



Original Article

## Impact of Tobacco Use in the Etiology of Chronic Renal Failure among Sudanese Patients

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### ABSTRACT

*Article history:*

Received 1 January 2022

Accepted 31 March 2022

Available online 30 April 2022

<https://doi.org/10.47723/kcmj.v18i1.786>

**Keywords:** Chronic renal failure, tobacco, Sudan, educational level.



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*Background:* Chronic renal failure (CRF) is a clinical syndrome that occurs when there is gradual decline in renal operation overtime.

*Objective:* This study aims to investigate the prevalence of depression among medical students at university of Baghdad, college of medicine in Iraq and the association between some variables and depression.

*Aim:* This study aimed to identify the impact of tobacco use in the etiology of chronic renal failure among Sudanese patients in Omdurman Military Hospital and Omdurman Kidney Dialysis Center

*Materials and methods:* This descriptive community-based study was conducted in Khartoum State. A random sample of 100 cases with chronic renal failure and 100 control subjects were selected. Demographic, socioeconomic characteristics, prevalence of tobacco use among the respondents and incidence of acute and chronic illnesses associated with renal failure were statically tested to find its correlation to renal failure

*Results:* Findings showed that there was no significant statistical association between educational level and occupational status, to chronic renal failure (P-value > 0.05). Use of tobacco including cigarettes, snuff and water pipe, indicated significant association (P-value ≤ 0.05).

*Conclusion:* From the above findings the followings could be concluded that educational level showed significant statistical correlation to chronic renal failure. Use of tobacco (smoking, snuff and water pipe) is one of the most important remediable renal risk factors. Further studies focusing on controlled information on the success of a modern smoking cessation strategy in renal patients is highly recommended.

## Introduction

The first stage Chronic renal failure (CRF) is marked by a period of silent deterioration in renal status, kidney function decrease, but blood urea nitrogen (BUN) and creatinine values stay within normal limits. The second stage is characterized by development of a slight renal insufficiency. A 50% reduction in normal functioning is necessary before BUN and creatinine values are reflect the pathologic changes by increasing above reference ranges. The third stage is typified by impending renal failure. Anemia begins to develop (due to the constant deficient in erythropoietin production) and systemic acidosis commences (due to the faulty clearance of endogenous metabolic acids). The fourth and the last stage commences with the onset of the classic symptoms of the uremic syndrome. The conditions that can participate in ARF also may lead to CRF. Several factors were identified as causative agents for CRF (1).

A study conducted by Abboud et al, (2) showed that in 20 patients with CRF in Soba University Hospital, etiology was not determined because of late presentation to hospital, accordingly they concluded that etiology of CRF in Sudan greatly differ from that of developing countries. The main differences were in the renal calculi, which, although being the second commonest cause of CRF in the Sudan, were rare in European countries. Also Aboud et al, (2) reported that diabetes mellitus was the much commoner cause of CRF in Sudan than Europe, while other etiological factors were similar.

The renal failure is one of the most common problems in Sudan among both males and females. It is fatal disease so that this study runs to find out the negative impacts of tobacco use on renal function, by study the effect of this bad habit in patients with chronic renal failure.

This study aimed to identify the impact of tobacco use in the etiology of chronic renal failure among Sudanese patients.

## Materials and Methods

### Study area: -

Omdurman Military Hospital and Omdurman Center for Kidney Dialysis.

### Study design:

This was descriptive cross-sectional study.

### Ethical consideration:

The aims of this study were fully explained to the respondents and their consent to participate in this study was obtained verbally. The results showed and discussed with the respondents.

An official letter was taken from Ahfad University to approach the directors of both Omdurman Military Hospital and Omdurman Center for Kidney Dialysis for permission to conduct this study.

### Study population:

The study population consisted of the test group and control group of Sudanese males and females.

### Sample size

Questionnaires were filled with two hundred (200) participants, divided equally among control and test group. The control group consisted of hundred (100) healthy Sudanese males and females with

no signs and symptoms of renal failure, while the test group consisted of hundred (100) Sudanese patients diagnosed with renal failure.

### Data collection methods

Primary data were collected using questionnaires. Secondary data were obtained from relevant topics in both published and unpublished works including books, reports, previous studies, periodicals and Internet.

### Questionnaire

A structured questionnaire designed to obtain personal information, usage of tobacco by respondents, causes of renal failure, was administered to all the respondents.

### Data Management and Analysis

The primary data from questionnaires were analyzed using Statistical Packages for Social Sciences (SPSS). Risk factors data were compared between test and control groups by using chi square test. Frequency distributions were used to present the data of the two groups. Data will be presented in tables and figures.

## Results

**Table 1:** Distribution of occupation of respondents

Group	Occupation	Frequency	Percent
Control	Student	30	30.0
	Labor	18	18.0
	Policeman	10	10.0
	Employee	9	9.0
	Farmer	1	1.0
	Businessman	12	12.0
	Housewives	2	2.0
	Teacher	5	5.0
	Doctor	1	1.0
	Technician	4	4.0
	Labor	1	1.0
	Driver	5	5.0
	Without work	1	1.0
	Lawyer	1	1.0
Total	100	100.0	
Case	Student	26	26.0
	Labor	18	18.0
	Policeman	2	2.0
	Employee	8	8.0
	Farmer	1	1.0
	Businessman	15	15.0
	Housewives	3	3.0
	Teacher	3	3.0
	Doctor	2	2.0
	Technician	6	6.0
Driver	2	2.0	
Lawyer	6	6.0	
Without work	8	8.0	
Total	100	100.0	

Occupational status as shown in table (1) showed no clear differences among cases and control, where the highest parentage of both control (30%) and cases (26%) were students, and labors scored the same percentage (18%) among both of the studied groups. Other

occupation showed low parentages ranged between 1-15 % with no clear variations between cases and control subjects.

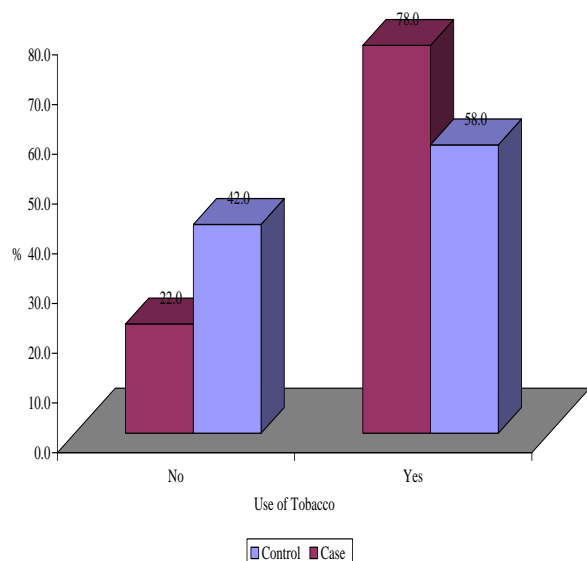
Statistical test for association between occupation and chronic renal failure among the respondents indicated no significant association ( $P \geq 0.05$ , at 95% confidence).

**Table 2:** Level of education of respondents

Group	Level of education	Frequency	Percent
Control	Basic	15	15.0
	Secondary	33	33.0
	University	45	45.0
	Post graduate	4	4.0
	Illiterate	3	3.0
	Total	100	100.0
Case	Basic	15	15.0
	Secondary	27	27.0
	University	48	48.0
	Post graduate	4	4.0
	Illiterate	6	6.0
	Total	100	100.0

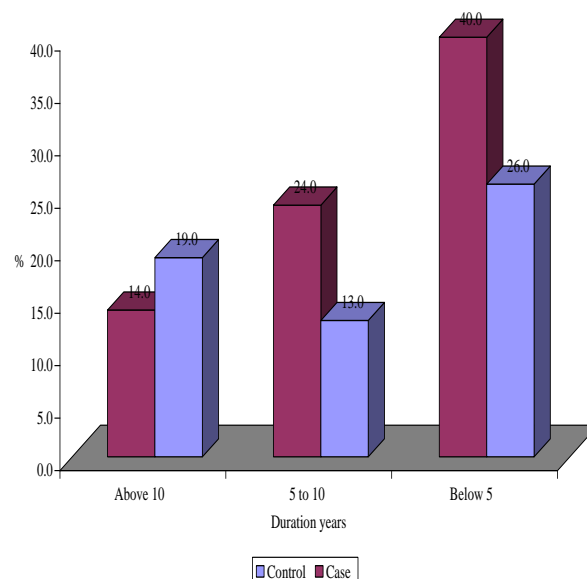
The commoner educational level among both control and case subjects was university level (45%) for control and (48%) for cases, followed by secondary level which was mentioned by 33% of the control in contrast to 27% of the cases, 15% of both control and cases have basic level of education, 3% of control were illiterate in contrast to 6% of cases.

No significant statistical association between chronic renal failure and educational level of the respondents ( $P \geq 0.05$ , at 95% confidence).



**Figure.1:** Use of tobacco by respondents

According to the above figure, use of tobacco was more common among the cases (78%) than control subjects (58%). This showed significant statistical association between use of tobacco and chronic renal failure among the respondents ( $P \leq 0.05$ , at 95% confidence).



**Figure. 2:** Duration of tobacco used by respondents

As shown in Figure (2) duration of using tobacco among the respondents showed significant statistical association with renal failure ( $P \leq 0.05$ , at 95% confidence), where the cases who use tobacco for 5 – 10 years (24%) were more than control who used tobacco for the same duration.

**Table 3:** Type of tobacco used by respondents

Group	Type of tobacco used	Frequency	Percent
Control	Cigarette	22	22.0
	Snuff	2	2.0
	Water pipe(shisha)	9	9.0
	Cigarette and snuff	8	8.0
	Cigarette and water pipe(shisha)	12	12.0
	Snuff and water pipe(shisha)	1	1.0
	All types	4	4.0
	Total	58	58.0
Case	Cigarette	33	33.0
	Snuff	2	2.0
	Water pipe(shisha)	15	15.0
	Cigarette and snuff	8	8.0
	Cigarette and water pipe(shisha)	7	7.0
	All types	13	13.0
	Total	78	78.0

The frequency of depressed participants is 238 (73.7%) while that of the non-depressed (minimal depression) participants is 85 (26.3%). The prevalence of depression among males was  $68/108 = 0.629$  (62.9%) while that of females was  $170/215 = 0.79$  (79%). The prevalence of non-depressed among males was  $40/108 = 0.37$  (37%) while that of females was  $45/215 = 0.209$  (20.9%).

Distribution of the respondents according to type of tobacco used as indicated in table (3) showed clear variations among case and control subjects. Use of cigarette was more common among cases (33%) than among control (22%), also the use of water pipe (shisha) was found among (15%) of cases versus (9%) of control. Use of all types of tobacco was clearly varied among both groups, where (13%) of cases used all types of tobacco in contrast to only (4%) of the control.

Statistical test showed significant association between the type of tobacco used and chronic renal failure ( $P \leq 0.05$ , at 95% confidence).

**Table 4:** Health problems complained by the respondents due to tobacco use and its association with renal failure

Group	Disadvantages of tobacco use	Frequency	Percent
Control	Hypertension	5	5.0
	Kidney stones	10	10.0
	Diabetes	3	3.0
	Heart diseases	2	2.0
	Urinary tract infections	11	11.0
	None	69	69.0
	Total	100	100.0
Case	Hypertension	40	40.0
	Kidney stones	20	20.0
	Diabetes	18	18.0
	Heart diseases	12	12.0
	Urinary tract infections	10	10.0
	Total	100	100.0

The above table indicated clear variation among control and cases with regard to certain chronic diseases associated with renal failure and use of tobacco, while (40%) of the cases were hypertensive, only (5%) of the control group in the same category, kidney stones was common among (20%) of cases versus (10%) of the control, diabetic cases were (18%) of cases compared to (3%) of the control subjects, and the other complications showed the same ratios. There was significant statistical association between prevalence of certain chronic diseases and chronic renal failure among the respondents ( $P \leq 0.05$  at 95% confidence).

## Discussion

Demographic and socioeconomic characteristics of the respondents were statistically tested and correlated to case and control subjects.

Occupational status showed no clear differences among cases and control, where the highest parentage of both control (30%) and cases (26%) were students, and labors scored the same percentage (18%) among both of the studied groups. Other occupation showed low parentages ranged between 1-15 % with no clear variations between cases and control subjects. Statistical test for association between occupation and chronic renal failure among the respondents indicated no significant association ( $P$ - value  $\geq 0.05$ , at 95% confidence).

Educational level showed no significant statistical association with chronic renal failure ( $P$ -value  $\geq 0.05$ ). Murthy and Matthew, (3)

said that (Low economic status is recognized as a risk factor of many health problems, particularly in low resource settings, people with low socioeconomic status often have limited income, restricted access to health care services, poor nutrition, and a low level of awareness about health issues and preventive behavior. All of these factors can make them more vulnerable to illness and preventable diseases). Results agreed with Kabbalo, et al., (4).

Smoking and other types of tobacco use among the respondents were investigated. The findings showed that, use of tobacco was more common among the cases (78%) than control subjects (58%), in addition the average use rate of tobacco per day was found to be more common among the case subjects than control, for a period ranged between 5 – 10 years for different types of tobacco including cigarettes, snuff and water pipe, which indicates significant association between use of tobacco and chronic renal failure among the respondents ( $P$ - value  $\leq 0.05$ ), findings supported by reports of Janssen et al., (5), Pinto et al., (6) and Whelton et al., (7)

Incidence of chronic diseases associated with chronic renal failure were tested among both, the case and control subjects. Findings indicated clear variation among control and cases with regard to certain chronic diseases associated with renal failure and use of tobacco, while (40%) of the cases were hypertensive, only (5%) of the control in the same category, kidney stones was common among (20%) of cases versus (10%) of the control, diabetic cases were (18%) compared to (3%) of the control subjects, and the other complications showed the same ratios. There was a significant statistical association between prevalence of certain chronic diseases and chronic renal failure among the respondents ( $P$ -value  $\leq 0.05$ ).

Studies showed clear evidence of association between renal failure and certain chronic diseases, such as reports of Wachtell et al, (8) and Stengel et al., (9).

A previous study by Lee et al., concluded that findings suggest potentially harmful effects of the degree of exposure to smoking on the progression of chronic kidney disease (10).

Boggia et al., reported that smoking cessation slows the progression of kidney disease in smokers should drive our effort to help our patients quit smoking. Smoking prevention at the population level and particularly in those at risk of chronic kidney disease or with established chronic kidney disease should be part of health policies and regulations all around the world (11).

Smoking is associated with a greater risk of end-stage kidney disease; the risk increases with an increase in the smoking duration, number of cigarettes smoked daily, and pack-years (12).

Smoking significantly increased the risk for new-onset of chronic kidney disease based on proteinuria development in population without chronic kidney disease, and the association was more predominant in the younger population (13).

## Conclusion

From the above findings the followings could be concluded that educational level showed significant statistical correlation to chronic renal failure. Use of tobacco (smoking, snuff and water pipe) is one of the most important remediable renal risk factors. It has a negative impact on renal function even in subjects without apparent renal disease, which presumably may have dramatic socioeconomic consequences.

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**To cite this article:** Idris A, Mohammed H, Osman M. Impact of Tobacco Use in the Etiology of Chronic Renal Failure Among Sudanese Patients. *Al-Kindy College Medical Journal*. 2022;18(1):13-17.