

## The Magnitude of Chronic Kidney Disease and its Risk Factors at Zewditu Memorial Hospital, Addis Ababa, Ethiopia

Cheru Kore<sup>1\*</sup>, Alemu Tadesse<sup>2</sup>, Bruktawit Teshome<sup>2</sup>, Kassaye Daniel<sup>2</sup>, Amde Kassa<sup>2</sup> and Dawit Ayalew<sup>2</sup>

<sup>1</sup>Department of Public Health and Nursing, Rift Valley University, Addis Ababa, Ethiopia

<sup>2</sup>Department of Pharmacy, Rift Valley University, Addis Ababa, Ethiopia

\*Corresponding author: Cheru Kore, Department of Public Health and Nursing, Rift Valley University, Addis Ababa, Ethiopia, Tel: +251 912 441 527; E-mail: cherucuc@gmail.com

Received Date: May 08, 2018; Accepted Date: June 14, 2018; Published Date: June 20, 2018

Copyright: © 2018 Kore C, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

### Abstract

**Background:** Chronic Kidney Disease has been simplified over the last 5 years. Chronic Kidney Disease (CKD) is defined as kidney damage or glomerular filtration rate (GFR) <60 ml/min/1.73 m<sup>2</sup> for more than 3 months with implications for health. The prevalence rates of CKD worldwide are high and have increased in the last few years to about 13%-15%, with an increased prevalence of diabetes and hypertension which shows it is becoming one of the public health problems.

**Objective:** To assess the magnitude Chronic Kidney Disease and its associated factors among patients at Zewditu Memorial hospital.

**Methodology:** This study was done by an institutional based cross sectional study.

**Results:** A total of 320 individuals were participating on the study. The response rate of 320(100%). The participants, of whom 151 (47.2%) were males and 169 (52.8%) were females. The mean age (± standard deviation) of the participants was 40.1 (± 14.6) years and 128(40%) were in the age range of 19-35 years.

**Conclusion and recommendations:** The magnitude of CKD in this study inveterate, that the disease become abundant and need attention. Facing this, we restate the need to aware by health professionals in improvement of primary care treatment and follow-up of patients with hypertension and any kind of kidney infection.

**Keywords:** Chronic kidney disease; Hypertension; Diabetes; Renal disease

### Introduction

Chronic Kidney Disease has been simplified over the last 5 years. Chronic Kidney Disease (CKD) is defined as kidney damage or glomerular filtration rate (GFR) <60 ml/min/1.73 m<sup>2</sup> for more than 3 months with implications for health. The prevalence rates of CKD worldwide are high and have increased in the last few years to about 13-15%, with an increased prevalence of diabetes and hypertension which shows it is becoming one of the public health problems [1]. Lack of national registries and community-based studies in Africa makes a challenge to know its prevalence in the continent. Studies from Egypt and East Africa have suggested that CKD is at least three or four times more frequent in developing countries [2]. Currently Chronic Kidney Disease became a major public health problem worldwide. It has taken on the status of public health concern in recent years, due to its increased prevalence among the world's population and its impact on morbidity and mortality in affected patients. CKD is the 12th highest cause of death and 17th highest cause of disability worldwide [3].

Of the approximately 1 million people in the world with severe chronic kidney disease who are being treated with some form of renal-replacement therapy, 90 percent live in developed countries. In most

developing countries, however, only 5 to 10 percent of patients who require renal replacement therapy can obtain it. However, the rapid rush in diabetes and hypertension, both of which predicted to drive epidemic in CKD, was dramatically escalating this burden [4].

Renal disease deaths in Ethiopia reached 12,038 or 1.47% of total deaths. Very low level of awareness about renal diseases, their risk factors, lack of data on renal diseases for management and the threat these tricks to health professionals, policy makers and the public [5].

Given the limited financial and human resources available in our country, a valid estimate of CKD magnitude needed to inform resource allocation and prevention programs. Moreover, the scarcity and high cost of dialysis and kidney transplantation oblige for early the identification and management of associated factors [6].

### Statement of the problem

Chronic diseases became a major challenge to 21st century as world health policy. In developing countries, the growing prevalence of chronic diseases such as Chronic Kidney Disease has severe implications on health and economic output. The rapid rise of common risk factors such as diabetes, hypertension, and obesity, especially among the poor, results in even greater and more profound burdens that developing nations are not equipped to handle [7].

Chronic Kidney Disease (CKD), a non-communicable disorder included in the plan, is ranked 18th among the global causes of death-it was ranked 27th in 2011 and the number of deaths from CKD has risen by 82% during that time. It is the third among the top 25 causes of death, next to HIV/AIDS and diabetes [8].

In sub-Saharan Africa, hypertension and diabetes mellitus are among the leading causes of end-stage renal disease. By 2020, the burden of diabetes and cardiovascular disease was have increased by 130% in Africa alone, with concomitant increases in the prevalence of CKD and end-stage renal disease [5].

In the context of the epidemiological transition in Ethiopia, a double burden of disease is already emerging with the mix of persistent infectious diseases and increasing non communicable diseases [9].

According to WHO, comprehensive and integrated action is the means to prevent and control chronic disease. In low-income countries, such as Ethiopia, chronic disease is a growing problem. Like many other chronic diseases, the incidence of Chronic Kidney Disease (CKD) in Ethiopia is rising because of increased risk factors such as high blood pressure and diabetes mellitus [10].

There are virtually not sufficient published reports on the incidence, magnitude, or survival of patients with renal disease in Ethiopia. So it makes difficult to plan substantial public health programs that can help to the development and implementation of more effective intervention programs. St. Paulo's hospital is pioneer for health service specially related to kidney problem and has the first kidney-transplanting center which will be beneficial from the outcome of our research. Generally, this research primarily intended to provide additional timely and objective information about current situation of CKD and its risk factors among patients [11].

## Significance of the study

Chronic Kidney Disease is not only the individual issue but also family and community problem. Therefore, identifying assessing the magnitude and risk factors helps to tackle the problem. The disease especially if the patient reaches end stage of renal disease, family face challenge due to dialysis fee. Therefore, the result of this study will provide an insight for health institutions, educational centers, and policy makers and for the government to see the level of the problem and to develop intervention tools [12].

## Objective

### General objective

- To assess the magnitude Chronic Kidney Disease and its associated factors among patients at Zewditu Memorial hospital.

### Specific objectives

- To determine the magnitude of Chronic Kidney Disease at Zewditu Memorial hospital.
- To identify associated factors for Chronic Kidney Disease at Zewditu Memorial hospital.

## Methodology

### Study area

The study area, Zewditu Memorial hospital is found in kirkos Sub city, Addis Ababa city administration. The hospital, which was first built by Swedish missionaries in the compound of the present National Palace, moved out to its current location behind the palace after constructing better facilities. It was built, owned and operated by the Seventh-day Adventist Church, but was nationalized during the Derg regime in about 1976. The hospital is named after Empress Zawditu, the cousin and predecessor on the throne of Emperor Haile Selassie. Today the Zewditu Hospital is operated by the Ministry of Health. It has a catchment population of more than five million. The hospital has 300 beds for inpatient service.

The hospital has been providing the appropriate health services. Besides, incorporates over 12 departments that include internal medicine, neurology, general surgery, ENT, psychiatry, ophthalmology, dentistry (maxillofacial surgery), radiology, dermatology, gynecology and obstetrics, pediatrics, and emergency medicine. The hospital will launch kidney transplant center in the near future. It makes pioneer for the service and has good opportunity for researchers and policy makers for program monitoring and evaluation. The hospital also offers dialysis service for 20 people per day with 6 machines.

### Study design

This study was done by an institutional based cross sectional study.

### Source population

The source populations were medical cases patients at Zewditu memorial hospitals from the outpatient department with period of October 20, 2017 until December 10, 2017.

### Study population

Medical patients appear in the OPD/Nephrology clinic are the study population.

### Inclusion criteria

Adult Patients who attend the hospital outpatient department at the time of data collection and who are willing to participate in the study are included.

### Exclusion criteria

Patients who are unable to participate in the study in addition Patients age less than 18 years will be excluded.

### Sample size determination

The sample size is done by single proportion formula. The actual sample size for this study is computed using single proportion formula as indicated below.

$$n = \frac{(Z_{\alpha}^2 P(1-P))}{d^2}$$

Where:

n=sample size

$z$ =Reliability coefficient for 95% level of confidence (1.96)

$p$ =expected proportion (0.5) of people living with Chronic Kidney Disease

$d$ =expected margin of error of (0.05)

$1-p=0.5$

$n=384$

Based on the Health Management Information System reports of the Zewditu Memorial hospital the three months duration of patient flow was 1920. So we were use the following correction formula because the number of patients is less than 10,000.

$$nf = \frac{n}{(1 + \frac{n}{N})N} = 1920$$

As a result, 320 patients were involved in the study.

### Sampling technique and procedures

Adult Patients (>18 years of age) coming to medical outpatient is considered as study participants. For recruiting the study participants, purposive sampling is used. Thus adult patients coming to the Medical OPD and those who were willing to participate in the study, are included until the calculated sample size is fulfilled.

### Data collection procedure

All of the group members working with volunteer hospital staff nurses with structured questionnaire were done for the data collection procedure. Then the diagnosis was confirmed by checking medical record. The survey questionnaire was first written in English and translated into Amharic.

### Study variables

**Dependent variable (outcome):** Chronic Kidney Disease.

**Independent variables:** Socio-demographic characteristics.

### Operational definitions of the variables

**Chronic renal failure:** is defined as either pathological abnormalities or markers of damage, including abnormalities in blood or urine tests or GFR<60 ml/min/1.73 m<sup>2</sup> for>=3 months.

**Adult patients:** Patients who attend Medical OPD Zewditu memorial hospital Age ≥ 18.

**Knowledge on kidney function and disease:** Patient knows the role of kidney and understands malfunction signs like flank pain, change in urination.

### Data analysis

All analysis is done by Descriptive statistics tool that is using Univariate Analysis like the distribution the central tendency. Demographic and clinical data is described.

### Data quality assurance procedures

The data collections is done by all of the group members working with volunteer hospital staff nurses who work in Medical OPD of Zewditu memorial Hospital.

### Ethical consideration

Permission for the study is obtained from the Zewditu memorial Hospital internal research review board and from Rift Valley University internal research review board. Names is not been used and confidentiality is maintained by keeping data collection forms were locked in a secure cabinet.

### Results

#### Socioeconomic and demographic characteristic of the study subjects

A total of 320 individuals were participating on the study. The response rate is 320 (100%). The participants, of whom 151 (47.2%) were males and 169 (52.8%) were females. The mean age (± standard deviation) of the participants was 40.1 (± 14.6) years and 128 (40%) were in the age range of 19-35 years.

Of the total participants, 78.5% were less than 50 years old. 103 (32.2%) had secondary level of education and only 24 (7.5%) had degree and above level. Regarding to marital status married and single was constituted 179 (55.9%) and 94 (29.4%) respectively. Widowed and divorced patients have proximate score 21 (6.6%) and 26 (8.1%) respectively. Study participant come dominantly from Addis Ababa and Oromia region 176 (55.0%) and 104 (30.5%) respectively [13].

#### Clinical characteristic of respondent

It was found that 129 (40.3%) of the respondents had hypertension, 75 (23.4%) had diabetes and 64 (20.1%) had cardiac problem. Almost all cases included in the study for having HTN, diabetic and cardiac problem had continuous follow up in the hospital. The above-mentioned metabolic disorders were more or less similar on both sex for hypertension (female=49%, male=51%) but in contrary for DM and cardiac problem was found to be common for females than males. Kidney infection history consists of 113 (35.3%) of the respondents from these 35 (89.7%) of them had CKD.

#### Magnitude of CKD

From the total participant, the assessed prevalence of CKD was 39 (12.2%). Magnitude of CKD by age group was higher among<35 years 16 (41.02%) and 35-41 years, 41-47, and>47 bring about 8 (20.51%), 9 (23.07%) and 6 (15.38%) respectively. Gender result illustrates CKD more prevalent on males than females: 24 (62%) and 15 (38%). CKD cases related to incorporates 7 (17.9%) cases of Diabetic mellitus, 23 (58.9) of Hypertension and 9 (23.1%) of patients with cardiac problem. CKD prevalence was higher among participants with history of kidney infection encompasses 35 (89.7%).

### Discussion

Chronic kidney disease in sub-Saharan Africa study shows that CKD prevalence was significantly higher among participants>60 years old than ≤ 60 years old (42.9% vs. 14.5%). CKD prevalence was higher in females than males (28.6% vs. 10.6%). By age group, CKD (all

stages) was more prevalent among persons aged >60 years (39.4%) than among persons aged 40-59 years (12.6%) or 20-39 (8.5%) years (Fiseha, 2014; Perico and Remuzzi, 2014). The mean age of patients was  $36.7 \pm 14.5$  years, with more than two third being in the age group between 21 to 40 years. Gender distribution was nearly equal, with 50.3% being male. Patients came from all corners of the country with more than a third (38.4%) coming from the capital Addis Ababa and two third (67.5%) were urban residents. The majority (90.7%) of patients acquired AKI in the community [14].

The mean age of the CKD patients over the study period varied between 58 and 61 years. Prevalence was higher in males (male to female ratio 1:0.8) and in patients aged 35-64 years ( $p=0.014$ ; Cramer's  $V=0.039$ ). The occurrence of chronic conditions in the CKD population was prevalent, with hypertension occurring in more than half the CKD patients [15]. In comparison to our study, our shows that Magnitude of CKD by age group was higher among <35 years (41.2%) and 35-41 years, 41-47, and >47 bring about 20.5%, 23.07% and 15.4% respectively. In Cohort study from Japan on Risk factors for Chronic Kidney Disease illustrate the incidence of developing protein urea also increased with age in addition, Male subjects more frequently developed CKD I or II than female subjects (Hospital, 2014)[16]. Other paper from Nigeria shows high prevalence in males than in females. The reason for the difference in the prevalence of the disease among the two genders could be genetic basis. In comparison to our study, our shows that Gender result illustrates CKD more prevalent on males than females: 24(62%) and 15 (38%). Since older age is an established risk for CKD, the age distribution of the study patients can substantially affect the prevalence of CKD. The prevalence of CKD and its risk factors are high in this rural community of South Western Nigeria Majority had moderately impaired kidney function [17].

In another study that is a population based survey in Northern Tanzania showed that the community based prevalence of CKD was 7.0% (95% CI 3.8-12.3), and awareness was low at 10.5% (4.7-22.0) [18]. The urban prevalence of CKD was 15.2% (9.6-23.3) while the rural prevalence was 2.0% (0.5-6.9) [19]. In comparison to our study ours shows that the participant come dominantly from Addis Ababa and Oromia region 176 (55.0%) and 104 (30.5%) respectively. CKD patients usually have severe hypertension (BP>180/100 mmHg) and are often young, Lean black males without other major risk factors [20]. In our case CKD cases related to incorporates 7 (17%) cases of Diabetic mellitus and 9 (23%) of patients with cardiac problem. CKD prevalence was higher among participants with history of kidney infection encompasses 35 (89.7%). The findings of this study would be helpful for the governmental and non-governmental organization, institutions of individuals that have direct or indirect input in the study. This can be accomplished through submission reports, presentation of finding at appropriate meetings and workshops and through publication on scientific journals.

## Conclusion

The magnitude of CKD in this study inveterate, that the disease become abundant and need attention. The magnitude of the disease involves in all age categories and common among male than females beside CKD without any underline-associated factors appear abundant. CKD prevalence was higher among participants with history of kidney infection and therefore needs urgent attention.

## Recommendations

- Facing this, we restate the need to aware by health professionals in improvement of primary care treatment and follow-up of patients with hypertension and any kind of kidney infection.
- Ministry of health must take assignment on increment of Levels of awareness and knowledge among patients and providers must be regards CKD and its many consequences.
- Researchers must plan to do the Magnitude of CKD and associated factors with population-based set-up study.
- Periodic medical evaluation of the society must advocate for early management and detection by health professional and key informants.

## Acknowledgments

Above all, we would like to praise the Almighty God who gave us the patience and the strength to overcome all the difficulties we faced in our travel in the past five years. We are very much indebted to Mr. Alemu Tadesse for his invaluable comments and suggestions starting from development of the research proposal up to the presentation of this research thesis. Our thanks also go to Zewditu hospital staffs for facilitating the data collection process at each step.

## References

1. Ababio GK, Bosomprah S, Olumide A, Aperkor N, Aimakhu C, et al. (2017) Predictors of quality of life in patients with diabetes mellitus in two tertiary health institutions in Ghana and Nigeria. *Niger Postgrad Med J* 24: 48-55.
2. Amira O, Taslim B, William R (2014) Chronic kidney disease: a ten-year study of aetiology and epidemiological trends in Lagos, Nigeria. *Brit J Renal Med* 19: 19-23.
3. Fiseha T, Kassim M, Yemane T (2014) Prevalence of chronic kidney disease and associated risk factors among diabetic patients in Southern Ethiopia. *Am J Health Res* 2: 216-221.
4. Lola N, Keveer RT, Uba MN, Sambo BD, Dathini H, et al. (2014) Predisposing factors to chronic renal failure among clients attending kidney center of University of Maiduguri Teaching Hospital, North-Eastern, Nigeria. *J Res Nurs Midwifery* 3: 106-111.
5. Ibrahim A, Ahmed MM, Kedir S, Bekele D (2016) Clinical profile and outcome of patients with acute kidney injury requiring dialysis: An experience from a haemodialysis unit in a developing country. *BMC Nephrology* 17: 1-5.
6. Ladi-Akinoyemi TW, Ajayi I (2017) Risk factors for chronic kidney disease among patients at Olabisi Onabanjo University Teaching Hospital in Sagamu, Nigeria: A retrospective cohort study. *Malawi Med J* 29: 166-170.
7. Nugent RA, Fathima SF, Feigl AB, Chyung D (2011) The burden of chronic kidney disease on developing nations: A 21st century challenge in global health. *Nephron Clin Pract* 118: 269-277.
8. Lebov JF, Valladares E, Peña R, Peña EM, Sanoff SL, et al. (2015) A population-based study of prevalence and risk factors of chronic kidney disease in León, Nicaragua. *Can J Kidney Health Dis* 2: 1-14.
9. Levey AS, Eckardt KU, Tsukamoto Y, Levin A, Coresh J, et al. (2005) Definition and classification of chronic kidney disease: a position statement from Kidney Disease: Improving Global Outcomes (KDIGO). *Kidney Int* 67: 2089-2100.
10. World Health Organization (2003) The world health report 2003: shaping the future.
11. Levin A, Hemmelgarn B, Culleton B, Tobe S, McFarlane P, et al. (2008) Guidelines for the management of chronic kidney disease. *Can Med Assoc J* 179: 1154-1162.

12. Meuwesen WP, Du Plessis JM, Burger JR, Lubbe MS, Cockeran M (2016) Investigation of the coexistence of CKD and non-communicable chronic diseases in a PBM company in South Africa. *S Afr Fam Pract* 58: 136-41.
13. Sumaili EK, Krzesinski JM, Zinga CV, Cohen EP, Delanaye P, et al. (2008) Prevalence of chronic kidney disease in Kinshasa: Results of a pilot study from the Democratic Republic of Congo. *Nephrol Dial Transplant* 24: 117-122.
14. Perico N and Remuzzi G (2014) Chronic kidney disease in sub-Saharan Africa: A public health priority. *Lancet Glob Health* 2: 124-125.
15. Pinho NA, Silva GV, Pierin AM (2015) Prevalence and factors associated with chronic kidney disease among hospitalized patients in a university hospital in the city of São Paulo, SP, Brazil. *J Bras Nefrol* 37: 91-97.
16. Nishijima T, Kawasaki Y, Mutoh Y, Tomonari K, Tsukada K, et al. (2017) Prevalence and factors associated with chronic kidney disease and end-stage renal disease in HIV-1-infected Asian patients in Tokyo. *Sci Rep* 7: 14565.
17. Oluyombo R, Ayodele OE, Akinwusi PO, Okunola OO, Akinsola A, et al. (2013) A community study of the prevalence, risk factors and pattern of chronic kidney disease in Osun State, South West Nigeria. *West Afr J Med* 32: 85-92.
18. Stanifer JW, Maro V, Egger J, Karia F, Thielman N, et al. (2015) The epidemiology of chronic kidney disease in Northern Tanzania: A population based survey. *PLoS ONE* 10: e0124506.
19. Moosa MR, Van der Walt I, Naicker S, Meyers AM (2015) Important causes of chronic kidney disease in South Africa. *S Afr Med J* 105: 320-327.
20. Zoccali C (2006) Kidney diseases in the developing world and ethnic minorities. *N Engl J Med* 47: 559-560.