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Knowledge about Chronic Kidney Disease among Patients with Diabetes and Hypertension in a Hospital

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ABSTRACT

Background: Patients with diabetes and hypertension have a high risk of early progression to chronic kidney disease which results poor patient outcomes and high treatment costs. Patients' awareness on complications of diabetes and hypertension enables them adopt healthy life style and good treatment adherence thus prevent the chronic kidney disease. The objective of this study was to assess the knowledge of chronic kidney disease and find the association of knowledge and sociodemographic variables among patients with diabetes and hypertension.

Methods: It was a descriptive cross-sectional study conducted in Outpatient Department of a community hospital, Kapilvastu, among 95 patients with diabetes and hypertension. Purposive sampling technique was used to select the patients. Data was collected through face-to-face interviews with a structured interview questionnaire. Collected data was entered in SPSS and analysed using descriptive and inferential statistics.

Results: The study result found that 43.2% of respondents had a high level of knowledge 40.0% had moderate level of knowledge, and 16.8% had a low level of knowledge regarding chronic kidney disease.

Conclusions: Based on the findings of the study, more than half of the respondents have a moderate to low level of knowledge on prevention of chronic kidney disease. Awareness-raising programs need to be conducted regularly to delay the progression and prevention of chronic kidney disease for patients who have diabetes and hypertension.

Keywords: *Chronic kidney disease, Diabetes mellitus, Hypertension, Knowledge*

INTRODUCTION

Chronic kidney disease (CKD) is a progressive loss of kidney function occurring over several months to years. There is an alarming rise of CKD prevalence globally associated with significant morbidity and mortality, necessitating special attention as one of the growing public health problems.[1] According to a study on the global burden of disease in 2017, CKD was the 12th leading cause of death worldwide.[2] The prevalence of CKD in the general population is 13.4% globally.[3] In the context of Nepal, the prevalence of CKD is 10.6%.[4] however another study shows 6%.[5]

Diabetes Mellitus (DM) is the leading cause of CKD and end stage renal disease (ESRD) worldwide. About 30% to 40% of those with diabetes eventually will suffer from kidney failure.[6] Studies from Nepal found 86.6% CKD prevalence in diabetes patients [7] and diabetes and hypertension as risk factors for CKD. Hypertension is the second major cause of ESRD besides DM.[8] Patients with hypertension had a far greater prevalence of CKD (26%) compared to those without the disease (8%).[6]

Assessment of knowledge, attitudes, and practices could be an early step forward to determine the extent to which an individual can follow healthy behaviors. Screening clinical indicators of renal dysfunction is fundamental for the early detection of patients at risk for CKD. Moreover, it is also imperative to increase patients' awareness to modify their lifestyle toward preventing the occurrence of the disease. Early screening and population education regarding CKD positively affect patients' understanding of CKD and treatment outcomes. [1] The objective of this study was to assess the knowledge of chronic kidney disease and find the association of knowledge and sociodemographic variables among patients with diabetes and hypertension.

METHODS

This was a descriptive cross-sectional study conducted among the patients with diabetes and hypertension who visited the Outpatient Department (OPD) in Sanjivani Community Hospital in Shivraj Municipality, Kapilvastu, Lumbini Province, Nepal. The hospital was selected as per the feasibility of the researcher. Non-probability purposive sampling technique was used to select the subjects. The total sample of the study was calculated by using standard Cochran's formula:-

$$(n) = \frac{Z^2_x p_x q}{L^2}$$

Total calculated sample size was 95.

Research proposal approval was obtained from the Research Department of Maharajgunj Nursing Campus and ethical approval was taken from Institutional Review Committee (209[6-11] E2 078/079), Institute of Medicine. Administrative approval was obtained from the hospital authority to collect the data. Informed written consent was taken from the respondents after explaining the study's purpose. Data was collected through face-to-face interview from August to September 2021 using the structured Nepali version questionnaire at OPD when they came for doctor check-ups at their convenience time. Approximately 20-25 minutes took to interview each respondent.

Patients diagnosed either hypertension and or DM for at least 1 year by the physician, age 20 years and above, both male and female, who were willing to participate were included in the study. Patients who had already been diagnosed with CKD and who were not physically and mentally able to give information were excluded from the study. Content validity of the instrument was established by consultation with a research advisor & expert in kidney disease. The research instrument was formulated in English language and translated to the Nepali language then again back-translated to English. It was consulted with a bi-lingual expert to preserve the similar meaning.

Data was checked for completeness, coded, and entered in Statistical Package for Social Science (SPSS- Version 26). Data was analyzed using descriptive statistics to calculate frequency, percent, mean, and standard deviation, and inferential statistics (Chi-square) measure the association between knowledge of chronic kidney disease and selected variables. The obtained score of knowledge was transferred to percent and was categorized as high level of knowledge (≥ 65%), moderate level of knowledge (40-64%), and low level of knowledge (<39%)

RESULTS

Table 1: Socio-demographic characteristics of the respondents n=95

Characteristics	Number	Percent
Age (in completed years)		
20-39	8	8.4
40-59	58	61.1
>60	29	30.5
Mean±SD =54.28 ±12.51		
Sex		
Male	60	63.2
Female	35	36.8
Ethnicity		
Brahmin/Chhetri	40	42.1
Janajati	25	26.3
Dalit	16	16.8
Madhesi	13	13.7
Shahi/Thakuri	1	1.1
Religion		
Hindu	84	84.4
Buddhist	5	5.3
Christian	3	3.2
Islam	3	3.2
Marital status		
Married	83	87.4
Unmarried	1	1.1
Widow/Widower	11	11.6
Educational status		
Cannot read and write	23	24.2
Can read and write	19	20.0
Primary	21	22.1
Secondary	14	14.7
Higher secondary	6	6.3
Bachelor and above	12	12.6
Occupation		
Agriculture	24	25.3
Business	21	22.1
Homemaker	14	14.7
Government service	10	10.5
Previously worked in abroad	10	10.5
Daily wage worker	8	8.4
Private service	8	8.4
Economic status		
Sufficient income for 6 months	8	8.4
Sufficient income for 6-12 months	36	37.9
Sufficient income for more than 12 months	51	53.7

Table 1 presents the socio-demographic information of the respondents. Among 95 respondents, nearly two-thirds of respondents (61.1%) were in the age group of 40-59 years with a mean age of 54.28 years and a standard deviation of 12.51. Two-thirds of the respondents (63.2%) were male, 87.4% were married, 42.1% were Brahmin, 84.4% followed Hinduism and about one-fourth of respondents (24.2%) were illiterate, 25.3% were engaged in agriculture, more than half of respondents (53.7%) had sufficient income for more than 12 months.

Table 2: Clinical characteristics of the respondents n=95

Characteristics	Number	Percent
Diagnosis of HTN or DM		
1 year	19	20.0
2-5 years	52	54.7
6-10 years	21	22.1
>10 years	3	3.2
Other disease apart from DM/HTN		
Yes	17	17.9
No	78	82.1
Other diseases (n=17)		
High cholesterol	4	23.5
Gout	4	23.5
Arthritis	3	17.7
Heart disease	3	17.7
Hypothyroidism	3	17.7
Family history of DM/HTN		
Yes	39	41.1
No	56	58.9
Relationship with them (n=39)		
Father	11	28.2
Mother	13	33.3
Grand father	3	7.7
Grand mother	2	5.1
Brother	4	10.3
Relatives	6	15.4
Health person ever talked about the risk of developing CKD		
Yes	49	51.6
No	46	48.4
Ever been tested for kidney function		
Yes	34	35.8
No	61	64.2
Test for* (n=34)		
Blood	34	100.0
Urine	9	26.5
Ultrasound	7	20.6

**Multiple responses*

Table 2 depicts that more than half of respondents (54.7%) had been diagnosed of diabetes or hypertension since 2-5 years, followed by (22.1%) since 6-10 years. Apart from diabetes or hypertension, 17.9% of respondents had other comorbidities such as high cholesterol, gout, arthritis, heart disease, and hypothyroidism. Less than half (41.1%) had a family history of diabetes and or hypertension. Almost half of the respondents (51.6%) mentioned that the health person talked to them about the risk of developing CKD. Among 95 respondents only 34 (35.8%) tested for kidney function where all of them tested for blood.

Table 3: Respondents' knowledge regarding CKD n=95

Variables	Number	Percent
Function of kidney		
Filter waste product #	74	77.9
Test for measuring kidney function*		
Blood test	71	74.7
Ultrasound	49	51.6
Urine test	45	47.4
Blood pressure	30	31.6
Meaning of CKD		
Reduction of kidney's ability to filter #	50	52.6
Causes of CKD *		
High blood pressure	77	81.1
Diabetes mellitus	76	80.0
Recurrent kidney infection	74	77.9
Genetic disorder	37	38.9
Urinary infection	34	35.8
Signs and symptoms of early stage of CKD		
Asymptomatic until advance #	19	20

*#Correct response *Multiple responses*

Table 3 depicts that more than three-fourths of the respondents (77.9%) knew the function of the kidney is to filter the waste products from blood. Regarding tests for measuring kidney function about three-fourths of the respondents (74.7%) said blood tests and more than half (51.6%) said ultrasound. More than half of the respondents (52.6%) stated reduction in kidneys' ability to filter is CKD. Regarding risk factors of CKD, most of the respondents (81.1%) mentioned high blood pressure followed by diabetes mellitus (80%), recurrent kidney infection (77.9%), genetic disorder (38.9%) and urinary infection (35.8%). Only 20% recognized CKD remains asymptomatic at an initial stage.

Table 4: Respondents' knowledge regarding prevention of CKD n=95

Preventive measures of CKD*	Number	Percent
Regular checkups and screening for renal function	82	86.3
Have healthy food (more fruits and vegetables)	82	86.3
Under control of blood pressure and sugar level	79	83.2
Drink enough water	76	80.0
Maintain healthy weight	76	80.0
Avoidance of alcohol	70	73.7
Limit over-the-counter drug	66	69.5
Regular exercise	64	67.4
Reduce salt intake	44	46.3
Avoidance of smoking	38	40.0
Stress reduction activity	38	40.0
Get enough sleep	26	27.4
Interval for follow-up		
3 months	28	29.5

**Multiple responses*

Table 4 presents preventive measures for CKD, most of the respondents (86.3%) mentioned regular checkups and screening for renal function and the same number of respondents stated having healthy foods. Similarly, 83.2% mentioned keeping control of blood pressure and sugar level, (80%) believed to maintain healthy weight and drinking enough water. Less than one-third of the respondents (29.5%) correctly knew that they should do followups in every 3 months.

Table 5: Respondents' knowledge regarding complications and prognosis of CKD **n=95**

Variables	Number	Percent
Complications of CKD*		
End stage renal disease	82	86.3
Fluid retention	75	78.9
Decrease immunity	34	35.8
Anemia	27	28.4
Damage to nervous system	17	17.9
Bone disease	11	11.6
CKD progress to kidney failure	90	94.7
Kidney failure is fatal if not treated	79	83.2

**Multiple responses*

As in above table 5, most of the respondents (86.3%) stated ESRD is a complication of CKD followed by fluid retention (78.9%), decreased immune (35.8%), anemia (28.4%), damage to the nervous system (17.9%) and bone disease (11.6%). Almost all respondents (94.7%) knew that CKD can progress to kidney failure and the majority (83.2%) stated CKD is fatal if not treated.

Table 6: Respondents' level of knowledge on CKD

Level of knowledge	Number	Percent
High level of knowledge (≥ 65%)	41	43.2
Moderate level of knowledge (40-64%)	38	40.0
Low level of knowledge (< 39%)	16	16.8
Total	95	100.0

Table 6 depicts that among 95 respondents, nearly half of the respondents (43.2%) had a high level of knowledge regarding CKD followed by a moderate level of knowledge (40.0%) and a low level of knowledge (16.8%).

Table 7: Association of level of knowledge and selected socio-demographic variables n=95

Characteristics	Level of knowledge		P value
	Adequate no. (%)	Poor no. (%)	
Age			0.002
20-39	8 (100)	0 (0)	
40-59	48 (82.8)	10 (17.2)	
>60	15 (51.7)	14 (48.3)	
Sex			0.122
Male	48 (80)	12 (20)	
Female	23 (65.7)	12 (34.3)	
Ethnicity			
Brahmin/Chhetri	30 (75)	10 (25)	0.973
Janajati	19 (76)	6 (24)	
Others	22 (73.3)	8 (26.7)	
Religion			
Hindu	66 (78.6%)	18 (21.4)	0.027
Others	5 (45.5)	6 (54.5)	
Educational status			
Illiterate	14 (60.9)	9 (39.1)	0.017
Secondary and below	39 (72.2)	15 (27.8)	
Higher secondary and above	17 (100)	0 (0)	
Occupation			
Agriculture	17 (70.8)	7 (29.2)	
Business	17 (81)	4 (19)	0.586
Service	15 (83.3)	3 (16.7)	
Others	22 (68.8)	10 (31.2)	
Economic status			
Sufficient for 6 months	7 (87.5)	1 (12.5)	
Sufficient for 6-12 months	23 (63.9)	13 (36.1)	0.150
Sufficient for more than 12 months	41 (80.4)	10 (19.6)	

P<0.05 statistically significant values

Table 7 shows that there was a statistically significant association between the level of knowledge and age of respondents p=0.002. But, there was no significant association between the level of knowledge and sex, ethnicity, religion, educational status, occupation, and economic status.

DISCUSSION

This study assessed the knowledge on CKD among the patients diagnosed with diabetes or hypertension. In this study mean age of respondents was 54.28 years, more than half (63.2%) were male, 87.4% were married, one-fourth (24.2%) were illiterate, 25.3% did agriculture, more than half of respondents (53.7%) had sufficient income for a year. A study from India on knowledge on type 2 diabetes the mean age of the patients was 56 ± 11.25 years, and 51.7% were female, majority (96.3%) were married. [9]

This study depicts (77.9%) respondents knew the function of the kidney is to filter the waste products from blood this finding is higher than in the study by Wanjala in Kenya (65.1%)[10] and Hussain and colleague from India only 44.27% were aware of the kidney's function.[9] Regarding causes of CKD, in this study, most of the respondents (81.1%) mentioned high blood pressure followed by diabetes mellitus (80%) this finding is similar with studies by Goro and colleague in Ethiopia said high blood pressure (80%) less number for diabetes mellitus (44.2%) [1] and by Oluyombo et al. from Nigeria high blood pressure (89.8%) and diabetes (79.2%). [11] Another study from India contrast result, only 33.43% of the patients correctly identified diabetes and hypertension as risk factors for CKD. [9] In this study, only one-fifth of the respondents (20%) said at that CKD remains asymptomatic until disease advance which is slightly lower than a study by Goro et.al. in Ethiopia that is (29.8%).[1]

Regarding preventive measures in this study most of the respondents (83.2%) stated keeping under control of blood pressure and sugar level which is quite higher than study conducted in Rwanda by Jacqueline which was (75%). [7] In this study majority of the respondents (73.7%) stated avoidance of alcohol could prevent CKD which is similar to a study done in Ethiopia by Asmelash et al. that is (73.5%).[6] Similarly 40% and 67.4% mentioned avoidance of smoking and regular exercise respectively which is contrast with study of Ethiopia by Asmelash et al. that was smoking (3.7%) and regular exercise (7.4%).[6] In this study 78.9% respondents stated fluid retention is a complication of CKD which is similar with study conducted in Ethiopia by Tegegne et al. (77.4%). [12]

Among 95 respondents in this study, less than half (43.2%) had high level of knowledge regarding CKD prevention which is slightly higher than study done by Goro et.al. in Ethiopia among patient with DM and HTN (36.5%)[1] and (35.6%) in Rwanda by Jacqueline[7] and another study by Ng and colleague from Malaysia (26.3%). [13] The difference may be because the education level of study participants, where (34.6%) were illiterate in Ethiopia however this finding was quite similar with study done by Wanjala from Kenya (45.6%)[10] but lower than study done in north west Ethiopia by Asmelash et al. among patient with HTN (68.7%).[6] This might be due to the difference in sample size.

CONCLUSIONS

This study concludes that nearly two fifth of the respondents have high level of knowledge regarding CKD. Though, more than half of the respondents have moderate to low level of knowledge on CKD. This result indicates that health professionals and policy makers need to emphasize on knowledge and awareness raising program regarding screening and following preventive measures of CKD before it progresses to kidney failure among high risk patients who have DM and HTN at hospital and community level.

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