

Characteristics of Chronic Kidney Disease Patients Admitted At a Tertiary Care Hospital in Bangladesh

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Abstract

Background: Chronic kidney disease (CKD) has been emerged as a challenging public health issue in worldwide. It is the third largest increase of any major cause of death in the United States. In Bangladesh, CKD prevalence was 9.9% according to C-G equation and 7.2% according to MDRD study equation. Therefore researcher conducted this study to explore the characteristics of chronic kidney Disease patients in Bangladesh.

Objectives: The purpose of this study is to identify the characteristics of patients with chronic kidney disease.

Methodology: A descriptive study design was carried out by face to face interview and hospital record. One hundred and twenty participants were conveniently recruited from a tertiary level hospital in Bangladesh. Characteristics of kidney disease were identified using Socio-Demographic Questionnaire (SDQ-11), Clinical Characteristics Questionnaire (CCQ-17) and Health Behavioural Questionnaire (HBQ-3). Data were analyzed by descriptive statistic.

Result: The majority of the participants were male (73.3%) and most of them < 60 years old. About 71.7% participants have family history of hypertension. Maximum respondents (70.0%) were in stage-V. Pedal edema (80.8%) represents as most common clinical feature. Majority of the participants were smoker (60.0%), used smokeless tobacco products (68.3%) and most of CKD patients (91.7%) agreed that drinking alcohol can cause chronic kidney disease.

Conclusion: Majority of the CKD patients were presented to the health care facilities in last stage. This result recommended that the need for earlier diagnosis and increased awareness about risk factors of CKD in Bangladesh. Further correlational study would be designed to clearly identify the present study gap.

Keyword: CKD, Characteristics, Risk factors.

Date of Submission: 10-11-2020

Date of acceptance: 25-11-2020

I. Introduction

1. Background

Chronic kidney disease (CKD) has become a serious public health issue. Currently over 1.4 million patients are receiving renal replacement therapy worldwide. One way to reduce the economic burden of chronic kidney disease would be early intervention. In order to achieve this, we should be able to identify individuals with increased risk of renal disease (Kazancıoğlu, 2013). Chronic kidney disease was defined as a urine albumin-to-creatinine ratio ≥ 30 mg/g or an estimated glomerular filtration rate < 60 mL/min/1.73 m² using the Chronic Kidney Disease-Epidemiology Collaboration equation (Park, Baek, & Jung, 2016)

The prevalence of chronic kidney disease (CKD) is high and rapidly increasing worldwide. In the United States, the percentage of patients with CKD increased from 11.96% (1988-1994) to 13.65% (2007-2012), accounting for >20 million people. (Change, et al, 2016). CKD is an increasing cause of morbidity and mortality in the United States. (Haroun, et al., 2003). Overall CKD mortality has increased by 31.7% over the last 10 years, making it one of the fastest rising major causes of death, alongside diabetes and dementia. CKD ranked as the 17th leading cause of global years lost of life, an 18.4% increase since 2005, and the third largest increase of any major cause of death in United State ((Park, Baek, & Jung, 2016). The total prevalence estimate of chronic kidney disease for adults aged ≥ 20 years in Korea was 8.2%. By disease stage, the prevalence of chronic kidney disease was as follows: stage 1, 3.0%; stage 2, 2.7%; stage 3a, 1.9%; stage 3b, 0.4%; and stage 4-5, 0.2% I Korea (Park, Baek, & Jung, 2016). Although data are scarce for developing countries, it is estimated that by 2030, 70% of patients with end stage renal disease (ESRD, stage 5 CKD), will be in developing countries where such growing demand will out trip the budgetary capabilities of health care systems.. (Orantes,

et al., 2011). In Bangladesh CKD prevalence was 9.9% according to C-G equation and 7.2% according to MDRD study equation. (Hasan, et al., 2013).

An individual's genetic and phenotypic make-up puts people at risk for kidney disease. Factors such as race, gender, age, and family history are highly important. For instance, being of African-American descent, older age, low birth weight and family history of kidney disease are considered to be strong risk factors for chronic kidney disease (Kazancioglu, 2013). Kazancioglu says moreover that smoking, obesity, hypertension, and diabetes mellitus can also lead to kidney disease. An uncontrolled diabetic and/ or hypertensive patient can easily and quickly progress to an end-stage kidney disease patient. Some modifiable risk factors can prevent or slow down progression to end-stage renal disease (ESRD) (Kazancioglu, 2013). Recognized environmental risk factors for CKD include exposure to heavy metals, agrochemicals; and nephrotoxic substance, associated with Balkan endemic nephropathy, found in star fruit (*Averrhoa, carambola L.*) and some Chinese herbal remedies. Other CKD risk factor described are use of non-steroidal anti-inflammatory drugs (NSAIDs) and the infectious disease leptospirosis, Hantavirus, leprosy and malaria (endemic in Central America). (Orantes, et al., 2011).

Several characteristics of the patients have been identified as risk factors for CKD such as Socio-demographic characteristics, Clinical characteristics and Health behavior characteristics. Clinical manifestations of chronic kidney disease reduced urine output, nocturia, hematuria, pruritis, pallor, raised BP, pedal edema, proteinuria and dipstick hematuria. (Amoako, et al., 2014). Dyslipidemia is a major risk factor for cardiovascular morbidity and mortality and is common among patients with CKD. Lipid profiles vary widely in these patients, reflecting the level of kidney function and the degree of proteinuria. In general, the prevalence of hyperlipidemia increases as renal function declines, with the degree of hypertriglyceridemia & elevation of LDL cholesterol being proportional to the severity of renal impairment (Thomas, Kanso, & Sedor, 2008). As patients progress through the stages of CKD, nutritional requirements are altered and metabolism of protein, water, salt, potassium, and phosphorus are affected. These changes lead to ineffective energy generation despite adequate intake of protein and carbohydrate substrates. In more extreme manifestations, these alterations in nutrient utilization cause "uremic malnutrition," a syndrome that is distinct from malnutrition caused by inadequate nutrient intake (Thomas, Kanso, & Sedor, 2008).

Due to chronic kidney disease, the following health problems were present as complications and these are anemia, hyperlipidemia, nutrition, osteodystrophy, and cardiovascular risk (Thomas, Kanso, & Sedor, 2008). The anemia of CKD increases morbidity and mortality from cardiovascular complications (angina, Left ventricular hypertrophy and worsening heart failure), which may lead to further deterioration of renal function and the establishment of a spiteful cycle termed the cardio-renal anemia syndrome. CKD associated mineral bone disorders significantly increase mortality in CKD patients.

To reduce the development of End Stage Renal Diseases (ESRD) early detection and aggressive control of the risk factors is more important. For this, purpose awareness about characteristics of chronic kidney disease should be developed. Awareness generation can motivate the CKD patients to seek health care support for early and effective intervention.

II. Objectives

General objectives

The purpose of this study is to identify the typical characteristics of patients with chronic kidney disease at National Institute of Kidney Diseases & Urology (NIKDU) in Dhaka.

Specific objectives

1. To explore the socio-demographic characteristics of patients with chronic kidney disease at NIKDU.
2. To explore the clinical characteristics of patients with chronic kidney disease at NIKDU.
3. To explore the health behavior of patients with chronic kidney disease at NIKDU.

III. Methods

1. Study Design

A descriptive study design was used to identify the characteristics of patients with Chronic Kidney Disease (CKD) from NIKDU.

2. Study Participants

The participants were 120 CKD patients recruited from a tertiary level Kidney hospital in the area of a metropolitan city in Bangladesh, which was a Government hospital. This hospital was selected because it was exclusive Kidney hospital where chronic kidney disease patients were available. Patients with CKD who met the following inclusion criteria were conveniently selected.

Inclusion criteria

- Age 20 years and more
- Confirmed diagnosis of Chronic Kidney Disease

- Admitted in hospital
- Willingness to participate in the study

Sample size

The sample size was calculated using G*power (Version 3.1.2). Statistical parameters were set as follows: $\alpha = 0.05$, small effect size = 0.25, power $(1-\beta) = 0.80$. The calculated sample size was 84. To reduce the attrition rate 20% more subjects were added. Therefore, the final sample size was 112 in this study which were satisfactory for statistical analysis. However researcher interviewed 120 patients with the structured questionnaires.

3. Instruments

A review of the literature is conducted to select standardized instruments to measure the identified concept of characteristics of patients with Chronic Kidney Disease. A questionnaire was developed by the researcher based on review of literature. The questionnaire contains three parts-

1. Socio-Demographic characteristics
2. Clinical Characteristics and
3. Health Behavior characteristics

1. Socio-demographic Characteristics of CKD Patients

Socio-demographic characteristics of CKD patients were assessed using 11 items. The socio-demographic characteristics included age, sex, religion, level of education, marital status, occupation, monthly family income, living area, , family history of kidney disease, family history of diabetes mellitus and family history of hypertension.

2). Clinical Characteristics of CKD Patients

Clinical characteristics of CKD patients were assessed using 17 items. Clinical characteristics included duration for suffering from CKD, Times of admission due to CKD, Times of taking treatment, history of dialysis, times of hemodialysis, times of peritoneal dialysis, Kidney function, Lipoproteins, Blood pressure, Blood glucose, weight, height, urine protein/24hours, comorbidities, clinical manifestations, times of taken prescribed medicines, follow medical advices.

3). Health behavior Characteristics of CKD Patients

Health behavior characteristics of CKD patients were assessed using 3 items. Health behavior characteristics included use of smoke tobacco product, use of smokeless tobacco products and opinion about drinking alcohol that can cause CKD.

4. Data Collection

Data were collected by face to face interview using the standard questionnaire. Prior to data collection, the study was approved by the Institutional Review Board of Bangabandhu Sheikh Mujib Medical University (BSMMU) and National Institute of Advanced Nursing Education and Research (NIANER, Dhaka, Bangladesh). Permission was obtained from hospital authority. Data was collected from January to February 2019 in the National Institute of Kidney Diseases & Urology (NIKDU) in Dhaka, Bangladesh. Before data collection, written consent was taken from participants. All participants were ensured that their participation have been voluntary. The subjects' confidentiality and anonymity was strictly maintained with code numbers. Subjects can be withdrawn at any time without any reason. Subjects was informed that the findings of the study is submit to scientific journal for publication and present at conferences. Surveys and code sheets were secured in a locked file accessible only to the investigator. All necessary information collect from the subjects had been kept confidential and destroy after completion of the study.

5. Data Analysis

The data were analyzed by using SPSS version 23.0. Descriptive statistics such as proportion, percentages, frequency distribution, mean, standard deviations were used to summarize socio-demographic characteristics, clinical characteristics and health behavior characteristics.

IV. Results

1. Socio-demographic characteristics of the patients

Table 1 illustrate the distribution of frequency, percentage, mean, and SD of socio-demographic characteristics of Chronic Kidney Disease patients. The mean age of participant was 49.77 years (SD =11.962). Majority of the participants were male (73.3%) and most of them (87.5%) were Muslim and maximum (90.8%)

of them were married. Nearly half of the participant's level of education (45.0%) were secondary/ above, 34.2% of the participants were primary school level. Below one third of the respondent's (31.7%) occupation were service (Private/Govt.) and about 25.8% participant's occupation were agriculture and business. The mean income of family was 15241 Taka (SD=9376.348). Majority of the participants were (60.0%) lived in rural area. Most of the participants (71.7%) have family history of hypertension.

Table1. Socio-demographic characteristics of the patients (N=120).

Variable	Category	Frequency	Percent	M(SD)
Age (Year)	20-39	24	20	49.77 (11.962)
Max-72, Min-20	40-59	70	58.3	
	60-80	26	21.7	
Gender	Male	88	73.3	
	Female	32	26.7	
Religion	Muslim	105	87.5	
	Hindu	15	12.5	

Table1.Socio demographic characteristics of the patient (continued)

Variable	Category	Frequency	Percent	M(SD)
Marital Status	Single	11	9.2	Marital Status
	Married	109	90.8	
Level of Education	Analphabet	25	20.8	
	Primary	41	34.2	
	Secondary/Above	54	45.0	
Occupation	Agriculture	31	25.8	
	Service	38	31.7	
	Business	31	25.8	
	Others	20	16.7	
Family monthly income (Taka)	1000-15000	79	65.8	15241(9376.348)
	16000-30000	30	25	
	31000-45000	11	9.2	
Residence	Rural	72	60.0	
	Urban	48	40.0	
Family Medical History				
	History of Kidney disease	26	21.7	
	History of diabetes mellitus	63	52.5	
	History of hypertension	86	71.7	

2. Clinical characteristics of the patients

Table 2 describes the distribution of frequency, percentage, mean and SD of clinical characteristics of the patients. Nearly half of the respondents (49.2%) were suffering from CKD between 1-3 years and most of them (61.7%) were admitted in hospital due to CKD 2-4 times who were taking treatment (57.5%) in between 6 months to 2 years. More than half of the respondents (53.3%) had history of not taken hemodialysis and about 53.3% participants had not taking hemodialysis when there was maximum respondents (70.0%) were in stage-V. Majority participant's S. creatinine (94.2%), S. albumin (93.3%), S. urea (97.5%) were in danger level. In the other-hand HB% (88.3%), S. calcium (89.2%) and S. phosphorus (92.5%) level shows also abnormality which leads majority of the participants were anemic.

Most of the respondents were hypertensive (Systolic-63.3%, Diastolic-55.8%) and leading hyperglycemia (56.7%) when most of their BMI (63.3%) in normal level. But level of Urine protein/24h the maximum participants (98.3%) were in high level and also have diabetes mellitus (59.2%) and hypertension (78.3%) as comorbidity. The findings showed that all of the participants who suffered from CKD, most of them had symptoms of pedal edema (80.8%), pallor (79.2%), protein-urea (72.5%), reduced urine output (60.8%), raised BP (55.0%), Nocturia (48.3%) and hematuria (47.5%).

Table 2. Clinical characteristics of the patients (N=120).

Variables	Category	Frequency	Percent	M(SD)
Suffering from CKD (Years)	< 1	41	34.2	1.76 (0.487)
	1-3	59	49.2	

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Admitted in hospital due to CKD	> 3	20	16.7	1.92 (0.616)
	1st time	28	23.3	
Times of taking treatment	2-4 times	74	61.7	1.76 (0.608)
	> 4 times	18	15.0	
	<6 months	40	33.3	
History of dialysis	6 months –2years	69	57.5	
	> 2 years	11	9.2	
Times of taking Hemodialysis	None	64	53.3	
	Hemodialysis	56	46.7	
	Never done	64	53.3	
Kidney Function	GFR	1-8 times	40	33.3
		> 8 times	15	12.5
		Stage I (≥ 90)	1	0.8
		Stage II (60-89)	5	4.2
		Stage III (30-59)	11	9.2
		Stage IV (15-29)	19	15.8
		Stage V (<15)	84	70.0

Table 2. Clinical characteristics of the patients(continued)

Variables	Category	Frequency	Percent	M(SD)
S. Creatinine	Normal level (0.6-1.2)	7	5.8	7.53 (4.816)
	High level (1.3 and more)	113	94.2	
S. Urea	Normal level (7-20)	3	2.5	86.83(35.473)
	High level (>20)	117	97.5	
S. Albumin	Low level (<3.5)	112	93.3	1.08(0.295)
	Normal level (3.5-5.5)	7	5.8	
	High level (>5.5)	1	0.8	
Lipoproteins				
Hemoglobin	Anemia (0-12.4)	106	88.3	9.66(2.080)
S. Calcium	Normal (12.5-17.5)	14	11.7	6.98 (1.749)
	Hypocalcaemia (<8.5)	107	89.2	
	Normal level (8.5-10.2)	12	10.0	
	Hypercalcaemia (>10.2)	1	0.8	
S. Phosphorus	Hypophosphatemia (<2.5)	111	92.5	6.11 (1.347)
	Normal level (2.5-4.5)	5	4.2	
	Hyperphosphatemia (>4.5)	4	3.3	
Blood Pressure on Admission				
Systolic Blood Pressure	Normal (<120)	35	29.2	143.3(28.977)
	Prehypertension (120-139)	9	7.5	
	Hypertension (140 & more)	76	63.3	

Table 2. Clinical characteristics of the patients(continued)

Variables	Category	Frequency	Percent	M(SD)
Diastolic Blood Pressure	Normal (<80)	51	42.5	90.33(17.811)
	Prehypertension (80-89)	2	1.7	
	Hypertension(90&more)	67	55.8	
RBS on Admission	Hyperglycemia(>7.8mmol/L)	68	56.7	8.89 (3.275)
	Normal value(4.4-7.8mmol/L)	51	42.5	
	Hypoglycemia (<4.4mmol/L)	1.8	0.8	

BMI	Underweight (<18.5)	7	5.8	23.15(3.303)
	Normal (18.5-24.9)	76	63.3	
	Overweight (25-29.9)	35	29.2	
	Obese (Over 30)	2	1.7	
Urine protein /24h	Normal value (<0.80 g)	2	1.7	3.66(2.515)
	High (0.80 and more)	118	98.3	
Comorbidities				
	Diabetes Mellitus	71	59.2	
	Hypertension	94	78.3	
	Myocardial Infarction	24	20.0	
	Chronic heart disease	10	8.3	

Table 2. Clinical characteristics of the patients (continued)

Variables	Category	Frequency	Percent	M(SD)
Clinical manifestations				
	Pedal edema	97	80.8	
	Pallor	95	79.2	
	Proteinuria	87	72.5	
	Reduced urine output	73	60.8	
	Raised BP	66	55.0	
	Nocturia	58	48.3	
	Hematuria	57	47.5	

3. Health behavior characteristics of the patients

Table 3 describes the distribution of frequency and percentage of Health behavior characteristics of CKD patients. It shows that most of the participants (46.7%) had a history of regular taken of prescribed medicines were 7 days/week and follow medical advices as recommended (avoid to take extra salt -74.2% and maintain amount of water intake -87.3%) which represents that the participants were regular in taken prescribed medicines per week and follow medical advices as recommended. Maximum participants (60.0%) had a history of use smoke tobacco products and also most of the participants (68.3%) had history of use smokeless tobacco products. Majority of the participants (91.7%) were agreed that drinking alcohol can causes kidney diseases.

Table 3. Health behavior characteristics of the patients(N=120).

Variables	Category	Frequency	Percent
Regular taken prescribes medicine	1 day-4 days	30	25.0
	5days-6days	34	28.3
	7 days	56	46.7
Follow medical advices			
	-Avoid to eating extra salt- as recommended	89	74.2
- Maintain amount of water intake-as recommended	94	87.3	
Use smoke tobacco product	Yes	72	60.0
Use smokeless tobacco product	Yes	82	68.3
Opinion about drinking alcohol that cause CKD	Disagree	10	8.3
	Agree	110	91.7

V. Discussion

1. Characteristics of study participants

The mean age of the CKD patients in this study was 49.77 years and most of them were less than 60 years, which is the economically most active age group. This findings is similar to the findings from Urban Bangladesh (Anand, et al., 2014) but contrasts with that seen in developed country (Am, Kidney Dis. 2004). This may be due to the improved health care facilities in developed countries that allow control of the risk factors of CKD, so less CKD patients in younger age group.

In this study, male was more than female (73.3% vs. 26.7%). Similar findings were observed in studies from Northern part of BD (MOBASHER, ALAM, &SYED., 2018) (66.8% vs. 33.2%) and USA (Agarwal R, Light RP. 2011) (61.2% vs. 38.8%). The male predominance may be due to the fact that CKD and its risk factors such as hypertension and smoking are commoner in male than female. This study shows nearly half of

the patients were well educated, secondary/above 45.0%, in another study of China (Chen, et al., 2009) also shows that about half of their patients also well educated (53.1%). About 63.3% of the patients possessed normal weight in terms of BMI, 5.8% underweight and 30.9% overweight and obese. Nearly similar findings were published by other investigators, Chen, et al., 2009.

This study shows that several clinical variables were associated with CKD. Those variables include hyper-uricaemia, anaemia, diabetes mellitus, hypertension, high level of S. creatinine and decreased level of albumin. Similar findings were observed in China (Chen, et al., 2009). Study showed that, hyper-uricaemia (97.5%) is associated with CKD. In the studies published elsewhere, hyper-uricaemia was reported to be a risk factor for the development of CKD and the risk for new-onset kidney disease (Chen, et al., 2009). This study also shows that anaemia is another variable associated with CKD. Here 88.3% of the CKD patients had anaemia. The findings was consistent with other study of Ghana. (Amoako, et al., 2014).

In our study, 70% patients were in stage 5 at presentation and 15.8% patients were in stage 4. Similar findings were observed in study done in other developing countries (Amoako, et al., 2014). This late presentation might be partly due to poor awareness of CKD among the general population. Several factors may account for the younger age of patients with CKD in the developing world. In this study clinical features of the patient's with CKD shows that pedal edema 80.8%, proteinuria 72.5% raised BP 55% and hematuria 47.5%. In this study urine protein/24h also in high level about 98.3%. Study shows 72.5% patient had proteinuria at the time of diagnosis of CKD. So, proteinuria may be a cost convenient tool for screening of CKD and also to see the progression of kidney damage. There is a high prevalence of infections /infestations and these contribute to the development of chronic glomerulonephritis, which is the leading cause of CKD in other developing countries also (Naicker, 2003). This study shows that 60.0% patients had the habits of smoking and 68.3% patients were smokeless tobacco user. Another study found that use of tobacco in the form of smoking and chewing was significantly higher in CKD group than in the normal population. (Huda, & Alam, 2012). Ejerblad, et al. (2004) suggested that heavy cigarette smoking increased the risk of chronic renal failure for both men and women, at least CRF classified as nephrosclerosis and glomerulonephritis.

VI. Conclusion And Recommendation

1. Conclusion

Advanced stages of chronic kidney disease are common in patients seeking care at the National Institute of Kidney Diseases and Urology (NIKDU) hospital, Dhaka. By the Modification of Diet in Renal Disease (MDRD) study equation maximum patients were in stage 5. In this study, majority of the affected patients were economically active age groups. Hypertension and diabetes mellitus are common causes of chronic kidney disease. Majority patient's S.creatinine, S.albumin, S.urea were in danger level which were major characteristics of chronic kidney disease. The majority of patients have an associated anemia. Pedal edema, Pallor and Proteinuria were common clinical manifestations during initial assessment of Chronic Kidney Disease (CKD) patients. Only a limited proportion of patients are able to afford hemodialysis. It is important to implement appropriate screening programmes to aid early detection of Chronic Kidney Disease (CKD) in at risk populations. Early detection and aggressive control of the risk factors for development of Chronic Kidney Disease (CKD) are necessary to prevent and reduce the scourges of Chronic Kidney Disease (CKD) in resource poor settings where services for renal replacement therapy are unaffordable for most patients requiring such services.

However, there are some limitations present in this study. The patients in this study were from a single regional kidney institute. Study sample were selected conveniently.

2. Recommendation

It is important to improve method for reducing the development of End Stage Renal Disease (ESRD). In this respect, nurses should improve the awareness about characteristics of Chronic Kidney Disease (CKD), that they can provide some advices to the patients about kidney diseases in early stage. Further correlational study was recommended.

Acknowledgements

First and foremost, I would like to express my deep gratitude to Almighty Allah for giving me a great opportunity to study for a master's degree at National Institute of Advanced Nursing Education and Research (NIANER), Mugda, Dhaka.

My sincere and heartiest gratitude is to my thesis chair Jotsna Akter, whose constructive advices, excellent guidance, caring and clear explanations help me in completion of this study. I would like to acknowledge the valuable direction of my respected co-adviser Dr. Mohammad Nurul Anowar for his motivational inspiration, valuable advices, sympathetic co-operations, and continuous mentoring. My sincere

gratitude is to Mst. Khaleda Akter for her guidance, valuable suggestions, thoughtful advice and inspiration in making this study successful.

I also want to thank my expert Professor Emeritus Won Hee Lee who provided valuable suggestion and constructive guidelines in my thesis. I would like to express great appreciation and deep respect for Emeritus Professor Chung Yul Lee, who is a cheerleader and a true friend, without her continue valuable suggestion I could not successfully complete my thesis. With this I am also obliged to Emeritus Professor Tae Wha Lee, Dean and Professor, college of Nursing and Director, Graduate School of Nursing for her valuable suggestions about my thesis.

I also wish to acknowledge the dedication of the Physicians, nursing staffs, nursing officers and the patients who helped and allowed me to take interview and collect data from hospital records. I humbly remember the contribution of my husband for understanding and consider my absence at so many times throughout the study period. He also guided me as my best friend and always supported me to continue my studies. I am also respectful to my parents who always taught me how I can overcome the barriers of my life and complete the study period with patience.

Lastly, I am obliged to our respected DGNM sir, Tandra Sikder for giving me the opportunity to complete my study and to all of my friends for help and support during my graduate studies, specially my dear loving and close friends, Zannatul Ferdaus and Sonia Akter for their positive understanding, constructive support and encouragement throughout the course.

References

- [1]. Amoako, Y. A., Laryea, D. O., Bedu-Addo, G., Andoh, H., & Awuku, Y. A. (2014). Clinical and demographic characteristics of chronic kidney disease patients in a tertiary facility in Ghana. *The Pan African Medical Journal*, 18.
- [2]. Anand, S., Khanam, M. A., Saquib, J., Saquib, N., Ahmed, T., Alam, D. S., & Chertow, G. M. (2014). High prevalence of chronic kidney disease in a community survey of urban Bangladeshis: a cross-sectional study. *Globalization and health*, 10(1), 9.
- [3]. ABM MOBASHER, ALAM NUSRAT, SYED ANISUZZAMAN. (2018) Socio-demographic and clinical characteristics of CKD patients of northern part of Bangladesh Rangpur Medical College Ratindra Nath Mondal I Moni Rani Hypertension and Research Center Rangpur European Academic Research Vol. VI.
- [4]. Agarwal R, Light RP. Determinants and prognostic significance of electro-cardiographic left ventricular hypertrophy criteria in chronic kidney disease. *Clin J Am Soc Nephrol*. 2011 Mar;6 (3):528–36
- [5]. Chang, P. Y., Chien, L. N., Lin, Y. F., Wu, M. S., Chiu, W. T., & Chiou, H. Y. (2016). Risk factors of gender for renal progression in patients with early chronic kidney disease. *Medicine*, 95(30).
- [6]. Chen, N., Wang, W., Huang, Y., Shen, P., Pei, D., Yu, H., Shi, H., Zhang, Q., Xu, J., Lv, Y., & Fan, Q. (2009). Community-based study on CKD subjects and the associated risk factors. *Nephrology, dialysis, transplantation: official publication of the European Dialysis and Transplant Association - European Renal Association*.
- [7]. E. Ejerblad, C. M. Fored, P. Lindblad et al., "Association between smoking and chronic renal failure in a nationwide population-based case-control study," *Journal of the American Society of Nephrology*, vol. 15, no. 8, pp. 2178–2185, 2004.
- [8]. Hasan, M. J., Kashem, M. A., Rahman, M. H., Quddush, R., Rahman, M., Sharmeen, A., & Islam, N. (2013). Prevalence of chronic kidney disease (CKD) and identification of associated risk factors among rural population by mass screening. *Community Based Medical Journal*, 1(1), 20-26.
- [9]. Haroun, M. K., Jaar, B. G., Hoffman, S. C., Comstock, G. W., Klag, M. J., & Coresh, J. (2003). Risk factors for chronic kidney disease: a prospective study of 23,534 men and women in Washington County, Maryland. *Journal of the American Society of Nephrology*, 14(11), 2934-2941.
- [10]. Huda, M. N., & Alam, K. S. (2012). Prevalence of chronic kidney disease and its association with risk factors in disadvantaged population. *International journal of nephrology*, 2012.
- [11]. Inker, L. A., Astor, B. C., Fox, C. H., Isakova, T., Lash, J. P., Peralta, C. A., & Feldman, H. I. (2014). KDOQI US commentary on the 2012 KDIGO clinical practice guideline for the evaluation and management of CKD. *American Journal of Kidney Diseases*, 63(5), 713-735.
- [12]. Kazancıoğlu, R. (2013). Risk factors for chronic kidney disease: an update. *Kidney international supplements*, 3(4), 368-371.
- [13]. K/DOQI. clinical practice guidelines on hypertension and antihypertensive agents in chronic kidney disease. *Am J Kidney Dis*. 2004 May; 43(5 Suppl 1): S1-290.
- [14]. Levey, A. S., Coresh, J., Balk, E., Kausz, A. T., Levin, A., Steffes, M. W., & Eknoyan, G. (2003). National Kidney Foundation practice guidelines for chronic kidney disease: evaluation, classification, and stratification. *Annals of internal medicine*, 139(2), 137-147.
- [15]. Levin, A. (2001). Identification of patients and risk factors in chronic kidney disease evaluating risk factors and therapeutic strategies. *Nephrology Dialysis Transplantation*, 16(suppl_7), 57-60.
- [16]. NKF, A to Z Health Guide, About chronic kidney disease 2017. <https://www.kidney.org/atoz/content/about-chronic-kidney-disease>
- [17]. Orantes, C. M., Herrera, R., Almaguer, M., Brizuela, E. G., Hernández, C. E., Bayarre, H., & Velázquez, M. E. (2011). Chronic kidney disease and associated risk factors in the Bajo Lempa region of El Salvador: Nefrolempa study, 2009. *MEDICC review*, 13, 14-22.
- [18]. Park, J. I., Baek, H., & Jung, H. H. (2016). Prevalence of Chronic Kidney Disease in Korea: the Korean National Health and Nutritional Examination Survey 2011–2013. *Journal of Korean medical science*, 31(6), 915-923.
- [19]. Thomas, R., Kanso, A. O., & Sedor, J. R. (2008). Chronic Kidney Disease and Its Complications. *Primary Care*, 35(2), 329 vii. <http://doi.org/10.1016/j.pop.2008.01.008>.

- [20]. Tsai, W.-C., Wu, H.-Y., Peng, Y.-S., Ko, M.-J., Wu, M.-S., Hung, K.-Y., Chien, K.-L. (2016). Risk Factors for Development and Progression of Chronic Kidney Disease: A Systematic Review and Exploratory Meta-Analysis. *Medicine*, 95(11), e3013. <http://doi.org/10.1097/MD.0000000000003013>
- [21]. ST Ahmed¹, MA Rahim², Ali M Z³, MM Iqbal⁴. Prevalence of primary renal diseases among patients on maintenance haemodialysis: A hospital based study. Vol. 2, No.- 2, January 2012.

Mst. Suraiya Akter. "Characteristics of Chronic Kidney Disease Patients Admitted At a Tertiary Care Hospital in Bangladesh." *IOSR Journal of Nursing and Health Science (IOSR-JNHS)*, 9(6), 2020, pp. 28-36.