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Coverage of citizen health screening program and prevalence of selected non-communicable diseases in Rukum West District of Nepal

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ABSTRACT

Introduction: Non-communicable diseases (NCDs) are the leading cause of the global burden of disease. With the increasing burden of NCDs, gaps persist in the care continuum for NCD services. The Citizen Health Screening Program (CHSP) was implemented by the Health Service Directorate in accordance with guidelines approved by the Ministry of Social Development, Karnali Province. The aim of the program was to screen for Non-Communicable Diseases among the elderly population and to ensure access to health services for management.

Methods: This retrospective cross-sectional study analyzed secondary data from the Citizen Health Screening Program in Rukum West, Nepal. Conducted over seven months, it screened individuals aged 55 and above for hypertension, raised blood sugar, and possible kidney disorders. Data collection followed standardized protocols to measure hypertension, raised blood sugar, and possible kidney disorders, with trained government health workers. Descriptive analysis was performed using Excel and STATA.

Results: The screening covered 78% of the target population, identifying hypertension (15.2%), raised blood sugar (12.2%), and possible kidney disorders (12.5%). Hypertension, raised blood sugar, and possible kidney disorders were higher among females and increased with age. The hypertension, diabetes, and possible kidney disorders varied across local levels, with Musikot urban municipality, Tribeni rural municipality, and Sanibheri rural municipality showing the highest rates, respectively.

Conclusion: The study highlights a significant NCD burden, with higher prevalence in women and older adults. Expanding screening to younger populations and implementing targeted interventions are essential to enhance prevention and management efforts in Rukum West, Nepal.

Keywords: Diabetes, Elderly, Hypertension, Kidney Disorder, Non-Communicable Disease

INTRODUCTION

Non-communicable diseases (NCDs) have emerged as the leading cause of global disease burden, accounting for half of the top 10 leading causes of early death and disability.[1] NCDs killed at least 43 million people in 2021, equivalent to 75% of non-pandemic-related deaths globally.[2] The global burden of disease projections indicate that, without significant intervention, this figure is expected to rise to 79% by 2040.[3] In Nepal, NCDs are responsible for approximately 66% of total deaths, with a high prevalence of Chronic Obstructive Pulmonary Disease (COPD), diabetes, chronic kidney disease (CKD), and coronary artery disease.[4] Among these conditions, hypertension is a major contributor to cardiovascular diseases, including coronary artery disease, heart failure, renal insufficiency, and stroke.[5]

Over the past two decades, Nepal has witnessed a 6% increase in hypertension prevalence between 2000 and 2020.[6] Nationally, an estimated 18% of women and 23% of men aged 15 years and older are affected by hypertension. In Karnali Province, the prevalence is relatively lower, with 12% of women and 18% of men diagnosed with the condition.[7]

Despite the growing burden of NCDs, significant gaps remain in the continuum of care. For instance, less than 18% of hypertensive individuals have ever received medication, nearly 47% of those with high blood glucose levels are unaware of their condition, and only 36% of those undergoing treatment successfully achieve blood glucose control in Nepal.[3] Chronic kidney disease also contributes to morbidity and mortality, with 6% of the population affected in Nepal.[8] As CKD increases risk for cardiovascular events among patients with diabetes and hypertension, early detection and preventive measures are critical to improving overall cardiovascular health outcomes.[9]

The regional disparities in risk factors and healthcare access highlight the need for localized evidence to guide intervention and health promotion initiatives. Recognizing the urgent need for NCD management, the Karnali Province Government, through the Ministry of Social Development, launched the Citizen Health Screening Program (CHSP) in the Nepali fiscal year 2079/80. The primary goal of this initiative is to enhance early detection of NCDs among the elderly population and improve access to necessary healthcare services. By identifying at-risk individuals and facilitating timely intervention, CHSP aims to bridge the existing gaps in NCD management. The CHSP was implemented by the Health Service Directorate in accordance with guidelines approved by the Ministry of Social Development, Karnali Province.

This study evaluates the coverage and prevalence of NCDs among the elderly population in Rukum West district. The findings will provide critical insights into the burden of NCDs at the local level and help inform strategies to enhance disease prevention and management

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efforts in Nepal.

METHODS

This study is a retrospective cross-sectional analysis employing a quantitative study design, based on secondary data from the Citizen Health Screening Program conducted by the Health Service Directorate, Karnali Province, Nepal, in Rukum West district. The program was implemented over seven months, from September 2023 to March 2024. Approval for this study was obtained from the Health Service Directorate, Surkhet, under reference number 1117.

Screening activities were conducted across all 89 health facilities in Rukum West, comprising four municipal hospitals, 24 Health Posts, 45 Basic Health Service Centers, one Primary Health Care Center, four Community Health Units, and 11 Urban Health Centers. The screened cases were referred to the District Hospital and Chaurjahari Hospital for further confirmation and medication. (Figure 1)

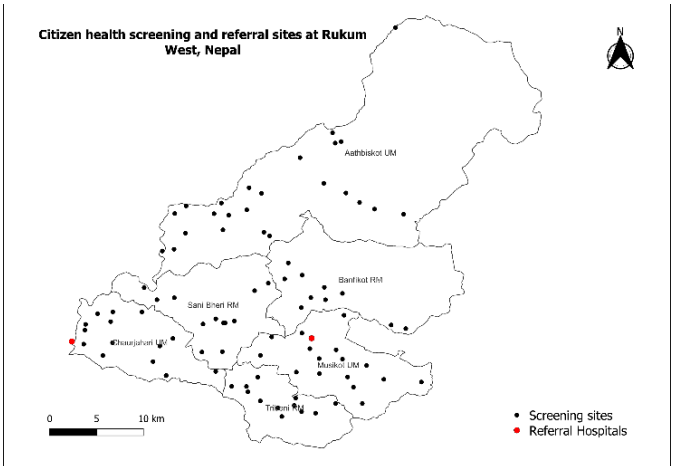

Figure 1: Screening and referral sites in Rukum West

The district consists of six local administrative units, with three urban municipalities and three rural municipalities. The screening program targeted the entire elderly population aged 55 years and above, based on the National Census 2078, with a total target population of 18,608.[10] A total of 14509 elderly populations were screened during the study period.

The program was implemented by the Health Service Directorate, Surkhet. Before the screening, nurses and paramedics at each local level underwent orientation and training in standardized techniques for measuring high Blood Pressure (BP), elevated blood sugar, and potential kidney disorders. Participants were classified as having high blood pressure if at least two systolic BP readings were ≥140 mmHg, at least two diastolic BP readings were≥90 mmHg, or they were taking antihypertensive medication. Raised blood sugar was defined as a fasting blood sugar level ≥126 mg/dL, a postprandial or random blood sugar level ≥140 mg/dL, or the use of antidiabetic medication. Individuals with albumin levels ≥30 mg/dL were categorized as having a possible kidney disorder. The blood pressure was measured using a BP monitor (Rossmax BP monitor), blood sugar using blood glucose test strips and a glucometer (MHI Safety First), and the albumin level was measured through a dipstick test using reagent strips (Cybow urine reagent strips) for urinalysis. The required screening tools and kits were supplied by the Health Service Directorate, Surkhet.

To ensure maximum participation, Female Community Health Volunteers (FCHVs) actively mobilized the target population and informed them about the screening dates and sites. Data collection was performed at screening sites by trained health workers, who immediately compiled and reported the data to the health section of the respective local levels. The compiled records were then submitted to the Health Service Directorate in Excel format.

Descriptive analysis (frequencies and percentages) of NCD coverage and prevalence was conducted using Excel and Stata. As secondary data were utilized, formal approval was obtained from the Health Service Directorate to ensure participant anonymity and confidentiality. The diagnosed cases of hypertension, raised blood sugar, and possible kidney disorders were referred to the district hospital and Chaurjahari hospital for confirmatory diagnosis and treatment.

RESULTS

In the present study, 14,509 (78%) of the total target population were screened for non-communicable diseases. The screening for selected non-communicable diseases had covered 8680 (96%) of the male and 5829 (60%) of the female elderly population in Rukum West district. (Table 1)

The screening program had identified the prevalence of hypertension among 15.2% of the population aged 55 years and above. Similarly, the prevalence of raised blood sugar and possible kidney disorder was reported as 12.2% and 12.5%, respectively. The problem of NCDs was reported to be high among females, 18.4%, 16.6%, and 17.9%, respectively, for hypertension, raised blood sugar, and PKD. (Table 2)

In the age group of 55 to 59 years, the prevalence of hypertension, raised blood sugar, and PKD are 11.9%, 9.1%, and 10.1%, respectively. Similarly, in the age group 70 and above years, it is 21.5%, 15.8%, and 16.2% respectively for hypertension, raised blood sugar, and PKD. Across different local levels in Rukum West, hypertension is more prevalent in Musikot UM (20.9%), elevated blood sugar in Tribeni RM (16.1%), and PKD in Sanibheri RM (14.3%). (Table 2)

DISCUSSION

This study assessed the coverage of the Citizen Health Screening Program and analyzed the prevalence of selected non-communicable diseases in Rukum West, Nepal. The overall prevalence of hypertension, raised blood sugar, and PKD among the screened population was 15.2%, 12.2%, and 12.5%, respectively. The prevalence of hypertension in Rukum West was lower than the national estimates reported in a scoping review, which found prevalence ranging from 22.4% to 38.6%.[11] Similarly, a systematic analysis covering the period 2016-2020 reported a pooled prevalence of hypertension as 32%.[5] Additionally, a study conducted in Kathmandu found that 50% of the elderly population had hypertension, with a higher prevalence in women (52%),[12] exceeding the prevalence observed in this study in a rural setting. The discrepancies in hypertension prevalence could be due to geographic and population differences.

In the current study, hypertension was found more often among females (18.4%). This finding contrasts with a study conducted in rural Nepal, which reported a much lower prevalence of 3.3% among women.[13] In contrast, studies in urban areas of Nepal have consistently reported a higher prevalence of hypertension among men.[14,15] The higher burden of hypertension among women in Rukum West could be attributed to the increased exposure to risk factors, including higher tobacco consumption among women in Karnali Province compared to other provinces.[16] However, further study is required to explore the risk factors in the district.

The prevalence of elevated blood sugar in this study was 12.2%, with higher rates among females (16.6%) and individuals aged 60 years and older. A scoping review on diabetes in Nepal reported prevalence rates ranging from 4.1% to 9.5%, with the highest prevalence (25.9%) observed among the elderly in Kathmandu.[11] Similarly, a recent study in Nepal found 13.3% of elderly individuals had diabetes.[17] A 2019 survey estimated the prevalence of raised blood sugar at 5.8% among the general population, with approximately 10% of individuals aged 4 to 69 years affected.[4] Notably, the same survey reported a prevalence of around 1% in Karnali Province, indicating a rapid increase in diabetes cases in the region.

One of the major strengths of this study is the high screening coverage among the elderly population in the district, ensuring comprehensive NCD screening. The CHSP was implemented using trained government health workers, ensuring standardized screening procedures. However, a key limitation of the study is the exclusion of younger adults, which restricts the generalizability of the NCD burden to the entire district population. Another limitation is the lack of follow-up data for referred cases, which makes it difficult to assess treatment uptake and disease management outcomes. Expanding the screening to include the

Table 1: Proportion of screened population for NCDs at Rukum West, Nepal

Municipality	Target population (Equal or more than 55 years)			Screened Population			Proportion of screened		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Aathbiskot UM	1787	1800	3587	1294	983	2277	72.41	54.61	63.48
Banfikot RM	1149	1207	2356	1196	695	1891	104.09	57.58	80.26
Musikot UM	1975	2174	4149	1966	1326	3292	99.54	60.99	79.34
Tribeni RM	1249	1305	2554	1409	934	2343	112.81	71.57	91.74
Sanibheri RM	1236	1339	2575	1257	877	2134	101.70	65.50	82.87
Chaurjahari UM	1619	1768	3387	1558	1014	2572	96.23	57.35	75.94
Total	9015	9593	18608	8680	5829	14509	96.28	60.76	77.97

Table 2: Prevalence of selected NCDs from screening at Rukum West, Nepal

Indicator	Total screened (N)	Hypertension (%)	Raised blood sugar (%)	PKD (%)
Total	14509	2206 (15.2)	1777 (12.2)	1816 (12.5)
Sex				
Male	8680	1132 (13)	795 (9.2)	772 (8.9)
Female	5829	1074 (18.4)	982 (16.6)	1044 (17.9)
Age-group				
55 - 59	6746	807 (11.9)	615 (9.1)	677 (10.1)
60 - 69	4783	757 (15.8)	691 (14.4)	656 (13.7)
70 and above	2980	642 (21.5)	471 (15.8)	483 (16.2)
Municipality				
Aathbiskot UM	2277	348 (15.3)	295 (13)	317 (13.9)
Banfikot RM	1891	276 (14.6)	204 (10.8)	232 (12.3)
Musikot UM	3292	687 (20.9)	497 (15.1)	464 (14.1)
Tribeni RM	2343	391 (16.7)	377 (16.1)	292 (12.5)
Sanibheri RM	2134	225 (10.5)	213 (10)	306 (14.3)
Chaurjahari UM	2572	279 (10.8)	191 (7.4)	205 (8)

***PKD: Possible Kidney Disorder; UM: Urban Municipality; RM: Rural Municipality**

younger population and implementing a follow-up mechanism for referred cases would improve the effectiveness of NCD management in Rukum West.

CONCLUSION

The study highlights a significant burden of hypertension, raised blood sugar, and PKD in Rukum West, Nepal. The findings indicate a lower prevalence of hypertension compared to national estimates but reveal a higher prevalence among women. The rising trend of raised blood sugar, particularly among older adults, underscores the need for early intervention strategies. The study's strength lies in its comprehensive screening of the elderly population by trained health workers using reliable tools. However, the exclusion of younger adults limits the generalizability of the findings. To enhance the effectiveness of the CHSP, we recommend expanding screening to include adults, integrating targeted interventions for high-risk groups, and strengthening preventive measures, such as lifestyle modification programs and regular follow-ups, to address the growing burden of NCDs in the region.

DECLARATION

Author Contributions

OPP and RK conceptualized and designed the research; KS and PK did data collection; RK, OPP, and PK, BBB conducted the data analysis and interpretation; RK, OPP, and PK, BBB drafted the manuscript; and all authors reviewed the manuscript and approved the final version of the manuscript. All authors agreed to be accountable for all aspects of the research work. Note: RK, PK, OPP, KS, and BBB are abbreviated names of authors.

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Ethical Approval

The approval for the study was taken from the Health Service Directorate, Surkhet for using secondary data (Reference no: 2082/83/1117)

Consent/Assent

NA

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request

Conflicts of Interest

Author(s) declare no conflict of interest

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The author(s) received no external funding for this research.

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