

Original Research Article

Prevalence and associated risk factors of hypertension in care homes of Makawanpur district, Nepal

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ABSTRACT

Background: Non-communicable diseases (NCDs) are increasingly burdensome. Hypertension stands out as a major NCD responsible for numerous deaths and disabilities in Nepal. Various factors, socio-demographic, socio-economic, and behavioral, affect hypertension. This study aims to determine the prevalence of hypertension and identify its associated risk factors among residents of care homes in Makawanpur district.

Methods: A cross-sectional quantitative study was conducted to gather data from residents in four care homes in Hetauda Sub-Metropolitan, Makawanpur district, Nepal. The care homes were selected using a census approach. Data were collected from each institution as a sample, totaling 139 individuals. A structured questionnaire, based on the NCD STEPS survey, was used along with Kobo-Toolbox for data collection. After collection, data were cleaned, sorted, coded, and decoded for analysis with SPSS software.

Results: In 139 care home residents in Makawanpur district (median age of 75 years), 51.1% of the participants had hypertension. The history of smoking was strongly associated with developing high blood pressure (58.4%; $p=0.03$), as well as the family history of hypertension (68.6%; $p<0.005$), and the presence of anxious or stressful (or mental pressure) symptoms (60.5%; $p=0.01$). The participants who were physically active also had higher rates of having hypertension (58.7%).

Conclusions: Hypertension was highly prevalent (51.1%) among elderly care home residents in Makawanpur. Smoking history, family history of hypertension, and psychological stress were significantly associated with hypertension.

Keywords: Hypertension prevalence, Non-communicable diseases, Associated risk factors, Care homes, Hetauda, Nepal

INTRODUCTION

The number of non-communicable diseases (NCDs) such as hypertension, heart disease, kidney disease, diabetes, thyroid issues, musculoskeletal and digestive problems, as well as anxiety, depression, and dementia, is rising in today's world.¹ Hypertension has emerged as a significant public health issue in Nepal, particularly amidst the country's ongoing epidemiological transition.²

Makawanpur district, located in Bagmati Province of central Nepal, has seen a growth of care facilities, especially in expanding urban areas like Hetauda. Records from the local health office indicate that there are now four care homes in the district, caring for over 150 residents combined. Nevertheless, information about the health conditions of these residents, especially concerning NCDs like hypertension, is limited or unavailable.

As the population ages, there is a noticeable increase in the number of elderly individuals moving to care homes. Aging is a natural and ongoing process that begins at birth. Biologically, it occurs due to accumulated molecular and cellular damage over time, which causes a decline in an individual's physical, mental, and social abilities.³ Under the Senior Citizen Act 2063 of Nepal, age above sixty years is considered a senior or elder citizen.⁴ The aging population is rapidly increasing as a permanent global trend, driven by rising life expectancy and declining birth rates. In 2021, one in ten people worldwide was aged 65 or older, and this is projected to rise to one in six by 2050.^{1,5} In Nepal, 10.21% of the population is aged 60 or older.⁶

Hypertension is a long-term condition that poses significant health risks, including coronary heart disease, stroke, and other vascular issues. It is a leading cause of premature death in developing countries. Various factors, such as socio-demographic, economic, educational, and behavioral aspects, contribute to hypertension.⁷ Evidence indicates that institutionalized care may increase the risk of hypertension, influenced by factors such as mental stress, physical inactivity, inconsistent diets, prolonged medication use, and social isolation.⁸ According to WHO cutoff points, systolic blood pressure (SBP) over 140 mmHg and diastolic blood pressure (DBP) is above 90 mmHg.² Hypertension is a widespread cardiovascular disease and a significant public health issue, particularly among the care home population. As a chronic condition, hypertension contributes to the development of coronary heart disease, stroke, and other vascular complications.⁹

The move to care homes or assisted living facilities in Nepal is driven by various personal, social, financial, and health reasons. Major factors include the loss of spouses or care givers, family conflicts, chronic health conditions, financial dependency, and property disputes.^{8,10} In Makawanpur district, there are four care homes, all located in Hetauda, the capital of Bagmati province in Nepal. The operation, oversight, and management of these care homes involve government agencies, private organizations, non-profits, and religious groups. The Government of Nepal (GoN) has introduced various policies and guidelines, such as the Senior Citizen Act of 2006, to regulate the standards of these elderly homes.¹¹

Hypertension, diabetes, and asthma were more prevalent physical health issues, while depression and anxiety were common mental health concerns among elderly individuals. Implementing regular health check-up programs for seniors can improve both their physical and mental well-being, helping to prevent complications early.¹² Government employees, as a significant population group, influence NCD prevention, healthcare costs, and productivity through their quality of life, health consciousness, and healthy behaviors. Nonetheless, they may face higher risks of NCDs due to shifting lifestyles and urbanization.¹³ Detecting risk factors and behaviors during childhood and adolescence is vital for advocating

strategies to lower the risk of CVD in later life. While cardiovascular disease usually manifests in middle age or later, the risk factors, such as smoking and dietary habits, are largely shaped by behaviors learned in childhood and carried into adulthood.¹⁴ Hypertension and its related complications are significant causes of mortality and disability in South Asian countries such as India, Bangladesh, Nepal, Bhutan, and Sri Lanka. Recent WHO estimates indicate that 1.13 billion people worldwide have hypertension, with two-thirds living in low- and middle-income countries.²

METHODS

Study design

An analytical cross-sectional study design was used to estimate the prevalence of hypertension and examine its association with selected socio-demographic, socioeconomic, and behavioral factors at a specific point in time.

Study period

The study was conducted in selected care homes of Makawanpur District, Nepal from October 2025 to January 2026.

Study area

The study was conducted in four care homes: OM Aashram, Manav Sewa Aashram, Divya Sewa Nikedan, and Gairigau Aashram in Makawanpur District, Bagmati, Nepal. All four care homes were located within Hetauda Sub-Metropolitan City, the capital of the Bagmati Province.

Study population

The study population comprised individuals residing in selected care homes in Makawanpur District during the study period. Participants included both male and female residents aged 60 years and above who had been living in the care homes for at least one month prior to data collection.

Inclusion criteria

Participants were eligible if they were aged 60 years or older, had resided in the selected care homes for at least one month, and were able to provide information verbally or in writing. Residents with available medical records that could be used to verify their hypertension status were also included.

Exclusion criteria

Residents with serious or terminal illnesses or conditions that prevented effective communication or participation were excluded. Individuals who were deaf or mute, or

those with severe cognitive impairment that prevented them from understanding or responding to the study questions, were also excluded.

Sample size

A census approach was used, whereby all eligible residents of the four selected care homes were enrolled to study. A total of 139 eligible residents were included in the study.

Sampling technique

A census sampling technique was employed. All four identified care homes in Makawanpur District and all eligible residents within these institutions were included. This approach was considered appropriate because of the limited number of care homes and the manageable size of the study population, allowing comprehensive coverage of the target population.

Study variables

Hypertension status was dependent variable. Independent variables were age, sex, educational status, marital status, smoking status, alcohol consumption, physical activity, salt intake, family history of hypertension, psychological factors, including anxiety, stress, or mental pressure and source of income

Data collection technique

After obtaining formal approval from college, researcher-initiated contact with the administrators or heads of the four selected care homes in Makawanpur District. Initial communication was conducted through official letters followed by phone calls or in-person visits to explain the study objectives, procedures, and ethical considerations.

Following institutional approval, the researcher visited each care home to identify an appropriate schedule for data collection and participant interviews. The purpose of the study, inclusion and exclusion criteria, confidentiality measures, and the expected role of the facility staff were clearly explained during on-site briefing sessions. Data were collected through face-to-face interviews using a structured questionnaire, along with a review of available medical documents, prescriptions, and institutional health records to verify hypertension status.

Data collection tools

The study utilized a standardized questionnaire adapted from the WHOSTEPS survey instrument designed for NCD risk factor surveillance. The questionnaire was digitized and administered using the KoBo Toolbox platform to enhance the efficiency and accuracy of data collection. In addition, clinical and institutional records, including prescriptions and medical records, were

reviewed to validate self-reported information regarding hypertension status.

Data processing and analysis

Following completion of data collection through KoBo Toolbox, the collected data were checked for completeness and consistency. Data were exported to Microsoft Excel and subsequently analyzed using the statistical package for social sciences (SPSS). Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to summarize socio-demographic characteristics and the prevalence of hypertension among participants.

Bivariate analysis using the Chi-square test was conducted to examine the association between hypertension status and categorical independent variables such as sex, education level, and smoking status. Results were presented in tables, graphs, and charts with appropriate interpretation in relation to the study objectives.

Quality control and quality assurance

Validated tools such as WHO STEPS questionnaire were used to ensure consistency and comparability data. Data collection was conducted by qualified health professionals to maintain data quality. Collected data were regularly reviewed for completeness and correctness to minimize errors. Confidentiality of participants was strictly maintained, and personal identifiers were not disclosed regular feedback and support from supervisor were ensured.

Validity

A standardized and validated instrument (WHO STEPS questionnaire) was used to ensure accuracy in measuring variables related to hypertension. The tool has been previously used in similar studies in Nepal, ensuring contextual and content validity.

Reliability

Proposal preparation and questionnaire development of the study was done in the close guidance of the supervisor. Simple and understandable language was used as much as possible.

Ethical considerations

Ethical approval was obtained from Little Buddha College of Health Science and the Health Section of Hetauda Sub-Metropolitan City, Makawanpur. Written informed consent was obtained from all participants after explaining the objectives and procedures of the study. Participation was entirely voluntary, and participants were informed of their right to withdraw from the study at any stage without any consequences. Confidentiality

and anonymity of participants were strictly maintained throughout the study. Data were securely stored and accessible only to the researcher and supervisor.

RESULTS

Socio-demographic characteristics of the respondents

Table 1 presents the socio-demographic characteristics of the respondents. The mean age of the respondents were 76.42 years. Among the total participants, 51.1% were male and 48.9% were female. More than half of the respondents (52.5%) were widowed, followed 33.8% married and 13.7% were divorced.

Socio-economic characteristics of the respondents

Table 2 illustrates the socio-economic characteristics of the respondents. More than three-fourths of the respondents (78.4%) had no formal education, whereas 16.6% had completed primary-level education and only 5% had attained secondary-level education. Regarding previous occupation, more than half of the respondents (55.4%) had been engaged in agriculture, followed by unemployment (18.7%). Other occupations included labor work (12.2%), migrant work (7.9%), and business (5.8%). Nearly two-thirds of the respondents (61.8%) relied on social security allowances as their primary source of income, while 19.4% reported having no regular source of income. An equal proportion of respondents (9.4% each) depended on previous savings and family support.

Life-style related characteristics of the respondents

Table 3 presents the lifestyle-related characteristics of the respondents. None of the respondents reported current smoking; however, more than half (55.4%) were former smokers, and among them, 72.3% had smoked for more than 10 years. Similarly, none of the respondents reported current alcohol consumption, although 53.2% had consumed alcohol in the past, with nearly two-thirds reporting alcohol use for more than 10 years. Regarding physical activity, 45.3% of respondents engaged in light-intensity physical activity, while 35.3% engaged in moderate-intensity physical activity. None reported involvement in vigorous-intensity physical activity.

Salt intake behavior of the respondents

Table 4 shows the salt intake behavior of the respondents. More than one-third of the respondents (38.8%) reported rarely consuming extra added salt, while 28.8% consumed it sometimes and 21.6% never consumed extra added salt. Regarding processed food consumption, 31.7% consumed processed foods sometimes, 30.2% rarely consumed them, and 29.5% never consumed processed foods. Only 5.8% consumed processed foods often, while 2.9% reported always consuming them.

Health seeking behavior of the respondents

Table 5 presents the health-seeking behavior of the respondents. All respondents reported undergoing regular health checkups. The majority (63.3%) received health checkups at care home health facilities, followed by private clinics, while 25.2% visited government health institutions for regular checkups.

Hypertension related characteristics

Table 6 illustrates hypertension-related characteristics of the respondents. Almost all respondents (94.2%) had previously measured their blood pressure. The majority (79.9%) reported taking medication for chronic diseases. Less than one-third of respondents (25.2%) reported a family history of hypertension, whereas 26.6% were unaware of their family history of hypertension. More than half of the respondents (54.7%) reported feeling anxious, stressed, or mentally pressured.

Hypertension status

Table 7 shows the prevalence of hypertension among the respondents. More than half of the respondents (51.1%) were found to have hypertension.

Relationship between socio-demographic characteristics with hypertension

Table 8 presents the association between socio-demographic characteristics and hypertension status among the study participants. The findings indicate that family history of hypertension was significantly associated with hypertension status ($p < 0.005$), suggesting that participants with a family history of hypertension were more likely to have hypertension.

Relationship between socioeconomic characteristics and hypertension

Table 9 presents the association between socioeconomic characteristics and hypertension status among the study participants. Most socioeconomic characteristics were not significantly associated with hypertension. However, current source of income was significantly associated with hypertension ($p = 0.03$), indicating a potential relationship between participants' socioeconomic circumstances and hypertension status.

Relationship between life style related factors with hypertension

Table 10 presents the association between lifestyle-related factors and hypertension status among the study participants. Among the lifestyle-related factors examined, anxiety, stress, or mental pressure was significantly associated with hypertension ($p = 0.01$), whereas the other factors showed no statistically significant association.

Table 1: Socio-demographic status, (n=139).

Characteristics	Male, (n=71)		Female, (n=68)		Total
Age group (in years)	N	%	N	%	
≤75	37	52.1	34	47.9	51.1
>75	34	50	34	50	48.9
Mean=76.42, SD=±9.13					
Marital status					
Married	22	52.4	25	47.6	33.8
Widowed	30	45.5	43	54.5	52.5
Divorced	11	57.9	8	42.1	13.7

Table 2: Socio-economic characteristics.

Characteristics	Male, (n=71)		Female, (n=68)		Total
Level of education	N	%	N	%	
No formal schooling	51	46.8	58	53.2	78.4
Primary (1-5)	14	60.9	9	39.1	16.6
Secondary (5-8)	6	85.7	1	14.3	5
Past occupation					
Farmer/ agriculture	40	51.9	37	48.1	55.4
Labor	10	58.8	7	41.2	12.2
Business	6	75	2	25	5.8
Migrant worker	9	81.8	2	18.2	7.9
Unemployed	9	34.6	17	65.3	18.7
Current source of income					
No regular source	10	37	17	63	19.4
Previous savings	11	84.6	2	15.4	9.4
Support from family /relatives	6	46.2	7	53.8	9.4
Social security allowance	44	51.2	42	48.8	61.8

Table 3: Lifestyle related characteristics, (n=139).

Characteristics	Male, (n=71)		Female, (n=68)		Total
	N	%	N	%	
Current smoking					
No	71	51.1	68	48.9	100
Past smoker					
Yes	40	51.9	37	48.1	55.4
No	31	50	31	50	44.6
Consumption duration, (n=77)					
1-5 years	5	50	5	50	12.9
6-10 years	7	63.6	4	36.4	14.3
More than 10 years	28	50	28	50	72.3
Current alcohol consumption					
No	71	51.1	68	48.9	100
Past alcohol consumption					
Yes	36	48.6	38	51.4	53.2
No	35	53.8	30	46.2	46.8
Consumption duration, (n=74)					
1-5 years	2	33.3	4	66.7	8.1
6-10 years	8	42.1	11	57.9	25.7
More than 10 years	26	53.1	23	46.9	66.2
Light intense physical activity					
Yes	41	65.1	22	34.9	45.3
No	30	39.5	46	60.5	54.7
Moderate intense physical activity					
Yes	32	65.3	17	34.7	35.3

Continued.

Characteristics	Male, (n=71)		Female, (n=68)		Total
	N	%	N	%	
No	39	43.3	51	56.7	64.7
Vigorous intense physical activity					
No	71	51.1	68	48.9	100

Table 4: Salt intake behavior, (n=139).

Characteristics	N	Percentage (%)
Consumption of extra added salt		
Never	30	21.6
Rarely	54	38.8
Sometime	40	28.8
Often	10	7.2
Always	5	3.6
Consumption of processed foods		
Never	41	29.5
Rarely	42	30.2
Sometime	44	31.7
Often	8	5.8
Always	4	2.9

Table 5: Health seeking behavior, (n=139).

Characteristics	N	Percentage (%)
Regular health checks up		
Yes	139	100
If yes,		
Regular health checks up		
Government health institutions	35	25.19
Care home health facility	88	63.3
Private clinic /hospital	51	36.7
Pharmacy /medical shop	16	11.5

Table 6: Hypertension related characteristics.

Characteristics	Male, (n=71)		Female, (n=68)		Total
Ever measured blood pressure	N	%	N	%	
Yes	67	51.1	64	48.9	94.2
No	4	50	4	50	5.8
Hypertension told by doctor					
Yes	40	52.6	36	47.4	42
No	27	49.1	28	50.9	58
Drugs consumption for hypertension, (n=77)					
Yes	37	52.1	34	47.9	100
Any medication for chronic disease					
Yes	55	49.5	56	50.5	79.9
No	16	57.1	12	42.9	20.1
Family history of hypertension					
Yes	21	60	14	40	25.2
No	37	55.2	30	44.8	48.2
Don't know	13	35.1	24	64.9	26.6
Anxious stressed or mentally pressure					
Yes	38	50	38	50	54.7
No	33	52.4	30	47.6	45.3

Table 7: Hypertension status.

Dependent variable	Male, (n=71)		Female, (n=68)		Total
Hypertension status	N	%	N	%	
Yes	37	52.1	34	47.9	51.1
No	34	50	34	50	48.9

Table 8: Relationship between socio-demographic characteristics with prevalence.

Sociodemographic factors	Hypertension		P value
	No (%)	Yes (%)	
Age (in years)			
≤75	40 (56.3)	31 (43.7)	0.074
>75	28 (41.2)	40 (58.8)	
Sex			
Male	34 (47.9)	37 (52.1)	0.803
Female	34 (50)	34 (50)	
Marital status			
Single	46 (47.9)	50 (52.1)	0.723
Married	22 (51.2)	21 (48.8)	
Family history			
No	28 (41.8)	39 (58.2)	<0.005
Yes	11 (31.4)	24 (68.6)	
Don't know	29 (78.4)	8 (21.6)	

Table 9: Relationship between socioeconomic characteristics and hypertension.

Socio-economic factors	Hypertension		P value
	No (%)	Yes (%)	
Level of education			
No formal schooling	57 (52.3)	52 (47.7)	0.129
Schooling	11 (36.7)	19 (63.3)	
Past occupation			
Farmer	34 (45.9)	40 (54.1)	0.45
Non-farmer	34 (52.3)	31 (47.7)	
Current source of income			
No regular source of income	32 (60.4)	21 (39.6)	0.03
Social security allowance	36 (41.9)	50 (58.1)	

Table 10: Relationship between life style related factors with hypertension.

Lifestyle factors	Hypertension		P value
	No (%)	Yes (%)	
Past smoking habit			
No	36 (58.1)	26 (41.9)	0.053
Yes	32 (41.6)	45 (58.4)	
Past alcohol consumption habit			
No	33 (50.8)	32 (49.2)	0.683
Yes	34 (47.3)	39 (52.7)	
Feel anxious, stressed, or mentally pressured			
No	38 (60.3)	25 (39.7)	0.01
Yes	30 (39.5)	46 (60.5)	
Light physical activities			
No	42 (55.3)	34 (44.7)	0.07
Yes	26 (41.3)	37 (58.7)	
Moderate physical activities			
No	45 (50)	45 (50)	0.43
Yes	23 (46.9)	26 (53.1)	

DISCUSSION

The prevalence of hypertension observed in this study was 51.1%, indicating a substantial burden of hypertension among elderly individuals residing in care homes. This finding reflects the increasing trend of hypertension prevalence compared to earlier studies conducted in Nepal during the early 1990s, which reported a prevalence of 13.8%, and is also comparable with findings from similar studies conducted among elderly populations in care homes reporting a prevalence of 48.8%.^{7,15}

The present study identified a strong association between family history and hypertension ($p < 0.005$). Similar findings have been reported in a study conducted in Iran, where family history was significantly associated with hypertension ($p = 0.015$).¹⁶ This suggests that genetic predisposition and shared family-related lifestyle factors may contribute to the development of hypertension among elderly populations.

In this study, anxiety, stress, or mental pressure was significantly associated with hypertension ($p = 0.01$). These findings are supported by previous cross-sectional studies among elderly populations, which reported that higher stress levels and poor sleep quality were significantly associated with hypertension.¹⁷ Psychological stress may contribute to elevated blood pressure through neuroendocrine and behavioral pathways, particularly among older adults residing in institutional settings.

Although none of the respondents were current smokers, past smoking showed a borderline association with hypertension ($p = 0.053$), indicating a possible increased risk among former smokers. Similar findings have been reported in previous studies, including large prospective studies among men and women that demonstrated a modestly increased risk of hypertension among former smokers.¹⁸ However, some studies have reported no significant association, particularly among populations with lower cumulative smoking exposure.

Limitations

The cross-sectional design of the study does not allow for establishing cause-and-effect relationships between hypertension and the determined factors. Self-reported information on lifestyle-related factors may have been subject to recall and social desirability bias. Besides, the analysis used the presence of hypertension based on the patient's records or prescriptions rather than independent measurements of blood pressure.

CONCLUSION

The study provides important insights into the socio-demographic, socioeconomic, and lifestyle-related factors associated with hypertension among elderly residents of

care homes in Makawanpur district. The prevalence of hypertension was 51.1%, indicating a substantial burden in this population. The mean age of participants was 76.42 years, with a nearly equal proportion of males (51.1%) and females (48.9%). More than half of the participants were widowed (52.5%), while the majority had no formal education (78.4%). Social security allowances were the primary source of income for 61.8% of participants.

Despite all participants reporting regular health check-ups and 94.2% having their blood pressure measured, the prevalence of hypertension remained high. A statistically significant association was observed between family history of hypertension and hypertension status ($p < 0.005$). Similarly, anxiety, stress, or mental pressure was significantly associated with hypertension ($p = 0.01$), suggesting a potential relationship between psychological well-being and hypertension among older adults. Current source of income was also significantly associated with hypertension ($p = 0.03$), indicating that socioeconomic circumstances may contribute to hypertension risk in this population.

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