

Public knowledge of chronic kidney disease among Ethiopians: a cross sectional study.

abdella birhan yabeyu (✉ birhanabdella@gmail.com)

Tikur Anbessa Specialized Hospital <https://orcid.org/0000-0002-8334-4305>

yared belete belay

Mekele University

kaleab taye haile

University of Gondar

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Abstract

Background : awareness of chronic kidney disease (CKD) includes general knowledge of CKD, its risk factors. Early identification and management of CKD can reduce undesired outcomes related to the disease. However, nearly all CKD conditions were not clinically familiar primarily because of the poor public awareness about the disease.

Methods: A community based cross-sectional study was conducted. The target population of this study was lay public and health professionals were excluded from the study. Proportional numbers of study participants were included from each sub-city based on their total population size. The data was analyzed using SPSS version 21. Frequencies, table's percentage, mean and standard deviation were used to describe the response of participants. Independent T test and one way ANOVA statics were used identify factors associated public knowledge of CKD.

Results: A total of 350 individuals were approached, 301 of whom completed and returned the questionnaire, giving a response rate of 86%. In this study, the mean (SD) knowledge score of participants was 11.12 (\pm 4.21) with a minimum score of 0 and a maximum of 22. With respect to distribution of CKD knowledge score, half of the respondents score 11 and less. One way ANOVA revealed that educational level had significant effect on knowledge of CKD. Respondents who had a qualification of degree had relatively higher knowledge scores than the other category participants (P-value = 0.015). Independent t-test was also performed but failed to reveal any association between socio-demographic characteristics and knowledge score.

Conclusions : The general knowledge level of the Ethiopian population about CKD and its risk factors is low. Currently, non-communicable disease such as diabetes and hypertension becomes public concern those are one of the significant risk factors for CKD. As our study indicated even these groups of populations are not adequately informed regarding their increased risk for developing CKD.

Keywords: chronic kidney disease, public knowledge, Ethiopia

Background

Health literacy explained as an individual's capacity to understand health information and catch up in the healthcare process. Insufficient health literacy among the population is associated with deteriorated health outcomes (1). Awareness of Chronic Kidney Disease (CKD) includes general knowledge of CKD, its risk factors and consequences (2). CKD defined as an estimated or measured glomerular filtration rate (GFR) $< 60 \text{ mL/min/1.73 m}^2$ that is present for \geq three months with or without evidence of kidney damage or evidence of kidney damage with or without decreased GFR (3).

Early identification and management of CKD can reduce undesired outcomes related to the disease. However, nearly all CKD conditions were not clinically familiar primarily because of the poor public awareness about the disease (4). Limited public knowledge of the particular disease is an obstacle to the

successful implementation of prevention programs (5). In a study of 676 patients with CKD, more than 1/3rd of patients claim to know little about their own CKD diagnosis and nearly half reported that they did not know of treatment alternatives if their kidneys failed (6). In Ethiopia, there is a shift from communicable disease into chronic non-communicable disease in the past few decades (7).

The causes of CKD differ worldwide. Poor glycemic control, uncontrolled hypertension, nephrotoxins drugs and smoking are recognized as the leading risk factors of CKD (8,9). Between 1990 and 2010, the spread of CKD moves up to significant lists of causes of global death, which is from 29th to 18th (10). A large Chinese study found a 10.8% prevalence of CKD. Hence only 12.5% of them knew about their disease (11).

There is a consensus that CKD prevention is the best health policy alternative for decreasing both the costs and associated with a better health outcome of this disease particularly in the developing countries which have limited healthcare resources (12). Therefore, creating Awareness about CKD and its risk factors among the public is an essential strategy for CKD prevention. Whereas, limited knowledge about the disease and possible risk factors likely the cause for unsuccessful prevention strategies and advanced stage diagnosis of the disease.

Information about public knowledge of CKD is crucial to understand the information gap and planning several educational interventions. To evaluate the public knowledge and point out the areas of fallacy in the population, this cross-sectional study conducted in Addis Ababa. However, unlike other countries, no study had been done yet and findings of this study will assist in identifying knowledge gaps, preparing educational sessions, facilitate screening programs among the society and has the potential to prevent the occurrence of CKD. Therefore, the current study aimed at assessing the public knowledge of CKD by using a validated tool.

Methods

Study design and setting

A community based cross-sectional study was conducted in Addis Ababa, which is the capital of Ethiopia. The city is administratively divided into 10 sub-cities. According to 2007 national population and housing census report, the city had an estimated population of 3,604,000 (1,703,000 males and 1,900,000 females) (CSA, 2013).

Participant Recruitment

The target population of this study was lay public and health professionals were excluded from the study. Proportional number of study participants were included from each sub-city based on their total population size. Convenient sampling was employed to collect the data from all ten sub cities until we have the desired sample from each sub city. Written and verbal consent was obtained from each study participants based on their educational status.

Study Instrument

A paper based self-administered and interviewer administered questionnaire was used to collect data from study participants. The data collection tool was developed through extensive review of literature. The questionnaire was initially developed in English, was translated to Amharic language and back to English to ensure that the final version gave the intended meaning. Amharic version of the questioner was used for collecting data. The survey instrument was further pre-tested on 25 Addis Ababa residents who were not included in the final analysis and slight modifications were instituted in the final data collection tool. The final questionnaire has six major parts. Section one assessed socio-demographic information of the study participants. Section two aimed to explore participant's general knowledge regarding CKD. Section 3 and 4 focused on examining the acquaintance of respondents with basic kidney functions and common laboratory investigation used to measure kidney's health, respectively. Section 5 included questions to investigate respondent's knowledge on risk factors of CKD whereas Sect. 6 aimed to assess the sign and symptoms of advanced CKD. The survey questions on the knowledge of Kidney and CKD was categorized into three responses (True, False and I don't know).

Data Collection

Two trained data collectors were enrolled in data collection. The principal investigators provided half day training for data collector on the data collection instrument and ethics. The data collection was done from September to November, 2018.

Statistical analysis

The data was analyzed using statistical package for social science (SPSS) version 21. The response of the study participants was rated as 1 = True, 2 = False and 3 = I do not know, when the correct answer for the respective question is true: it was rated as True = 1, False = 0 and I don't know = 0. Otherwise when the correct answer is False, it was coded as True = 0, False = 0 and I don't know = 0. Frequencies, table's percentage, mean, inter quartile range (IQR) and standard deviation (SD) were used to describe the response of participants. Independent T test and one way ANOVA statics were used identify factors associated public knowledge of CKD.

Results

A total of 350 individuals were approached, 301 of whom completed and returned the questionnaire, giving a response rate of 86%. The mean (SD) age of study participants was 33.03 ± 10.05 years and it ranged from 18 years to 65 years. Almost equal number of male (48.2%) and female (51.8%) respondents represented the study. Nearly thirty percent of respondents completed secondary school (28.9%) and were unemployed (29.9%), respectively. Majority of the respondents were single (175, 58.1%).

Of the total 301 participants, forty (13.3%) of them had familial history of CKD and less than five percent of respondents had personal history of stroke (3.7%). Remarkably, Eighty percent of the participants were

free from any medical condition that require medication at the time of the study. 10.6%, 7.6% and 7.0% of respondents have had hypertension, Diabetes and heart attack, respectively. In this study, majority of participants live in the house of five and above (54.5%) (See table 1).

In this study, the mean (SD) knowledge score of participants was 11.12 (\pm 4.21) with a minimum score of 0 and a maximum of 22. With respect to distribution of CKD knowledge score, half of the respondents score 11 and less. Majority of the participant are aware that kidney makes urine (72.8%) and clean blood (67.8%). More than half of the participant identified that Diabetes (57.8%) and hypertension (51.8%) are the risk factors for CKD. However only one fourth of the participants knew that being female has got nothing to do with increasing the risk of CKD (25.2%). A significant number of respondents knew that urine test help to determine kidney health (87.7%). Nearly sixty percent of respondents recognized that certain medications could help in lowering the progression of CKD (57.5) (See table 2).

One way ANOVA was employed to test significant association between Socio-demographic characteristics and Knowledge score. The analysis revealed that educational level had significant effect on knowledge of CKD. Respondents who had a qualification of degree had relatively higher knowledge scores than the other category participants (P-value = 0.015). Independent t-test was also performed but failed to reveal any association between socio-demographic characteristics and knowledge score (See table 3).

Discussion

Public health literacy is important concept in the modern society that determine the health behavior of individual's and community. It affects the level of health services utilization and improves the intended outcome of health care services (14). The complex nature of chronic disease needs better health literacy from the public and individual patient. With better health literacy it is possible to reduce the incidence of chronic disease and improve management of their complication efficiently. Knowledge toward the disease is important component of health literacy and it influences the level of health literacy significantly (15–16). This study is the first in its kind in Ethiopia to assess the public knowledge towards chronic disease. CKD is a significant health concern in Ethiopia. Despite the inadequacy in data of national figure hospital based assessment revealed higher magnitude of CKD (17). For combating this health problem improving health literacy of the society would be beneficial. Therefore understanding the knowledge gap and determining the appropriate intervention is prior issue. Consequently findings generated from this study would be a significant input for policy maker and program manager to look into appropriate intervention. In our study we explored the public knowledge towards CKD using the tool adopted from previous study (5). The tool was pretested and discussed with experts on its strength to capture the necessary details.

The computed mean (SD) knowledge score was found to be 11.2 (\pm 4.21) which is substantial level of knowledge. It is comparable with the findings reported from Australia and Tanzania, which was 10.34 (\pm 5.0) and 3.85 (\pm 4.66) respectively (5, 13). This high score of knowledge is mainly associated with

participant characteristics. We recruited the participant from the capital city of the country unlike the previous study (13) and more than half of them had a college diploma and above. Finding from the current study established that educational level had significant effect on knowledge of CKD with P-value of 0.015. Therefore the higher score of the knowledge would be associated with large number of educated participant and the study site we selected. This finding wouldn't be representative of the country hence the literacy rate of the Ethiopian population is below 50 percent and only 20.4 percent of the population is urban population (18). Study included a significant number of rural household participants claimed lower knowledge score in comparison to our study (13).

Regarding general knowledge of study participants on chronic kidney disease, 83.7% of the study participants knew that a person could lead a healthy life with one healthy kidney; this was slightly lower in comparison to Hong Cong study, in that study most (84.7%) of the participant were aware of the kidney's function (11). However, the finding of the current study is also promising since organ shortage is a global crisis and the public knowledge and awareness is crucial element for promoting the living organ donation practice (19). As a developing country the level of awareness claimed in this study is substantial. Lower number of a study respondent (22.6%) believes that herbal supplements can be effective in treating CKD however 2/3rd of the participant from Tanzania study claimed that they were likely to use traditional medicines for the treatment of kidney disease and also around 14% of use self-treatment with home remedies(13). A study from Nigeria revealed that 47.8% of respondents have faith in local herbal concoctions and spiritual means to cure CKD (10). This may be associated with the belief in herbal medicine in the urban area.

In the present study, almost half (57.5%) of the study participants knew that certain medications could help to slow down the worsening of CKD, which was lower in comparison to Hong Cong study (80%). In previously, mentioned study half of the study group had a risk factor for CKD such as diabetes and hypertension (11) that may increase their awareness towards risk factor for CKD. With current evidence expanding health education to prevent CKD is indispensable. Since there are several treatment options which able to render the progression of CKD by preventing the advance in risk factor (20). Most participants knew that the kidney makes urine and kidney clean blood but around 21 and 34 percent of the participants identified that the kidney helps to maintain blood pressure and keep bones healthy respectively. Likewise, in Hong Cong study nearly half of the study participants did not know the role of the kidney in maintaining blood pressure (11). Therefore health education focusing on chronic disease prevent and management is critical. There is increase in prevalence of the chronic disease in Ethiopia particularly in urban setups therefore due focus from policy maker and health care strategist is expected (21).

The majority of the study respondents knew that hypertension (51.8%) and diabetes (57.8%) are the risk factors for the development of CKD. This finding is similar to several studies elsewhere (10–12). This finding is promising since the public has a good awareness on the risk factor of the disease the possibility of prevention would be higher. With regard to signs and symptoms of an advanced stage of CKD, 68.8% of recognized water retention is one of the advanced stage symptoms, nausea and vomiting

(39.5%), loss of appetite (56.6%) and increased fatigue (75.7%). This finding depicted participants had good knowledge on alarming signs and symptoms of CKD in comparison to previously reported results (5, 10). This would be helpful for implementing prevention strategies and management of communicable disease.

Similar to other studies, public knowledge CKD significantly associated with the level of education. Several other studies depicted level of education is significant associated with knowledge related to CKD (5, 10–11). Since health literacy is highly associated with personal determinant like knowledge and competence this variation is the expected (14). In addition to health literacy general literacy of the society is very essential for improving overall wellbeing of the society.

This study assessed the public knowledge of CKD for the first time in Ethiopian and it produced useful findings which serve as an input for health education programs at community level, in health facilities and in media sector. Furthermore the findings serve as an input for in service and pre-service training of health professionals in Ethiopia. As a limitation we recruited participants only from the capital city of the country and further studies focusing on the rural base of the country will be needed.

Conclusion

The general knowledge level of the Ethiopian population about CKD and its risk factors is low. Currently, non-communicable disease such as diabetes and hypertension becomes public concern those are one of the significant risk factors for CKD. As our study indicated even these groups of populations are not adequately informed regarding their increased risk for developing CKD. Future public awareness programs should be more targeted toward patients with CKD risk factors and communities with low educational level.

Abbreviations

CKD:chronic kidney disease; GFR:glomerular filtration rate; IQR:inter quartile range; SD:standard deviation; SPSS:statistical package for social science.

Declarations

Ethical approval and consent to participation

The study was approved by the ethics review committee of the school of pharmacy, Addis Ababa University. Before initiation of the study a written informed consent was obtained from all of the participants.

Consent for publication

Not applicable.

Availability of data and material

The data sets analyzed in the current study are available from the corresponding author on request.

Conflict of interest

No conflicts of interest were declared by the authors.

Funding

No financial support was gained to conduct the study.

Author's contribution

ABY designed the work. ABY and KTH were participated in proposal writing and data collection. KTH and YBB were participated in data analysis and interpretation. ABY, KTH and YBB were responsible for questioner design and manuscript wrote up. All authors read and approve the final manuscript.

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Author's information

¹ Department of Pharmacology and Clinical Pharmacy, School of Pharmacy, Addis Ababa University, Addis Ababa, Ethiopia.

² Department of Pharmaceutics and Social Pharmacy, School of Pharmacy, Mekele University, Mekele, Ethiopia.

³ Department of Pharmaceutics and Social Pharmacy, School of Pharmacy, University of Gondar, Gondar, Ethiopia.

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Tables

Table 1. Socio-demographic characteristics of study participants (n=301)	
Variables	No (%)
Age	
Mean(\pm SD)	33.03(\pm 10.05)
Median(IQR)	32(14)
Sex	
Male	145(48.2)
Female	156(51.8)
Educational status	
Able to read and write	57(18.9)
Secondary school	87(28.9)
Diploma holder	65(21.6)
Degree Holder	68(22.6)
Masters and above	24(8)
Marital status	
Single	175(58.1)
Married	114(37.9)
Divorced/widowed	12(4)
Employment status	
Unemployed	90(29.9)
labor	47(15.6)
Government employed	86(28.6)
Private employed	61(20.3)
Others	17(5.6)
Familial History of CKD	
Yes	40(13.3)
No	261(86.7)
Medical condition that require Medication	

Yes	58(19.3)
No	243(80.7)
Hypertension	
Yes	30(10)
No	255(84.9)
Unknown	16(5.3)
Diabetes Mellitus	
Yes	23(7.6)
No	244(81.1)
Unknown	34(11)
Heart Attack	
Yes	21(7)
No	248(80.4)
Unknown	389(12.6)
Personal History of stroke	
Yes	11(3.7)
No	290(96.3)
Number of person living in the house	
One	24(8)
two	27(9)
Three	38(12.6)
Four	48(15.9)
Five and above	164(54.5)

Table 2. number(percentage) of correct response to individual items on the questionnaire by respondents(n=301)	
Question	Correct response N (%)
1. ^T A person can lead a normal life with one healthy kidney	252(83.7)
2. Herbal supplements can be effective in treating chronic kidney disease	68(22.6)
3. ^T Certain medications can help to slow-down the worsening of chronic kidney disease.	173(57.5)
What functions do the kidney perform in our body?	
1. ^T The kidneys make urine	219(72.8)
2. ^T The kidneys clean blood	204(67.8)
3. The kidneys help to keep blood sugar level normal	63(20.9)
4. ^T The kidneys help to maintain blood pressure	117(38.9)
5. The kidneys help to breakdown protein in the body	36(12.0)
6. ^T The kidneys help to keep the bones healthy	101(33.6)
Which of the following are commonly used to determine the health of your kidneys?	
1. ^T Blood test	158(52.5)
2. ^T A urine test	264(87.7)
3. A fecal (poo) test	123(40.9)
4. ^T Blood pressure monitoring	94(31.2)
What are the risk factors for chronic kidney disease?	
1. ^T Diabetes	174(57.8)
2. Being female	76(25.2)
3. ^T High blood pressure	156(51.8)
4. ^T Heart problems such as heart failure or heart attack	98(32.6)
5. Excess stress	67(22.3)
6. ^T Obesity	172(57.1)
What are the signs and symptoms that a person might have if they have advanced chronic kidney disease or kidney failure	
1. ^T Water retention (excess water in the body)	207(68.8)
2. Fever	31(10.30)

3. † Nausea/vomiting	119(39.5)
4. † Loss of appetite	170(56.5)
5. † Increased fatigue (tiredness)	228(75.7)

T: True Items

Table 3. one way ANOVA test between socio-demographic characteristics and mean knowledge score

characteristics	Mean score(SD)	Df	F	P-value
Gender		300	0.31	0.860
Male	11.14(4.36)			
Female	11.23(4.078)			
Marital status		300	1.798	0.167
Single	11.5(3.95)			
Married	10.61(4.5)			
Divorced/widowed	12(4.5)			
Education level		300	3.151	0.015*
Able to read and write	9.73(4.56)			
Secondary school	11.75(3.9)			
Diploma holder	11(3.87)			
Degree holder	13.25(3.73)			
Masters and above	11.25(5.93)			
Occupation		300	0.761	0.551
Unemployed	11.8(3.43)			
Laborer	10.65(4.99)			
Government employee	11.01(4.6)			
Private employee	10.92(3.92)			
Others	11.3(4.72)			
Family history of CKD		300	0.386	0.766
Yes	11.57(4.92)			
No	11.13(4.09)			
Medical condition that require medication		300	0.001	0.972
Yes	11.2(4.11)			
No	11.18(4.24)			
Hypertension		300	0.744	0.462

Yes	12.03(4.17)			
No	11.12(4.21)			
I don't know	10.62(4.25)			
Diabetes		300	0.818	0.442
Yes	11.69(2.99)			
No	11.25(4.17)			
I don't know	10.38(5.12)			
Heart attack		300	0.760	0.468
Yes	10.76(5.12)			
No	11.33(4.12)			
I don't know	10.5(4.23)			
History of stroke		300	0.088	0.766
Yes	10.82(5.79)			
No	11.2(4.15)			
Number of people in the household		300	1.705	0.149
One	11.59(4.22)			
Two	11.13(4.08)			
Three	11.92(4.17)			
Four	10.8(3.96)			
Five and above	9.5(5.1)			

Df: degree of freedom; * statistically significant

Supplementary Files

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