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**The Magnitude of Chronic Renal Failure and Its Associated factors
among patients at St. Paulo's Hospital, Addis Ababa, Ethiopia**

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LIST OF ABBREVIATION

BMI	Body Mass Index
CRF	Chronic Renal Failure
DM	Diabetic Mellitus
CVD	Cardiovascular Disorder
GFR	Granular Filtration Rate
CD	Chronic Disease
WHO	World Health Organization
HTN	Hypertension
ESRD	End Stage Of Renal Disease
MDRD	Modification Of Diet In Renal Disease
IPD	Inpatient Department
MOPD	Medical Outpatient Department

ABSTRACT

Background: Chronic renal failure is on the rise to cause of morbidity and mortality worldwide. According to the latest world health organization data, renal disease deaths in Ethiopia accounted for 1.47% of total deaths. However, limited study had previously been conducted to show the magnitude of CRF among medical outpatients at St. Paulo's hospital. Therefore, this study was designed to determine the magnitude of CRF and associated factors on medical outpatient's patients.

Objective: To assess the magnitude & associated factors of chronic renal failure from Medical outpatient department in St. Paulo's Hospital, Ethiopia

Method: This study used an institutional based cross sectional study. A trained nurse using structured questionnaire to interviewed participants. The survey questionnaire was first written in English and then translated into Amharic. 320 patients were interviewed from using a structured questioner and their Medical record revised. Data entry and analysis was done using SPSS statistical package version 20. The descriptive statistics was done. Logistic regression used to check for the presence of association between variables at the 95% confidence level.

Result: The overall magnitude of CRF among medical outpatient department patients was 12.2%. CRF all age group likely develop the disease at statistically significant P value < 0.05. CRF cases with kidney infection were 5% greater than without kidney infection (AOR = 0.05, 95% CI 0.02, 0.16, P<0.01). In addition CRF cases with hypertension were 40% greater than without hypertension (AOR =0.43; 95% CI 0.18, 0.97; P=0.04).

Conclusion: It is demonstrated that chronic renal failure common in all age group and common among male than females. Chronic renal failure magnitude among patients with hypertension and kidney infection had statistical significance. Chronic renal failure is rising at an alarming rate therefore, we recommend that relevant prevention, diagnostics, and therapeutic measures must undertake in all health facilities.

1. INTRODUCTION

1.1 Background

The global prevalence of CKD estimated to be 8 – 16 %, which shows it is becoming one of the public health problems. 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 (1).

Currently Chronic renal failure 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 (2). Presently, CRF is the 12th highest cause of death and 17th highest cause of disability worldwide. However, the rapid rush in diabetes and hypertension, both of which predicted to drive epidemic in CRF, was dramatically escalating this burden (3).

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 (2,3). Given the limited financial and human resources available in our country, a valid estimate of CRF 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 (4).

1.2 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 renal failure 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, result in even greater and more profound burdens that developing nations are not equipped to handle (2,4).

Chronic renal failure (CRF), 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 CRF has risen by 82% during that time. It is the third among the top 25 causes of death, next to HIV/AIDS and diabetes (5).

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 CRF and end-stage renal disease (2). 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 (5, 6).

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 renal failure (CRF) in Ethiopia is rising because of increased risk factors such as high blood pressure and diabetes mellitus(6).

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. The study area, St. Paulo's hospital, pioneer for health service specially related to kidney problem and has the first kidney-transplanting center, so the study can achieve its objective.

Generally, this research primarily intended to provide additional timely and objective information about current situation of CRF and its associated risk factors among patients.

1.3 Significance of the study

Chronic renal failure is not only the individual issue but also family and community problem. Therefore, identifying assessing the magnitude-associated 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. Most of dialysis service given from private institution this makes the problem devastating. Therefore, the result of this study provides an insight for health institutions, educational centers, policy maker and governments to see the level of the problem and to develop intervention tools.

2. LITERATURE REVIEW

2.1 Magnitude of CRF

Chronic renal failure has taken the public health worry in recent years, due to its increased prevalence among the world's population. The National Kidney Foundation estimates that 20 million Americans have chronic renal failure and at least a further 20 million people have an increased risk (2, 3).

CRF categorized into five stages according to the level of reduced kidney function and evidence of kidney damage. Stage 5 end-stage kidney disease (ESKD) is the most severe form of CRF, where kidney function deteriorates so much that kidney replacement therapy (KRT) in the form of dialysis or kidney transplant is required to survive. The early stages of CRF are potentially reversible, but once a person reaches ESRD, kidney function does not usually improve. Many people do not know they have CRF because up to 90% of kidney function can be lost before symptoms appear (4).

In the adult US population the estimated prevalence of CRF stage 1–4 is 11·6% (about 26 million people), a figure similar to that reported in other high-income countries. These are Norway (10·2%), Japan (12·7%), Taiwan (11·8%), China (10·7%), and (13·7%) in South Korea (5). The Lancet Global Health, John Steiner and colleagues assessed about the epidemiology of CRF in sub-Saharan Africa. The overall prevalence of CRF in the region was 13·9% (95% CI 12·2–15·7), with estimates ranging from 2% in Cote d'Ivoire to 30·2% in Zimbabwe, and approaching 20% in Ghana, Nigeria, Rwanda, and Congo. The Study from Ethiopia, which entitles

Prevalence of Chronic renal failure and associated risk factors among diabetic patients in southern part of Ethiopia. Two hundred fourteen eligible participants the estimated prevalence of CRF, defined by GFR <60 ml/min/1.73 m², in this study was 18.2% (CI 95% = 12.3% - 23.2%) and 23.8% (CI 95%= 17.5% - 29.9%) when defined by according to the MDRD and C-G equations, respectively. According to the National Kidney Foundation classification, system CRF prevalence estimated from apparent kidney damage and kidney function and categorized into stages, with increasing stage numbers corresponding to increased severity (6).

The prognosis of Chronic renal failure is not promising; most patients experience a steady decline in renal function over a variable time course and if untreated can result in end-stage renal disease thereby necessitating dialysis or kidney transplantation. It is pertinent to state that, medical conditions that cause rapid deterioration of renal function carry poor prognosis. People who smoke, have poorly controlled diabetes mellitus or are obese are likely to have their disease progress faster. All these are associated with high cost and long hospital stay creating untold burden on the already insufficient financial resources of the patient. However, with better understanding of predisposing factors associated with Chronic renal failure, high-risk clients of chronic renal failures and acute renal failure prevented from getting to end stage renal disease (7, 8).

2.2 Factors associated with CRF

Studies disclose that there are associated risk factors with the development of CRF and which are remediable or potentially modifiable, in order to detect early CRF and intervene at the earliest possible stage.

Age and Gender

CRF prevalence was significantly higher among participants >60 years old than ≤ 60 years old: 42.9% vs. 14.5% ($p < 0.001$) and 64.3% vs. 17.7% ($p < 0.001$) according to the MDRD and C-G equations, respectively. CRF prevalence was higher in females than males: 28.6% vs. 10.6% by MDRD ($P = 0.001$), and 31.9% vs. 7.0% by C-G ($P = 0.018$). By age group, CRF (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 (5, 6). Men had an adjusted odds of CRF more than 3 times that of women (POR=3.47; 95% CI: 2.50, 4.80), and this estimate remained statistically significant even when we further controlled for other factors associated with CRF prevalence and moderately correlated with sex (7). Other paper from Nigeria shows high prevalence in males than in females (8). Cohort study from Japan on Risk factors for Chronic renal failure illustrate The incidence of developing protein urea also increased with age in addition, Male subjects more frequently developed CRF I or II than female subjects (9).

Metabolic syndrome

Metabolic syndrome is a common and often under diagnosed disease entity, characterized by a clustering of metabolic and cardiovascular atherosclerotic risk factors, including disturbances of glucose and insulin metabolism, hypertension, dyslipidemia and central obesity (10).

The Longer duration of diabetes, defined as duration more than 10 years, was reported in 31.8% of the participants and was associated with a high prevalence of CRF (32.4% and 39.7%) compared to shorter duration: 32.4% vs. 11.6% by MDRD ($P < 0.001$), and 39.7% vs. 16.4% by C-G ($P < 0.001$). CRF prevalence also was greater among persons with diabetes than among those without diabetes (40.2% versus 15.4%). Among persons with cardiovascular disease than among those without cardiovascular disease (28.2% versus 15.4%), and among persons with hypertension than among those without hypertension (24.6% versus 12.5%). Prevalence of CRF was 24.3% among participants with self-reported diabetes and 8.4% among those without a diabetes diagnosis. CRF prevalence was 20.7% among participants who self-reported high blood pressure, and 7.4% among those who not. Other hospital-based study from Nigeria ratifies study from patients who attending University of Maiduguri Hospital kidney center. Analyzing primary diseases that may be responsible for chronic renal failure are hypertension, diabetes mellitus, established heart problem and obesity (6,7,8).

Obesity is associated with multiple other conditions that are known to cause compromised renal function, including hypertension, diabetes, hyperuricemia, and

the metabolic syndrome that can independently have a detrimental effect on renal function (12).

Knowledge about CRF

According to previous studies, knowledge about the disease and treatment may increase patient's empowerment, adherence to treatment and quality of life in addition. Knowledge of chronic kidney disease justifies and supports the success of disease prevention as described by the health belief model (15).

Levels of awareness and knowledge among patients and providers must be improved to prevent CRF, its progression, and its many consequences. Many factors, such as patient health literacy/numeracy and psychological factors and patient-provider communication, which likely play a large part in modifying CRF awareness and resulting preventive behaviors, are difficult to measure (21). Additionally, no single dataset or study population will be sufficient to study all predictors and outcomes of disease awareness, and outcome studies require `substantial resources (15). Despite these challenges, further studies are essential to fully understand the factors and consequences associated with CRF awareness. However, because such studies will take time, efforts to increase awareness through dissemination of basic CRF information, may need to be implemented simultaneously with these studies, given the high prevalence of CRF and its risk factors (21).

3. OBJECTIVE

General objective

- ❖ To assess magnitude Chronic Renal Failure and its Associated factors among patients in medical outpatient department at St. Paulo's hospital.

Specific Objectives

- ✓ To determine the magnitude of Chronic renal failure in St. Paulo's Hospital
- ✓ To identify associated factors for Chronic renal failure in St. Paulo's Hospital

4. METHODS AND MATERIALS

4.1 Study area and Period

The study was conducted in Addis Ababa the capital of Ethiopia, which has an area of 530.14 square Kilometer divided into 10 sub cities with 100 Woredas. Based on 2007 Ethiopian census, Addis Ababa has a total population of 4,107,372. Addis Ababa has 41 hospitals and 128 health centers.

The study area, St. Paulo's Hospital found in Addis Ababa City and in Gulelie Sub City. It is the second largest public hospital in the nation, built by the Emperor Haile Selassie in 1961 with the help of the German Evangelical Church. It has a catchment population of more than five million. The hospital has 350 beds for inpatient service. The hospital has provided the appropriate health services. Besides, incorporates over 13 departments that include internal medicine, neurology, general surgery ENT, psychiatry, ophthalmology, dentistry (maxillofacial surgery), radiology, dermatology, gynecology, obstetrics, pediatrics, biomedicine and emergency medicine. The hospital launched kidney transplant center in 2015. It makes pioneer for the service and has good opportunity for researchers and policy makers for program monitoring and evaluation. This study was conduct from Medical Inpatient department of St. Paulo's hospital, Addis Ababa, Ethiopia.

4.2 Study design

This study was an institutional based cross sectional study.

4.3 Source and study Population

The source populations were medical cases patients at St. Paulo's hospitals from the outpatient department with period of June 6, 2008 until July 6 2008. Medical patients appear in the OPD were the study population.

4.3.1 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 were included.

4.3.2 Exclusion Criteria

Patients who acutely sick and unable to participate in the study in addition Patients age less than 16 years were excluded.

4.4 Sample size determination

- The sample size determined for the prevalence of CRF by single proportion formula for the first objective.

$$n = \frac{z^2 p(1-p)}{w^2}$$
$$= \frac{(1.96)^2 (0.5)(0.5)}{(0.05)^2}$$

$$= 384$$

Where, n = sample size

p = estimated percent in the population (0.5)

w = margin of error/level of precision (0.05)

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

- Sample size using double proportion formula was in order to acquire a sample adequate to detect this variability with different associated factors. Then for this study Epi info version 7.2.01 used for calculation for second objective.

Double proportion sample size expressed as the following formula

$$N = \frac{\{Z_{\alpha/2} \sqrt{(1+r)(1-p)} + Z_{\beta} \sqrt{P_1(1-P_1) + \frac{p_2(p_1-p_2)^2}{r}}\}^2}{(p_1-p_2)^2}$$

The following assumptions were used

P1= Prevalence of associated factors with the case

P2= prevalence of associated factors without the case

Z $\alpha/2$ = standard score corresponding 95% confidence interval (1.96)

Z β = standard score corresponding 80% power (0.84)

r= ratio between group one and group two as 1

Objective	Associated factors	Z $\alpha/2$ of 1- β (power)	Z $\alpha/2$ of 95% CI	P1	P2	Odds ratio	Ratio	N total
To assess	Gender(7)	0.8	1.96	57.7	28.6	3.4	1:1	107
the associated factors of	History of DM(5)	0.8	1.96	56.6	22.5	4.5	1:1	78
CRF	History of hypertension(5)	0.8	1.96	74.7	25.3	8.7	1:1	40

Since sample, size from single proportion is greater than the sample size obtained from double population proportion analysis from Epi info, a total sample size of 348 was taken by correction formula 305 of patients included for the study.

Correction sample size is equal to

$$= \frac{n}{1+n/N}$$

$$= \frac{384}{1+384/1500}$$

$$= 305$$

Where, n = largest sample size

N = Total OPD medical patient attendant per month

- Thus, the study included 305 study subjects plus 5% non-response. Then the data collected from 320 patients.

4.5 Sampling technique and procedures

Adult Patients (>16years of age) coming to medical outpatient considered as study participants. For recruiting the study participants, a systematic random sampling was used. All adult patients had equal chance to participate in the study. Thus adult patients coming to the Medical OPD and those who willing to participate in the study, included until the calculated sample size fulfilled. The data collection was preceded with a Pretest in Zeweditu hospital medical OPD patients at 10% of sample size.

4.6 Data Collection Procedure

A trained nurse using structured questionnaire interviewed participants. Then the diagnosis confirmed by check medical record. The survey questionnaire was first written in English and translated into Amharic.

4.7 Study Variables

Dependent variable (outcome)

- Chronic Renal Failure

Independent variables

- Age, sex, educational status, marital status, smoking and alcohol consumption, Knowledge about CRF, family history of CRF, cardiac problem, kidney infection, diabetic and hypertension status

4.8 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 $GFR < 60 \text{ ml/min/}1.73 \text{ m}^2$ for ≥ 3 MONTHS.

Adult patients: Patients who attend Medical OPD at St. Paulo's hospital Age ≥ 16 .

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

4.9 Data Analysis procedures

All analyses and calculations were performed using SPSS software (SPSS version 20). Data presented as the means \pm SDs for continuous variables and as proportions for categorical variables. Demographic and clinical data were described. The odds ratio (OR) between the factors and CRF was calculated using binary logistic regression analysis for important demographic data, BMI and clinical cases which are well known risk factors for CRF, P values less than 0.05 at 95% confidence interval were considered statistically significant. Finally, Multivariate analysis model was used to identify associated factors for developing chronic renal failure.

4.10 Data quality assurance procedures

The data collectors were hospital staff nurses work in medical OPD. Moreover, the supervisor department head nurse. Training was given for supervisors and data collectors for one day and half. Orientation was given to the supervisors separately on how to supervise the data collectors, check for completed questioner; and to correct any mistake or problem.

4.11 Ethical consideration

Permission for the study obtained from Ethics Committee of the School of Public Health, Addis Ababa University. Ethics approval also from the Saint Paulo's Hospital internal research review board. Names not used and confidentiality maintained by keeping data collection forms locked in a secure cabinet. Patient's willing to participate interviewed in nursing station with private setting.

4.12 Dissemination plan

The result of the study will be presented to workshops and medical panels. In addition, effort exerted to make published on medical journals or else allocated in the university's medical library as reference for further research or education.

5. RESULT

5.1 Socio-demographic characteristics

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 (\pm standard deviation) of the participants was 40.1 (\pm 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. The study participant included 178(55.6%) of patients have average monthly incomes in ETB less than 2000 and patients with average monthly income greater and equal to 2000 of patients encompasses 27.2% of the patients (Table 1).

Table 1 Socio-demographic characteristics of adult patients in St. Paulo's hospital internal medicine outpatient department, 2016

Characteristics	Frequency (n=320)	Percent
Sex		
Male	151	47.2
Female	169	52.8
Age		
<35	141	44.1
35-41	50	15.6
41-47	38	11.9
>47	91	28.4
Address of the patient		
Oromia	104	32.5
Addiss Ababa	176	55.0
Amhara	25	7.8
SNNPR	11	3.4
Tigray	2	0.63
other	2	0.63
Marital status		
married	179	55.9
single	94	29.4
Divorced	26	8.1
widowed	21	6.6
Educational Status		
degree and above	24	7.5
Diploma	47	14.7
Secondary school	103	32.2
Primary school	75	23.4
Illiterate	65	20.3
can read and write	6	1.9

5.2 Anthropometric characteristic of participant

According to WHO staging of body mass index (BMI) the respondents categorized to underweight, normal, overweight, obesity, and patients score 6.9%, 39.7%, 21.9% and 31.6% respectively. The mean and SD of BMI of the participant was 23.6 ± 3.6 kg/m². The body mass composition includes 127(40%), 70(21.9%) and 89(27%) for normal, overweight and moderate obesity respectively. The magnitude of CRF related to BMI underweight, normal weight and overweight resulted 2(5.1%), 26(66.6%) and 11 (28.2%) respectively.

Table 2 Anthropometric in relation to CRF status of participant in St. Paulo's hospital internal medicine outpatient department, 2016

Variable	with CRF (N=39)	without CRF (N=281)
BMI		
Under weight	2(5.19%)	20(7.1%)
Normal	26(66.6%)	166(39.14%)
Over weight	11(28.2%)	83(21.4%)
Moderate obesity	0	10(28.1%)
Sever obesity	0	2(4.3%)

5.3 Clinical characteristic of participant

It was found that 129 (40.3%) of the participants 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 participant from these 35(89.7%) of them had CRF. (Table 3)

Table 3 Clinical characteristic in relation to CRF among adult patients in St. Paulo's hospital internal medicine outpatient department, 2016

Variables		with CRF (N=39)	without CRF (N=281)
HTN	yes	23(58.9%)	106(37.7%)
	No	16(41.1%)	175(62.3%)
DM	Yes	7(17.9%)	68(24.2%)
	No	32(82.1%)	213(75.8%)
Cardiac Problem	Yes	9(23.1%)	55(19.6)
	No	30(76.9%)	226(81.4)
Presence of kidney infection	Yes	35(89.7%)	78(27.8%)
	No	4(10.3%)	202(72.2%)

5.4 Magnitude of CRF

From the total participant, the assessed prevalence of CRF was 39 (12.2%). From total CRF cases 2.2%, started dialysis and all of them got the dialysis service from private facilities.

Magnitude of CRF 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. Gender result illustrates CRF more prevalent on males than females: 24(62%) and 15(38%).

CRF cases related to incorporates 7 (17%) cases of Diabetic mellitus and 9(23%) of patients with cardiac problem. CRF prevalence was higher among participants with history of kidney infection encompasses 35(89.7%). In addition, Family history of kidney disease present in 33.3% from total participants.

5.5 Associated factors for CRF

A bivariate logistic regression was performed to examine the relationship between CRF and the independent variables (age, sex, marital status average monthly income, smoking status, alcohol drinking status, family history of CRF, BMI, HTN, DM, cardiac problem, kidney infection history and knowledge on kidney function and disease . (Table 5)

HTN was four times COR [95%CI] = 4.6[0.21 to 0.83, $p < 0.0$] more likely to be associated with chronic kidney disease than patients without the presence of HTN. History kidney infection was two times COR [95% CI] = 2 [0.15 to 0.28 $p < 0.01$] more likely to be associated with chronic renal failure than patients without the presence of kidney infection history. In addition, without knowledge on kidney function and disease COR [95% CI] = 3.6[0.13 to 0.54 $p = 0.02$] had three times to have CRF case than had have knowledge on kidney function and disease.

Besides, no statistical significant differences seen with CRF participant's in relation with age COR [95% CI] 0.37[0.12, 11.17], sex COR [95% CI] 5.3 [0.98, 3.85]. Smoking use COR [95% CI] 13.02[0.43, 8.27], alcohol drinking COR [95% CI] 5.79 [0.35, 1.66], average monthly income COR [95% CI] 1.52[0.73, 3.17], family history COR [95% CI] 8.6[0.25, 1.08], having DM & cardiac problem COR [95% CI] 9.6[0.62, 3.46], and COR [95% CI] 6.1[0.31, 1.75] respectively. Furthermore BMI not statically not significant with CRF as bivariate result of COR 0.9 and CI includes zero.

Table 4 Bivariate logistic regression predictors of CRF among adult patients in St. Paulo's hospital internal medicine outpatient department,2016

Variables	CRF		COR 95% CI	P-value
	Yes	No		
Age				
< 35	16	12	0.55(0.20,1.46)	0.23
35-41	8	42	0.37(0.12,1.14)	0.08
41-47	9	29	0.23(0.08,0.69)	0.09
>47	6	85	1	
Sex				
Male	24	127	1.94(0.98,3.85)	0.06
Female	15	154	1	
Family CRF history				
Yes	13	166	0.53(0.25,1.08)	0.08
No	26	115	1	
Monthly income				
<2000	20	158	1.5(0.73,3.17)	0.29
≥2000	14	73	1	
Smoking status				
Yes	2	26	1.8(0.43,8.27)	0.4
No	37	255	1	
Alcohol use				
Yes	10	60	0.76(0.35,1.66)	0.5
No	29	221	1	
HTN				
Yes	23	106	0.42(0.21,0.83)	<0.01*
No	16	175	1	
DM				
Yes	7	68	1.45(0.62,3.46)	0.39
No	32	213	1	
Cardiac Problem				
Yes	9	55	0.78(0.31,1.75)	0.5

No	30	226	1	
Presence of kidney infection				
Yes	35	78	0.04(0.02,0.12)	<0.01*
No	4	202	1	
Knowledge on kidney function & ds				
Yes	26	97	0.26(0.13,0.53)	<0.01*
No	13	184	1	

Note * p<0.05 value statically significant predictors

5.6 Multivariate Analysis

After incorporating all significant ($p < 0.20$) in addition age and sex which are relevant biological variables in the bivariate analysis, multivariate logistic regression was performed to identify risk factors independently associated with CRF.

Multiple logistic regression model (Table 5) included the following variables: Age, Sex, kidney infection history, HTN and Knowledge about kidney function. Sex, HTN and kidney infection history were significantly associated with the occurrence of chronic renal failure. Knowledge on kidney function and disease had statistical significance for development of CRF but not after adjustment.

In multivariate analysis, CRF all age group likely develop the disease at statistically significant P value < 0.05 . CRF cases with kidney infection were 5% greater than without kidney infection (AOR = 0.05, 95% CI 0.02, 0.16, $P < 0.01$). In addition CRF cases with hypertension were 40% greater than without hypertension (AOR = 0.43; 95% CI 0.18, 0.97; $P = 0.04$).

Table 5 Multivariate regression analysis of factors associated CRF among adult patients in St. Paulo's hospital internal medicine outpatient department, 2016

Variables	CRF		COR 95% CI	Adjusted Odds 95% CI	P-value
	Yes	No			
Age					
< 35	16	12	0.55(0.21,1.47)	0.29(0.09,0.93)	0.03*
35-41	8	42	0.37(0.12,1.14)	0.22(0.05,0.82)	0.02*
41-47	9	29	0.23(0.08,0.69)	0.15(0.04,0.57)	0.01*
>47	6	85	1	1	
Sex					
Male	24	127	1.94(0.98,3.85)	2.26(0.99,5.13)	0.05
Female	15	154	1	1	
HTN					
Yes	23	106	0.42(0.21,0.83)	0.43(0.18,0.97)	0.04*
No	16	175	1	1	
Presence of kidney infection					
Yes	35	78	0.04(0.02,0.13)	0.05(0.02,0.16)	<0.01*
No	4	202	1	1	
Knowledge on kidney function & disease					
Yes	26	97	0.26(0.13,0.54)	0.54(0.23,1.23)	0.143
No	13	184	1	1	

6 DISCUSSION

1. Magnitude of CRF

In this hospital based quantitative cross sectional study, magnitude and associated factors of CRF among patients that attend medical outpatient department has been assessed.

This study confirmed Magnitude of CRF was 12.2%.The magnitude of CRF in comparable Studies from world and sub-Saharan encompasses Africa 10% and 13.9% respectively (3).

This study reveals magnitude of CRF statistically significant for all age group. So indicates CRF reported in all age group. Therefore, study in Nigeria confirmed our result a 10-year retrospective study of cases of chronic renal failure (CRF) at Olabisi University Teaching Hospital reported that CRF cut across all age grades and the study conclude that age is not a predisposing factor to the disease (8). This finding is consistent with other studies that have shown its association with age that indicates much larger cases of younger age groups in the study (9).

2. Associated factors for CRF

This study illustrate CRF had Co-morbid with chronic illness particularly hypertension. CRF cases with hypertension were 40% greater than without hypertension (AOR =0.43; 95% CI 0.18, 0.97; P=0.04).

Other study also confirms that Hypertension patients recognized as strong Predictor for progression of renal dysfunction and developing CRF (9). Other Study confirms Patients suffering from reduced kidney function, most often because of DM or HTN, represent a global population that is highly vulnerable to CRF (10). Other study also

confirms the primary diseases as hypertension was found to be the major primary diseases that may be responsible for chronic renal failure (15).

This study multivariate analysis result on CRF cases with kidney infection were 5% greater than without kidney infection (AOR = 0.05, 95% CI 0.02, 0.16, $P < 0.01$). Other study also confirmed Prevalence of chronic renal failure 48.5% in Patients with Chronic renal infection (17).

This result shows 26(66.6%) of patients with normal BMI and even 2 (5.9%) with underweight of BMI had CRF. Similarly other study confirms these result the risk of CRF in obese subjects did not reach statistical significance (adjusted odds ratio 1.27, 95% CI: 0.92-1.74) (10). Other study disapproves the two and express that a high BMI at baseline was identified as a significant risk factor for developing kidney disease (12). These can due to study design difference.

7 STRENGTHS AND LIMITATIONS OF THE STUDY

Strength

- The study can show the load of the disease.
- The study can contains multiple variables to see in on associated factors.
- The data and result can be used for junior researches as baseline.

Limitation

- The co morbid cases like HTN and kidney infection history and CRF cannot determine case and effect relationship in this study.
- Facility based study affects the reliability of the magnitude of CRF obtained so need population based study.
- The study populations were patients so it can interferes accuracy of the response.
- With single facility result, it can be difficult for generalization.

8. CONCLUSION

The magnitude of CRF 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 CRF without any underline-associated factors appear abundant. CRF magnitude among patients with hypertension and kidney infection had statistical significance.

9. Recommendation

- 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 CRF and its many consequences.
- Researchers must plan to do the Magnitude of CRF 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.



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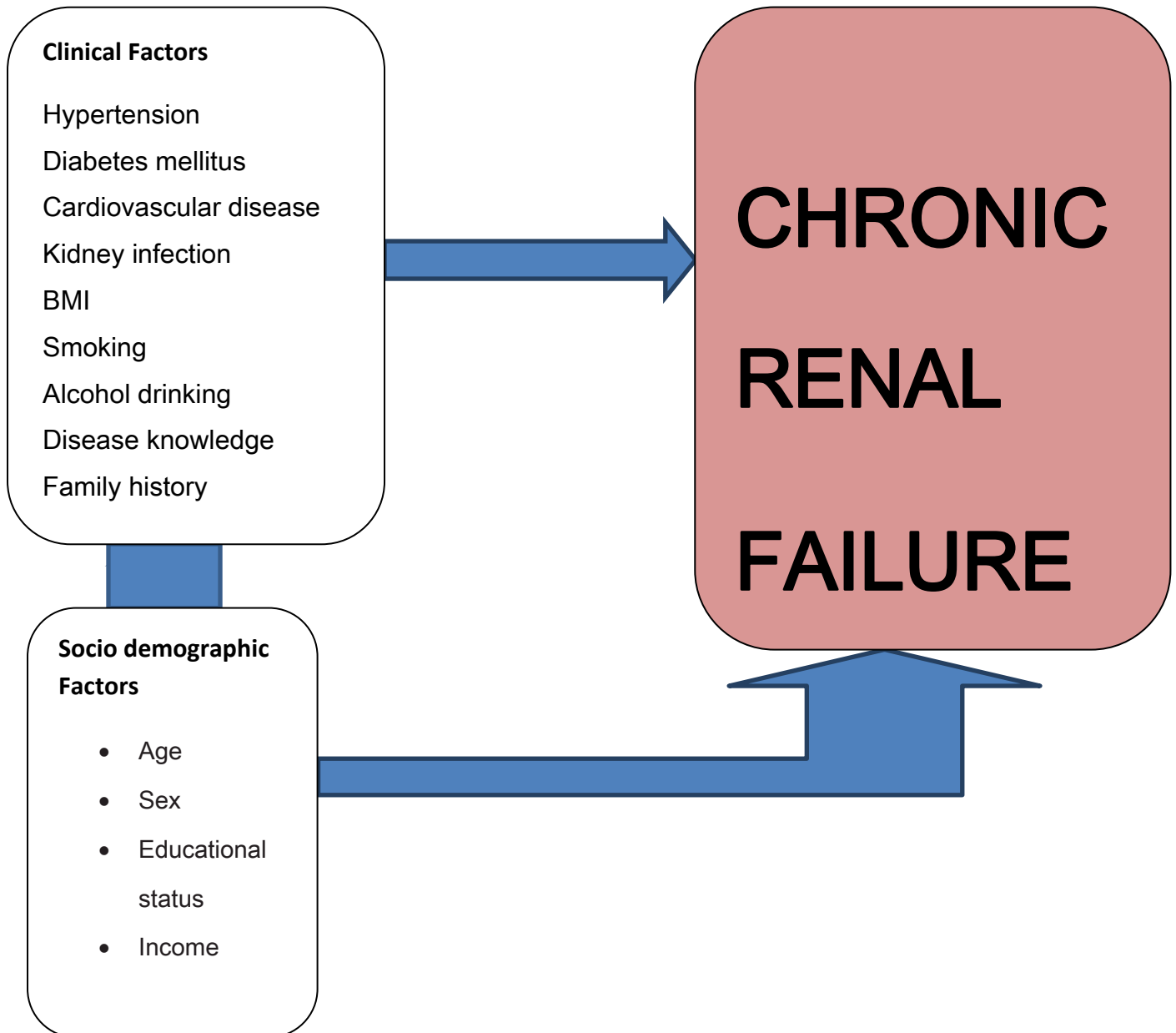
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11. ANNEXES

Figure 1: Conceptual framework to Assess prevalence and risk factors of chronic renal failure, St. Paulo's hospital Addis Ababa, Ethiopia 2016

Note  Dependent Variable  Independent Variable



Annex1

Questionnaire for prevalence & associated risk factors of chronic renal failure

Information sheet

Good morning/afternoon, my name is

Now we are conducting a survey on magnitude& associated factors of chronic renal failure.

Whether you was participating or not, not affect the service, you may receive from health unit. The information makes big input for the community to overcome solution for the problem.

The interview may take 10-15 minutes to complete. Whatever information you provide was be keeping strictly confidential and not shown to other persons. Participation in this survey is voluntary and you can choose not to answer any individual question or all of the questions.

Annex 2

Written Consent

The content of the survey discussed on information session. I have read the information has had the opportunity to ask question, and I have had all my questions answered to my satisfaction.

I voluntarily agree to participate and may refuse to answer any questions any time, and without it affecting my services in anyway.

Signature_____

Annex 3

Questioner for assessment of prevalence of Chronic renal failure and its Associated Factors in St. Paul's Hospital, Addis Ababa, Ethiopia

Name of the reviewer -----

Date -----

1 Sex Male _____ Female _____

2 Age _____

3 Resident Area Region _____

4 Educational status

- Illiterate Can read and write Primary school
 Sec. school Diploma Degree and above

5 Marital status

- Married Divorced
 Single Widowed

6 Occupation

- Employed Student No work
 Self employed Retired

7 Average monthly income _____

8 BMI (Body Mass Index) _____ or weight _____ and Height _____

9 In the past, did you ever smoke any tobacco products?

- Yes No If No skip 9

10 How long ago did use? _____

11 Family History of any kidney problem

- yes No

12 Have you ever consumed any alcohol?

- yes No If No skip 12

13 How long ago did use? _____

14 Have you had a HTN?

- yes No If No skip 14

15 How long ago you were first diagnosed? < 1 year / 1-3 years / 3-5 years / 5-10 years / >10yrs

16 Do you have follow up

- yes No

17 Have you had a DM?

- yes No If No skip 18

18 How long ago you were first diagnosed? < 1 year / 1-3 years / 3-5 years / 5-10 years / >10yrs

19 Do you have follow up

- yes No

- 20 Have you had a cardiac problem?
 yes No If No skip 21
- 21 How long ago you were first diagnosed?< 1 year / 1-3 years / 3-5 years / 5-10 years/>10yrs
- 22 Do you have follow up
 yes No
- 23 Do you know Kidney function
 yes No
- 24 Do you know Kidney disease S/S _____
- 25 Do you know have kidney infection
 yes No
- 26 Have you had a CRF?
 yes No If No skip 27
- 27 How long ago you were first diagnosed?< 1 year / 1-3 years / 3-5 years / 5-10 years/>10yrs
- 28 Do you have follow up
 yes No
- 29 Do you have dialysis session
 yes No If No skip 30
- 30 Where do you perform the dialysis? _____

Annex 4

ስለፅንዖት-ላሊት-መዳከም እና ተያያዥ ምክንያቶች የተዘጋጀ መጠይቅ

የመጠይቅ ገላጻ

- ጤና ይስጥልኝ እኔ _____ እባላለሁ።
- አሁን ስለፅንዖት-ላሊት-መዳከም እና ተያያዥ ምክንያቶች በተመለከተ አንድ ጥናት አዘጋጅተናል። በዚህ ጥናት ውስጥ ተሳታፊ እንዲሁኑ ታስብዎል። ይህ ጥናት ለህብረተሰቦች ግሮን መጠንና ተያያዥ ምክንያቶች እንዲያውቅ ይረዳል።
- መጠይቅን ሲሞላ የሚሰጡት መረጃ በሚሰጥ ርዕደት ጠበቅታል። በዚህ ጥናት ውስጥ ሲሳተፉ መመለስ ያልፈለጉት ጥያቄ የመተውኑን ዲህ-ምሙሉ በሙሉ ጥያቄዎቹን ያለ መመለስ መብት የተጠበቀነው። የእርሶተሳትፎ በዚህ ጥናት ውስጥ ትልቅ ቦታ ስላለው ጊዜ ምንሰውተው እንደሚሳተፉ ባለሙሉ ተስፋኑን።
- መጠይቅን ለመሙላት 10-15 ደቂቃ ይፈጃል
- እና መሰግናለን!

Annex 5

የፅሁፍ የስምምነት ማረጋገጫ

የሰጣችሁኝ ገለጻቸውን በፈቃድኝ በጥናቱ ለመሳተፍ ተስማምቻለሁ። ነገር ግን ጥያቄዎን ለማሟላት ወይም ለሌላ ማረጋገጫ ጠይቃለሁ። ስምምነቴንም በፊርማዬ አረጋግጣለሁ።

ፊርማ _____

Annex 6

ስለ ፅኑ የኩላሊት መዳከም እና ተያያዥ ሁኔታዎችን መመዘኛ መጠይቅ
የጠያቂ ስም -----
ቀን -----

- 1 ፅታ ወንድ ሴት
- 2 ዕድሜ _____
- 3 የመኖሪያ አድራሻ _____
- 4 የትምህርት ደረጃ? _____
- 5 የጋብቻ ሁኔታ? ያገባ የተለየ
- 6 የስራ ሁኔታ? ያላገባ ባል/ሚስት በሞት የተለየ
- 7 አማካይ ወርሃዊ ገቢ _____
- 8 የቁመትና የክብደት አመጣጥን (Body Mass Index) _____ ክብደት _____ ቁመት _____
- 9 ሲጃራ ወይም ሌላ አነቃቄ ጭስን ይጠቀማሉ? አዎ አልጠቀምም አልጠቀምም ከሆነ ቀጣዩን ጥያቄ ይዘለል
- 10 ለምን ያህል ጊዜ ተጠቀሙ? _____
- 11 በቤተሰብ የኩላሊትን ህመም አለ አዎ የለም
- 12 የአልኮል መጠጥ ይጠቀማሉ? አዎ አልጠቀምም አልጠቀምም ከሆነ ቀጣዩን ጥያቄ ይዘለል
- 13 ለምን ያህል ጊዜ ተጠቀሙ? _____
- 14 የደም ግፊት አለበት ተብለው ያውቃሉ አዎ የለም የለም ካሉ ቀጣዩን ይዘለሉ
- 15 የደም ግፊት በሽታ እዳለቦት ካወቁ ምን ያህል ጊዜ ነው? < 1 አመት / 1-3 አመት / 3-5 አመት / 5-10 አመት / >10 አመት
- 16 የደም ግፊት በሽታ የህክምና ክትትል አሎዎት? አዎ የለም
- 17 የስኳር በሽታ አለበት ተብለው ያውቃሉ አዎ የለም የለም ካሉ ቀጣዩን ይዘለሉ
- 18 የስኳር በሽታ እዳለቦት ከተረጋገጠ ምን ያህል ጊዜ ነው? < 1 አመት / 1-3 አመት / 3-5 አመት / 5-10 አመት / >10 አመት
- 19 የስኳር በሽታ የህክምና ክትትል አሎዎት? አዎ የለም
- 20 የልብ ህመም አለበት ተብለው ያውቃሉ አዎ የለም የለም ካሉ ቀጣዩን ይዘለሉ
- 21 የልብ ህመም በሽታ እዳለቦት ካወቁ ምን ያህል ጊዜ ነው? < 1 አመት / 1-3 አመት / 3-5 አመት / 5-10 አመት / >10 አመት
- 22 የልብ ህመም በሽታ የህክምና ክትትል አሎዎት? አዎ የለም
- 23 የኩላሊትን ጥቅም ያውቃሉ? አዎ የለም
- 24 የኩላሊት ህመም ምልክቶችን ካወቁ ቢገልፁልን _____
- 25 የኩላሊት ኢንፊክሽን አለበት ተብለው ያውቃሉ አዎ የለም
- 26 የፅኑ ኩላሊት ድክመት አለበት ተብለው ያውቃሉ አዎ የለም የለም ካሉ ቀጣዩን ይዘለሉ
- 27 የፅኑ ኩላሊት ድክመት እዳለቦት ካወቁ ምን ያህል ጊዜ ነው? < 1 አመት / 1-3 አመት / 3-5 አመት / 5-10 አመት / >10 አመት
- 28 የፅኑ ኩላሊት ድክመት የህክምና ክትትል አሎዎት? አዎ የለም
- 29 የኩላሊት አጥበት አድርገው ያውቃሉ አዎ የለም የለም ካሉ ቀጣዩን ይዘለሉ
- 30 የኩላሊት አጥበት አገልግሎቱን ከየት ያገኛሉ _____