



**PREVALENCE OF CHRONIC KIDNEY DISEASE AMONG DIABETIC PATIENT
IN BANGLADESH**

THESIS ON

Submitted to

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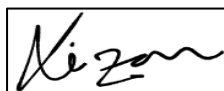
**FACULTY OF HEALTH AND LIFE SCIENCES
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APPROVAL

The Thesis entitled **Prevalence of CKD among Diabetic Patient**", submitted by **Jannatul Ferdousi** to the Department of Nutrition and Food Engineering, Daffodil International University, has been accepted as satisfactory to the partial fulfillment of the requirement for the degree of B.Sc. in Nutrition and Food Engineering and Approved as to its style and content.

EXAMINING COMMITTEE

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DECLARATION

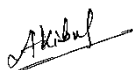
It reliefs me with great pleasure to introduce your able self. Hence I would like to say my so many thank for very direction, advice and all methods of support you provide the report which in itself a big achievement that by your progressive guidance one can work. Writing this report in itself was a very elaborate learning process. To write this report I used the information that, in my belief, is best for analysing and helps provide at least some accuracy to what will happen next. I am sorry if I could not make it better the rest of this blog is all my effort to meet your report objectives. The practical knowledge and experience that I have acquired from writing a preparation report will be invaluable to me in my practice as a future work. Please forgive me if anything incorrect in the report, even after putting my best efforts. Please feel free to fill me in on your opinions and ideas about the report.

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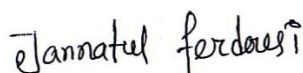
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First, I want to thank God for this apprenticeship report. I got experience from my internship in Kidney foundation and Research Institute Bangladesh. This was the time that I learned as professional and personal experience. I want to thank K. My supervisor M. Mahdiuzzaman Sayed & Co Supervisor Akibul Islam Chowdhury at Daffodil International University, for their continuous support to guide me with useful instructions while managing internship along this report writing and finally allowing me to complete my internship under Kidney Foundation Research Institute I am also grateful to Tazreen Yusuf Malick, dietician at Kidney Foundation and Research Institute for giving me an opportunity of learning in her busy schedule time.

ABSTRACT

Diabetes is an epidemic globally. It is not selective; that is, it can affect anyone, literally; it is truly cross-sectional, and also multi-national. Notably, the occurrence of type 2 diabetes has escalated at an alarming rate, especially in the low-and middle-income countries for over the past three decades. Nevertheless, diabetic nephropathy- popularly known as diabetes, or diabetic kidney disease- a type of CKD has significantly questioned this issue. It is an enduring situation characterized primarily by damage to the capillary blood vessels in the glomeruli of the kidneys' nephrons. Diabetes is the most prevalent cause of CKD, reports The World Kidney Day. Notably, the global burden of CKD is escalating at an explosive rate; cross-sectional survey. Details Data of 120 kidney failure patients with diabetes, who had been admitted. In our study among elderly responded, the majority of age group between Females were 55%, male were 44% [Table/Fig-5], out of all responds, (20%) were primary passed and in (%) SSC Passed 9 (7.5), HSC Passed 30(25) Graduated 2 (1.7). More than half of the respondent developed diabetes 119 (99.2%) and 1 case were not diabetes Confirmation [Accepted]; 67 patients (55.83%) with high creatinine and abnormal level of As pronounced differences, it is essential for conclusion conclusion ends up at of standard was 53 causes. Generally, diabetes and CKD is a vicious cycle. Abstract in Bangladesh Chronic Kidney Disease is a burgeoning public health problem and high-risk conditions like hypertension or diabetes are the major responsible factors

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CHAPTER-1

INTRODUCTION

1.1 Introduction

Diabetes is increasing alarmingly. Diabetes is not discriminatory, but a disease that can affect any human being irrespective of socio-economic status and national boundaries. Diabetes can be defined as a chronic, metabolic disease characterized by elevated levels of blood glucose or blood sugar, leads over time to serious damage to the heart, blood vessels, eyes, kidney and nerves.(Teklewoini MariyeZemicheal, 2020). Diabetes is a chronic, metabolic disease characterized by elevated levels of blood glucose (or blood sugar), which leads over time to serious damage to the heart, blood vessels, eyes, kidney sand nerves(al R. N., 2023). The more common of the two is type 2 diabetes, which generally strikes adults and happens when a person becomes resistant to insulin or doesn't make enough of it The incidence of type 2 diabetes worldwide has increased at an alarming rate in countries across all income levels during the past three decades. Diabetes typed-1Color version of Type 2, Diabetes Typed/Formerly young person diabetes former called infantile (or insulin-dependent) - Color with Written in it.removeAll insulins from pancreas by itself. Affordability of treatment, including insulin access greatly determine the survival rates for diabetics. By 2025, everyone agreed should have put a halt to the diabetes and obesity pandemic as well.(Rev., 2018). Diabetes is now affecting about 422 million people all over the world, most of the cases being in low-and middle income countries and also causes millions of deaths every year. Diabetic kidney disease has been identified as the most important cause of CKD worldwide, and it is increasing both in case number and prevalence over the past decades, as shown by the Table 2 below. This is because diabetes is a kind of chronic disease. According to the American Diabetes Association, 2010, diabetic nephropathy is still a major cause of CKD and ESRD. Protein Urea or Albumin Urea followed by hypertension, with a hike in Blood pressure coupled with a dropping kidney function is the combination of abnormalities usually detected in both of these kinds of CKD. This is a common late stage complication of type 1 diabetes, and most cases that undergo renal replacement therapy are due to diabetes, While in type II it presents in most people in three to two decades from the time of being diagnosed. The other name for the disease is Diabetic kidney disease. While in the US, 1 out of every 3 persons, who get diabetes will experience nephropathy. One-third of the people diagnosed with diabetes will develop kidney disease, or diabetic nephropathy, and from 20 to 30 percent also advance to a condition that can lead to end-stage renal failure. The susceptibility to nephropathy shown by the patients with diabetes(Jensenaetal, 2015). The period of diabetes appears to have been relevant to risks. That is no hum - there is absolutely no get rid of intended for diabetic and also healing plan compatible life time. It is best to look at your blood pressure or diabetes and take additional kidneys you are at risk for other kidney problems, including narrowing of the arteries in their kidneys: Endovascular disease - osteomyelitis caused by

anthrax with an underlying etiology – the endovascular disease by itself as an entity that causes interstitial fibrosis and tubular etc. Cordarone sport is usually classified into two forms, high blood pressure problems and other kidney diseases the risk of foreran. Chronic Kidney Disease CKD has proven to be a world health issue. From that point forward it had been designated as “World Kidney Day” and was observed by the entire populace across the world – Electric Avenue. Kidney disease is as harmful as leprosy, at which class Leprosy is as cold. A chronic kidney problem is diminishing into a global burden at a distressing pace – such a public health problem indicates to a particular end. Kidneys – one in each human bean – zero organisms. Horvitz The kidneys are filtration systems in which your body filters and separates the blood in your body and etc. extra filtered water, waste etc. helps you avoid it (Levey AS E. K., 2019). But kidney disease means your kidneys are damage and cannot filter blood as they should The lack of global awareness, funding for the treatment present in less than 10% of all countries, and political will cause millions to die each year from not having access t o affordable therapeutics Australia is one country which provides dialysis solution at \$9000 per qaly whereas most people cannot afford it especially those who do live on <\$2 a day) There are an estimated 1 million deaths being deposited annually around this world due mainly because there be no safe & filtration anymore -Approximately. Saudi Arabia and Belgium are expected to have the highest rates of predicted CKD among high-income countries (24% of their respective populations), while Norway and The Netherlands fared best for low levels of prevalent CKD. It is the ninth leading cause of death in America, and CKD. CKD affects more than 1in7U. Adults aged 15 years and above in the United States are presumed to have CKD at over 15% polycystic kidney disease is a common inherited disease affecting about 500,000 Americans.(Andrew S. Levey, 2017). In lupus, up to 50% of adults and as many as 80% of children will develop kidney disease called Lupus Nephritis; in the general public there is a lifetime risk (age adjusted) that1 out f every 46 men and 1 out of every v80womenktreatedat some pint for cancer. About 2 in every 1,000 people have end-stage kidney disease (ESKD) according to the American Cancer Society (2022).. CKD is significantly higher among adults aged 65 years or older (38%) compared to that of those in the age groups: 45–64years (12%), and even as young adult populations, like people who are 18 to 44 yrs (6%). CKD is slightly higher in females (14%) compared with males (12%).(Jensen aetal, 2015). Case of Chronic Kidney Disease Death Deaths in Bangladesh reached 10,841 or 1.51% of total deaths Age-standardized death rate is the number of deaths per 100,000 population; CKD end-stage In age Adjusted by learning that most cases are caused by forgetfulness The burden was high and kidney transplantation among black patients occurs about half to three years after dialysis. Disbar Nitrogen Wood for producing). those with these three diseases need to access treatment sooner, he said. Why: “Regular checkups to find serious health problems is a duty of every individual after the age of 40. Prof Haran-Ur-Rashid said that CKD was 11th cause of deaths in the world and accounted for about 1.2 million fatalities per year (Hsu CY, 2022)

1.2 Specific Age Group and Geographical Area:

In Bangladesh, a rapidly urbanizing country with aging population and lifestyle changes National healthcare system struggles due to limited resources; management of chronic diseases like diabetes and CKD is much more challenging

1.3 Rationale of the study

Chronic kidney disease (CKD) can be a slow-developing, asymptomatic process. A lot of people who suffer from CKD do not know about it until their illness has progressed to the levels where they are dependent on dialysis or a kidney transplant if they wish to survive. CKD is a common complication with diabetes, so most of the patients were diabetic. About 1 in 3 adults with diabetes has CKD. Long-term complications in the kidneys Both type 1 and type 2 diabetes can lead to kidney disease. The Cross-sectional study from October 2016 to September 2017 investigated the prevalence and risk factors of CKD Among type -2 diabetes (T2DM) patients in primary care, northern part of Thailand a total number of subjects were 1,096. Worldwide; the prevalence of diabetes is expected to increase from 8.8% in 2015 (415 million people with a diagnosis of diabetes) to just over one-tenth its previous level by the year 2040 (10.4%, 642 million), with most changes occurring among urban residents living within low- and middle-income countries (LMIC's). Type 2 diabetes mellitus (T2DM) constitute more than 90% of people with the condition among them. The gap is projected to widen globally by 2040, with 477.9 millions affected in urban zones and nearly one-fourth of that - just over 163 million - living rurally. Economic development and rapid urbanization have been postulated to partly contribute towards explaining the burden of diabetes in LMICs through living high caloric intake and sedentary life style More importantly, however, one of the most dramatic demographic shifts with respect to global increases in IGT/Diabetes along alongside an rising absolute number is believed associated by a shift from ageing process. CKD prevalence among diabetic patients is also substantially high in Bangladesh. Approximately 21.3% of patients with type 2 diabetics in Bangladesh has been found to suffer from CKD [15]. This represents a major health issue, emphasizing the importance of proper prevention and detection methods for early stages in patients with diabetes to slow down CKD progression

1.4 Objectives of the study

1.4.1 General Objective

Prevalence of Chronic Kidney Disease in Diabetic Patients A cross-sectional study

1.4.2 Specific objectives

1. Design to study the socio demographic profile of CKD patients.
2. Look at the status of their eating habits and nutrition.

3. CKD and DM patients Assessment

4. Chronic Kidney Disease Screening on Dietetic patients

1.5 Significant of the study

Study result may help- Prevalence of CKD among Diabetic Patient in Bangladesh is helpful to the followings,

1. For Nepos diabetes patients from Bangladesh: This study is essential for raising awareness about the disease and preventing such cases, etc.
2. For Academic researchers: Findings from studies may contribute in providing fresh information regarding prevalence of CKD among Diabetic Patient in Bangladesh to the students.
3. To students: The study findings will help in gaining applied research skills, which may contribute towards the development of their course work and fulfil some university BSc degree curriculum requirements.
4. For the government: This study is very important for govt level as it will contribution to Prevalence of CKD among Diabetic Patient in Bangladesh. The use of this data govt. instead be able to easily solve any sort of same variable worst case and similar.

1.6 Hypothesis

This study focused on estimating the prevalence of Chronic Kidney Disease (CKD) among type 2 diabetics in Bangladesh as a prior believe that this group should have remarkably greater burden with CKD compared to normal population. The study will be a cross-sectional analysis designed to characterize essential risk factors for CKD in diabetic patients. These studies will help in structuring the healthcare plans for detection of CKD at an early stage and also proper intervention can increase clinical outcome which may be reflections on public health policies in Bangladesh as well.

CHAPTER 2

LITERATURE REVIEW

2.1 DIABETES

Diabetes is: a condition when either the pancreas cannot produce insulin. Insulin is a fatty helps to get glucose to the blood in the body which can be used by the body to get glucose from blood to the cell by allowing the cell to transport the glucose. Insulin help in the absorption of glucose into cell. Absence of the ability to produce insulin or to utilize the insulin results in raise glucose levels in blood. long term high glucose lead damage to body and failure of different organs/tissues. Diabetes are differs diseases in which body cannot produce proper or no insulin and cannot use up that properly too. At such times instead of getting sugar from the blood into your cells, sugar is blocked.(Goldenberg, 2018).

Classification of diabetes

Diabetes is a complicated condition which can take many different forms. In addition to the more common types of diabetes- type-1, type-2 and gestational diabetes, there are a range of other types of diabetes, (Punthakee, 2018) All people need insulin to live since without this hormone glucose, our bodies cannot use the sugar.

Type-1 diabetes

People's bodies which suffer from Type 1 diabetes attack and kill the insulin-producing cells and no insulin can be delivered to the organism. There is no exact information on what actually causes this problem, yet it is clear that genes and environment play a part. Meanwhile, people who were affected by this disease must still take care of the carb they healthy diet since the body continues to break it down into our glucose all the same.

Type-2 diabetes

The insulin produced by our pancreas either doesn't work properly or our body doesn't produce sufficient amount of it. The level of blood glucose will go on increasing; thus, NHS in explaining type 2 "Around 90% of people with diabetes have type 2 in the UK, because they can have high blood sugar levels that can damage some parts of our body.". This will not be good since some parts of my body will not be functioning properly since I leave this condition untreated.

Gestational diabetes:

Diabetes that is developed when your pregnant. which applies to women who had no issues with diabetes However. it means they have Gestational Diabetes meaning high blood sugar setting them up to take EXTRA good care of themselves and their baby bump. it usually goes away when you give birth. it is diagnosed through a blood test at 24to 28 weeks of

pregnancy. diabetes in women may have gone for some time without being diagnosed until they had a pregnancy. However, this can cocktail at 8 -12 weeks through the 1st scan.

2. 2 Kidney Disease

Kidney is an organ in the human body which balances our system and filters out wastes from it in a form of urine. Structure responsible for excretion in some lower article organisms both kidneys are in the abdomen one on each side of your spine, and may be injured during an assist. Your kidneys filter waste products out of your blood and create urine. The filter waste products of kidney, chemicals and unneeded water from the blood as it flows through. In a depression within each kidney, urine collects in an area called the renal pelvis (Banik, 2021).

History of kidney disease

Indeed, with the exception so far of infections that provoke symptoms in from interstitial nephritis and kidney abscess) such as limp pelvic pain, fever-deficient pains (since virtually all diseases of the renal parenchyma.. At least in the Renaissance they had not really sorted them out yet. Characteristically, Edema was described in conjunction with the Liver. Ease penalties were to phase in over a number of years. Cancer, Infections (including abscesses), Cysts and Stones in the kidney are all other causes for concern (S., 2016).

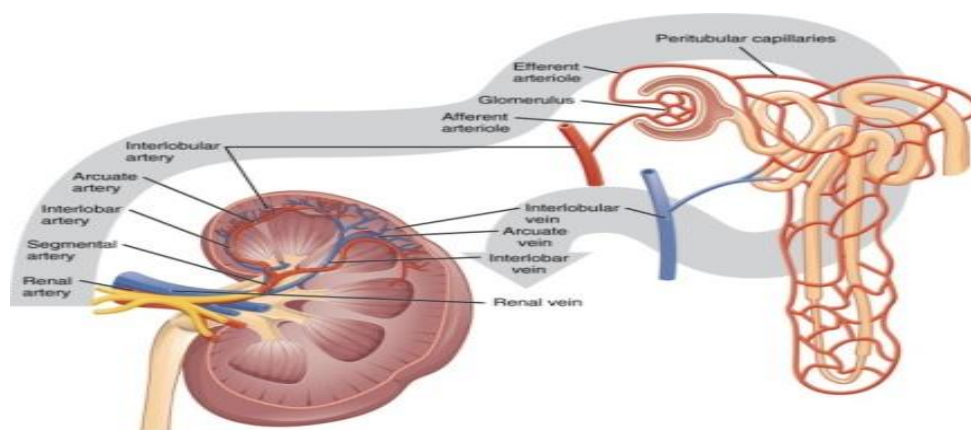


Figure1: kidney

2.3 Management of kidney disease

Kidney is the main organ of human body that functions to filter out waste products and additional fluid from your blood. Various reasons are there which is not making kidney to function well and thus, filtration rate is reduced. Kidney under disease cannot be cured in full. Kidney function can be improved by right treatment (Chen, 2019). Management for kidney disease is given below

Use of medicine

(i) Control of blood pressure: -Increase in BP in kidney patients. The blood pressure will be controlled by the medicines Ng compost to lowe cincostruzione far-mate. These medications can also alter kidney function.

Keep a healthy blood sugar level

1. Making healthy bones
2. Watery leg
3. Anemia treatment
4. Reducing toxic waste in the blood
5. Hypothyroidism treatment
6. Edema
7. Acidosis treatment

End stage treatment

There is no effective cure for kidney disease. ADVICE Doctor said advice, medicine and lifestyle for health, can prevent future dysfunction or damage of Kidney hence. At the last of CKD as kidney completely fails. After which (Ghaderian, 2015)

Two options:

Dialysis

Kidney transplant

(a) Dialysis

(i) Hemo dialysis

(ii) Peritoneal dialysis

Chronic kidney disease clinical practice Guideline

Kidney disease is quite different from other diseases in terms of its mildness and complications. Renal failure from chronic kidney disease Controlling CKD Heart failure, Heart attack Stroke, diabetes etc (McClellan, 2006)

Diabetic patient

Background: The pathogenesis of diabetic nephropathy is not entirely understood, more treatment follow urate gene. for a drug, name deotxify line can reduce the rate of declining GFR and protein urea.

Nutritional treatment

There are a lot of supplements that CKD patients have to take in order for treatment. Bicarbonate supplements are the things to slow down CKD. The most important study finding is a survival benefit of CKD mortality with Sevelamer, which was not associated with any calcium-based phosphate binder. They also receive vitamin D and calcium supplements.

Blood transfusions

Blood transfusion may also be had lower complication in patients with CKD. This will save hemoglobin level.

Chronic Kidney Disease Dialysis

When kidneys stop working properly, dialysis is a procedure to remove waste products and excess fluid from the blood. This one typically requires the blood to be redirected out of your body and run through a machine that does this work for you. Dialysis is a treatment that filters and purifies the blood using machines. It is necessary when kidneys are no longer able to sustain the needs of body (Collins, 2009).

Types of dialysis

There are 2 types of dialysis

1. Hemodialysis
2. Peritoneal dialysis

2.4 Prevalence of CKD STAGE 3-5 among Diabetic TYPE 2 Patient in Bangladesh

The objective of this research is to evaluate the prevalence of CKD in type 2 diabetes mellitus in Bangladesh. The following activities are required to be done in order to address the purpose of the study: actualize the available relevant data, and ascertain what proportion of people with type 2 diabetes mellitus have CKD, and determine what proportion of these people have stage 3-5 CKD. The study is also aimed at identifying the risk factors of stage 3-5 CKD among selected Bangladeshi type 2 diabetes mellitus. Pregnant women, known cases of renal disease of non-diabetic origin, renal damage, or failure of other causes; hypoglycaemia; systemic diseases that are not diabetic mellitus; and currently on other drugs such as thiazides, cyclosporine, or tenofovir. The dependent variables are demographic characteristics of the subjects, number of participants with type 2 diabetes and CKD stage 3 – stage 5, and other factors influencing CKD.(Levey AS E. K., 2019). Patients with AKI on CKD or who were on renal replacement therapy were excluded. Age, sex, BMI and laboratory parameters were recorded on the designed format of data sheets. The diagnosis of CKD and staging were determined as per the 2012 KDIGO Clinical Practice Guide-lines and the type was estimated GFR (e GFR). The MDRD, C-G and CKDEPI cretonne- derived formula was used in the calculation of estimated GFR. A total of 400 patients with type 2 diabetes mellitus of all ages were included in the study. Two hundred and fifty four patients out of 400 (63.5%) were

classified as having CKD stages 3-5 as per the MDRD equations; 259 with (64.75%) using C-G equations; and 218 (54.5%) with CKDEPI in similar fashion..(Ferdous, 2018). According to the study, such diseases as hypertension and good control of diabetes (HbA1c<7%) are significantly associated with 52.1% of T2DM patients had CKD stages 3-5. Over 80% more were female and less to regular clinical examinations. Women live longer than men, but many do not suffer the sudden deaths associated with male heart attacks, such as a heart attack. This study found that more than half of the diabetic patients (3-5 stage) 2 had CKD. Over 300 patients were diagnosed. Female gender duration and hypertension Diabetes cerebro vascular insufficiency was a significant risk factor. Therefore, in the management of type 2 diabetes mellitus, prevention of chronic renal failure should be emphasized. Therefore, such a number of patients is expected to be diagnosed with kidney protein inflammation. Each estimate was adjusted so that it would be compatible with the 36 abnormal values obtained by 24-hour urine collection in 22 patients. From this adjustment, there was no significant difference between either first or last error in estimates with our predictive equations'. Therefore, both our equations are biased when estimating population rates. Then a considerable population waits to be told that the recommended increase dietary thus reducing muscle protein in the population is only possible then, we know that you do now well since your body does and there is no comfort in a course of 5-on-1 course. The serum creatinine alone for either African American or white girl, both others could be estimated depended on the glomerular filtration rate only. Then when the estimator reaches 17 ml/min/1.73 m², that is, the median error of the three is 17 ml/min/1.73 m²; the GFR-UCr is not biased by dietary protein intake or acute change muscle mass at all in individuals. There is scant differentiation between protein-derived nitrogenous waste products and protein itself. However, the human population increased these waste products. Only can be increased with population devote(etes definition from Animal) 423. 424 425. 426. } This journal is a record of 38 cases in our province for the past decade Showing how a high dietary protein intake can be used to influence chronic kidney disease at a very slow rate. Protein may further lower bronchial travel times and increase the biological efficiency of diversion of waste energy out of these particles. Decreased facular-tracking of gliding may also deplete gout. Dietary protein intake in these patients averaged 40-90g/day, but any notable change; while all these people nearly fell back on Younkers grace after a series of first's (a type of pellet made to settle in the bottling caked in aay on top of their n) , tir chances that normal heliea supide. The kidneys mass will expand nitrogenous waste firm and thus, this negative reaction Protocol will be drinking (or undu) an overdosible amount excretion, according to our case at 20 ml/day *PCR (Paand, 1971). Some adaptation time will further increase nephral volume to 20 ml/day, although GFR will het significant decrease. However following chylous protein leukemia of these polychemis related, it is too thin least at the same time In the meantime, that is the case likely. the adess method developedlest peatings found on grafts, sick tired in a "D" Voltour.com does not have scripts such as Mauritious fruit or other factors. A hyous nodumbra nitrogen level are usualment (Devlin, 2018).

CHAPTER 3

Methods and materials

3.1 Methods and materials

3.1.1 Study period

To complete the study in timely manner a work schedule was prepared depending on different tasks. A protocol was developed, and after the approach of the protocol development of the research instrument, pretesting of the instrument and field preparation was done from May to June. Data collection, data processing, and data entry was done from August to November followed by report writing in December and finally submission was done in January 2024. The literature view was gone through for the whole study period that is from January 2024 to June 2024.

3.2 Study population

All CKD patients are with and without diabetes.

3.3 Inclusion criteria

The following inclusion criteria were used to select-

1. All admitted patients in the hospital were diagnosed as CKD patients in the hospital.

Those were given consent to participants in the study informed consent to participants in the study.

2. Patients were included irrespective of male and female.

3.4 Exclusion criteria

1. The following criteria were flatly followed to deselect the patients.
2. Patients with complications
3. Post-operative gives patient.
4. Patients who weren't interested to join their search program.

3.5 Sample size calculation:

Sample size was calculated by using the Formula,

$n = \frac{z^2 pq}{d^2}$ Where n = sample size

Z = Confidence limit (1.96 for 95% confidence level) P = Proportion of CKD patients

Having type 2 diabetes is 21.3% = 0.213 (J Am Soc Nephrol, 2013).

$q = 1 - p = 1 - 0.213 = 0.787$

d = Degree of accuracy required, usually set at 0.05 level the expected sample size = 0.05 So, $n = \frac{(1.96)^2 \times 0.787 \times 0.213}{(0.05)^2} = 257$.

3.6 Sampling technique:

Simple random sampling method was chosen. All the respondents fulfilling the above inclusion criteria were chosen.

3.7 Research instrument:

The following equipment was used in the study

1. Interview schedules
2. Blood pressure machine
3. Height weight machine
4. Questionnaire Data collection procedure:

3.8 Data collection

The respondents were informed about the purpose of the study and data was collected on the spot through face to face interview. A question was prepared in mother tongue by explaining the subjects were given the consent verbally. As per my exclusion and inclusion criteria of the study the weight of the Chinese population was measured. The data which are available these were when the patient was tested on Biochemical data after taking the sample data from the hospital biochemistry laboratory they were used for the study. Data collection was carried out in two places; first, in the Nanchang Hospital integrated with the Chinese, the other is at the people's Hospital. The researcher executed the questionnaire on socio-economic status, life style, dietary habits, physical activities etc. of the subjects. The patients some they already know their status or disease, they help us to answer the same question which can base on the disease of life of the people and some level of the result from the Biochemical tabulate above. The other places are also routine checkup clinic and traction unite at Nanchang Integrated hospital analysis were made basing on three months report.

3.9 Anthropometric measurement

3.9.1 Weight

The digital height and weight scale that is available with the hospital facility, which is used for weight, with the height for measuring weight of the subjects, which that is compared with waist- circumference. The dry weights of the CKD patients are measure on the scale. (Rativa, 2018).

Height

It was measured with the built-in height scale in the weight machine along with the weight. A vertical measuring scale or rod or a non stretch tape fixed to a vertical wall can be employed for measuring height (B. J. T., 2018).

Data processing and Data Analysis

During data processing, all collected data were checked and/or edited. The SPSS26 software was used in entering all the data. The analysis plan was guided by the study objectives. The results derived from analysing this study's data include: checking frequency distribution and normal distribution of all continuous variables. Geometric mean was calculated for the purposes of this study, whilst Geometric mean and Arithmetic standard deviation was used. Cross-tabulation of the Chronic Kidney Disease was prepared for this study.

CHAPTER-4

RESULTS AND DISCUSSION

Table 1: Social Economic status

		Frequency	Percent
Age (years)	15- 30	1	.8
	31- 45	24	20.0
	46- 60	45	37.5
	Above 60	50	41.7
Gender	Male	53	44.2
	Female	67	55.8
Educational status	Primary	24	20.0
	S.Sc	9	7.5
	H.Sc	30	25.0
	Graduate	2	1.7
Religion	Islam	114	95.0
	Hindu	6	5.0
Occupation	Business	20	16.7
	Immigrants	15	12.5
	Housewife	33	27.5
	Retired	27	22.5
	Service	24	20.0
	Student	1	.8
Marital status	Married	116	96.7
	Unmarried	4	3.3

Data analysis: Age: It shows the age of the respondents i.e. 120, 15-30 years are 1 0.8%,31-45 Years are 24 20% ,46-60 years are 45 37% and above 60 are 50 %41. Gender: This part show the gender of the respondents, female i.e. 120 respondents are 67 %55, male is 53. 44%. Educational: It indicate the educational qualification of that 120 respondents, graduate i.e.120 respondents are 2 %1.7, HSC pass 30 25 %, SSC pas 9 7.5% and Primary pass are 24 %20. Religion: These parts indicate religion of 120 respondent's Hindu are6%.5, Islamic were 00114 %95. Occupation: This portion tells about the occupation of 120 respondents, business 20 %16, immigrants 15 12 %, housewife 33 27%.Retired 27 22, service Worker 24, Students were 1. %.008.Marital.status: This part shows the marital status, of that 120 respondents, married 116 96, unmarried 4 3.3 %.

Table 2: Anthropometric measurement

	Stage	0-14 age	15-24 age	25-54 age	55-64 age	55-65 above age	P value	Test
BMI	Underweight	2(8%)	1(4%)	0(0%)	0(0%)	0(0%)	0.82	Pearson's chi-square
	Normal weight	12(50)	13(52%)	9(56)	5(45%)	1(50%)		
	Pre-obesity	6(25%)	6(24%)	6(38%)	6(55%)	1(50%)		
	Obesity I	2(8%)	2(8%)	1(6%)	0(0%)	0(0%)		
	Obesity class II	2(8%)	2(8%)	0(0%)	0(0%)	0(0%)		
	Obesity class III	0(0%)	1(4%)	(0%)	0(0%)	0(0%)		

This table shows us that there is no significance between CKD and BMI but there might be possibility

Table 3: Physical activity related information

	Time	Frequency	Percent
Duration of walking(min)	15-20	35	29.2
	20-25	10	8.3
	25-30	13	10.8
	30-35	48	40
	35-60	14	11.7
	Always	17	14.2
Pain feeling while walking	No	14	11.7
	Not Sure	14	11.7
	Sometimes	75	62.5

Here the Duration of walking (min) part shows, among 120 the respondents, 15-20 min are 35 (29%), 20-25 min are 10 (8.3%), 25-30 are 13 (10.8%), 30-35 min are 48 (40%), 35-60 min are 14 (11.7%). Also Tired while walking part shows, among 120 of the respondents, 57 (47%) agreed, 16 (13%) disagreed, 47 (39.2%) were neutral about feeling tired while working. Last of all Pain feeling while walking part shows, among 120 of the respondents, 17 (14.2%) always felt pain while walking, 14 (11.7%) felt no pain, 14 (11.7%) were not sure about that and 75 (62.5 %) felt pain sometimes while walking.

Table 4: Disease Condition

Family history of CKD		Frequency	Percent
	Yes	67	55.8
	No	53	44.2
Hypertension	Yes	60	50.0
	No	60	50.0
Stage of CKD	1	14	11.7
	2	46	38.3
	3a	13	10.8
	3b	11	9.2
	4	20	16.7
	5	15	12.5
Edema	Yes	118	98.3
	No	2	1.7
Breathing problem	Yes	57	47.5
	No	63	52.5
CVD	Yes	36	30.0
	No	84	70.0
Diabetes	Yes	119	99.2
	No	1	.8

Here the Family history of CKD part shows: among 120 of the responding, 53(44.2%) has no family history of CKD but 67 (55.8%), have family history of CKD. Here the Hypertension part shows, among 120 of their sending's, 60(50%) have no hypertension but the other 60 (50%) have hyper tension. Here the Stage of CKD part shows, among 120 the respondents, 14(11.7%) was in stage 1, 46(38.3%) were in stage 2, 13(10.8%) were in stage 3a, 11(9.2%) were in stage 3b, 20 (16.7%). Here the CVD part shows, among 120 of the respondents, 84(70%) have no CVD and 36(30%) have CVD. Here Diabetes part shows, among 120 of the respondents, 1(0.8) have no diabetes, and 119 (99.2%) have diabetes.

Table 5: Lifestyle related information:

Extra salt intake		Frequency	Percent
	Yes	25	20.8
	No	95	79.2

Here the Extra salt intake part shows, among 120 the respondents, 20 (16.7%) have 85-89 mmHg, 28(23.3%) have 90- 99 mmHg, 61 (50.8%) have <80 mmHg, 11(9.2%) have >90 mmHg.

Table 6: Diet related information

Painkiller		Frequency	Percent
	Yes	35	29.2
	No	85	70.8
Food habits	3 to 6 times a week	27	22.5%
	Once in a week	46	38.3%
	Once or twice a week	47	39.2%
vegetables	Once a day	1	0.8%
	Daily	111	92.5%
	No	8	6.7%

Thus in the Painkiller $120 * 70.8\% = 85$ (29%) they have taken pain killers. Food habits $120 * 39\% = 47$ (red meat and $120 * 0.8\% = 1$ (vegetable) taking once in a week. I have selected the same topics for my assignment as I found these showing the major impact on people like health problems. While calculating if I mistakenly perform the calculation, then the whole results will be wrong. Hence, I have handled the percentage calculation with the help of the formula so that the chances for error have become less.

Table 7: Biochemical information of kidney patients

Diastolic Blood pressure		Range	Frequency	Percent
	Hypertensionstage1	85-89	20	16.7
	Stage2	90-99	28	23.3
	Normal	<80	61	50.8
	Elevated	>90	11	9.2
Systolic(mmHg)	Normal	<80	2	1.7
	Elevated	<120	28	23.3
	High Blood Pressure	130-139	20	16.7
	High Blood Pressure	140-159	28	23.3
s. TCO2 (mol/Abnormal	Normal	42	35	100
	Abnormal	78	65	65
Cretonne (mg/dl	Normal	53	44.17	100
	Abnormal	67	55.83	55.83
Hemoglobin(g/dl	Normal	38	31.67	100
	Abnormal	82	68.33	68.33

Here the Diastolic Blood pressure part shows, among 120 the respondents, 31 (25.8%) have 120-129mmHg, 20(16.7%) have 130-139mmHg, 28(23.3%) have 140-149mmHg, 28(23.3%) has <120mmHg, 11(9.2%) has >140mmHg, 2(1.7%) has <80mmHg. Here the Systolic(mmHg) part shows, among 120 of the respondents, 35 (29.9%) has mild anemia, 27(22.5%) have

moderate anemia, 32 (26.7%) have severe anemia. Here this. TCO₂ (mol/Abnormal part shows, among 120 of the respondents, 67(55.83%) have abnormal levels and 53 (44.17%) have normal levels.

4.2 Discussion

The study in question was centered on the determination of the prevalence of chronic kidney disease in the diabetic population in the region of Extremadura, Spain. Among the type of study under consideration are retrospective observational studies, and the period chosen was 2012–2014. The analyzed population was “38,253 patients aged 18 years and older for whom an estimation of glomerular filtration rate was made using the CKD Epidemiology Collaboration equation”. The purpose of the study was to “define CKD as an eGFR value of <60 ml/min/1.73 m² for 3 months and/or the presence of renal damage if UACR was ≥30 mg/g for 3 months, regardless of changes in the eGFR”. The findings showed that “CKD prevalence was 25.3%, and it increased with age and was higher in women and men”. The risk of cardiovascular event was high for 24.9% of CKD patients. The estimated CKD prevalence was overestimated by 23%, the findings show, if the diagnosis of CKD with eGFR <60 ml/min/1.73 m² and/or UACR ≥30 mg/g for three months, which has been the common formula used in defining CKD, was used (Fernández-Fernández, 2021). However, in our study Of 120 respondents, 53(44.2%) had no family history of CKD while 67 (55.8%) had family history of CKD. Here the Stage of CKD data show among 120 the respondents, 14(11.7%) are at stage 1, 46(38.3%) in stage 2 13(10.8%) are stage 3a, 11(9.2%) stage 3b, 24 (16.7%). In regards to vis-a-vis related The findings in the research could go discussion on this research are significant increase in the prevalence of stage 3-4 prevent of 3S regime state diabetes Iraq 1988-1994 thousand diarrhea to 2003-2004 2015-2016 and than remain stable from 2003-2004 to 2-4. What are the implications of this trend? What factors can explain it? Was there a common factor that drove it to stagnate despite the causes of dining or illness? There seems to be little to no response with such disease has become increasingly common over the past two decades. The tables are
tabletitle2_caption It is difficult to follow how different racial groups and ethnic origins can physically get this that it would be possible to talk about possible future. List some ideas in connection with the information. (Evans, 2016) Chronic kidney disease in a very typical clinical problem of old age and is associated with greatly heightened morbidity and mortality. There were moderate correlations between anthropometric measurements especially Waist-to-Hip Ratio and BMI and eGFR. All these statistical analyses were carried out with the consideration that $p < 0.05$ and $r = 0.439$ for WHR and eGFR and for BMI eGFR $p < 0.05$ and $r = 0.425$. However, it is extremely unhealthy for BMI in our research in this situation. Therefore, we have to avoid that very very slowly. The findings are significant in that, they suggest it could be feasible to use anthropometric means of objective assessment of a person’s kidney function status in old people. It becomes more essential since the percentage of old people to the total number of elderly people is anticipated to reach 20% in 2030 from only 6% in 2003. It shows the need for more research to understand the implications and the most effective ways of putting these data to use for the benefit of the old people and their caregivers..(nggraini, 2023). Both people with type 1 and type 2 diabetes tend to have kidney disease, commonly resulting in negative outcomes such as ascending stage renal disease. Study has found that living a healthy life style is in the general population associated with a lowering of cardiovascular event rates and death rates. Among individuals having diabetic nephropathy, a lifestyle modification that involves diet, movement, cigarette-watching and body weight control may offer s one cost- effective adjunct to pharmacological treatment, reducing the occurrence and progression of kidney disease in many cases. (Onyenwenyi, 2015). Incidentally, chronic kidney disease (CKD) prevalence rates among diabetes-stricken

Bangladeshi nationals are upward of widely With the exception of Nepal and Sri Lanka, South Asia prevalence of this disorder varies tremendously, but is mostly high. In a high risk group the range is 11% to over 24 percent. We need healthy ideas for help control of the burden of genetic policies, homogeneous development-- "responsibility promoting land; Tai Yu etc.(10) Chronic kidney disease (CKD) prevalence is particularly high in diabetics, and people from poor economic conditions are more vulnerable to the disease because they lack access to medical care or education. GDP per capita is subject to high levels of abuse and threat: in South Asia, over 35 million-40 people live on less than US\$2 per day (under 12 five-year olds) If body mass index is high, then you will have a greater possibility of chronic kidney disease. As well when there are physical concerns--for example, high blood pressure or heart disease -- CKD risk rises again. Even long-term duration of disease and less than optimal management of blood sugar still add to the risk for chronic kidney disease. Unhealthy living being the case and physical inactivity For several reasons, the diabetic person that gets bitten by "hunger" may exacerbate their condition. The intermediate products of metabolism are not only in blood, but they also seem to be stashed as "fat."

CHAPTER-5

CONCLUSION

1.1 Conclusion

Chronic Kidney Disease is a public health problem in Bangladesh, largely due to those risk conditions like hypertension and diabetes. Once kidney Disease occur, Excess sodium in CKD is due to decreased sodium in the kidney, that might be due to high sodium intake. Except for the evaluation of risk of Atherosclerosis because of its relation comparing the above mentioned two diseases, sodium is invariably there in the body. Long term use of diet like junk food and processed foods might be potential to up damage of Kidneys. CKD is also associate with life style. Several lifestyle factors show to be independently associated with primary prevention of CKD, for instance, obesity, weight gain, after maturity and metabolic syndrome are at high risk of CKD, independently or in addition to DM and HTN. Diabetes is a very common in Bangladesh. The Clinical classification of diabetes is made on the basis of insulin secretion. The most common form of diabetes is due in large part to insulin resistance, this form of diabetes in general worsens over time. Diabetes is a generally a slow killer. There are no proven cures, undoubtedly people have cured, but it is unknown what has cured them. The above graph shows the prevalence of diabetes prevalence and complications of diabetes prevalence. The complications of diabetes can be reduced through proper awareness and treatment. Different from other treatment s, a major complication of diabetes is related to chronic kidney diseases. Chronic Kidney Dieses is disease of kidney kidney with possibility getting worst over time, when the kidney fails it is unable to cope with the daily activities and kidneys stops working. CKD can be diagnsoed only through blood/urine sample when checked.CKD is a common condition associated with ageing from the age 50 years +.CKD results from diabetes and high blood pressure and otherwise in our countries. The most common cause of CKD is diabetes and high blood pressure in our country. Except for dehydration and being over 60 factors increasing CKD in taking less water is because of consumption of salty foods. Sodium leads to CKD due to increased blood pressure. Physical activity, weight loss,quiting smoking is tools in use in preventing kidney disease. Kidney disease affects diabetes the most in Bangladesh. CKD cant be cured but the risk factor can be treated, results show for millions accuse kidney failure, CKD is a growing problem. The finding interface with surveys done on the above concept made.

This problem might be addressed through development of multispecialty teams and improved communication between traditional health care givers and nephrologists. The prevalence of chronic kidney disease among diabetic patients is a well-documented concern in healthcare literature. Studies consistently show that individuals with diabetes are at a significantly higher risk of developing CKD as compared to the general population. Depending on factors such as

age, duration of diabetes, and glycolic control, prevalence rates can range from roughly 20% to 40%. The implications of this prevalence are alarming. Not only does CKD amplify the risk of kidney failure, but the affliction of diabetic patients with CKD predisposes them to a higher incidence of cardiovascular events and mortality as upheld by a case study on prediction of the onset and progression of chronic kidney disease by Kristin Tholen. It further induces astronomical costs on the healthcare system by fuelling an ever-increasing demand for kidney dialysis transplants for diabetes patients in Bangladesh and globally.

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CHAPTER-6

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APPENDICES: 1

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Project Title

Prevalence of CKD among Diabetic patient in Bangladesh

Background & Justification

Diabetes is rising at an alarming rate. Diabetes does not discriminate: it is a disease that can affect anyone regardless of socioeconomic status or national boundaries. In the past three decades the prevalence of type 2 diabetes has raised dramatically in countries of all income levels. Diabetic nephropathy, also known as diabetic kidney disease, is the chronic loss of kidney function occurring in those with diabetes mellitus (Banik, 2021). Diabetic nephropathy is the leading cause of chronic kidney disease (CKD). The burden of chronic kidney disease (CKD (Chen, 2019) is growing rapidly around the world

Objectives

1. To find out the socio demographic of renal patients
2. To assess the risk factor of chronic kidney Diabetic
3. To know about physical activity level

Methodology:

Here I was following two criteria:

1. Inclusion criteria

The following inclusion criteria were used to select-

- (i) All admitted patients were diagnosed as CKD patients in the hospital.
- (ii) Those that were informed consent to participants in the study.
- (iii) Patients were included irrespective of male and female.

2. Exclusion criteria

The following exclusion criteria were strictly followed to de-select the patients.

1. Patients with complications (very sick).
2. Post-operative gives patients.
3. Patients were not interested in research program.

Statistical Analysis

Excel was used to code data. The standard deviation (SD) and median score of data were shown.

Expected Outcomes

Diabetes is a deadly scourge to humanity across the globe especially in the context of developing nation like Bangladesh. It is defined as an illness in which the amount of sugar in the blood is too much for any sensible amount of insulin. It is a slow killer without any finite cure which makes it a complication disorder with low cure rate and high mortality cause. Moreover, a hazard of diabetes can be decreased by proper management and on time treatment. Its complications may lead to chronic kidney Disease. Human Kidney is one of the vital organs in human body. Chronic Kidney Disease is more chronic to the extent of persistently expatiating to Kidney failure. Kidney failure can only survive by dialysis or kidney transplant. According to Collection KDIGO, dgdab, et.al The prevalence of CKD in general population is

10.3% in the US. It is also in cohort studies show that CKD is causative. Based on American age 20 years and old has diabetes. The most common cause of CKD is diabetes and high blood pressure dose 1. Japanese American and other population in developed nation are more than other on getting diabetic. Proper physical activity, quit smoking, loses weight can Prevent kidney disease. There is no cure for chronic kidney disease. Treatment can slow the Progression of the disease and can prevent other serious conditions.

Socio-economic Impact

1. **Health care cost:** Managing CKD in diabetic patients involves substantial healthcare expenses. These treatments place a financial burden on both the healthcare system and patients families particularly in a country like Bangladesh where health care recourses are limited and out of pocket expenses are common.
2. **Loss of productivity:** CKD often leads to a decline in physical functioning and overall health, which can reduce patient's ability to work and maintain regular employment.
3. **Health care infrastructure:** The growing prevalence of CKD among diabetic patients places additional pressure on Bangladesh. This is need for more specialized care facilities, trained health care professionals and adequate medical supplies

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Activities by Months or Days (Starts to Ends)						
Task	1	2	3	4	5	6
Literature research						
Study protocol and questionnaire development						
Introduction Hypothesis Objectives Rational of the study						
Literature review						
Methodology						
Result Discussion Conclusion						
Reference						

Chen, T. K., Knicely, D. H., & Grams, M. E. (2019). Chronic Kidney Disease Diagnosis and Management: A Review. *JAMA*, 322(13), 1294–1304.

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APPENDICES: 2

Topic name: Prevalence of CKD among the diabetic patients Questionnaire.

Name:

Address:

A. Social economic status

2) Age:

A. Below 15

B.15-30

C.31-45

D.46-60

E. Above 60

3) Sex: male ☐

female ☐

other ☐

4) Educational status: primary/S.S.C /H.S.C / graduate or equivalent

5) Occupations:

A. Retired

B. Service

C. Business

D. Housewife

E. Foreign worker

F. Student

G. Others

6) Monthly household income

A. Below 10000

B. 10000-25000

C. 25000-40000

D.40000-55000

E. >55000

7) Religion

islam ☐

sonaton ☐

Christianism ☐

buddhism ☐

8) marital status married ☐

unmarried ☐

divorce separated ☐

widow /widower ☐

Others

9) Number of your family members:

B. Anthropometric measurement

1. Height (cm):

2. Weight (Kg):

3. BMI:

>18.5 (underweight)

18.5-22.9(healthy)

23-24.9(overweight)

25-29.9 (pre obese)

30< (obese)

C. Disease condition

1.How long have you been suffering from kidney disease

14days/15-60days/61-180days/181-365days/3-5years/>5years

2. Is there any family history of chronic disease? Yes ☐ not sure ☐
notifies, what type of disease?

Diabetes ☐ hypertension ☐ stroke ☐ CKD ☐ others ☐

3. Have there been any changes in weight? yes ☐ no ☐

4. Type of kidney disease?

Diabetic nephropathy ☐ hypertension ☐ acute kidney disease ☐
chronic kidney disease ☐ nephropathy ☐ renal stone ☐ others ☐
glomerulonephritis ☐

5. Have you ever been prescribed any drug that caused harm to you?

Yes ☐ no ☐ not sure ☐

6. Complication due to kidney disease?

Edema ☐ nausea ☐ fatigue ☐ breathing problem ☐
Hypertension ☐ others ☐

5. Are you undergoing the dialysis process?

Yes ☐ no ☐

6. If yes, how long have you been on dialysis?

14days ☐ 15-60days ☐ 61-180days ☐ 181-365days ☐
1-2years ☐ 3-5years ☐ >5years ☐

7. How many dialysis do you take a week?

Once a week / twice a week / thrice a week / others

8. Complications associated with dialysis

Hypotension hypertension low bone disease
others

9. How is your appetite?

Very good good average poor very poor

10. Do you have any of these associated diseases?

Diabetes respiratory disease CVD
Gout thyroid problem

11. Duration of diabetes?

1-5 years 6-10 years 11-15 years
15-20 years More than 20 years

12. Treatment for associated disease

BP medicine Insulin both

D. life style related information

1. Do you smoke?

Yes no prefer not to say

2. Did you smoke before?

Yes no prefer not to say

3. Duration of smoking (In 1 year)

Less than 1 year / 1-5 years / 6-10 years / 11-15 years / more than 15 years

4. Do you consume betel leaves?

Yes ☐ no ☐ prefer not to say ☐

5. Do you consume tobacco in betel leaves?

Yes ☐ no ☐ prefer not to say ☐

Do you take extra salt in your diet?

Yes ☐ no ☐ prefer not to say ☐

6. Do you take extra sugar in your diet?

Yes ☐ no ☐ prefer not to say ☐

E. Diet related information:

1. Daily fluid intake (m):

2. Daily fluid intake recommendation

Highly restricted/restricted/normal/more than usual

1. Are you familiar with food restriction?

Yes ☐ no ☐ prefer not to say ☐

2. Do you take any supplements?

Yes ☐ no ☐ not sure ☐

5. If yes, what type of supplement do you take?

Zn ☐ multivitamin ☐ Mg ☐ Ca ☐

6. Do you avoid any of this food?

Coconut water fruits like banana Red meat nuts
And seed beans and legume

7. Food frequency questionnaire (past 7 days)

Food	Never	Not last week	1 day	Once or twice Last week	3 to 6 times last week	Once or twice a day	3 or more times a day
Rice							
Bread							
Red meat							
Poultry							
Fish							
Egg							

Milk						
Fruits						
vegetables						
Leafy vegetables						
Citrus fruit						
Milk tea						
Liquor tea						

Physical activity related information

1. How long do you walk?

15min 15-30min 30-45min
 45-60min 1hours

2. Do you get tired while walking?

Strongly disagree disagree
 Neutral agree

3. I can do works by my selves

Strongly disagree disagree neutral
 agree strongly agree

G. Bio chemical information of kidney patient(last3month)

1) Body weight(kg):

2) Uric acid:

3) Serum albumin:

4) Serum creatinine:

5) Serum urea:

6) HbA1c :

7) RBs :

8) Hemoglobin:

9) Bilirubin:

10) Cholesterol:

TG:

TC:

LDL: