KNOWLEDGE AND PERCEIVED SUSCEPTIBILITY TO CHRONIC KIDNEY DISEASE AMONG AUTO-MECHANICS AND ALLIED PROFESSIONALS IN BODIJA COMMUNITY OF IBADAN NORTH LOCAL GOVERNMENT AREA, NIGERIA

ABSTRACT

In Nigeria, the prevalence of Chronic Kidney Disease (CKD) is not known, but several studies, mostly hospital-based, suggest a range of 1.6 to 12.4%. Automobile materials, which contain heavy metalsare being utilized bymechanics and people in allied professions daily without

awareness of the health implications of the exposure. Therefore, this study aims to investigatethe knowledge and perceived susceptibility to chronic kidney disease among auto-mechanics and allied professionals in the Bodija Community of Ibadan North Local Government Area, Nigeria.

This study was a descriptive cross-sectional. Pretested semi-structured interviewer-administered questionnaire was administered to 209 respondents. Knowledge of chronic kidney diseases, perceived susceptibility towards chronic kidney diseases,and preventive practices were measured on 32-,14-, and 24-point scales respectively. Data were analyzedusing descriptive statistics and Fisher's exact test at a 5% level of significance.

Few (32.1%) respondents age ranged from 40 to 49 years old with amean age of 38±9.5years, 50.7% were Christians and 96.7% were Yoruba. Knowledge score was 12.9±6.4, and 71.3% had a poor knowledge. Most (82.3%) of the respondents stated that herbal supplements could be effective in treating CKD, and 34.4% mentioned high blood pressure as a cause of CKD. The perceived susceptibility score was 5.2±3.1 and 73.2% had negative perceived susceptibility to CKD. Most (89.0%) agreed that consumption of local herbs cannot predispose them to CKD. Practice score was 6.8±2.6 and 98.1% had a poor practice.

Most of the respondents had poor knowledge ofchronic kidney disease, negative perceived susceptibility, and poor preventive practices toward chronic kidney disease. A concerted effort should be made to improve the knowledge of chronic kidney disease and its preventive practices.This could lead to a change in attitude and behavior, thereby reducing the risk factors of chronic kidney disease.

Key Words: Chronic Kidney Disease. Auto-mechanics, Allied professionals

INTRODUCTION

About 10% of the world's population is affected by chronic kidney disease (Haileamlak, 2018). Atleast 2.4million deaths per year are now attributed to chronic kidney disease and hence documented as the 6th fastest-growing cause of death (Mendoza-Pittí*et al.*, 2022). In Nigeria, the prevalence of chronic kidney disease is not known, but several studies, mostly hospital-based,

suggest a range of 1.6 to 12.4% (Odubanjo *et al.*, 2011). Chronic kidney disease sufferers in Nigeria are mostly from the young or middle-aged group who make up themajority of the workforce (Okaka&Unuigbe, 2014).

Hypertension and diabetes mellitus (chronic non-communicable diseases [NCDs]) are the two major causes of CKD worldwide. Diabetes initially was not a common cause of end-stage kidney disease among Nigerians, but it is now becoming a more prominent aetiological factor (Alebiosu& Ayodele, 2006). Further studies have, however, shown the influence of heavy metals on kidney functions. The major routes of heavy metals exposure inhumans include:inhalation, ingestion, and skin absorption. All these occur in several places including mechanic workshops.

The major known risk factors for the development of chronic kidney diseases include unhealthy eating habits (Bruce *et al.*,2009), behavioral lifestyles (i.e. smoking, alcohol consumption), diabetes, hypertension, and long-term exposure to heavy metals (Orannusi, 2013). The level of exposure to heavy metals including lead from petrol leaded batteries, radiators, spray paints, and soldering wires increases the risk of developing chronic kidney diseases (Oranusi, 2013). Materials containing heavy materials are being utilized among mechanics and auto-professionalsas part of their professional consumables.Improper hand washing before eating and regular consumption of local herbs and concoctions, which may be very toxic to the body and coupled with poor health-seeking behavior (Ulasi&Ijeoma, 2010) are predominant among the auto-mechanic and allied professionals.Metallic elements that may be found in oil as a result of wear processes are mainly Al, Fe, Pb, Mn, and Ni, whereas the concentration of K and Na is mostly observed as an effect of the contamination of oil (Artur *et al.*, 2019). The total contents of Ba, Ce,Cd, Cr, Cu, Fe, Mn, Ni, Pb, V,and Zn were determined in emissions, fuels, and lubricating oils(Coufalík*et al.*, 2019).

It is usual to spot automobile workshops spread all over most cities in Nigeria. These workshops have since been recognized as a main source of pollution to the environment. Unfortunately, despite the global recognition of chronic kidney disease as a global public health epidemic, many Nigerians are still unaware of the location of the kidney, functions of the kidney, symptoms of the disease, and the causes of kidney failure (Okwuonu*et al*., 2015). Therefore, this study aims atinvestigatingthe knowledge and perceived susceptibility to chronic kidney disease among auto-mechanics and allied professionals in the Bodija Community of Ibadan North Local Government Area, Nigeria.

METHODOLOGY

Study Design

This study was a descriptive cross-sectional design that made use of a semi-structured interviewer-administered questionnaire.

Study Area

The study was carried out among theauto-mechanics and allied professionals in mechanic villages located in the Bodijacommunity of Ibadan North Local Government Area of Oyo State, Nigeria. Ibadan North Local GovernmentArea has an area of 27km^2 and a population of 306,795 at the 2006 census (Obed*et al*., 2018). The mechanic village is made up of one accredited workshop and ten non-accredited workshops.

Personal observations revealed that these individuals engaged in unhealthy use of drugs, alcohol intake, and concoctions. They are exposed to heavy metals and unhealthy dietsfrom food hawkers; hitherto, making them at high risk of non-communicable diseases, especially chronic

kidney disease. Being the largest local government area in the state, with the highest population, the recommendations emanatingfrom the study couldbe adopted by other local governmentareas in the state and the country as a whole.

Study Population

The study population consists of auto-mechanics and allied professionals in mechanic villages located in Bodijacommunity of Ibadan North Local Government Area.

Sample Size

The sample size for this study was estimated from the Leslie Kish formula for single proportion which is as follows:

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

P= Prevalence of chronic kidney disease in Olorunda, Osun State 12.3% (Chukwuonye&Oviasu, 2012)

E = Degree of accuracy set at 0.05

Z_α= Standardized value of α at 0.05 = 1.96

$$n = \frac{1.96^2 \times 0.123(1-0.123)}{0.05^2} = \frac{0.4149}{0.0025} = 165.96, approximated\ to\ 166$$

To adjust for 10% non-response rate

=166 /1-10%= 184

The total sample size was 184, which was the minimum population size that made the study

valid.

Sampling Technique

A purposive sampling technique was used for accredited auto-mechanics and allied professionals while snowballing was used for the non-accredited ones within the Bodija community of Ibadan North Local GovernmentArea. The accredited auto-mechanics are the ones who were registered under the State Government and their contact information was used to access them. The non-accredited auto-mechanics were not registered and were contacted using snowballingmethod.

Instrument for Data Collection

The quantitative method was used for data collection. This involved the use of a validatedand pre-testedsemi-structured, interviewer-administered questionnaire. The questionnaire was divided into foursections which were:Socio-demographic characteristics**,**knowledge of chronic kidney disease,perceived susceptibility of the respondents to chronic kidney disease,and practice of preventive measures against chronic kidney disease.

Validity of Instrument

There was an extensive review of the literature to ensure appropriate content and face validity. Construct validity was also ensured by making sure that variables in the specific objectives were well represented in the instrument. The instrument was also given to the project supervisor as well as some research experts in the Faculty of Public Health to help ascertain the quality of the instrument. The instrument was translated to Yoruba Language and was translated back to English to ensure that it retained its original meaning.

Reliability of Instrument

The pre-testing of this study was carried out among auto-mechanics and allied professionals at Olorunsogo, Molete, Ibadan South West Local Government, Oyo State; a similar population group. A Cronbach Alpha measurement was used to determine how reliable the instrument was and a co-efficient of 0.76 was obtained.

Data Collection Procedure

The data were collected by the researcher with the assistance of four research assistants, who were trained prior to the time of data collection. Both the benefits and the possible harms that may arise as a result of participating in the study were explained to the research participants. The informed consent forms (attached to the questionnaires) were distributed to the potential participants after they were given adequate information about the study. After the copies of the questionnairehadbeen filled, the researcher checked for completeness and errors before leaving the field.

Data Management

A coding guide was developed along with the data collection tool in order to facilitate theentry andanalysisof open-ended questions. Sorting, cleaning, and coding of data for analysis weredone. Using the coding guide, the data collected werecarefully entered into the Statistical Package for Social Science (SPSS version 21) and analysed. Descriptive analysis was done to report the mean and standard deviation for quantitative variables. The results obtained from the analysis were summarized and presented in tables and charts. Fisher exact test was used to test the hypotheses at a significance level of 0.05. Respondents' knowledge of chronic kidney diseases was measured on a 32-point knowledge scale andscores $\leq$16 was rated as poor knowledge and>16was considered as good knowledge. Respondents'perceived susceptibility was measured

on a 14-point perception scale. Perception score (PS) of ≤7 and PS of >7was rated as negative and positive, respectively. A 24–point scale was used to measure practices of preventive actions against kidney disease, where a scoreof ≤12represented poor preventive actionsand a score >12 represented good preventive actionsagainst kidney diseases.

RESULT

Socio-Demographic Characteristics

Few(32.1%) of the respondents ages ranged from 40 to 49 years old with the mean age of 38±9.5years, 50.7% were Christians and 96.7% were Yoruba. Many (58.4%) of the respondents were allied professionals.Below average (41.6%) of the respondents were auto mechanicsand the highest level of the education of 52.2% was secondary school. Majority(77.0%) of the respondents were married and many (53.6%) were in a monogamous marital union (Table 1)**.**

Table 2 shows the awareness of previous cases of chronic kidney disease. None (0.0%) of the respondentswasaware of any worker who had died of chronic kidney disease, 97.6% had never gone for medical screening in any hospital for chronic kidney disease, and96.2% werewilling to check the condition of their kidneys.

Table 1 Socio-Demographic Characteristics of Respondents (n= 209)

Socio-Demographic Characteristics	Frequency	Percent (%)
Age		
20-29 years	55	26.3
30-39 years	54	25.8
40-49 years	67	32.1
50-59 years	31	14.8
60 years and above	2	1.0
Mean – 38±9.5years		
Gender		
Male	208	99.5
Female	1	0.5
Ethnicity		
Yoruba	202	96.7
Igbo	7	3.3
Religion		
Christianity	106	50.7
Islam	90	43.1
Traditional	13	6.2
Occupation		
Auto Mechanics	87	41.6
Allied Professionals	122	58.4
Level of Education		
Primary	81	38.8
Secondary	109	52.2

Tertiary	3	1.4
No Education	16	7.6
Marital Status		
Single	25	12.0
Married	161	77.0
Divorced	15	7.2
Widowed	4	1.9
Separated	4	1.9
Marital Union		
Monogamous	112	53.6
Polygamous	49	23.4

Table 2Previous Cases of Chronic Kidney Disease (n=209)

	Frequency	Percent (%)
Number of deaths in the past five years due to any cause		
3	5	2.4
4	31	14.8
Don't Know	173	82.8
Causes of Death		
Accident	1	2.8
Sickness	2	5.6
Sudden Death	5	13.9
I don't know	28	77.8
Awareness of any worker who died of CKD		
Yes	0	0.0
No	209	100.0
Awareness of media to monitor the health of kidney		
Yes	5	2.4
No	204	97.6
Ever gone for CKD screening in a hospital before		

Yes	5	2.4
No	204	97.6
Willingness to check the condition of the kidney		
Yes	201	96.2
No	8	3.8

4.2 Knowledge of Chronic Kidney Disease

The mean knowledge score for chronic kidney disease was12.9±6.4. The majority(71.3%) of the respondents had poor knowledge (Fig 1). Most (83.9%) of the respondents knew chronic kidney disease to be the failure of the kidney,and 34.4% mentioned high blood pressure as a cause of chronic kidney disease.Few (13.3%) of the respondents said that increased fatigue is a symptom of chronic kidney disease. Some (40.2%) of the respondents agreed that preventing CKD is by keeping blood pressure under control and keeping weight under control while 34.0% said it is by keeping blood sugar level under control. Most (81.8%) of the respondents knew that taking prescribed medication is a way of managing chronic kidney disease (Table 3). Most (82.3%) of the respondents agreed that herbal supplements can be effective in treating CKD (Table 3).

Table 3 Knowledge of Chronic Kidney Disease (n=209)

	Frequency	Percent (%)
Definition of Chronic Kidney Disease (n=56)		
Failure of the kidney	47	83.9
Inability to urinate	15	26.8
A disease of the kidney	24	42.9
Impaired kidney function	9	16.1
It is a disease caused by alcohol intake andeating unhealthy foods	6	10.7
The stone inside the kidney	1	1.8
When someone can't see well	4	7.1
Causes of Chronic Kidney Disease (n=127)		
High blood pressure	72	34.4
Diabetes	55	26.3
Symptoms of Chronic Kidney Disease (n=188)		
Body parts become swollen	89	47.3
Increased Fatigue	25	13.3
Malaise	16	8.5
Difficulty urinating	14	7.5
Paralysis	11	5.9
Weight loss	9	4.8
Bloody urine	6	3.2

Shortness of breath	6	3.2
Loss of appetite	4	2.1
Erectile dysfunction	3	1.6
Others	5	2.7
Herbal supplements can be effective in treating chronic kidney disease		
Yes	172	82.3
No	37	17.7
Can orthodox drug help to slow down the worsening of chronic kidney disease		
Yes	164	78.5
No	45	21.5
Ways of preventing chronic kidney disease		
Keeping blood pressure level under control	84	40.2
Keeping weight under control	84	40.2
Keeping blood sugar level under control	71	34.0
Proper washing of hands	65	31.1
No Mouth sucking of petrol	48	23.0
Regular cutting of nails	48	23.0
Ways of managing chronic kidney disease		
Taking prescribed medication	171	81.8
Control blood pressure	72	34.4
Control blood glucose level	59	28.2

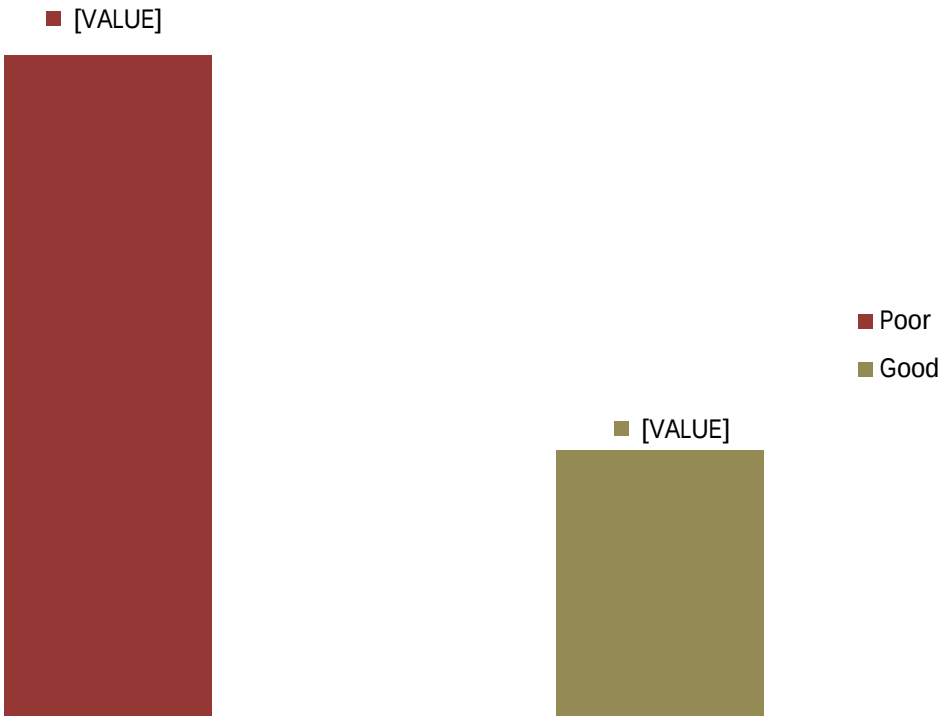

Figure 1 : Level of Knowledge of Chronic Kidney Disease

Perceived Susceptibility to Chronic Kidney Disease

The mean perceived susceptibility score was 5.2±3.1. The majority(73.2%) of the respondents had negative perceived susceptibility to chronic kidney disease (Fig 2). The Majority(89.0%) of the respondents agreed that consumption of local herbs cannot predispose them to CKD and25.4% of the respondents disagreed that long term exposure to car batteriesand gasoline cannot make them have CKD. The majority(64.1%) of the respondents disagreed that

consumption of alcohol makes them active, 57.9% agreed that CKD is caused by witches, and 54.1% disagreed that only very rich people are at risk of having CKD. Few (24.4%) disagreed that hand washing has no relationship with CKD and the majority(77.5%) of the respondents agreed that drinking alcohol cannot predispose them to CKD (Table 4).

Table 4 Perceived Susceptibility to Chronic Kidney Disease

Statements	**Agree** **n (%)**	**Disagree** **n (%)**
Consumption of Local herbs cannot predispose me to CKD	186 (89.0)	23 (11.0)
Long term exposure to car batteriesand gasoline cannot make me have CKD	156 (74.6)	53 (25.4)
Consumption of alcohol makes me active	75 (35.9)	134 (64.1)
Chronic disease is caused by witches	88(42.1)	121 (57.9)
Only very rich people are at risk of having CKD	96 (45.9)	113 (54.1)
Hand washing has no relationship with CKD	158 (75.6)	51 (24.4)
Drinking alcohol cannot predispose me to CKD	162 (77.5)	47 (22.5)

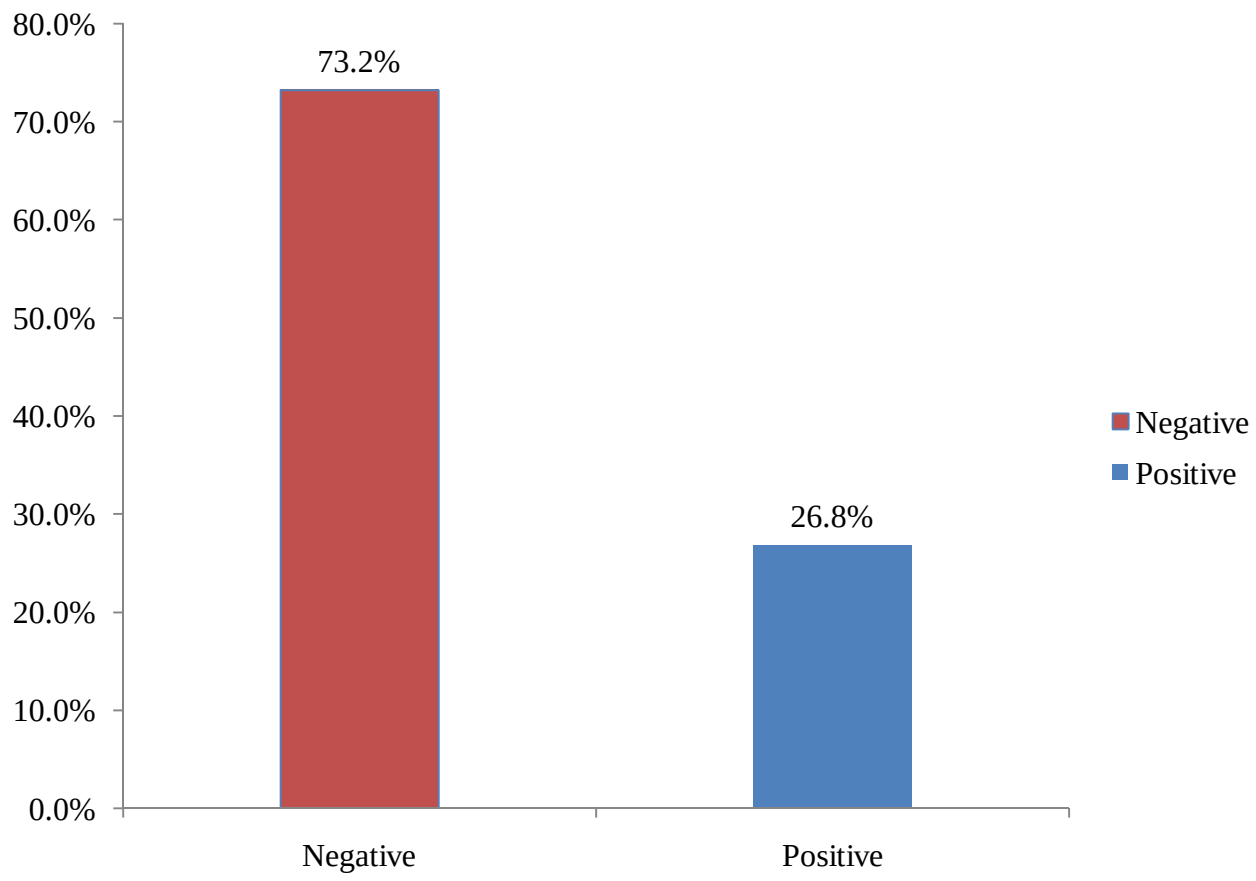

Figure 2: Perceived Susceptibility to Chronic Kidney Disease

Practice of Preventive Measures Against Chronic Kidney Disease

Respondents had a mean practice score of 6.8±2.6 and almost all (98.1%) of the respondents had poor practice (Fig 3). The majority(70.8%) of the respondents reduced the level of stress faced every day, many (52.6%) exercised regularly, few (27.3%) didnot smoke, and 24.9% had never consumed alcohol. Few (2.4%) washed hands with soap under running water before eating and 3.8% of the respondents washed hands with soap under running water after eating, and just 1.0% wore gloves and nose mask while using lead-containing materials/substances (Table 5).

Table 5 Practice of Preventive Measures Against Chronic Kidney Disease (n=209)

Statements	Frequency	Percent (%)
Check body weight regularly in a hospital	15	7.2
Exercise regularly	110	52.6
Check blood pressure in a hospital regularly	24	11.5
Reduce the level of stress faced every day	148	70.8
Check blood sugar level in a hospital regularly	22	10.5
Wash hands with soap under running water before eating	5	2.4
Wash hands with soap under running water after eating	8	3.8
Does not smoke	57	27.3
Never consumed alcohol	52	24.9
Stopped alcohol consumption	33	15.8
Wear gloves and nose mask while using lead-containing materials/substances	2	1.0

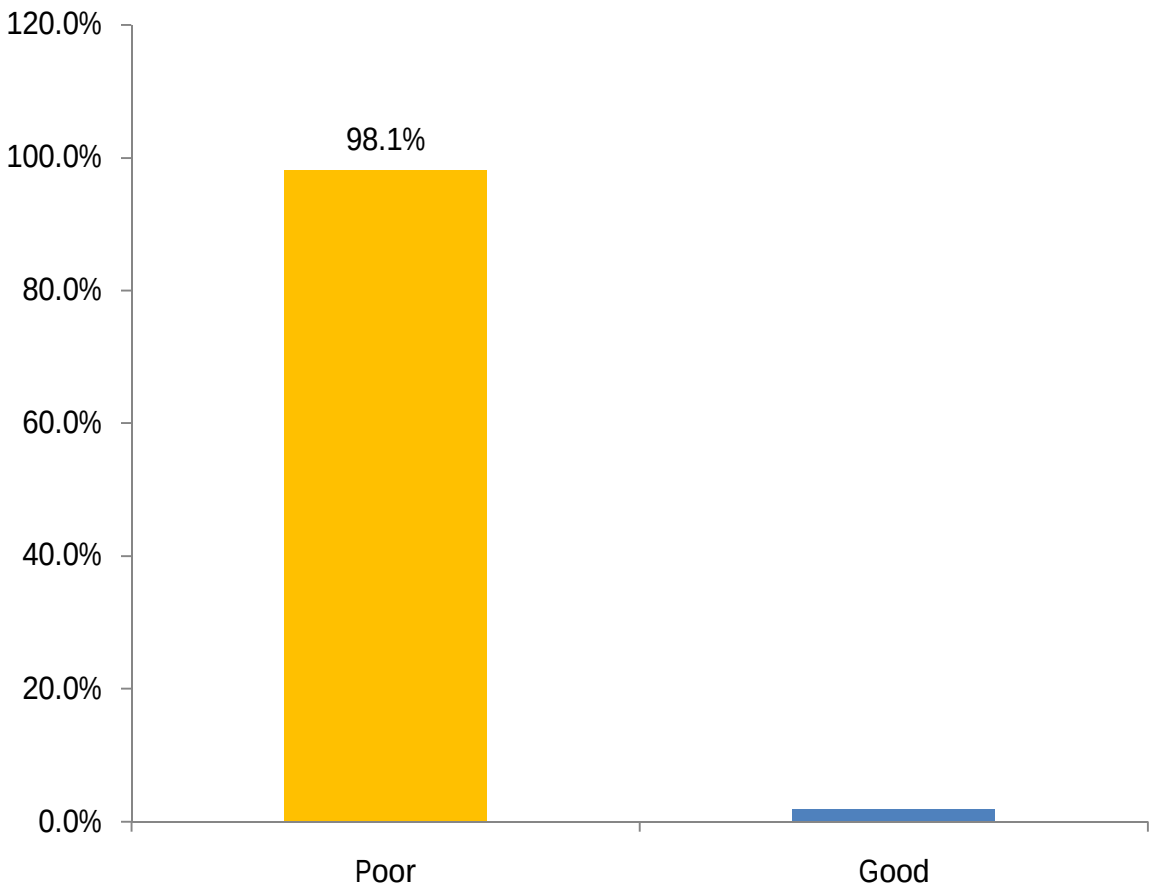

Fig3: Practice of Preventive Measures Against Chronic Kidney Disease

AssociationBetween Perceived Susceptibility to Chronic Kidney Disease and Preventive Measures of Chronic Kidney Diseases

Fisher's exact analysis showed a significant association between the respondents' perceived susceptibility to chronic kidney disease and preventive measures of chronic kidney disease.This suggests that the hypothesis is false and is therefore rejected.

Table 6:Association Between Perceived Susceptibility to Chronic Kidney Disease and Preventive Measures of Chronic Kidney Diseases

Perceived Susceptibility to Chronic Kidney Disease	**Preventive Measures forChronic Kidney Diseases**				
	Poor	**Good**	**df**	**Fisher's Exact**	**p-value**
Negative	153 (100.0%)	0 (0.0%)	1	11.142	0.001
Positive	52 (92.9%)	4 (7.1%)			

DISCUSSION

Almost all of the respondents were men. This supports AutoMechanic Edu (2018) opinion on the auto-mechanic field that it is dominated by men with few women developing a career in the field of recent. None of the respondents was aware of the worker who had died of chronic kidney disease,even though some auto mechanics and allied professionals could have died of chronic kidney disease. Almost all of the respondents had never gone for screening in any hospital for chronic kidney disease and this could be because just a few of them were aware of death cases

due to the disease, which could have prompted them to get screened forthe disease. It could also be because of poor awareness and poorknowledge ofchronic kidney disease, religious factors, cultural factors, access to chronic kidney screening services, and insufficient funds to access the services (Umeukeje*et al.*, 2018). In a study conducted in New South Wales, Australia, it was revealed that the financial capacity of the respondents was a major barrier to utilizing CKD screening provided by the hospital (Sinclair*et al.*, 2017).

Most of the respondents had poor knowledge of chronic kidney disease. This is similar to studies conducted in Tanzania, India, Australia, Hong Kong, and Iran, where it was reported that the level of knowledge of chronic kidney disease was poor among most of the study respondents (Stanifer*et al.*,2016; Gheewala*et al.*, 2018; Hussain*et al.*, 2019; Chow *et al.*, 2012; Roomizadeh*et al.*,2014). A study conducted in Nigeria is also in line with the study finding with just 27.1% of the respondents with good knowledge of chronic kidney disease (Oluyombo*et al.*, 2016). Some people's knowledge on chronic kidney disease could be due to poor health education and health awareness of the disease. According to Muhammad and Sen (2014), many people who are diagnosed with the disease do not have the opportunity or the platform to raise awareness about the condition because there are no proper structures or platforms for such awareness campaigns.

Improving the knowledge of the public on chronic kidney disease is one of the key factors that will reduce the prevalence of chronic disease (Clarke *et al.*, 2016). According to Spry (2008), promoting the national public health awareness programs can, therefore, be an effective way to create awareness and encourage people to seek medical screening and early intervention.

Most of the respondents had negative perceived susceptibility to chronic kidney disease. This is similar to a study by Boulware *et al.* (2009), where most did not feel susceptible to chronic

kidney disease. The majority of the respondents agreed that the consumption of local herbs cannot predispose them to CKD. This could be due to the perception of the healing benefits of herbs without having any side effects. One-fourth of the respondents disagreed that long term exposure to car batteriesand gasoline cannot make them have CKD. The respondents might have this perception because they are exposed to car batteriesand gasoline almost every day and might not have had any signs or symptoms that could be traced to the use of these materials.

Almost all of the respondents had a poor practice of preventive measures. This could be a result of theirpoor perceived susceptibility to chronic kidney disease. The hypothesis revealed that there was an association between respondents' poorperceived susceptibility and practice of preventive measures of CKD. This shows that their level of perceived susceptibility has a role to play intheir preventive measures. Therefore, interventions targeting the auto-mobiles and allied professionals' perception should be given attention to so as to promote preventive measures of chronic kidney disease among the population.

Most of the respondents had poor knowledge ofchronic kidney disease and most of the respondents had negative perceived susceptibility and poor preventive practice towards chronic kidney disease. A concerted effort should therefore be made to improve the knowledge ofchronic kidney disease and its preventive practices, which would therefore lead to a change in attitude and behaviour thereby reducing the risk factors of chronic kidney disease and ultimately reducing the burden of chronic kidney disease.

CONCLUSION

Concerted effort should ensure that stakeholders within the medical community and the government adopts community campaigns as done for communicable diseases like HIV/AIDS and Malaria to promote awareness about chronic kidney diseases.Furthermore, policies should also be made to promote the use of personal protective equipment (PPEs) and adequate monitoring be put in place to ensure adherence.

Ethical Approval and consent

Ethical approval was obtained from the Oyo State Ethical Review Committee at the Ministry of Health, Oyo State(REF NO.AD 13/479/1513). Informed consent was obtainedfrom all respondents before administering the questionnaire. They were informed that participation is voluntary and they would not suffer any consequences if they choose not to participate. The nature of the study, benefits, and objectives wereexplained to the respondents and they were assured that the information given would be treated with the utmost confidentiality. Respondents were intimated about the opportunity to withdraw their consent freely at any point during the study. The confidentiality of each participant was maximally maintained during and after the collection of their information. Information gathered from the respondents was stored in the computer for analysis by the researcher while copies of the filled questionnairewere kept for maximum safety.

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