(35)	
Educational status			
Uneducated	49(58.3)	35(41.7)	.870
Primary school	72(58.1)	52(41.9)	
Intermediate	18(69.2)	8(30.8)	
Graduate	22(61.1)	14(38.9)	
Post graduate	15(57.7)	11(42.3)	
Employment status			
Employed	44(62.9)	26(37.1)	.776
Self employed	30(60.0)	20(40.0)	
Unemployed	102(58.0)	74(42.0)	
BMI			
Normal	91(59.1)	63(40.9)	.719
Overweight	67(58.3)	48(41.7)	
Obese	18(66.7)	9(33.3)	
Hypertension duration			
< 1 year	41(59.4)	28(40.6)	.626
1-3 years	43(53.8)	37(46.3)	
4-5 years	27(64.3)	15(35.7)	
≥ 5 years	65(61.9)	40(38.1)	

Therapy type			
Monotherapy	138(57.5)	102(42.5)	.155
Multitherapy	38(67.9)	18(32.1)	
Other chronic diseases			
None	79(57.2)	59(42.8)	.648
1	71(62.8)	42(37.2)	
2	25(59.5)	17(40.5)	
3	1(33.3)	2(66.7)	

It can be seen that none of the independent variable including gender, age groups, Marital status, educational status, employment status, BMI, duration of hypertension, therapy type and other chronic diseases show no significant association with attitudes (p value>0.05).

4.4.3. Association between Practices and Independent variables

After categorizing practices into two categories, it was subjected to chi square test of statistical significance. The purpose of test was to find out the associations between independent variables and practices. The results of chi-square test are shown in table.

Table 10: Association between practices and independent variables

S. No.	Variables	Poor practices n (%)	Good practices n (%)	Chi Square (df)	P-value
1.	Gender				
	Male	68(58.6)	48(41.4)	1.701(1)	.192
	Female	119(66.1)	61(33.9)		
2.	Age groups				
	Under 25 years	7(53.8)	6(46.2)	.741(2)	.690
	25-45 years	91(65.0)	49(35.0)		
	More than 45 years	89(62.2)	54(37.8)		
3.	Marital status				
	Married	174(63.0)	102(37.0)	.031(1)	.861

	Unmarried	13(65.0)	7(35.0)		
4.	Educational status				
	Uneducated	58(69.0)	26(31.0)	4.766(4)	.312
	Primary school	81(65.3)	43(34.7)		
	Intermediate	14(53.8)	12(46.2)		
	Graduate	21(58.3)	15(41.7)		
	Post graduate	13(50.0)	13(50.0)		
5.	Employment status				
	Employed	40(57.1)	30(42.9)	2.137(2)	.344
	Self employed	30(60.0)	20(40.0)		
	Unemployed	117(66.5)	59(33.5)		
6.	BMI				
	Normal	89(57.8)	65(42.2)	11.96(2)	.003
	Overweight	73(63.5)	42(36.5)		
	Obese	25(92.6)	2(7.4)		
7.	Hypertension duration				
	< 1 year	49(71.0)	20(29.0)	5.975(3)	.113
	1-3 years	55(68.8)	25(31.3)		
	4-5 years	25(59.5)	17(40.5)		
	≥ 5 years	58(55.2)	47(44.8)		
8.	Therapy type				
	Mono therapy	155(64.6)	85(35.4)	1.080(1)	.299
	Multi therapy	32(57.1)	24(42.9)		
9.	Other chronic diseases				
	None	81(58.7)	57(41.3)	9..266(3)	0.026
	1	76(67.3)	37(32.7)		
	2	30(71.4)	12(28.6)		
	3	0(0.0)	3(100.0)		

Independent variables significantly associated with practices are BMI (p value=.003) and other chronic diseases (p value= 0.026). The variables including, gender, age groups, Marital status, educational status, employment status, duration of hypertension and therapy type do not show significant associations with practices (p value>0.05).

CHAPTER V: DISCUSSION

This study was conducted on 296 hypertensive patients (>18 years) who were visiting the OPD of a public sector tertiary care hospital in Rawalpindi. The primary purpose of the study was to assess the knowledge, attitudes and practices of hypertensive patients towards prevention and early detection of CKD. Another objective of study was to determine the association between socio demographic, clinical variables and KAP of hypertensive patients. Data was collected by using an interview administered validated questionnaire. Descriptive and inferential analysis was performed on the data using SPSS software. Out of total participants 39.2% were males and 60.8% were females. Out of 296 subjects (n=181; 61.1%) had poor knowledge, (n=176; 59.5%) had poor attitudes and (n=187; 63.2%) had poor practices towards prevention and early detection of CKD. Only (n=21; 7.1%) respondents knew that there are five stages for CKD, and every stage need management plan. (n=185; 62.5%) respondents were aware that people in the final stage of CKD need dialysis as a life-long treatment.

Chi-square test of statistical significance was used for inferential analysis. Inferential analysis indicated that knowledge is significantly associated with marital status (p value= 0.044) and educational status (p value<0.001). Attitudes did not show statistically significant association with any of independent variable (p value>0.05). BMI (p value=.003) and other chronic diseases (p value= 0.026) showed statistically significant association with practices.

Out of 296 participants, 120(40.50%) had good knowledge of CKD. These finding are higher than similar studies conducted in Nigeria 27.1% respondents (Oluyombo et al., 2016) and Malaysia where 30.1 % respondents had good knowledge about CKD (Yusoff et al., 2016). While some studies showed higher good knowledge about CKD like in Jordan (80.24%) (Khalil &Abdalrahim, 2014) and Ethiopia (68.7%) (Asmelash et al., 2020) respondents were

knowledgeable about CKD signs and symptoms, risk factors, complications and management. A reason for this higher knowledge score in Ethiopia could be that this study was conducted on institution based participants where the respondents have good access to health education. This factor can be an important reason for the higher knowledge of study subjects about CKD. Our results may differ from other studies because our sample size and study population are different from the other studies, conducted in other countries.

In our study 57.8% people responded that having increased blood pressure will make them more likely to get kidney disease. When compared with previous studies, in Jordan more than 50% participants (A. Khalil & Abdalrahim, 2014), Palestine(61.2%) (Sa'adeh et al., 2018) and Ethiopia (56.2%) (Asmelash et al., 2020) were aware about effect of uncontrolled hypertension on kidney disease. These findings were higher in contrast to Iran, where only 14.4% (Roomizadeh et al., 2014) respondents knew that uncontrolled BP affects kidneys.

More than 60% of participants were unaware that CKD is a serious illness and it is an irreversible illness. Less than half of subjects were aware about symptoms and complications of CKD. Only 7.1% respondents knew that CKD has 5 stages and 62.5% knew that people in case of kidney failure need dialysis. These results indicate that hypertensive patients had limited knowledge regarding CKD but more than 60% people were aware of kidney damage and dialysis. This is an important point to focus on as it indicates that although participants have limited knowledge about CKD but they have adequate knowledge about dialysis and kidney damage. This may be due to sufficient exposure to kidney damage and dialysis in general population. As CKD remains asymptomatic in initial stages so when it's diagnosed in patients it has reached advanced stages, where kidney damage has occurred and dialysis is required. This study indicates knowledge gaps in high risk individuals regarding CKD. So we should focus our

efforts on increasing knowledge and awareness about CKD, its risk factors, diagnosis, symptoms, screening and prevention. Better knowledge about CKD will lead to better screening and preventive strategies by hypertensive patients (K. M. Chow et al., 2014).

This study indicated that out of 296, 120 (40.50%) respondents had good attitudes towards CKD prevention and early detection. Our results are similar to results of a study that reported poorer attitudes towards prevention and early detection of kidney disease in African Americans (Waterman et al., 2008). A study conducted in Jordan showed that up to 60% respondents showed better attitudes towards CKD (A. Khalil & Abdalrahim, 2014). In another study conducted in Malaysia among hospitalized patients 68.9% respondents had good attitudes towards CKD. This high level of good attitudes can be due to reason that hospitalized patients were used for collecting data, so patients who are already ill may be aware of impacts of good attitudes towards health, so they showed a higher level of good attitudes (Yusoff et al., 2016). Another reason of low percentage of respondents showing good attitudes in our study could be due to difference in socioeconomic status and level of education.

This study identified that 109(36.8%) respondents showed good practices towards early detection and prevention of CKD. A study in Ethiopia showed 48.4 % participants had good practices (Asmelash et al., 2020) . When compared to study conducted in Malaysia 88.3% had good practices(Yusoff et al., 2016). The difference in level of good practices from country to country may be due to difference in socioeconomic status, educational status and doctor patient interaction.

It is evident from literature review that if we try to improve the knowledge, attitudes and practices of patients towards their disease, then it can lead to improved quality of life, better

management of disease and delay in complications. So we should try to control chronic kidney disease through health education and primary prevention approach(K. M. Chow et al., 2014).

Inferential Analysis

Our study indicates that knowledge is significantly associated with marital status (p value= 0.044) and educational status (p value<0.001). Our result indicating association between educational status and knowledge is similar to studies in Ethiopia (Asmelash et al., 2020), Tanzania (Stanifer et al., 2016) and Jordan (A. Khalil & Abdalrahim, 2014). Those participants who have higher level of education know better about CKD and its complications so they try to prevent themselves from CKD. The association between marital status and knowledge was not evident from the previous studies. A study suggested that a married partner can affect the morbidity and lifestyle patterns of his partner in a positive way. If one partner from a couple has good knowledge about CKD, so he/she can share it with his partner. So in this way marital status can influence the prevention and early detection of CKD in a good way.

The inferential analysis indicated that none of independent variables were associated with attitude score. Our results are different from a study conducted in Palestine where patients with high income and age were associated with higher attitude level (Sa'adeh et al., 2018). The difference in our results and previous study may be due to difference in demographics, culture, beliefs and perceptions of the two populations.

The results determined that there is a significant association of practice score with BMI (p value=.003) and other chronic diseases (p value= 0.026). A study conducted in Palestine reported that after regression analysis practice score were associated with total knowledge, total attitude, number of co morbidities and BMI. These results were somewhat similar to our results. People

with normal BMI are healthier as compared to overweight and obese people and they follow healthy practices. Their healthy behavior is responsible for their normal body weight and controlled blood pressure (Sa'adeh et al., 2018).

Those who are suffering from more than one chronic disease are generally more conscious of their health. They try to adopt healthy behaviors like doing regular walk and eating their medicines on time so they have better practices as compare to those who have a single chronic disease. So these healthy practices will lead to better prevention of CKD. During data collection it was seen that most people who only suffered from one chronic disease i.e. hypertension, they did not took their medicines on time and with prescription. They mostly showed poor practices towards their health. Another study reported that duration of hypertension and educational status was associated with good practices (Asmelash et al., 2020).

5.1. Strengths

This study was a community based study conducted in OPD of public sector tertiary care hospital. It was conducted by using a validated CKD Screening Index questionnaire, which makes the results of this research reliable. According to my knowledge it was determined that KAP study regarding early detection and prevention of CKD was not conducted in Pakistan, so I tried to cover a literature gap regarding CKD's early detection and prevention by conducting this study. The study indicates that there are gaps in knowledge and attitudes of the hypertensive patients regarding prevention and early detection of CKD. Awareness and health education programs should be created for fulfilling this gap and improving health outcomes for those who are at risk of developing CKD.

5.2. Limitations

This study was a cross sectional study, so it cannot determine the cause effect relationship between KAP, clinical and socio demographic variables. It cannot be used to establish a temporal relationship. The questionnaire was composed of close ended questions so it can be difficult to explain the underlying reason for a specific outcome by using it. Another limitation is that as the sample was only restricted to OPD of a tertiary care hospital in Rawalpindi so we cannot generalize it to a general population. As our sample size was limited so we cannot generate inferences about the whole population. Further research is required before generalizing research on whole population of Pakistan.

5.3. Conclusion

The study was conducted to determine KAP of hypertensive patients regarding prevention and early detection of CKD. The results indicated that participants did not have adequate knowledge, attitudes and practices regarding it. Knowledge about early detection of CKD is associated with marital and educational status. So we need to improve our educational system and integrate information about CKD in national health programs, to increase awareness in public about importance of early detection and prevention of CKD. Practices are significantly associated with BMI and other chronic diseases. A national chronic kidney disease educational program should be created to address the issue of lack of knowledge and to improve attitudes and practices towards prevention of CKD.

The hypertensive patients should be encouraged to adopt healthy practices which are essential for controlling hypertension. Mediums like television, social media and newspapers can be used for dispersing information about healthy practices. The healthy practices like eating medications on time, avoiding self medications, regular walk, regular checkups from doctor, consuming

balanced diet, avoiding smoking and alcohol can help in maintaining the hypertension. And if a hypertensive patient develops CKD then healthy lifestyle change can lead to slowing down the progression of CKD. Hence, it is important to adopt practices which lead to a healthy lifestyle.

5.4. Recommendations

Based on the current findings, following recommendations are put forward for the health authorities and future researchers to address this untapped public health issue:

1. The results of this study indicate that there is a knowledge gap in hypertensive patients regarding early detection and prevention of CKD, which leads to negative attitudes and unsatisfactory practices. So it is need of the hour to create awareness among high risk individuals to control the situation of CKD in our country. The policy makers should take notice of this problem and try to create suitable policies for controlling the situation. Public health practitioners and public/ private organizations should also give their input in creation of policies, so that maximum benefit can be achieved from the awareness program.
2. Secondly, awareness programs for the whole population and not only for hypertensive patients should be held everywhere in Pakistan, starting from school education up to promoting the role of nurses and doctor-patient relationship in providing knowledge and health advices to every patient especially those at high risk for developing CKD .
3. Greater efforts should be done to implement a screening protocol for high-risk patients in Pakistan, hoping to slow down the rising numbers of CKD patients and build up a healthy society.
4. It is recommended that healthcare workers should give better counseling to improve knowledge. Finally, more research is needed to better understand the effect of patient education in changes of patients' action to prevent CKD
5. Importance should be placed on creating awareness in both high risk and general population regarding early detection and prevention of CKD. Special health education

campaigns regarding CKD should be created by input of policy makers, public health practitioners and public/private organizations. This will help us in lowering the burden of CKD in coming years.

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ANNEXURE 1

Data Collection Tool

Knowledge, Attitudes and Practices of Hypertensive Patients Regarding Prevention and Early Detection of Chronic Kidney Disease in Islamabad

SECTION A

Demographics

1. What is your Gender?

Male

Female

2. What is your age in years? _____

3. What is your Marital Status?

Married

Unmarried

4. What is your level of Education?

Uneducated

Primary school

Intermediate

Graduate

Post graduate

5. What is your Employment status?

Employed

Self employed

Jobless

6. What is your Body mass index (BMI)?

- Normal
- Overweight
- Obese

SECTION B

Hypertension Related Questions

7. For how long are you suffering from hypertension?

- < 1 year
- 1-3 years
- 4-5 years
- ≥5 years

8. What is the type of therapy that you are taking for hypertension?

- Mono therapy
- Multi therapy

9. Are you suffering from any chronic disease other than hypertension like diabetes, cancer, heart disease, obesity and arthritis?

- none
- 1
- 2
- 3
- ≥ 4

SECTION C

Knowledge

No.	Do you know:	Yes	No
1	The kidneys regulate body water and chemicals in my blood such as sodium, potassium, phosphorus, and calcium		
2	The kidneys remove drugs and toxins introduced into my body		
3	The kidneys release hormones into blood to regulate blood pressure, produce red blood cells, and promote strong bones		
4	CKD is a serious illness		
5	CKD is an irreversible illness		
6	Becoming an old person will decrease the function of my kidneys		
7	Having increased blood pressure make me more likely to get CKD		
8	Having diabetes mellitus make me more likely to get CKD		
9	Having a family member with CKD will increase my chances of getting CKD		
10	Having high lipid in my blood will increase my chances of getting CKD		
11	Being a smoker increase my chances of getting CKD		
12	Becoming an obese person (fatty) will increase my chances of getting CKD		
13	Having untreated anemia will increase my chances of getting CKD		
14	Having kidney stones and recurrent urinary tract infection increases my chances of getting CKD		
15	Doing routine checkup of lab tests such as creatinine and serum urea nitrogen will decrease my chances of getting CKD		
16	Having CKD gives me sleeping trouble		
17	Having CKD gives me muscle cramps at night		
18	Having CKD gives me swollen feet and ankles and Puffiness around the eyes in the morning		
19	Having CKD gives me dry and itchy skin		
20	CKD gives me more often urination		
21	There are five stages for CKD, and every stage need management plan		
22	People in the final stage of CKD need dialysis as a life-long treatment		

Attitudes

No.	I believe that:	Disagree 1	Unsure 2	Agree 3
1	I will be shocked if I get kidney disease			
2	I will talk with my friends about kidney disease			
3	I will talk with my family about kidney disease			
4	Kidney disease is an expensive disease to diagnose and treat			
5	Maintaining good health is extremely important			
6	I should search for new information to improve my health			
7	I feel I will get kidney problem in the future			
8	Doctors and nurses should have given me more information about kidney disease			

Practices

No.	Do you practice:	Not at all 1	Sometimes 2	Always 3
1	I eat well balanced meals			
2	I exercise regularly such as walking and jogging			
3	I have regular checkups even when I'm not sick			
4	I keep my weight within normal range			
5	I not smoke			
6	I take only the medication with prescription			
7	I follow my medications regimen			
8	I follow my food restrictions, such as low salt diet and diabetic diet			

ANNEXURE 2

Informed Consent Form

I Maryam Sajjad, am student of MSPH- Final Semester, at Alshifa School of Public Health, Rawalpindi. I am doing research on Knowledge, Attitudes and practices of Hypertensive Patients Regarding Prevention and Early Detection of Chronic Kidney Disease in Rawalpindi. .

PURPOSE OF THE RESEARCH

The purpose of this study is to assess the knowledge, attitudes and practices of hypertensive patients regarding prevention and early detection of hypertensive patients visiting the OPD's of public tertiary care hospitals in Rawalpindi city.

PARTICIPATION

I do not anticipate that taking this study will contain any risk or inconvenience to you. Your participation is strictly voluntary and you may withdraw your participation at any time without penalty. I request you to answer the questions as honestly as possible. It will take no longer than 20 minutes to complete a questionnaire. All information collected will be used only for research purpose and will be kept highly confidential. Your identity and your responses will not be identifiable; all data will be stored anonymously. As this is solely a student project no incentive will be provided. Once study is completed, I would be happy to share the results with you if you desire.

Thank you for agreeing to participate in this study. Your feedback is important.

Consent

I have read and understand the information sheet and agree to take part in the study.

Signature _____ **Date** _____

ANNEXURE 3

IRB Letter



AL-SHIFA SCHOOL OF PUBLIC HEALTH
PAKISTAN INSTITUTE OF OPHTHALMOLOGY
AL-SHIFA TRUST, RAWALPINDI

No. MSPH-IRB/12-23
Date: 01st Oct, 2021

TO WHOM IT MAY CONCERN

This is to certify that Maryam Sajjad D/O Sajjad Khan is a student of Master of Science in Public Health (MSPH) final semester at Al-Shifa School of Public Health, PIO, Al-Shifa Trust Rawalpindi. He/she has to conduct a research project as part of curriculum & compulsory requirement for the award of degree by the Quaid-I-Azam University, Islamabad. His/her research topic which has already been approved by the Institutional Review Board (IRB) is **“Knowledge, Attitudes and Practices of Hypertensive Patients regarding Prevention and Early Detection of chronic Kidney Disease in Islamabad”**.

Please provide him/her necessary help and support in completion of the research project. Thank you.

Sincerely,

Dr. Ayesha Babar Kawish
Head of Department, MSPH
School of Public Health, PIO
Al-Shifa Trust, Rawalpindi