

Prevalence and Awareness of Hypertension among Adults and its Related Risk Factors

Basant Maharjan¹

¹Community Health Development Program, Public Health Concern Trust (pfect-NEPAL) Kathmandu, Nepal.

ABSTRACT

Background: Hypertension is a modifiable risk factor for cardiovascular diseases. Various studies conducted in the world showed high prevalence of hypertension, which is in increasing trend in Nepal also. The aim of this study was to assess hypertension status and risk behaviours among adult population in Kirtipur Municipality.

Methods: A cross sectional descriptive study was conducted among 580 adults of age 20 - 59 from December 2015 to April 2016. Data was collected by observation method to determine hypertension prevalence and Body Mass Index. Questionnaire was used to assess exposure to the risk factors.

Results: Among all hypertension prevalence was 37.0% (215 out of 580). The prevalence was 41.6% (110 out of 264) among male and 32.2% (105 out of 316) among female ($P < 0.03$ at 95% CI). Among 215 hypertensives, 37.2% were not aware about themselves having hypertension. Within last 12 months, 453 (78.1%) participants had checked their blood pressure. Proportion of hypertension was increasing with higher BMI and advancing age. Among all, 136 (23.7%) were current smokers, and 58.1% among them had hypertension.

Conclusions: This study indicated that hypertension prevalence was high among adults in Kirtipur municipality. Prevalence of smoking was also high, and among them hypertension prevalence was very high. About one-third participants with hypertension were not aware that they had hypertension. Habit of doing regular physical exercise was very low.

Keywords: Body mass index; hypertension prevalence; smoking.

INTRODUCTION

WHO estimates that non-communicable diseases were responsible for more than 68 % of deaths in 2012.¹ Hypertension, obesity, physical inactivity, smoking are some major cardiovascular risk factors² and if hypertension left uncontrolled, it causes stroke, myocardial infarction, cardiac failure, renal failure and blindness.¹ A report of 1996 stated arterial hypertension related cardiovascular diseases were responsible for nearly 20% of all deaths world-wide.³ Aging and behavioural factors, such as unhealthy diet, lack of physical activity, excess weight and stress attribute in increasing prevalence of hypertension.⁴ A review report stated prevalence of hypertension in Nepal ranges from 18.8% to 41.8%.⁵ Various studies in different places and time showed different prevalence.⁶⁻¹¹ Studies also showed many people having high blood pressure did not know they have hypertension.^{6,12}

The study was aimed to measure hypertension prevalence

among adults in Kirtipur municipality, and to explore the risk behaviours of people.

METHODS

This was a cross sectional study conducted among adult population of age between 20 and 59 years in Kirtipur municipality. Data was collected from December 2015 to April 2016. Ethical approval from Nepal Health Research Council was taken prior to start the study. Likewise, permission from Kirtipur Municipality Office was taken. Informed consent was sought from the participants before data collection. A total of 580 participants were selected from four selected wards of the municipality. At first, four wards out of 19 were selected randomly, and required number of households was selected on basis of proportionate probability sampling from each selected ward. One eligible member from each selected household was randomly chosen as participant. The people who have been temporarily residing as tenant in the selected households and the family members who

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Correspondence: Dr Basant Maharjan, Community Health Development Program, Public Health Concern Trust (pfect-NEPAL) Kathmandu, Nepal. Email: basant06maharjan@yahoo.com, Phone : +977 9841276057.

were not present at the time of data collection were excluded from selection list.

An observation format was used to record anthropometric information to calculate Body Mass Index (BMI) and blood pressure readings. Blood pressure was measured adopting guidelines recommended by the WHO STEP Surveillance, Training and Practical Guides to Physical Measurement Manual.¹³

A semi-structured questionnaire was used to assess knowledge about effects of hypertension and exposure to risk factors such as smoking, alcohol consumption, and physical activities. Prevalence of smoking was assessed on the basis of if the participants have smoked at least once within last seven days, use of alcohol was assessed on basis of if they have had any alcoholic beverage within last 12 months, and physical exercise assessed on basis of if they did exercises once or more in a week for at least 10 minutes at a time within last four weeks. Blood pressure was measured using digital automatic blood pressure monitor (OMRON, Japan), and recorded blood pressure was categorized according to the blood pressure classification of 7th Report of Joint National Commission which classifies level of blood pressure as: normal (< 120/80 mmHg), pre-hypertension (SBP 120-139 and / or DBP 80-89 mmHg), stage 1 hypertension (SBP 140-159 and / or DBP 90-99 mmHg) and stage 2 hypertension (SBP = / > 160 and / or DBP = / > 100 mmHg).² Observed SBP level = / > 140 mmHg and / or DBP = / > 90 mmHg was considered as existence of hypertension,¹ those who reported as they are on anti-hypertensive medications currently were also considered as previously diagnosed hypertensive.

A digital weighting scale (Tanita, Japan) was used to measure body weight and a statute height measuring scale (Bio-Plus, India) was used to measure body height. The BMI was interpreted on basis of the BMI Classification of Global Database on Body Mass Index, WHO¹⁴ and BIM Index for Asian Population.¹⁵ The data was entered into the SPSS 17 package, and descriptive statistics for frequencies, percentage and correlation were calculated for relevant variables.

RESULTS

Among 580 participants, 314 (54.5%) were female and 264 (45.5%) were male, and majority (39.5%) was in age group of 30 - 39 and majority (73.5%) was Newar. Of total 453 (78.1%) had checked their BP within last 12 months, and the practice proportion is higher among female and illiterate or participants with non-formal education (Table 1).

Table 1. Practice of checking blood pressure by gender and education status.

Gender	BP checked within last 12 months		Total
	Yes	No	
Female	255 (80.7%)	61	316
Male	198 (75.3%)	66	264
Total	453 (78.1%)	217	580
Education status			
Illiterate or no formal education	144 (86.7%)	23	166
School level	97 (78.2%)	27	124
Higher secondary or above	212 (73.1%)	78	290

On basis of JNC 7 category for BP classification, 235 (40.5%) were fall under Normal BP, 130 (22.4%) in Pre-Hypertensive stage, 194 (33.4%) in Stage I Hypertension and 21 (3.6%) in Stage II Hypertension (Table 2).

Table 2. Blood pressure status by age group on basis of JNC-7 classification of blood pressure.

Age Group	Blood Pressure Status				Total
	Normal	Pre HTN	HTN Stage I	HTN Stage II	
20 -29	16	3	1	0	20
30 - 39	156	47	21	5	229
40 - 49	45	47	81	3	176
50 - 59	18	33	91	13	155
Total	235 (40.5%)	130 (22.4%)	194 (33.4%)	21 (3.6%)	580

(* Normal - SBP < 120 and DBP < 80 mmHg; Pre HTN - SBP 120 - 139 or DBP 80 - 89 mmHg; Stage I HTN - SBP 140 - 159 or DBP 90 - 99 mmHg; Stage II HTN - SBP = / > 160 or DBP = / > 100 mmHg)

Among total, 215 (37.0%) were found with hypertension. The prevalence was 32.2 % among female and 41.6% among male (P <0.03 at 5% level of significance). The rate was highest (59.1%) among age group 50 - 59 (Table 3). Among 215 hypertensive, 80 (37.2%) did not know that they have high blood pressure.

Among all, 514 (88.6%) perceived that raised BP should be kept in control, and out of them 89.9% responded as otherwise it may cause paralysis or problem in brain, 61.8% as heart attack and 25.3% as problem in kidney. Out of 163 participants who told as they have high blood pressure, 61.3% responded they are on allopathic medication and 14.1% on alternative medication.

Table 3. High blood pressure status by age group and gender.

Age group	HTN Status Male		HTN Status Female		HTN Status Combined		Total	Confidence level 95%
	Yes *	No	Yes *	No	Yes *	No		
20 -29	0	5	1	14	1 (5%)	19	20	
30 - 39	15	87	11	116	26 (11.3%)	203	229	Fisher Exact
40 - 49	40	42	44	50	84 (47.7%)	92	176	P = <0.001
50 - 59	55	20	49	31	104 (59.1%)	51	155	
Total	110 (41,6% among male)	154	105 (32,2% among female)	211	215 (37.0% among total)	365	580	Male to Female; P <0.03

* SBP = > 140 mmHg and or DBP = > 90 mmHg

Table 4. Hypertension status by BMI.

BMI	High Blood Pressure		Total N=580
	Yes*	No	
BMI classification of Global Database on Body Mass Index, WHO ¹⁴			
Below (<18.5)	1 (10.0%)	9 (90%)	10
Normal (18.5 - 24.9)	49 (20.9%)	185 (79.1%)	234
Pre obese (25 - 29.9)	125 (44.9%)	153 (55.1%)	278
Obese (= / > 30.0)	40 (68.9%)	18 (31.1%)	58
BMI classification for Asian Population ¹³			
Under weight (<18.5)	1 (10.0%)	9 (90%)	10
Acceptable / increasing risk (18.5 - 23.0)	28 (18.5%)	123 (81.5%)	151
Increased risk (23 - 27.5)	96 (35.7%)	173 (64.3%)	269
Higher high risk (= > 27.5)	90 (60.0%)	60 (40.0%)	150

* SBP = > 140 mmHg and or DBP = > 90 mmHg

Among all, on basis of BMI classification of Global Database, WHO, 58 (10.0%) were obese and 278 (47.9%) were in pre obese state of BMI. Out of 58 obese and 278 pre obese, 68.9% and 44.9% respectively have hypertension. Likewise, on basis of BMI classification recommended for Asian Population, out of total, 150 (25.9%) were in higher high risk group and 269 (46.4%) were in increased risk group. Among higher high risk group and increased risk group, 60.0% and 35.7% respectively have hypertension (Table 4).

Out of 580 participants, 136 (23.5%) were current smokers, and among them 58.1% have hypertension whereas the prevalence was 27.4% among non-smokers (Table 5). Among total, 171 (29.5%) never consumed alcoholic beverage in last 12 months and other 409 (70.5%) had consumed alcoholic beverage at least one occasion more during the period. Only 158 (27.2%) responded as they do physical exercise and out of them 53 (33.3%) had responded as they do regular (= / or > 5 days in a week) physical exercise.

Table 5. Current smokers and hypertension status among the smokers.

Smoking status	High Blood Pressure		Total
	Yes	No	
Yes	79 (58.1%)	57	136 (23.5%)
No	112 (27.4%)	296	408
Used to smoke*	24 (66.7%)	12	36
Total	215	365	580

* Never smoked within last three months with intension to quit smoking

DISCUSSION

Out of 580 participants, it was found that about 453 (78.1%) participants have checked their BP in last 12 months which was only 57.3% in a national level survey conducted in Nepal in 2013.⁹ The rate was higher in women (80.7%) in compare to men (75.3%). The practice of checking BP was found more among illiterate or without formal education (86.7%) in compare to those having higher-level education (73.1%) and school level formal education (78.2%).

On basis of JNC 7 category for BP classification, 130 (22.4%) were in Pre Hypertensive stage, which is high risk ratio (2.5 among women and 1.6 among men) for cardiovascular diseases in compare to normal BP¹⁶ which was much lower than a community study in 2015 that showed 46.6% pre-hypertension.¹² Among all, 215 (37.0%) participants have raised blood pressure (SBP = / > 140 or DBP = / > 90 mmHg), which was 32.2% among women and among men it was 41.6%. The difference was significant at 5% significance level (P <0.03). The prevalence is higher than a national level study of 2015 which reported 26 % prevalence of hypertension among Nepalese adults (Men 31 % and women 21 %) ⁹, and a rural community study in 2015 which showed 20.5% prevalence (Male 30.6% and Female 13.8%).¹²

The study found that prevalence of hypertension is increasing with advancing of age (5% in age group 20 - 29; 11.3% in age group 30 - 39; 47.7% in age group 40- 49; 59.1% in age group 50 -59). The difference was highly significant at 5% level of significance (P <0.001). The prevalence among age group 50 - 59 years old was slight lower than a study conducted in Banepa municipality in 2012, which showed 49.4% among age group 50 - 64 years¹⁰ but higher than one another study of municipalities of Kathmandu that showed 45.0% among age group 50-59, and almost similar among the age group below 30 years old (5.9%) and among 40 - 49 years group (47.3%).¹¹ The prevalence among age group below 30 years was much more lower than one another study of 2010 that showed prevalence of 11.1%.¹⁷

Among 215 participants having high blood pressure currently, 80 (37.20%) were not aware that they have high BP. The data is higher in compare to the 7th Report of the JNC on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure which stated it was approximately 30 percent² and is much less than a study of Dhulikhel that showed 69.9% of hypertensive were unaware of their hypertensive status¹⁴ and almost similar (39.1%) to a study of city malls in Kathmandu that showed only 39.13%.¹⁸ Out of 112 participants who have never checked BP in last 12 months, 24 (11.2%) have hypertension and did not know about their hypertensive state and who responded as they are hypertensive (163 participants), 100 (61.3%) had responded they are currently on allopathic medication. However medication history was collected on basis of the information provided by the participants without further verification.

Among all, 234 (40.4%) have normal BMI score, which is very less than the report of STEPS National Survey Nepal 2013, i. e. 67.9%.⁹ About 47.9% participants were in pre-obese state and 10.0% in obese category, which

were 17.7% and 4.0% respectively in the same national level study. The prevalence of hypertension was found increasing with higher the BMI score (20.9% among those with normal BMI score, 44.9% among pre-obese and 68.9% among obese). On the basis of the BMI Index recommended for Asian Population¹⁵ as well, proportions of hypertension were increasing with higher the BMI (18.5 % among acceptable group, 35.7% among increasing risk group and 60.0% among higher high risk group).

Among total, 136 (23.5%) were current smokers and the rate is slight higher than the national survey in 2013 which showed it was 18.5%.⁹ Likewise, a study in three municipalities of Kathmandu in 2016 showed only 19.9% prevalence of smoking¹¹ and 28.6% in a rural community among 20 - 50 years adults.⁸ Among the current smokers, 79 (58.1%) were found with hypertension whereas it was only 27.4% among the non-smokers (112 out of 408). Of total, 409 (70.5%) consume alcoholic drinks with various consumption frequencies (some with less than one time per month in average to more than four times per month average). A study of other municipalities in Kathmandu reported prevalence of alcohol use was 27.0% only¹¹ and in a rural community in Sindhupalchowk showed 47.8%.⁸ The high prevalence of alcohol use may be due to socio-cultural acceptance in the community.

Habit of doing physical exercise was found less. Among all, only 158 (27.2%) responded as they do physical exercise and out of them, only 53 (33.5%) responded as they do physical exercise regularly (>=5 times per week).

There are some limitations in the study. History of using anti-hypertensive medication was relied on the information provided by the participants without further verification, assessment of alcoholic drinks consumption was assessed just as if one consumed alcoholic beverage or not in last 12 months rather than on the basis of Standard Drinks used, and physical activity was assessed in terms of if one has habit of involvement in physical activities rather than calculating Minute Energy Consumption rate.

CONCLUSIONS

The prevalence of hypertension among adults of Kirtipur municipality was 37.0%, with slight lower rate among women (32.2.0%) compared to men (41.60%). Prevalence of hypertension was found increasing with advancing of age, and was found increasing with higher the BMI score. Among 215 participants having hypertension, 37.2% was not aware that they have hypertension. Nearly one-fourth (23.5%) participants were current smokers, and

among them 58.1% had high blood pressure, and 27.2% participants did physical exercises, but only 9.1% did regular physical exercises.

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