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PREVALENCE, AWARENESS, TREATMENT AND CONTROL OF HYPERTENSION AND MEDICATION ADHERENCE AMONG ELDERLY IN BARANGAY 836, PANDACAN, MANILA, PHILIPPINES

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ABSTRACT

Hypertension is a global public health issue and a major cause of morbidity and mortality. Hypertension is very common among the elderly and with a rapidly aging population, the prevalence of hypertension continues to rise, placing a substantial and escalating social and economic burden. This cross-sectional, population-based study assessed the prevalence and associated risk factors, awareness, treatment and control of hypertension among elderly residents of Barangay 836, Pandacan, Manila, as well as their medication adherence. A total of 108 eligible participants (72% response rate) completed an interviewer-administered questionnaire and undergone health examination focusing on BP and BMI measurement. Hypertension prevalence was 81.5%. Of the individuals who have hypertension, 77.3% were aware of their condition and 72.7% of the hypertensive participants were receiving antihypertensive drugs. However, only 15.9% of these participants achieved blood pressure control (130/80) according to the ACC/AHA recommendation. Multivariate logistic regression analysis showed that participants with family history of HTN and age 60 to 79 years are significant risk factors in the development of hypertension in this study (OR>1, p<0.05). Medication adherence was evaluated indicating about two-thirds of hypertensive participants have poor knowledge of HTN and its treatment, and majority (82.5%) exhibited non-perfect adherence in the management of hypertension. Significant findings of this study can be utilized by health care providers and researchers to determine the recent local situation of hypertension and better understand their patients' level of medication adherence for designing effective hypertension prevention and management programs in the country.

Keywords: Health assessment, hypertension, Philippines and urban.

INTRODUCTION

Hypertension (HTN) has been the leading cause of mortality in South-East Asia (SEA), similar to the worldwide statistics. Although this region has been perceived to be less prone to cardiovascular diseases (CVDs), the prevalence of HTN has been reported to be about 35%. In addition, awareness and control of hypertension in SEA is also low, both being below 50%[1]. The high level of prevalence of hypertension has attributed to the present pandemic of CVDs and death.

Existing literatures suggest that the proportion of people with hypertension increases with age[2]. Individuals with normal blood pressure at 55 years of age have a 90% lifetime risk for developing HTN[3]. In fact, the elderly constitute an important group in the epidemiology of hypertension. Of all age groups, they have the highest prevalence of hypertension and are at particularly high risk of hypertension-related diseases[4]. Recognizing the elderly as an at-risk population, earlier studies in various countries reported the prevalence, awareness, treatment and control of hypertension among the elderly[5-8].

The elderly population is increasing in developing countries as they undergo demographic transition, with a concomitant increase in life expectancy. Indeed, it is estimated that by the year 2050, the majority of the elderly people worldwide will reside in low- and middle-income countries[9]. Most of the cardiovascular health burden attributable to hypertension occurs in the developing world[10]. Therefore, with a rapidly aging population, the prevalence of HTN and related cardiovascular morbidity in Asian patients continues to rise, placing a substantial and escalating social and economic burden on this region.

Hypertension among the elderly is treatable, and blood pressure lowering can reduce the incidence of major coronary events and stroke[11,12]. However, despite the effectiveness of treatment, studies report that elderly with hypertension have the lowest levels of BP control compared with younger age group, even if they are more aware of their hypertension and more likely to be under medication[13].

Medication adherence has been increasingly recognized as an important factor in elderly persons' health. Various studies have shown that medication non-adherence is associated with poor health status in this population. Understanding factors associated with adherence level is a key component in the management of hypertension among elderly.

Despite these alarming trends, studies on HTN among elderly in urban areas are limited, especially in the Philippines. Although available national data survey (FNRI, 2013) did assess the prevalence of HTN, it did not focus exclusively on elderly. Thus, this present study aimed to;

1. Investigate the prevalence and distribution of hypertension, and associated risk factors,
2. Determine the status of awareness, treatment and control of hypertension among elderly in Barangay 836, Pandacan, Manila, Philippines, and
3. Assess the medication adherence level and its associated factors among elderly hypertensives.

METHODS

Study Design and Participants

A cross-sectional, population-based study was conducted in the Barangay 836, Pandacan, Manila on March, 2018. Target participants were elderly/senior citizens (60 years old and above) and permanent residents of Brgy. 836, Pandacan, Manila. Residents who were hospitalized, with cognitive impairment or unable to communicate verbally were excluded. From the reference population of 241 elderly based on the community registry, a sample size of 150 was predicted. A simple random sampling design was used. Each participant was given explanation about the procedure and objectives of the study. Written and oral consent were obtained from the participants. Confidentiality was assured and they were informed that their participation is fully voluntary and they could freely opt out if they chose. A total of 108 eligible participants (72% response rate) completed an interviewer-administered questionnaire and undergone health examination focusing on BP and BMI measurement.

Data Collection

A modified pre-validated questionnaire[6,8,15] was used and developed into a multi-item structured questionnaire to elicit the following information; socio-demographic information, BP and BMI, lifestyle habits, medical history, and item-scale questions assessing key factors related to treatment adherence. From existing literatures, these factors include knowledge of HTN and treatment[16], patient-doctor relationship[17], medication beliefs[18] and patient adherence[15].

An examination site was set up in the community hall. During the course of interview, two sitting blood pressure measurements were performed using a mercury sphygmomanometer, according to a common protocol adapted from procedures recommended by the American Heart Association[19]. The inter-rater reliability of the physical examination covering the BP measurement ranges from 0.91-1[20]. Body weight was measured using a digital scale. Height was measured (to the nearest 0.5 cm) with the participant in an erect position against a vertical surface.

Hypertension is defined as a mean systolic blood pressure (SBP) of $\geq$130 mmHg, a mean diastolic blood pressure (DBP) of $\geq$80 mmHg, or current use of medication to lower blood pressure[19]. Awareness of hypertension was defined as being perceived by the

participants who were diagnosed as hypertensive by physicians. Treatment for hypertension was measured by those being aware of their prior diagnosis of hypertension and who were using prescribed antihypertensive drugs. Control of hypertension refers to those who were treated, taking antihypertensive drugs having a mean SBP <130 mmHg and a mean DBP <80 mmHg among elderly hypertensives.

Knowledge of Hypertension

This consists of 9 items assessing general knowledge about HTN and drug treatments. Good knowledge of HTN required correct responses to the 4 questions on this topic in the questionnaire. Similarly, the patient's knowledge of anti-hypertensive drugs was also obtained from the specific questions on this topic in the questionnaire.

Beliefs about Medication

The 18-item questionnaire (BMQ) comprises two sections that evaluate participants' beliefs about the necessity of their medication in disease management and their concerns on its potential adverse effects. Respondents indicate their degree of agreement with each statement on a five-point Likert scale, ranging from 1-strongly disagree to 5-strongly agree. Scores obtained for individual items within both scales are summed. Higher scores indicate stronger beliefs.

Patient-Doctor Relationship

The 9-item based questionnaire (PDRQ-9) measures the doctor-patient relationship from the patient's perspective, which has been assessed specifically in primary care. Also, respondents indicate their degree of agreement with each statement on a five-point Likert scale, ranging from 1-strongly disagree to 5-strongly agree.

Patient Adherence. The Hill-Bone Medication Adherence (HBMA) Scale consists of 9 four-point Likert-type items (1-none of time, 2-some of the time, 3-most of time, and 4-all the time) that measures patient's self-reported compliance.

Statistical Analysis

Descriptive statistics were used to report the prevalence, awareness, treatment, and control of HTN. The associations between categorical (e.g. socio-demographic, health-related and lifestyle-related) variables were tested by the use of contingency tables and the Chi-square test. Multivariate logistic regression analysis was conducted to investigate the factors associated with the prevalence of hypertension. Odds ratios (ORs) with 95% confidence intervals (95% CIs) for hypertension status were also calculated. All statistical analyses were performed using XLSTAT 2018.2.50198. p value of less than 0.05 is considered statistically significant.

RESULTS

The prevalence of hypertension was 81.5% (88/108) among study participants. Table 1 shows the distribution of socio-demographic and life-style related factors by hypertension prevalence rates, awareness, treatment and control. In this study group, gender, educational attainment and family history of HTN are significantly associated with the prevalence of hypertension (Chi-square, $p<0.05$).

Of the individuals who have hypertension, 77.3% (68/88) were aware of their condition. Similarly with prevalence, females and those having a family history of HTN, as well as current or past smokers were more aware of their hypertension. 72.7% (64/88) of the hypertensive participants were receiving antihypertensive drugs. However, only 15.9% (14/88) of these participants achieved blood pressure control (130/80) according to the ACC/AHA recommendation. No statistical differences were observed in awareness, treatment and control by age, marital status, employment status, BMI, eating habit and alcohol consumption (Chi-square, $p<0.05$).

In order to further analyze risk factors of hypertension, hypertension was taken as dependent variable, while age, gender, marital status, educational attainment, employment status, BMI, family history of HTN, eating habit, smoking and alcohol consumption as independent variables. Multivariate logistic regression analyses were performed to find independent association of these factors. Table 2 presents predictors of HTN which confirms the importance of a number of factors identified in Table 1. Particularly, individuals in lower age group level appeared to have higher risk of developing hypertension (OR>1, $p<0.05$). Compared with participants with non-formal education, those who finished primary or secondary level were more likely to suffer from hypertension (OR>1, $p<0.05$). In addition, hypertensive individuals with a family history of HTN had a higher chance of developing hypertension than those without (OR>1, $p<0.05$). Gender, marital status, employment status, BMI and lifestyle-related habits were not independently associated with hypertension based on the results of the analysis.

Eighty out of the eighty-eight hypertensive participants completed the questionnaires that assess adherence level with a response rate

of 90.9%. Table 3 summarizes the adherence level and its associated factors to hypertension management. Two out of three participants had poor knowledge with regards to hypertension and its treatment. Majority of the sample (82.5%) believed in the necessity of their medication for maintaining health (i.e. had scores greater than the scale midpoint). 60% of the study sample (had score higher than scale midpoint) were concerned about potential long-term effects and dependence on the drug, too much trust on their physician, and safety of natural remedies over anti-HTN drugs. Likewise, for the level of satisfaction, 90% of the participants had good relationship with their doctors. Unfortunately, patient adherence, as evaluated by HBMA scale, resulted to a relatively low (17.5%) perfect adherence among study sample.

DISCUSSION

The present study showed that the prevalence of hypertension in the study group (81.5%) was higher compared to the 8th National Nutrition Survey conducted by the Food and Nutrition Research Institute of the Department of Science and Technology, Philippines in 2013 reporting prevalence rates of 33.1% among 60-69 years old and 34.1% among 70 years old and above[21]. It was also higher than those in Asian countries such as Taiwan (60.4%)[5], Korea (68.7%)[6], Thailand (51.1%)[7], China (48.5%)[8] and Singapore (73.9%) [22].

Similar to previous studies, the association of hypertension with gender, family history of HTN and educational background was observed[6,8,23]. However, from the multivariate analysis, although elderly female Filipinos had a higher prevalence of hypertension than men, the relationship was considered not statistically significant. In contrast to findings from developed countries, where risk factors for cardiovascular diseases, including hypertension, are more pronounced among the less educated groups, higher educational levels is associated with increased chances of hypertension[24]. Still, a family history of HTN was determined to be strong predictor of hypertension in this study, supporting similar findings in different populations [8,23].

Overall, the rates of awareness and treatment of hypertension among study subject is higher than most studies from other countries, although a few studies reported similar figures[5-8,22]. The levels of awareness and treatment of hypertension are contingent efforts aimed at raising awareness about hypertension, together with the efficiency of health-care services in detecting hypertension and initiating treatment. Thus, these findings suggest good public health awareness, screening programs and health-care services in the country. In the Philippines, the Department of Health (DOH) is continuously addressing hypertension through many strategies and initiatives such as screening for hypertension and other non-communicable diseases like diabetes in health facilities nationwide. People who are diagnosed with hypertension are enrolled in the DOH Hypertension and Diabetes Registry and Club for regular follow-up medical examination with provision of maintenance medicines[25].

Although not statistically significant, a low control percentage was observed among hypertensive participants undergoing treatment. Such finding might be attributed from lack of information on the right management of hypertension. Some patients did not know that they needed to take antihypertensive drugs in their whole lives. Instead, they believed that they could stop taking the drugs when their BP was checked and found "normal". Therefore, it is crucial to promote health education to enable the communities to realize the importance of treatment adherence and regular medical check-ups. Antihypertension programs in communities can be implemented for regular monitoring of blood pressure as well as pharmacological treatment regimen of people with hypertension.

Further, from the perspective that a family history of HTN and age 60 to 79 years are strongly associated with hypertension in this study, immediate relatives of persons diagnosed with hypertension should be monitored and advised to have their blood pressure regularly checked. Older residents should also be similarly advised.

Medication adherence is a key component in the management for patients with hypertension. The key to design interventions to improve medication adherence is a greater understanding of the factors related to poor. Patient-Doctor Relationship gives the opportunity to assess the communication, level of satisfaction and availability in dealing with the physician in regard to patient`s point of view[26]. With higher percentage showing good relationship, this indicated better level of satisfaction among participants. Majority have positive beliefs about the necessity of their medication. However, strong concerns about potential adverse effects and drug dependence were expressed by more than half of the participants.

Major findings indicate that about two-thirds of hypertensive participants have poor knowledge of HTN and its treatment, and majority exhibited non-perfect adherence in hypertension management. Thus, intervention

must be directed towards improving knowledge and adherence in individuals by regularly attending an educational program during outpatient visits scheduled by primary care health-providers to achieve better control of hypertension.

CONCLUSION

The study revealed that the prevalence of hypertension among elderly Filipinos is higher than most Asian countries. From several contributing factors to such difference, gender, educational attainment and family history of HTN were significantly associated with the prevalence of hypertension. However, elderly in the lower age groups and with family history of HTN had higher risks of developing the disease. Despite acceptable level of treatment and awareness, the alarmingly low rate of control among elderly hypertensives is an indicative of the need for immediate strategies and interventions to improve BP control. Medication adherence is an important factor that must be addressed for successful treatment and control of HTN in this high-risk population.

Health care providers and researchers can utilize the findings of this study to ascertain the up-to-date local situation of hypertension and better understand their patients' level of medication adherence for designing effective hypertension prevention and management programs.

Table 1: Percent (%) Distribution of Socio-Demographic and Lifestyle-related Factors and Hypertension Status among Elderly in Barangay 836, Pandacan, Manila (March 2018)

	Total (n=108)	HTN Prevalence (n=108)[a]	HTN Awareness (n=88)[b]	HTN Treatment (n=88)[b]	HTN Control (n=88)[b]
Age					
60-70	46.3	40.7	36.4	34.1	11.4
71-80	38.9	31.5	29.5	27.3	4.5
81 and above	14.8	9.3	11.4	11.4	0.0
Gender					
Male	18.5	18.5	22.7	20.5	4.5
Female	81.5	63.0*	54.5*	52.3	11.4
Marital Status					
Single	3.7	3.7	2.3	2.3	0.0
Married/Cohabiting	40.7	32.4	36.4	31.8	6.8
Widowed/Divorced/Separated	53.7	36.1	38.6	38.6	9.1
Educational Attainment					
Non- formal Education	7.4	3.7	2.3	2.3	0.0
Primary	37.0	35.2	37.5	34.1	4.5
Secondary	50.0	42.6*	37.5	36.4	11.4
Tertiary	5.6	0.0	0.0	0.0	0.0
Employment Status					
Unemployed	81.5	66.7	59.1	54.5	9.1
Employed (Health-related)	1.9	1.9	2.3	2.3	0.0
Employed (Not health-related)	16.7	13.0	15.9	15.9	6.8
BMI					
Underweight: BMI<18.50	9.3	5.6	3.4	3.4	2.3
Normal: BMI (18.5-22.99)	33.3	25.9	26.1	23.9	4.5
Overweight: BMI (23-24.99)	24.1	20.4	15.9	15.9	4.5
Obese: BMI>25	33.3	29.6	31.8	29.5	4.5
Family History of HTN					
Yes	42.6	40.7*	34.1*	33.0	2.3
No	57.4	40.7	43.2	39.8	13.6
Eating Habit (salted/preserved food)					
Less than once per month	38.9	28.7	27.3	25.0	9.1
Twice or thrice a month	38.9	32.4	28.4	26.1	2.3
Two or three times a week	18.5	16.7	17.0	17.0	4.5
More than four times a week	3.7	3.7	4.5	4.5	0.0
Smoking					
Non-smoker	83.3	68.5	61.4	59.1	9.1
Current or past smoker	16.7	13.0	15.9*	13.6	6.8
Alcohol consumption					
Non-drinker	81.5	64.8	62.5	60.2	6.8
Occasional	18.5	16.7	14.8	12.5	9.1
Exercise					
Lack of exercise (less than once a month)	22.2	21.3	20.5	20.5	2.3
Occasional exercise (once a month or less than 3x per week)	31.5	23.1	26.1	25.0	9.1
Regular exercise (≥3 per week)	46.3	37.0	30.7	27.3	4.5

[a] Among all participants, [b] Among participants with hypertension, *p < 0.05, Chi-square Test

Table 2: Multivariate Analysis of Risk Factors of Hypertension

Variable	Odds Ratio (95% Confidence Level)	p-value
Age		
60-70	4.400 (1.171-16.531)	**0.028**
71-80	2.550 (0.715-16.531)	0.149
81 and above	Reference	
Gender		
Male	Reference	
Female	---	0.992
Marital Status		
Single	Reference	
Married/Cohabiting	---	0.993
Widowed/Divorced/Separated	---	0.993
Educational Attainment		
Non- formal Education	Reference	
Primary	19.000 (2.609-138.383)	**0.004**
Secondary	5.750 (1.189-27.810)	**0.030**
Tertiary	----	0.991
Employment Status		
Unemployed	Reference	
Employed (Health-related)	---	0.994
Employed (Not health-related)	0.778 (0.226-2.678)	0.690
BMI		
Underweight: BMI<18.50	0.321 (0.069-1.502)	0.149
Normal: BMI (18.5-22.99)	Reference	
Overweight: BMI (23-24.99)	1.179 (0.296-4.698)	0.816
Obese: BMI>25	1.143 (0.331-3.949)	0.833
Family History of HTN		
Yes	9.000 (1.969-41.128)	**0.005**
No	Reference	
Eating Habit (salted/preserved food)		
Less than once per month	Reference	
Twice or thrice a month	3.194 (0.635-16.052)	0.159
Two or three times a week	1.774 (0.612-5.140)	0.291
More than four times a week	---	0.991
Smoking		
Non-smoker	Reference	
Current or past smoker	1.321 (0.384-4.546)	0.658
Alcohol consumption		
Non-drinker	Reference	
Occasional	2.314 (0.491-10.903)	0.289
Exercise		
Lack of exercise (less than once a month)	5.750 (0.691-47.839)	0.106
Occasional exercise (once a month or less than 3x per week)	0.694 (0.248-1.945)	0.488
Regular exercise (≥3 per week)	Reference	

Table 3: Assessment of Adherence Level and Associated Factors among Hypertensive Participants (n=80)

Factors	Frequency	%
Knowledge of Hypertension and Antihypertensive Drugs		
Low Knowledge	52	65.0
High Knowledge	28	35.0
Belief About Medication (Necessity)		
Low Necessity	14	17.5
High Necessity	66	82.5
Belief About Medication (Concern)		
Low Concern	32	40.0
High Concern	48	60.0
Patient-Doctor Relationship		
Poor Relationship	8	10.0
Good Relationship	72	90.0
Patient Adherence		
Non-Perfect Adherence	66	82.5
Perfect Adherence	14	17.5

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