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ORIGINAL ARTICLE

Hypertension preventive behavior among pre-hypertensive adults in Phutthamonthon district, Nakhon Pathom province, Thailand

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Abstract

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The objectives of this research were to describe the hypertension preventive behavior and related risk factors among pre-hypertensive adults aged 35 years or older in Phutthamonthon district, Nakhon Pathom province, Thailand. Stratified sampling was used to select participants. Out of 382 self-administered questionnaires, only 227 (59.4%) which were completed and met the inclusion criteria. Chi-square tests and multiple logistic regressions were used to examine associations between independent and dependent variables. Preventive behavior was regarded as the dependent variable and other factors such as socio-demographic factors, physical factors, psycho-social factors and cues to action as independent variables.

The results showed that only 22.2% of participants had good preventive behaviors on hypertension. Chi-square tests revealed that factors significantly associated with hypertension preventive behavior were occupation, perceived susceptibility, perceived barriers and knowledge levels. After adjusting for other factors, people who had poor knowledge about hypertension were less likely to have good preventive behavior compared to those who had good knowledge (Adjusted Odds Ratio=0.36, 95% CI =0.08-1.59).

The findings suggested that health education programs should be strengthened and promoted to overcome knowledge deficiencies and negative perceptions. People should practice healthy behaviors to prevent hypertension. Moreover, strategies for overcoming the barriers of the old people, such as using home visits, should be more promoted.

Key words: hypertension, preventive behavior, pre-hypertensive adults, Thailand

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พฤติกรรมการป้องกันโรคความดันโลหิตสูงในผู้ใหญ่ที่มีภาวะเสี่ยงสูง ในอำเภอพุทธมณฑล จังหวัดนครปฐม ประเทศไทย

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บทคัดย่อ

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พฤติกรรมการป้องกันโรคความดันโลหิตสูงในผู้ใหญ่ที่มีภาวะเสี่ยงสูง
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วัตถุประสงค์ของการวิจัยนี้เพื่อศึกษาพฤติกรรมการป้องกันโรคความดันโลหิตสูงของผู้ ใหญ่ที่มีภาวะเสี่ยงต่อการเป็นโรคความดันโลหิตสูง ในอำเภอพุทธมณฑล จังหวัดนครปฐม ประเทศไทย และศึกษาปัจจัยเสี่ยงที่เกี่ยวข้องกับผู้มีภาวะเสี่ยงต่อการเป็นโรคความดันโลหิตสูง โดยใช้วิธีสุ่มตัวอย่างแบบมีชั้นภูมิในการเลือกผู้ร่วมวิจัยซึ่งเป็นผู้ใหญ่ที่อายุตั้งต่ 35 ปีขึ้นไป จากแบบสอบถามทั้งหมด 382 ชุด มีเพียง 227 ชุด (59.4%) ที่ตรงตามเกณฑ์เลือกเข้าในการศึกษานี้และได้ถูกกรอกอย่างสมบูรณ์ วิเคราะห์ข้อมูลโดยใช้การทดสอบไคสแคว์และการถดถอยลอจิสติกพหุคูณเพื่อศึกษาความสัมพันธ์ระหว่างตัวแปรอิสระและตัวแปรตาม ตัวแปรตามเป็นพฤติกรรมการป้องกันโรคความดันโลหิตสูง ตัวแปรอิสระ ได้แก่ ปัจจัยด้านประชากร ปัจจัยทางกาย ปัจจัยด้านจิตสังคม ปัจจัยที่ชี้นำให้ปฏิบัติ

ผลการศึกษาพบว่า ร้อยละ 22.2 ของผู้ร่วมวิจัยมีพฤติกรรมที่ดีในการป้องกันโรคความดันโลหิตสูง การทดสอบไคสแคว์พบว่าปัจจัยที่มีความสัมพันธ์กับพฤติกรรมในการป้องกันโรคความดันโลหิตสูงได้แก่ อาชีพ การรับรู้โอกาสเสี่ยงของโรค การรับรู้ต่ออุปสรรค ระดับความรู้เกี่ยวกับโรค เมื่อปรับอิทธิพลของปัจจัยอื่นๆ แล้ว ผู้ที่มีความรู้เกี่ยวกับโรคความดันโลหิตสูงน้อยมีแนวโน้มต่ำที่จะมีพฤติกรรมที่ดีในการป้องกันโรคนี้ (Adj. OR = 0.36, 95% CI = 0.08 – 1.59)

ข้อเสนอแนะจากการศึกษานี้ ควรส่งเสริมสนันสนุนโปรแกรมด้านสุขศึกษาเพื่อให้ความรู้เกี่ยวกับการป้องกันโรคความดันโรคหิตสูงในกลุ่มผู้ที่มีภาวะเสี่ยงต่อการเป็นโรคนี้ เพื่อขจัดปัญหาการขาดความรู้และการรับรู้เชิงลบในด้านการป้องกันโรคความดันโรคหิตสูง นอกจากนี้ควรส่งเสริมให้มีการเยี่ยมบ้านผู้สูงอายุบ่อยขึ้นเพื่อขจัดอุปสรรคในการป้องกันโรคความดันโรคหิตสูง

คำสำคัญ: โรคความดันโลหิตสูง พฤติกรรมการป้องกันโรค ผู้ใหญ่ที่มีภาวะเสี่ยงสูงต่อโรคความดันโลหิตสูง ประเทศไทย

Introduction

Hypertension is a public health problem and it continues to affect millions worldwide. It is a multifactorial disease due to a combination of genetic, environmental and lifestyle factors[1]. Many elements such as disintegrating health, attitudes, health beliefs, low socio economic status, low physical activity, and poor education are contributory in developing hypertension[2]. Public health problems which were previously serious have been successfully well controlled, including communicable diseases, malnutrition, maternal and perinatal morality, vaccine-preventable diseases and some tropical diseases[3].

In Thailand, the main factors leading to non-communicable diseases such as body mass index, systolic blood pressure, total cholesterol, are in a gradual increase since 1980 – 2008[4]. Hypertension is one of the most important issues that need to be addressed in Thailand. There have been challenges for the past 30 years, presently due to the advancements for a better life and modernization and there is a large cause of deaths due to chronic non communicable diseases. WHO (2008) reported that total deaths from non-communicable diseases were 227.1 in males and 191.3 in females per 1000. Non-communicable diseases deaths under age 60 were 32.3% in males and 25.0% in females. Estimated percentage of behavioral risk factors such as current daily tobacco smoking for males were 36.2% and females to 1.6% totaling to 18.4% and physical inactivity for males 16.5% and females 20.7% totaling to 18.7%[5]. Hypertensive emergencies included a broad range of clinical presentations where uncontrolled BPs leads to progressive or impending end-organ dysfunction[6]. The progression of persistent hypertension develops into a complicated hypertension after a long invariable asymptomatic period where it is evident of target organ damage to the aorta and small arteries, heart, kidneys, retina, and central nervous system.

Gradually the progression begins with pre-hypertension in persons aged 10-30 years by increased cardiac output, develops to early hypertension among 20-40 years, in which increased peripheral resistance is prominent, then to established hypertension among 30-50 years, and, finally, the development of complicated hypertension among 40-60 years[7]. The classification "pre-hypertension," introduced in the Joint National Committee who recognized this relationship and signals the need for increased education of health care professionals and the public to reduce BP levels and prevent the development of hypertension in the general population. Hypertension prevention strategies are available to achieve this goal with "Lifestyle Modifications". In a person who is in a pre-hypertensive state, it is likely that the person would develop hypertension. In a pre-hypertension state, health care providers will recommend lifestyle modifications and changes to bring the blood pressure down to a normal range. Medicines are rarely used for pre-hypertension, however, lifestyle changes may help control the blood pressure and to follow the health care provider's recommendations[8]. Improving lifestyle and health behaviours, reducing risk factors and enhancing health promotion factors, early screenings in the communities for hypertensive cases will ultimately reduce the morbidity and the complication due to hypertension[9]. Health care workers' advices on lifestyle change can have a positive impact on such risk factors[10]. Identifying the risk factors and screenings for hypertension and further research on it

can fulfill the challenges[9]. Prevention can be targeted in adults aged over 18 years and they should have their blood pressure checked regularly.

In this study, the Health Belief Model was applied as the base in understanding the hypertension preventive behavior among pre-hypertensive adults. The Phutthamonthon district of Nakhon Pathom province which is itself in the process of urbanization and the lifestyles are of both a mix of rural and urban. The cardiovascular risk factor levels in such settings are high where risk factor control strategies would prevent cardiovascular disease at an early age. The aim of the study was to describe hypertension preventive behaviour, characteristics of socio demographic factors, psychosocial factors, and cues to action among pre-hypertensive adults in Phutthamonthon district, Nakhon Pathom Province. Furthermore, the study examined the association between hypertension preventive behaviour and socio demographic factors, psychosocial factors, as well as cues to action among pre-hypertensive adults. The results of this study would suggest that health care providers should concern about health risk behaviours and factors related to hypertension of people in the urban areas. Screening for hypertension in this population would show us the necessity to implement health education programs and empowerment programs to increase awareness and prevention of hypertension, and adopting a healthy lifestyle.

Methods

The cross sectional study was employed. The target population of the study was pre-hypertensive adults. The data collection was conducted at health centers in Phutthamonthon district, Nakhon Pathom Province in Thailand. The patients were already screened for hypertension and who fell into the category as pre-hypertensive were included in the study mostly from the outpatients department. The inclusion criteria for selection of the participants was being 35 years or older. The exclusion criteria was excluding people who had diabetes mellitus, cardio vascular diseases, kidney diseases or patients who were receiving medications in compelling pre-hypertensive conditions. Structured questionnaires were distributed among people who were screened for hypertension in May 2013.

Stratified sampling was used to select paticipants in Phutthamonthon district. There are five health centers: Klongyong 1, Mahasawat, Watsuwan, Klongyong 2 and Salawan. When the pre-hypertension criteria (blood pressure numbers are equal or higher than 120/80, but below 140/90) was applied, only 227 participants who were selected. The questionnaires were of open and closed ended self-administered type. Participants took around 25 minutes on average to complete it.

The questionnaires comprised of five parts. The first part consisted of socio demographic and socio-economic factors dealing with age, gender, occupation, highest level of education, monthly income, family members with hypertension, duration of sleep and BMI.

The second part consisted of questions on knowledge about hypertension preventive behavior. There were eight questions in this part. For each question there was only one correct answer and three wrong answers. Participants were asked to mark only the best possible answer for the four answer statements. Markings for the correct answers were marked as 1, incorrect answers & unanswered statements were marked as 0. The total knowledge scores were

categorized into 3 groups: poor ≤ 50% (scores from 0-4), fair 51-80% (scores from 5-6), good > 80% (scores from 7-8)

The third part included perceptions on hypertensionwhich consisted of both positive and negative statements. Collectively perceived susceptibility of hypertension had 10 statements, with 6 positive statements and 4 negative statements. Perceived seriousness of hypertension had 6 statements all of them were positive. Perceived barriers of prevention of hypertension had 5 statements which were all negative and perceived benefits of prevention of hypertension had 3 statements, all of which were positive. For each item there were three options as Agree, Not sure and Disagree. Respondents were asked to mark only one option for each corresponding statement. For Positive Statements the answers were marked as Agree = 3, Not Sure = 2, Disagree = 1, for negative Statements the answers were marked as Agree = 1, Not Sure = 2, Disagree = 3. Total scores of each scale were categorized and coded as positive and negative perception. Cut off points were considered from the median. If scores were less than the median it was categorized as negative perception and if more than the median it was categorized as positive perception.

The fourth part measured cues to action. The questionnaires was designed to assess the respondents on how the desired information reached them. They were asked to select one answer for each statement. This section comprised of 5 statements. If they answered "YES" it was given 1 point and "NO" was given zero. The median was taken from the total scores of these 5 statements and then further categorized as good and poor. If total score was less than the median, it was categorized in to the poor level. If total score was at least the median, it was categorized into the good level.

The fifth part measured preventive behaviors on Hypertension. This part had 7 statements, all of these statements emphasized on the likelihood of action which was engaging in preventive behaviors towards hypertension. There were 5 positive statements and 2 negative statements. For each statement, the options given were "usually", "sometimes" and "never". "Never" meant that the person does not indulge in the said preventive behavior and was given 1 point, "sometimes" meant the person indulges occasionally in the preventive behaviour and was given 2 points, "usually" meant the person usually indulges in that preventive behaviour and was given 3 points. Positive Statements were marked as usually = 3, sometimes = 2, never = 1 and Negative statements were reversed in the markings as usually = 1, sometimes = 2 and never = 3.

The questions in the questionnaires were based on the health belief model and preventive behaviors and relevant literature to the topic. Pretesting of the questionnaires was done on 30 participants to find the reliability. They were in the same category as in the inclusion criteria in another health center in a similar environment. KR20 was calculated for the knowledge and Cronbach's Alpha for perception. Cronbach's Alpha coefficient for the perception increased from 0.498 to 0.616 when deleting one unclear question. The KR20 of the knowledge was equal to 0.514. One incomplete question was revised, therefore the coefficient increased from 0.514 to 0.564.

Descriptive statistics was used to analyze all the variables. Chi-Square test was used to find the association between each independent variable and the

dependent variable. Multiple logistic regressions were also carried out to find the significant predictors of the outcome. After the approval from the Committee of the Research Ethics of Mahidol University (MU-SSIRB), the data collection procedure was conducted.

Results

Out of 382 self-administered questionnaires, only 227 (59.4%) which were completed and met the inclusion criteria. Most of the participants (60.6%) in this study were females. The highest percentage (59.4%) of the participants' age belong to people who were less than or equal to ≤ 49 years. 26.5% of participants were between 50 and 59 years while only 14.2% were 60years and above. The main occupation was those who were employed at the private sectors (36.2 %) and only a quarter (25%) was employed at the public sectors. Surprisingly, 38.8% were unemployed (Table 1).

Table 1 Percentage of respondents by socio-demographic factors.

Socio - demographic factors	Number	Percent
Age group (years)	**219**	
≤ 49 years	130	59.4
50- 59 years	58	26.5
60 years and above	31	14.2
Gender	**226**	
Female	137	60.6
Male	89	39.4
Occupation	**224**	
Public Sector	6	25.0
Private Sector	81	36.2
Unemployed	87	38.8
Monthly household income (Baht)	**180**	
No income	2	1.1
Less than 5000	8	4.4
5,000-15,000	104	57.8
15,001-30,000	63	35.0
More than 30,000	3	1.7
Family Members with Hypertension	**227**	
Yes	91	40.1
No	136	59.9
BMI	**221**	
Normal range	141	63.8
Not normal range	80	36.2
Average sleep hours (n=221)	**221**	
6 hours & below	45	20.4
7 hours & above	176	79.6

Family history of hypertension showed that 40.1% had one of their family members with a history of hypertension, which included either of their parents, siblings or their relatives. However, 59.9% of the participants did not have a hypertension history in their families. Body mass index showed that 63.8 % were in their normal ranges while 36.2 % of the participants in the not normal ranges that included obese, underweight or over weight.

The knowledge levels of the participants were mostly poor (75.3%) while only 8.4% had good knowledge levels. The perception levels showed a higher positive perceived susceptibility of 83.6%, seriousness of 60.9%, benefits of 78.1%, and barriers of 100%. The highest negative perception was seen in perceived seriousness with 39.1%. Most participants (61.7%) in this study had good levels of cues to action. Moreover the poor preventive behaviour of the people in this study was high with 77.7% (Table 2). Occupation was significant associated with hypertension preventive behaviors (Table 3).

The knowledge levels showed a significant association with preventive behaviours (p-value=0.012) and those with poor knowledge levels had a higher percentage of poor preventive behaviors as shown in Table 4. Similarly people with negative perceived susceptibility also showed a significant association with preventive behaviours (p-value=0.036) making up a total of 91.7% of poor preventive behaviours. Perceived Seriousness, perceived benefits did not present any association; however perceived barriers showed a strong significance in relation to preventive behaviors. , there was significant association between the cues to action and preventive behavior. Table 5 shows information of hypertension through mass media produced a higher percentage of poor preventative behavior with 76.0 % and p-value significant to 0.027. Those who received information through health care personal had poor preventive behaviors of 75.3% and an association of p-value 0.001. Similarly information through Family members and relatives also produced a higher percentage of poor preventive behavior of 83.2% (P- value 0.03). Information through friends and neighbors was closely significant P – value 0.052 and through their mentors also showed a higher percentage (82.6%) towards poor preventive behavior. On the other hand, age group, gender, family members with hypertension, BMI, duration of sleeping, perceived seriousness, and perceived benefit were not significant associated with preventive behavior.

The significant variables which found an association relationship with the preventive behaviors and which were deemed as closely significant from the Chi-square test were further tested using multiple logistic regressions. After adjusting for other factors, people who had poor knowledge about hypertension were less likely to have good preventive behavior compared to those who had good knowledge (Adjusted Odds Ratio=0.36, 95% CI=0.08-1.59) (Table 6).

Table 2 Percentage of respondents by knowledge level, perception levels, cues to action and preventive behaviors on hypertension

	Number	Percent
Knowledge Level	**227**	
Poor (0-4)	171	75.3
Fair (5-6)	37	16.3
Good (7-8)	19	8.4
Perceived Susceptibility	**227**	
Negative (17-21)	36	16.4
Positive (22-30)	183	83.6
Median = 22, QD = 0.5, Min = 17, Max = 30		
Perceived Seriousness	**225**	
Negative (6-17)	88	39.1
Positive (18)	137	60.9
Median = 18, QD = 1.5, Min = 6, Max = 18		
Perceived Barriers	**224**	
Negative (<5)	0	0.0
Positive (≥5)	224	100.0
Median = 5, QD = 2, Min = 5, Max = 15		
Perceived Benefits	**224**	
Negative (<9)	49	21.9
Positive (≥9)	175	78.1
Median = 9, QD = 0, Min = 3, Max = 9		
Cues to Action	**227**	
Poor (0-2)	87	38.3
Good (3-5)	140	61.7
Preventive behavior on hypertension	**216**	
Good (>P75)	48	22.2
Poor (<P75)	168	77.7
Median=17, QD=0.5, Min=13, Max=21		

Table 3 Association between independent variables and preventive behaviors

Variables	n	Preventive Behavior		Crude OR (95% CI)	P-value
		Good%	Poor%		
Age Group					
≤ 49	122	21.3	78.7	1	
50-59	56	21.4	78.6	1.00(0.46– 2.17)	0.947
≥60	30	20.0	80.0	0.92 (0.34- 2.49)	0.87
Gender					
Female	128	25.8	74.2	1	
Male	87	17.2	82.8	0.60(0.30-1.19)	0.142
Family Members with Hypertension					
Yes	90	18.9	81.1	1	
No	126	24.6	75.4	1.40(0.72-2.73)	0.320
Occupation					
Public sector	51	27.5	72.5	0.89(0.41-1.93)	0.774
Private sector	79	11.4	88.6	0.30(0.13-0.70)	0.005
Unemployed	84	29.8	70.2	1	
BMI					
Normal Weight	132	24.2	75.8	1.34 (0.67- 2.68)	0.401
Not normal Weight	78	19.2	80.8	1	
Duration of sleeping					
6 hrs & less	45	13.3	86.7	1	
7 hrs & above	176	24.2	75.8	2.08 (0.82-5.27)	0.120

Table 4 Association between knowledge, perception and preventive behavior.

Variables	Preventive Behavior			Crude OR (95% CI)	P-value
	n	Good%	Poor%		
Knowledge Levels					
Poor	161	16.8	83.2	0.28 (0.10 – 0.75)	**0.012**
Fair	36	36.1	63.9	0.78 (0.25 – 2.42)	0.664
Good	19	42.1	57.9	1	
Perceived Susceptibility					
Negative	36	8.3	91.7	0.27 (0.08-0.92)	**0.036**
Positive	174	25.3	74.7	1	
Perceived Seriousness					
Negative	87	25.3	74.7	1.33(0.70-2.54)	0.390
Positive	128	20.3	79.7	1	
Perceived Barriers (scores)				1.19(1.08-1.30)	**<0.001**
Perceived Benefits					
Negative	49	16.3	83.7	0.61(0.26-1.49)	0.247
Positive	165	24.2	75.8	1	

Table 5 Association between cues to action and preventive behavior

Cues to Action-Sources of information	n		Good %	Poor %	P-value
Receiving information through mass media (Television, newspaper, radio, poster, brochures, books, magazines, handouts).	214	**Yes**	24.0	76.0	**0.027**
		No	6.5	93.5	
Receiving information through health care personal	213	**Yes**	24.7	75.3	**0.001**
		No	0.0	100.0	
Receiving information through family members and relatives.	214	**Yes**	16.8	83.2	**0.035**
		No	28.9	71.1	
Receiving information through friends and neighbors	212	**Yes**	16.1	83.9	0.052
		No	27.0	73.0	
Received information of Hypertension and its consequences through my mentor.	213	**Yes**	17.4	82.6	0.225
		No	24.4	75.6	

Table 6 Adjusted odds ratio from multiple logistic regression for preventive behaviors

Variables	Adj. OR	95% C.I. for OR		P-value
		Lower	Upper	
Age groups				
≤ 49	1			
50-59	0.87	0.31	2.47	0.790
≥ 60	0.82	0.24	2.77	0.750
Gender				
Male	0.59	0.23	1.50	0.270
Female	1			
Family members with hypertension				
Yes	1			
No	5.13	1.60	16.75	**0.001**
Occupation				
Public	1.46	0.48	4.48	0.500
Private	0.15	0.04	0.56	**0.005**
Unemployed	1			
BMI				
Normal weight	1.09	0.44	2.72	0.840
Not normal weight	1			
Perceived susceptibility				
Negative	0.23	0.04	1.16	0.070
Positive	1			
Perceived barriers (score)	1.46	1.22	1.74	**0.001**
Knowledge levels				
Poor	0.36	0.08	1.59	0.180
Fair	0.39	0.08	1.83	0.230
Good	1			

Discussion

This study included males (39.4%) and females (60.6%) and found that the prevalence of good preventive behavior of male and female participants were 17.2% and 25.8% respectively. There was no significance between sex and preventive behavior. However, the previous studies had proven that men are generally at high risk of prevalence of hypertension before 45 years of age and women after menopause, however, after that women are at high risk than men[11, 12]. Moreover, the result also showed that there was a high rate of poor preventive behavior among the male participants than the female participants. The majority aged 49 and below had good preventive behaviors with 21.3% while the poor preventive behaviors showed 78.7%. 21.4% of the participants aged between 50-59 had good preventive behaviors, but they had poor preventive behaviors of 78.6%. Those who were 60 years old and above also had a higher percentage of poor preventive behavior with 80.0%. In America the majority of people over 65 years of age have the diagnosis of hypertension and systolic blood pressure is of importance among those above 50 years of age[13]. These studies revealed that adult populations need to be carefully looked into for the prevention of hypertension comparably another study of Chinese trial (n=9,711) concluded that over 3179 patients over the age of 65 reported of having hypertension[14]. Also studies proved that hypertension is more prevalent in developing countries, this may be due to urbanization, changing in dietary habits social stress and an ageing population[15-16]. The results might have led to the fact that young people who have high income and proper education have good preventive behaviors than older people who earn less money. Another possibility may show that older people have low memory which may lead them forgetting meeting with health care providers, day to day barriers, urban family , busy life style, lack of caretakers or close family members, who can thereby assist them to provide a good quality of life. The high numbers of the participants were unemployed, as described before according to the research, the rate of women participants was high; thus it can be assumed that those unemployed participants are housewives by occupation. There were normal ranges and not- normal ranges of weights defined using the BMI. There was no association between BMI and preventive behaviors. However, this study showed that normal-weighted people have good preventive behaviors (75.8%) than those people having not-normal weights. Despite this previous studies have shown that normal weighted people have a higher cardiovascular event rates than the obese individuals, and obese people have higher incidences of hypertension[17-18].

This study reported individuals having a family history of hypertension had a higher percentage of poor preventive behavior. Genetic predisposition is a well-known factor of hypertension with unknown etiology. Hereditarily, people affected with a high blood pressure have elevated risks for coronary artery diseases[19]. Hence there is a hereditary predisposition and also they share common environments and other potential factors that increase their risk and the risk escalates when hereditary is combined with unhealthy lifestyle choices such as indulging in smoking and consumption of unhealthy diet.

Regarding knowledge this study found an association between knowledge level and preventive behavior in which the people at good knowledge level

had 57.9% of poor preventive behavior and those at poor knowledge level had 83.2% of poor preventive behavior, thereby there was association seen in the overall poor knowledge level regarding hypertension. Low knowledge levels increases the risks of being hypertensive thereby increasing the cardiovascular events, hence public awareness should be implemented necessarily[20]. Agreed to this, there has been a low level of awareness until recently, focus has been on communicable diseases such as HIV, TB and major non- communicable diseases such as CVD, DM, and other respiratory conditions have been given of less importance[21]. Such individuals can be hypertensive if they don't understand environmental and personal factors[22]. Patients require understanding the disease process as well as medication which can control hypertension and positive perception on health is associated with reduced risk of hypertension and education on general lifestyle habits and practicing them is essential[23].

There was no overall association found between the levels of cues to action and preventive behaviors; however, there were significant association between asking about accessing information through mass media (such as television, newspapers, radio, posters, brochures, books, magazines, and handouts), information through health care personnel, information through family members and relatives. Using the Health belief model another study showed significant relationship between the variables including cues to action in relation with self-care behaviors[24]. Similar to this, another study stated that the people in Phutthamonthon were able to answer correctly; and the researcher explained that in this area, once people are diagnosed as hypertensive, they are asked to go to a health center. Moreover, the study found that most of the participants knowing that they are hypertensive and are likely to have good preventive behaviors by modifying their lifestyles[25]. Simply to put, as the people seem to experience more knowledg on how to protect themselves on hypertension through health care centers.

In the present study, prevalence of pre-hypertension could not be determined. However, a community cross sectional survey in Uganda showed that more than one in three of adults in this population had pre-hypertension[26]. Preventive and public health interventions that reduce the prevalence of pre-hypertension need to be implemented.

Recommendations

This study showed only 22.2% of good preventive behaviors. Significant associations were seen in negative perceived susceptibility and poor preventive behaviors similarly there was an association with negative perceived barriers towards prevention of hypertension. There was an association between self-assessed knowledge and preventive behaviors, and also the knowledge levels showed significance. People with poor knowledge levels were less likely to have good preventive behavior compared to those who had good knowledge. Statistically significant association on multiple regression models was seen in people who were employed at the private sectors and people with a family history of hypertension.

This study recommends that pre-hypertensive adults adhere to more correct methods in measuring blood pressure and encouraged to do self-monitoring of blood pressures also these individuals should follow up carefully with subsequent visits to check for any

alterations and the rise of any metabolic symptoms. High risk adults should be educated on the knowledge on hypertension and its symptoms. To promote and maintain good preventive behavior, all healthy adults aged 18 and above need to indulge in physical activity for a minimum of 30 minutes for five days a week. Healthy work place environment and implementation of healthy time schedules for employees of private sectors with preventive behaviour programs should be initiated. Fruits and vegetables should be consumed, while salt and fat food should be reduced. Awareness on nutritional knowledge should be emphasized. Food authorities should consider labeling their food products with a "friendly message of healthy behavior" so that it enhances awareness to the consumers.

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