

THE PREVALENCE AND DETERMINANTS OF HYPERTENSION AMONG BHUTANESE MONKS IN THIMPHU TASHI-CHOE-DZONG

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ABSTRACT: Bhutan has seen an increasing trend of hypertension over last few years and the latest figures show that the prevalence rate of hypertension in Bhutan as per the hospital recorded figure was 310 per 10,000 population. However, there is no formal study being conducted on the prevalence among the Bhutanese population. The goal of the present study was to determine the prevalence and determinants of hypertension among Bhutanese monks residing in Thimphu Tashi-Choe-Dzong. The measurement tools used to collect the data for this study were self-administered questionnaire, measurement of blood pressure (2 times within 30 minutes), measurement of height and weight to determine Body Mass Index (BMI). The total sample size for this study consisted of 138 monks above age 20 and the prevalence rate of hypertension was 10.2%. This study has revealed that the age, total years as monk, monthly income, BMI and earlier history of hypertension were significantly associated with hypertension. However, the consumption of 'suja' (salted butter tea) and alcohol were found not associated with hypertension with p -value at $\alpha > 0.05$

Keywords: Hypertension, Blood Pressure, *Suja*, Alcohol, Body Mass Index (BMI)

INTRODUCTION

Hypertension is rapidly becoming a major public health concern and. However, it is a fact that hypertension and other non-communicable diseases lack prevention, Control and self-management skills, especially in developing and underdeveloped countries like sub-Saharan Africa and South East Asia. The Global and Regional burden of disease and Risk Factors, 2001: systemic analysis of population health data found that hypertension was leading cause of death and morbidity globally [1].

As per the WHO technical report in 2004, the estimated total number of adults with hypertension globally in 2000 was 972 million (957-987 million); 333 million (329-336 million) in economically developed countries and 639 million (625-654 million) in economically developing countries. The number of adults with hypertension in 2025 is predicted to increase by about 60% to a total of 1.56 billion (1.54-1.58 billion) and this predicts also side-by-side an increase in chronic disease burden which is closely linked with hypertension [2].

According to the World Health Organization (WHO), the South East Asia Region (SEAR) consists of 11 countries with diverse population size, land area, sociopolitical environment, economy and health care systems. Each country has epidemiological and geographical factors that may contribute to risks for developing pulmonary hypertension (PH) [3].

The 2007, Thimphu based survey on Risk Factors and prevalence of non-communicable diseases (NCD) found that a vast majority of the population (91.1%) is exposed to at least one of the NCD risk factors, but 56.5% three to five risk factors [4].

Though there is increasing trend in hypertension cases within Bhutan, there are no established statistics and records on the prevalence among different segments of population. This study is aimed at establishing grounded evidence on the prevalence of hypertension among monks. Monks are generally categorized in Bhutan as the most vulnerable group to develop high blood pressure due to sedentary living style.

METHODS

The data for this study were collected from 138 monks with eligible criteria (≥ 20 years) from Tashi-Choe-Dzong, Thimphu. Initially 154 monks were recruited, but only 138 could meet the eligible criteria. Purposive sampling technique using census method was used. Self-administered questionnaires were used to collect data on socio demographic characteristics, preventive behaviors on dietary habits, as well as their knowledge level on hypertension. Blood pressure readings were taken twice within 30 minutes. Height and weight measurements were also taken to determine BMI.

RESULTS

In this study 53.6% of the surveyed samples are within the age group of 20 to 30 followed by 18.1% within the age group 31 to 41, 20.2% of the surveyed sample in the age group 42 to 63 and only

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Table 1 Socio Demographic Characteristics

| Variables | Number | Percentage |
|--------------------------------------|------------|------------|
| Total number of studied-monks | 138 | 100 |
| SOCIO DEMOGRAPHIC | | |
| Age in Years; | | |
| ≤20 | 11 | 8 |
| 20-30 | 74 | 53.6 |
| 31-41 | 25 | 18.1 |
| 42-52 | 18 | 13 |
| 54-63 | 10 | 7.2 |
| Total years as monk; | | |
| ≤1 | 2 | 1.4 |
| 10-Jan | 61 | 44.2 |
| 20-Nov | 34 | 24.6 |
| 21-30 | 23 | 16.7 |
| 32-50 | 18 | 13 |
| Monastic Education Level; | | |
| Primary (up to 6 years) | 33 | 23.9 |
| Secondary(6-10 years) | 39 | 28.3 |

Table 2 Hypertension History

| Variable | Number | Percentage |
|--|--------|------------|
| Hypertension History in Family; | | |
| Yes | 22 | 15.9 |
| No | 72 | 52.2 |
| Do not know | 44 | 31.9 |
| Individual HT History; | | |
| Yes | 30 | 21.7 |
| No | 108 | 78.3 |
| Currently under HT treatment; | | |
| Yes | 9 | 6.5 |
| No | 21 | 15.2 |
| Current health status; | | |
| Very Poor | 3 | 2.2 |
| Poor | 30 | 21.7 |
| Normal | 77 | 55.8 |
| Good | 28 | 20.3 |

Table 3 *Suja* drinking pattern

| Variable | Number | Percentage |
|--|--------|------------|
| <i>Suja</i> (Salted Butter Tea); | | |
| Yes | 111 | 80.4 |
| No | 27 | 19.6 |
| <i>Suja</i>- Frequency of intake; | | |
| Never | 27 | 19.6 |
| 1-3 days/week | 73 | 52.9 |
| 4-6 days/week | 14 | 10.1 |
| 7 days/week | 23 | 16.7 |
| <i>Suja</i> – Quantity of intake; | | |
| Never | 27 | 19.6 |
| ≤1 cup of 200 ml | 39 | 28.3 |
| 1-3 cups of 200 ml | 56 | 40.6 |
| 3-4 cups of 200 ml | 11 | 8 |
| ≥5 cups of 200 ml | 4 | 2.9 |

Table 4 Alcohol drinking pattern

| Variables | Number | Percentage |
|---------------------------------------|--------|------------|
| Current Alcohol Drinking; | | |
| Yes | 19 | 13.8 |
| No | 98 | 71 |
| Past Habitual Drinker | 21 | 15.2 |
| When started drinking alcohol; | | |
| ≤20 years | 13 | 9.4 |
| 20-20 years | 5 | 3.6 |
| 30-39 years | 1 | 0.7 |
| ≥40 years | | |

8% are in 20 years of age. Majority of the study subjects, 44.2% were monks for last 1 to 10 years followed by 24.6% serving as monk between 11-20 years. 47.8% of the studied subjects are reported to have tertiary level of education and 37% have monthly income between 1000- 3000 (Table 1).

Among the studied subjects only 15.9% are reported to have family history of hypertension and 21.7% have individual history of hypertension before the survey. However only 6.5% are currently under treatment out of 21.7% reported cases (Table 2).

Regarding food consumption, the respondents were asked about their frequency and quantity of meal intake on per day per meal basis. Majority 133 (96.4%) reported of having only twice a day (morning and evening and remaining 5 (3.6%) have their meals from 3-4 times which is mostly 3 times (morning, noon and evening). Nonetheless 70 (50.7%) and 63 (45.7%) of the respondents have only ≤1 bowl and 1-2 bowls of their daily meals.

As for the 'suja' (salted butter tea) drinking, it was found that majority of surveyed-monks (111 or 80.4%) regularly take *suja* and the remaining 27 (19.6%) don't. Out of total 111 positive respondents, 74 of them (67%) take *suja* sometimes (1-3 days/week), 23 (21%) take every day and 14 (13%) mostly (4-6 days/week), respectively. 56 monks (40.6%) take 1-3 cups (200ml), 39(28.3%) take only ≤1 cups (200 ml), respectively. However, 4 monks (2.9%) take ≥5 cups (200ml), while 11 (8%) take 3-4 cups of *suja* (Table 3).

Nineteen monks (13.8%) revealed that they are current alcohol drinker, whereas the majority of them (71%) reported they are non-drinker. However, 21 monks (15.2%) were found to be past habitual drinkers (Table 4).

As for physical exercise 116 (84.1%) of 138 respondents engage in various forms of physical exercise out of which 54 (39.1%) engaged in moderate physical exercise at least 30 minutes in 1-3 days/week, 35 (25.4%) on regular basis (7 days/week) and 18 (13%) mostly (4-6 days/week). 27 (19.6%) of the respondents engage in vigorous physical exercise for at least 30 minutes sometimes (1-3 days/week), 10 (7.2%) on regular basis (7 days/week) and remaining 2 (1.4%) mostly (4-6 days/week).

Table 5 Physical Exercise and Meditation

| Variables | Number | Percentage |
|---|--------|------------|
| Total Number of Surveyed-Monks Studied | 138 | 100 |
| Physical Exercise; | | |
| Yes | 116 | 84.1 |
| No | 22 | 15.9 |
| Moderate Physical exercise; | | |
| Never | 10 | 7.2 |
| At least 30 min 1-2 days/week | 54 | 39.1 |
| At least 30 min 3-6 days/week | 18 | 13 |
| At least 30 min 7 days/week | 35 | 25.4 |
| Vigorous Physical exercise; | | |
| Never | 76 | 55.1 |
| At least 30 min 1-2 days/week | 27 | 19.6 |
| At least 30 min 3-6 days/week | 2 | 1.4 |
| At least 30 min 7 days/week | 10 | 7.2 |
| Meditation; | | |
| Yes | 122 | 88.4 |
| No | 16 | 11.6 |

Of the 138 surveyed monks, 122 (88.4%) respondent practice meditations and remaining 16 (11.6%) do not practice meditation for different reason (Table 5).

Regarding knowledge on hypertension, it was found that 55.1% respondent possessed fair knowledge on hypertension but 44.9% possessed poor knowledge on hypertension. In BMI category 31.2% were obese ($\geq 25 \text{ kg/m}^2$) and 10.9% (23-24.9 kg/m^2) are overweight as per the WHO recommended BMI cut-off for Asians.

Most respondents were satisfied or neutral in the score for the quality of life as monks.

DISCUSSION

The prevalence rate of hypertension in this study was 10.2% but however the actual rate could be higher owing to the larger number of subjects between age group of 20 to 30. Age was closely associated with the development of hypertension and similar findings were presented in a longitudinal study done by Kannel et al. [5] over the last 30 years showing that prevalence of hypertension increases with the growing age.

Age, total term served as monk, monthly income, BMI and individual history of hypertension (before survey) were found significantly associated with development of hypertension. However, there is conflicting findings on the monthly income; most of the studies have demonstrated that likelihood of developing high blood pressure is more significant with lesser income, contrary to the fact; this study found that high income is positively associated with development of high blood pressure. This statement has been inversely revealed in studies conducted by Matthews et al. [6]

In other words, the monks with higher income can

afford to buy more alcoholic drinks compared to the monks at lower income. Alcohol consumption increases blood pressure and this study is supported by the study conducted by Ezzati et al. [7]

Future researches were seen to have higher potential in the area of *Suja* Consumption leading to health impacts, chewing betel Nut, betel nut chewing has been age old tradition closely associated with the way of Buddhism practice in Bhutan; however this variable was not included in present study. As per the findings by Lin et al. [8] that Betel Nut chewing is associated with a greater risk of Cardiovascular Diseases.

Further studies should be done with reference to higher income and hypertension in the general population.

Since this study has adopted purposive sampling technique using census method, the findings from this study cannot be generalized to whole monk community in Bhutan. However, this study is at least expected to set a tone to further researches for other non-communicable diseases.

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