Prevalence and Associated Risk Factors of Chronic Kidney Disease among Individuals Attending a Screening Camp in Rupandehi District, Nepal: A Cross-Sectional Study

Shakti Basnet[1], **Sushil Khanal**[2], **Bimanchal Adhikari**[3], **Priya Bhusal**[4], **Aabishkar Parajuli**[3], **Aarju Khadka**[5], **Madhav Ghimire**[6]

[1]Department of Nephrology, Siddhababa Hospital, Butwal, Nepal, [2]Department of Surgery, Tribhuvan University Teaching Hospital, Kathmandu, Nepal, [3]Department of Emergency, Siddhababa Hospital, Butwal, Nepal, [4]Department of Internal Medicine, Chitwan Medical College, Chitwan, Nepal, [5]Department of Internal Medicine, Peking University of Health Sciences Center Beijing, China, [6]Department of Internal medicine and Nephrology, College of Medical Sciences Teaching Hospital, Bharatpur, Chitwan, Nepal.

ISSN: 3059-9733
DOI: 10.3126/jobh.v2i1.95797

CC BY NC ND

ABSTRACT

Background

Chronic kidney disease (CKD) is an emerging public health problem in globally, often detected late due to a lack of screening. Early identification through community-based screening camps can help in estimating the burden and associated risk factors. This study aimed to find the prevalence of CKD and its associated factors of CKD among individuals attending a screening camp in the Butwal area of Rupandehi District of Nepal.

Methods

A community based cross sectional study was conducted from 28th to 31st October 2025 in Butwal, Lumbini Province, Nepal. The screening camp was organized by Siddhababa Hospital and Research Center Pvt. Ltd. with support from the Nepal kidney foundation and Bridge of life USA. A total of 947 participants of all age groups were included. Data were collected using a structured questionnaire, consisting of anthropometric measurements, urine analysis, and serum creatinine for estimation of eGFR. CKD was defined based on reduced eGFR and/or markers of kidney damage. Data were analyzed using SPSS, and Chi-square test was used to assess associations. P-value <0.05 was considered statistically significant.

Results

The prevalence of CKD was 32.1% (with 95% CI as 29.13%-35.18%). The statistically significant variables associated with CKD are age (p<0.001), BMI (p<0.001), Diabetes (p=0.042), Antihypertensive medication use (p<0.001), Antidiabetic medication use (p=0.008), proteinuria (p=0.014), abnormal creatinine (p<0.001), abnormal eGFR (p=0.02), and urine pH (p<0.001).

Conclusions

CKD prevalence was high among screening camp participants, with significant associations with age, obesity, diabetes, and renal function markers. Community-based screening and early detection strategies are essential for the prevention and control of CKD in Nepal.

Keywords: Chronic kidney disease; Prevalence; Screening camp; Risk factors; eGFR; Nepal

Correspondence: Dr. Shakti Basnet, Department of Nephrology, Siddhababa Hospital, Butwal, Nepal. Email: drshaktibasnet1979@gmail.com, Phone: +977-9851089112. **Article received**: 2026-03-20. **Article accepted**: 2026-05-22. **Article published**: 2025-06-30.

INTRODUCTION

Chronic kidney disease (CKD) is a rapidly increasing global public health problem and a significant contributor to morbidity and mortality globally.[1] CKD is characterized by structural or functional abnormalities of the kidneys, manifested as kidney damage or decreased kidney function, persisting for three months or longer, regardless of etiology.[2] CKD is one of the growing non-communicable diseases worldwide. According to recent GBD-based estimates published in 2025, CKD affects more than 670 million people globally and causes approximately 1.5 million deaths each year. The global burden of CKD has increased substantially since 1990, driven largely by population aging and the rising prevalence of diabetes, hypertension, and obesity.[3] CKD is highly prevalent among patients with T2DM, with Joshi et al. reporting a prevalence of 86.6% in a tertiary care hospital in Nepal.[4] CKD often remains asymptomatic in its early stages, leading to delayed diagnosis and progression to end-stage renal disease (ESRD), which requires dialysis or kidney transplantation for survival. Early detection and identification of risk factors are therefore essential for prevention and control of disease progression. Globally, the burden of CKD is increasing, particularly in low- and middle-income countries where access to screening and specialized care is limited. Major risk factors include hypertension, diabetes mellitus, obesity, aging, and family history of kidney disease. Additionally, lifestyle factors such as frequent use of non-steroidal anti-inflammatory drugs, recurrent urinary tract infections, and exposure to nephrotoxic substances also contribute to kidney damage. Urinary abnormalities such as proteinuria, hematuria, and changes in urine specific gravity and pH are important early indicators of renal dysfunction. In Nepal, community-based screening camps provide an important opportunity for early detection of CKD and related risk factors, especially in resource-limited settings. Despite increasing attention, there is still limited evidence regarding the burden of CKD and its associated factors in community screening populations in Nepal. Understanding the prevalence and risk profile of CKD in such settings is essential for guiding preventive strategies and health policy formulation. Understanding the burden and risk factors associated with CKD is essential for healthcare planning, designing screening strategies, and preventing disease progression in resource-constrained settings, where access to renal replacement therapy is limited and costly. Therefore, this study aimed to determine the population-based prevalence of chronic kidney disease (CKD) and its associated factors in Nepal.

METHODS

Study Design

A community-based cross-sectional study was conducted to determine the prevalence and its associated factors CKD among individuals attending a health screening camp.

Study Area

The study was carried out from 28th to 31st October 2025 in the Butwal region of Lumbini Province, Nepal, including surrounding areas of Butwal. The screening camp was organized by Siddhababa Hospital and Research Center Pvt. Ltd., with technical support from the Nepal kidney foundation and Bridge of life USA.

Study Population

The study included all age groups individuals who attended the CKD screening camp during the study period and provided informed consent to participate.

Inclusion and Exclusion Criteria

Individuals of any age attending the screening camp and consenting to participate were included in the study. Participants with incomplete clinical or laboratory data or those who did not provide informed consent were excluded from the analysis.

Sample Size and Sampling Technique

A total of 947 participants were included in this study. A non-probability convenience sampling technique were used to collect the information from the individuals, where all eligible individuals attending the screening camp during the study period were enrolled.

Data Collection Procedure

Data were collected using a structured questionnaire.

The questionnaire included information on sociodemographic characteristics, history of hypertension, diabetes, and kidney disease, family history of chronic diseases, medication use, and urinary symptoms such as urinary tract infection and kidney stones.

Study Variables

The dependent variable was prevalence of CKD where as independent variables included the sociodemographic information including age, sex, BMI and comorbidity. Also, urine samples were analyzed for protein, glucose, blood, leukocytes, nitrites, ketones, bilirubin, urobilinogen, and ascorbic acid, along with urine pH and specific gravity. Blood samples were analyzed for serum creatinine and estimated glomerular filtration rate (eGFR) using standard laboratory methods.

Definition of CKD

Chronic kidney disease was defined based on reduced eGFR less than 60 mL/min/1.73 m^2 and/or the presence of kidney damage markers such as proteinuria or abnormal urinalysis findings, according to screening criteria used in the study.[5]

Data Management and Statistical Analysis

Data were entered and analyzed using SPSS software. Data were analyzed using descriptive and inferential statistics. In the descriptive statistics, frequency and percentage were calculate for categorical variables whereas mean and SD for continuous variables. In the inferential statistics to find the association Chi-Square test were. p-value of less than 0.05 was considered statistically significant.

Ethical Consideration

Ethical approval was taken from Siddhababa Hospital and Research Center Pvt. Ltd., (Ref. No. 345/2082). Written consent was taken from all participants before data collection. Confidentiality and anonymity of participants were strictly maintained throughout the study, and individuals with abnormal findings were referred Siddhababa Hospital and Research Center Pvt. Ltd., for further evaluation and management.

Result

A total of 947 participants were included in the study, with a mean±SD age of 53.12 ± 13.70 years. Nearly one third(27.8%) of the participants were belonged to 40-50 years, followed by 50-60 years (26.2%), while only 4.5% were aged ≤30 years. In sex more than half (52.8%) were Male. In BMI 4.0% were underweight, 38.5% had a normal and 57.4%) were overweight. In terms of comorbidities, hypertension was the most common condition, affecting 66.3% of participants, followed by diabetes (9.1%). Also, 77.9% of participants had at least one disease condition, including chronic kidney disease (CKD), diabetes, or hypertension (Table 1).

Table 1. Sociodemographic Characteristics of Participants (n=947).

Characteristics	Frequency (%)
Age (Years)	
≤30	43 (4.5)
30-40	110 (11.6)
40-50	263 (27.8)
50-60	248 (26.2)
60-70	173 (18.3)
≥70	110 (11.6)
Mean±SD	53.12±13.70
Sex	
Female	447 (47.2)
Male	500 (52.8)
BMI	
Under weight	38 (4.0)
Normal	365 (38.5)
Overweight	544 (57.4)
Comorbidity	
Hypertension	628 (66.3)

The prevalence of CKD was 32.1%, with a 95% confidence interval of 29.13% to 35.18% (Table 2).

Table 2. Prevalence of CKD (n=947).

Prevalence of CKD	Frequency (%)	95% CI	
		Lower bound	Upper bound
Yes	304 (32.1)	29.13	35.18
No	643 (67.9)		

The statistically significant variables associated with CKD are age (χ^2=92.842, p<0.001), BMI (χ^2=23.627, p<0.001), patients with diabetes (p=0.042), use of antihypertensive medication (p<0.001), and use of antidiabetic medication (p=0.008), protein in urine (p=0.014), creatinine (p<0.001), and eGFR (p=0.02), pH of urine (χ^2=24.54, p<0.001). (Table 3)

Table 3. Association between Chronic Kidney Disease (CKD) with clinicodemograpic variables (n=947).				
Characteristics	**Prevalence of CKD**		**Chi-Squre**	**p-value**
Age (Years)	**No**	**Yes**		
≤30	40 (93)	3 (7)	92.842	<0.001
30-40	93 (84.5)	17 (15.5)		
40-50	204 (77.6)	59 (22.4)		
50-60	171 (69)	77 (31)		
60-70	88 (50.9)	85 (49.1)		
≥70	47 (42.7)	63 (57.3)		
Sex				
Female	292 (65.3)	155 (34.7)	2.57	0.109
Male	351 (70.2)	149 (29.8)		
BMI				
Under weight	35 (92.1)	3 (7.9)	23.627	<0.001
Normal	269 (73.7)	96 (26.3)		
Overweight	339 (62.3)	205 (37.7)		
Comorbidity				
Hypertension	420 (66.9)	208 (33.1)	0.88	0.34
Diabetes	50 (58.1)	36 (41.9)	4.13	0.042
At least one disease (CKD, diabetes, hypertension)				
Taking medication for hypertension	120 (51.5)	113 (48.5)	38.117	<0.001
Taking medication for diabetes	72 (57.6)	53 (42.4)	7.007	0.008
Family history of comorbidity	248 (70.1)	106 (29.9)	1.208	0.272
Take pain medication frequently	77 (53.8)	66 (46.2)	<0.001	
History of kidney stones	105 (65.2)	56 (34.8)	0.64	0.42
Frequently UTIs	107 (66.9)	53 (33.1)	0.093	0.761
Blood in Urine	38 (71.7)	15 (28.3)	0.372	0.541
Urobilogen in Urine	16 (76.2)	5 (23.8)	0.677	0.41
Bilirubin in Urine	35 (57.4)	26 (42.6)	3.31	0.069
Protein in Urine	13 (46.4)	15 (53.6)	6.102	0.014
Nitrites in Urine	6 (54.5)	5 (45.5)	0.91	0.34
Ketone in Urine	0	1 (100)	2.11	0.14
Ascorbic Acid in Urine	50 (71.4)	20 (28.6)	0.43	0.511
Glucose in Urine	38 (63.3)	22 (36.7)	0.613	0.434
Leukocytes in Urine	32 (71.1)	13 (28.9)	0.22	0.63
CREATININE (Abnormal)	574 (66)	296 (34)	18.12	<0.001
eGFR 1 (Abnormal)	76 (78.4)	21 (21.6)	5.41	0.02
pH of Urine				
Acidic	421 (63.9)	238 (36.1)	24.54	<0.001
Alkaline	39 (61.9)	24 (38.1)		
Neutral	183 (81.3)	42 (18.7)		
Specific Gravity in Urine				
High	22 (78.6)	6 (21.4)	4.31	0.11
Low	349 (69.9)	150 (30.1)		
Normal	272 (64.8)	148 (35.2)		

Among the participants, 30.8% had been previously diagnosed with hypertension and 24.6% were on antihypertensive treatment. Diabetes was reported in 16.6%, with 13.2% currently receiving treatment. A family history of hypertension, diabetes, CKD, or heart disease was reported by 37.4%, and 15.1% reported frequent use of pain medications. Histories of kidney stones (17.0%) and frequent UTIs (16.9%) were also noted. Urinalysis showed blood in urine (5.6%), bilirubin (6.4%), glucose (6.3%), leukocytes (4.8%), protein (3.0%), nitrites (1.2%), ketones (0.1%), urobilinogen (2.2%), and ascorbic acid (7.4%). Abnormal creatinine and eGFR were observed in 8.1% and 10.2% of participants, respectively. Most participants had acidic urine (69.6%), 23.8% had neutral, and 6.7% had alkaline. Regarding specific gravity, 52.7% had low values, 44.4% normal, and 3.0% high (Table 4).

Table 4. Clinical, laboratory, and urinary characteristics of participants (n=947).

Clinical characteristics	Frequency (%)
Ever been told you have hypertension	292 (30.8)
Currently taking medication for hypertension	233 (24.6)
Ever been told you have diabetes	157 (16.6)
Currently taking medication for diabetes	125 (13.2)
Has anyone in ever been told you have kidney disease	66 (7.0)
Currently being treated for kidney disease	28 (3.0)
Family history of hypertension/ diabetes/CKD/heart disease	354 (37.4)
Take pain medication frequently	143 (15.1)
History of kidney stones	161 (17.0)
Frequent UTIs	160 (16.9)
Blood in Urine	53 (5.6)
Urobilogen in Urine	21 (2.2)
Bilirubin in Urine	61 (6.4)
Protein in Urine	28 (3.0)
Nitrites in Urine	11 (1.2)
Ketone in Urine	1 (0.1)
Ascorbic Acid in Urine	70 (7.4)
Glucose in Urine	60 (6.3)
Leukocytes in Urine	45 (4.8)
CREATININE (Abnormal)	77 (8.1)
eGFR 1 (Abnormal)	97 (10.2)
pH of Urine	
Acidic	659 (69.6)
Alkaline	63 (6.7)
Neutral	225 (23.8)
Specific Gravity in Urine	
High	28 (3.0)
Low	499 (52.7)
Normal	420 (44.4)

DISCUSSION

This study included 947 participants with a mean age of 53.12 ± 13.70 years, and 52.8% were male. A substantial burden of comorbidities was observed, with 77.9% having at least one condition, including hypertension (66.3%) and diabetes (9.1%). Previous diagnoses of hypertension (30.8%) and diabetes (16.6%) were also common, with 24.6% and 13.2% receiving treatment, respectively. In addition, 37.4% reported a family history of hypertension, diabetes, CKD, or heart disease, and notable proportions had histories of kidney stones (17.0%) and recurrent UTIs (16.9%), along with frequent analgesic use (15.1%). Although urinalysis abnormalities were relatively limited, impaired renal function was indicated by abnormal creatinine (8.1%) and eGFR (10.2%), while most participants exhibited acidic urine (69.6%) and low specific gravity (52.7%).

The prevalence of CKD in our study (32.1%; 95% reported by Shrestha et al. in a systematic review and meta-analysis conducted in Nepal, indicating a consistently high burden of CKD among Nepalese populations.[6] The prevalence of chronic kidney disease (CKD) in urban areas of Nepal has been estimated at approximately 10.6%.[7] However, evidence from a study conducted by the International Society of Nephrology's Kidney Disease Data Center (ISN-KDDC) across 12 low- and middle-income countries indicated a higher burden of CKD among Nepalese participants.[8]

The study conducted by Ji et al. in China found that the prevalence of CKD was 11.41% (95% CI: 11.07–11.74%).[9] The prevalence of CKD was 11.8% in Shanghai, [10] 13% in Beijing[5], and 19.1% in Tibet, [10] respectively. In Guangzhou, 12.1% of residents

aged ≥20 years had at least one indicator of kidney damage. [10-12] The prevalence of CKD was 9.49% (95% CI: 8.93-10.85) in a study conducted by Xue et al. among the Chinese population in Taian, China, assessing the prevalence of chronic kidney disease and associated factors.[11, 12]

Significant associations were observed between CKD and age ($p < 0.001$), BMI ($p < 0.001$), diabetes mellitus ($p = 0.042$), use of antihypertensive medications ($p < 0.001$), use of antidiabetic medications ($p = 0.008$), proteinuria ($p = 0.014$), abnormal serum creatinine ($p < 0.001$), reduced eGFR ($p = 0.02$), and urine pH ($p < 0.001$). Poudel et al. found that CKD was independently associated with older age, hypertension, diabetes mellitus, increased waist–hip ratio, higher total cholesterol levels, and Dalit ethnicity.[6] Othe researchers also found that the significant factors associated with CKD are decreased eGFR and albuminuria. [9, 13-15]

Limitations

The study was conducted among individuals attending a screening camp using a convenience sampling method, which may limit the generalizability of the findings to the population of Nepal. Additionally, the cross-sectional design restricts the ability to establish causal relationships between chronic kidney disease and its associated factors.

Conclusions

This study showed a high prevalence of chronic kidney disease among individuals attending a community-based screening camp in the Butwal region of Nepal. Chronic kidney disease was significantly associated with increasing age, higher body mass index, diabetes, use of medications for hypertension and diabetes, and abnormal renal function indicators such as proteinuria, elevated serum creatinine, and reduced estimated glomerular filtration rate. These findings suggest a substantial burden of undiagnosed or early-stage kidney disease in the community and highlight the importance of early detection and risk-based screening strategies.

Recommendation

Community-based screening programs should be strengthened with special focus on high-risk groups, along with early lifestyle modification, regular monitoring of renal function, and increased public awareness to prevent progression of kidney disease.

Conflicts of Interest: The authors declare that they have no conflict of interest.

Source of funding: The study did not receive any external funding. It was conducted with institutional support from Siddhababa Hospital and Research Center Pvt. Ltd., with technical assistance from the Nepal Kidney Foundation and Bridge of life USA.

Ethical and Publication Integrity: Ethical approval was obtained from the Institutional Review Committee of Bharatpur Hospital (IRC No./Ref: 081/82-049)

Availability of data and materials: The datasets used and analyzed during the current study are available from the corresponding author upon reasonable request.

Authors' Contributions

Conceptualization: Dr. Shakti Basnet, Dr. Madhav Ghimire, Dr. Sushil Khanal.

Data curation: Dr. Aarju khadka, Dr. Aabishkar Parajuli, Dr. Priya Bhusal.

Formal analysis: Dr. Shakti Basnet, Dr Sushil Khanal.

Investigation: Dr. Shakti Basnet.

Methodology: Dr. Shakti Basnet.

Supervision: Dr. Shakti Basnet, Dr. Madhav Ghimire.

Writing- original draft: Dr. Shakti Basnet.

Writing- review & editing: Dr. Shakti Basnet, Dr Sushil Khanal, Dr. Madhav Ghimire, Dr. Aabishkar Parajuli.

REFERENCES

1. Xie K, Cao H, Ling S, Zhong J, Chen H, Chen P, Huang R. Global, regional, and national burden of chronic kidney disease, 1990-2021: a systematic analysis for the global burden of disease study 2021. Frontiers in endocrinology. 2025 Mar 5;16:1526482. [DOI]
2. Levey AS, Coresh J, Bolton K, Culleton B, Harvey

KS, Ikizler TA, Johnson CA, Kausz A, Kimmel PL, Kusek J, Levin A. K/DOQI clinical practice guidelines for chronic kidney disease: evaluation, classification, and stratification. American Journal of Kidney Diseases. 2002;39(2 SUPPL. 1):i-i+. [PubMed]

3. Wang L, He Y, Han C, Zhu P, Zhou Y, Tang R, He W. Global burden of chronic kidney disease and risk factors, 1990-2021: an update from the Global Burden of Disease Study 2021. Frontiers in Public Health. 2025 Jul 24;13:1542329. [DOI]
4. Joshi R, Subedi P, Yadav GK, Khadka S, Rijal T, Amgain K, Rajbhandari S. Prevalence and risk factors of chronic kidney disease among patients with type 2 diabetes mellitus at a tertiary care hospital in Nepal: a cross-sectional study. BMJ open. 2023 Feb 1;13(2):e067238. [DOI]
5. Zhang L, Zhang P, Wang F, Zuo L, Zhou Y, Shi Y, Li G, Jiao S, Liu Z, Liang W, Wang H. Prevalence and factors associated with CKD: a population study from Beijing. American Journal of Kidney Diseases. 2008 Mar 1;51(3):373-84. [DOI]
6. Poudyal A, Karki KB, Shrestha N, Aryal KK, Mahato NK, Bista B, Ghimire L, Kc D, Gyanwali P, Jha AK, Garcia-Larsen V. Prevalence and risk factors associated with chronic kidney disease in Nepal: evidence from a nationally representative population-based cross-sectional study. BMJ open. 2022 Mar 1;12(3):e057509. [DOI]
7. Sharma SK, Karki P, Baral N, Perico N, Perna A. Remuzzi 5. G, et al. A community screening for chronic kidney disease, hypertension, diabetes and their management in Dharan, Nepal. InWorld Congress of Nephrology 2007 (Vol. 52, No. 189, pp. 205-12). [Link]
8. Ulasi I. Chronic Kidney Disease and Cardiovascular Risk. JAMA: The Journal of the American Medical Association. 2005 Jan 1. [DOI]
9. Ji A, Pan C, Wang H, Jin Z, Lee JH, Wu Q, Jiang Q, Cui L. Prevalence and associated risk factors of chronic kidney disease in an elderly population from eastern China. International journal of environmental research and public health. 2019 Nov;16(22):4383. [DOI]
10. Chen N, Wang W, Huang Y, Shen P, Pei D, Yu H, Shi H, Zhang Q, Xu J, Lv Y, Fan Q. Community-based study on CKD subjects and the associated risk factors. Nephrology Dialysis Transplantation. 2009 Jul 1;24(7):2117-23. [DOI]
11. Xue L, Lou Y, Feng X, Wang C, Ran Z, Zhang X. Prevalence of chronic kidney disease and associated factors among the Chinese population in Taian, China. BMC nephrology. 2014 Dec 21;15(1):205. [DOI]
12. Alam A, Amanullah F, Baig-Ansari N, Lotia-Farrukh I, Khan FS. Prevalence and risk factors of kidney disease in urban Karachi: baseline findings from a community cohort study. BMC research notes. 2014 Mar 27;7(1):179. [DOI]
13. Poudyal A, Karki KB, Shrestha N, Aryal KK, Mahato NK, Bista B, Ghimire L, Kc D, Gyanwali P, Jha AK, Garcia-Larsen V. Prevalence and risk factors associated with chronic kidney disease in Nepal: evidence from a nationally representative population-based cross-sectional study. BMJ open. 2022 Mar 1;12(3):e057509. [DOI]
14. Gummidi B, John O, Ghosh A, Modi GK, Sehgal M, Kalra OP, Kher V, Muliyil J, Thakur JS, Ramakrishnan L, Pandey CM. A systematic study of the prevalence and risk factors of CKD in Uddanam, India. Kidney International Reports. 2020 Dec 1;5(12):2246-55. [DOI]
15. Banik S, Ghosh A. Prevalence of chronic kidney disease in Bangladesh: a systematic review and meta-analysis. International urology and nephrology. 2021 Apr;53(4):713-8. [DOI]

Citation: Basnet S, Khanal S, Adhikari B, Bhusal P, Parajuli A, Khadka A, Ghimire M. Prevalence and Associated Risk Factors of Chronic Kidney Disease among Individuals Attending a Screening Camp in Rupandehi District, Nepal: A Cross-Sectional Study. JoBH, Nepal. 2026; 2(1): 1-7