

Factors Impacting Hypertension Awareness among Hypertensive Population: A Quantitative Study in a Tertiary Care Hospital in Malaysia

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Abstract

There are obstacles to high levels of hypertension awareness that are embedded in gender, income and lifestyle habits which need to be addressed. Those obstacles could lead to high levels of undiagnosed and uncontrolled hypertension. This study aimed to explore the various factors which might affect hypertension awareness among a hypertensive population in a tertiary care hospital. An observational, cross-sectional study was conducted from November 2018 to March 2019. The study was conducted among hypertensive patients at a tertiary care hospital in Selangor, Malaysia. A validated and translated questionnaire was utilised as a data collection tool. Descriptive and inferential statistical analysis was done using SPSS version 25. A thousand participants (female n=621, male n= 379) were recruited with mean age of 48± 11.09 years old. Approximately half of the respondents (51.3%) were not informed by their doctor that they have hypertension. More than half of respondents (66.3%) were unaware of the normal range of systolic and diastolic blood pressure (BP). Female gender, Chinese race, urban resident, older adults, and tertiary education level are the most significant factors which play a main role in influencing the level of awareness among patients with hypertension. Hypertension awareness needs to be addressed from a systemic point of view to solve the growing barriers through accessing the correct information about the disease. Health care providers and authorities need to regulate the manner in which information on mortal diseases is presented to the public in order to reduce incidence of malpractice by also encouraging individuals to mostly consider information on public health which emanates from acknowledged authorities rather than going with popular and charismatic sentiments.

Keywords: Hypertension, Awareness, Factors, Malaysia

العوامل المؤثرة على الوعي بارتفاع ضغط الدم بين السكان المصابين بارتفاع ضغط الدم: دراسة مقطعية في مستشفى تخصصي في ماليزيا

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الخلاصة

هناك عقبات أمام المستويات المرتفعة من الوعي بارتفاع ضغط الدم المتضمنة في نوع الجنس والدخل وأسلوب الحياة والتي تحتاج إلى معالجة. يمكن أن تؤدي هذه العقبات إلى مستويات عالية من ارتفاع ضغط الدم غير المشخص وغير المنضبط. هدفت هذه الدراسة إلى استكشاف العوامل المختلفة التي قد تؤثر على الوعي بارتفاع ضغط الدم بين السكان المصابين بارتفاع ضغط الدم في مستشفى الرعاية الثالثية. أجريت دراسة رصدية مقطعية في الفترة من نوفمبر ٢٠١٨ إلى مارس ٢٠١٩. وقد أجريت الدراسة على مرضى ارتفاع ضغط الدم في مستشفى الرعاية الثالثية في سيلانجور، ماليزيا. تم استخدام استبيان معتمد ومترجم كأداة لجمع البيانات. تم إجراء التحليل الإحصائي الوصفي والاستنتاجي باستخدام الإصدار ٢٥ من برنامج التحليل الإحصائي. تم تطويع ألف مشارك (عدد الإناث = ٦٢١، عدد الذكور = ٣٧٩) بمتوسط عمر ٤٨ ± ١١.٠٩ عامًا. بينت النتائج أن ما يقرب من نصف المشاركين (٥١.٣٪) لم يتم إخبارهم من قبل الطبيب بأن لديهم ارتفاع ضغط الدم. وأن أكثر من نصف المشاركين (٦٦.٣٪) لم يكونوا على دراية بالمعدل الطبيعي لضغط الدم الانقباضي والانقباضي. الجنس الأنثوي، والعرق الصيني، والمقيم في المدينة، وكبار السن، و التعليم العالي هي العوامل الأكثر أهمية التي تلعب دورًا رئيسيًا في التأثير على مستوى الوعي بين مرضى ارتفاع ضغط الدم. يجب معالجة الوعي بارتفاع ضغط الدم من وجهة نظر نظامية لحل الحواجز المتزايدة من خلال الوصول إلى المعلومات الصحيحة حول المرض. يحتاج مقدمو الرعاية الصحية والسلطات إلى تنظيم الطريقة التي يتم بها تقديم المعلومات المتعلقة بالأمراض المميتة للجمهور من أجل تقليل حدوث سوء الممارسة من خلال تشجيع الأفراد أيضًا على التفكير في معظم الأحيان في المعلومات المتعلقة بالصحة العامة التي تنبع من السلطات المعترف بها بدلاً من التعامل مع الجمهور والمعتقدات والمشاعر الشعبية.

الكلمات المفتاحية: ارتفاع ضغط الدم، الوعي، العوامل المؤثرة، ماليزيا

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Introduction

Hypertension is one of the major risk factors to cardiovascular failure and mortality⁽¹⁾. The recent data indicated that 1 out of 5 patients has well-controlled blood pressure, and globally around 9 million deaths are because of hypertension⁽²⁾. The level of hypertension in Southeast Asia (SEA) countries is increasing dramatically without appropriate action. Malaysia is one of SEA countries where its population is also suffered from hypertension⁽²⁾. According to a previous study, two out of every three Malaysians have high blood pressure, affecting approximately ten million adults⁽³⁾. Hypertension can be averted or controlled by having healthy lifestyle habits, being aware of the risk factors and how to avoid them. Therefore, one of the major methods in reducing hypertension is through raising hypertension awareness in both the young and adult population. This action would be across all ethnic barriers and status.

There have been major advancements in public health education and increase the usage of social medias through which information can be disseminated; however, hypertension awareness in society is still under progression⁽⁴⁾. Nearly two thirds of adults indicate hypertension awareness, while the remaining of hypertensive population is unaware about the risk that might hypertension causes if left untreated.^(3,5) Inadequate knowledge and awareness about blood pressure can lead to poor adherence to medications and, consequently, high rates of uncontrolled blood pressure, therefore raising awareness remains a critical agenda in improving hypertension control and averting cardiovascular disease⁽²⁾.

In Malaysia, the present healthcare system is paying more attention on therapeutic intervention rather than preventive care, with 70% of budget is allocated to pharmacological approach whereas 5% is to public health services (which include health promotion and prevention programmes)⁽⁶⁾. A recent literature study which analysed the data from 2006-2015 of hypertensive population in Malaysia, demonstrated that 85% of young adults (18-39 years old who were diagnosed with young-onset hypertension) are unaware of their diagnosis and less than 40% of them had controlled blood pressure⁽⁶⁾. Therefore, understanding the factors that probably influence the level of awareness towards hypertension is believed to be essential in the process of preventing and controlling hypertension⁽⁷⁾. Hence, this study aimed to explore the various factors which might affect hypertension awareness among a hypertensive population in a tertiary care hospital in Malaysia.

Materials and Methods

Study design, setting, and data collection.

An observational, cross-sectional study was conducted from November 2018 to March 2019 through the application of an anonymous survey to patients who attended cardiology clinic at Hospital Kuala Lumpur (HKL). A non-probabilistic sampling techniques was used to distribute questionnaire to participants who were willing voluntarily to participate in the study according to Raosoft calculator, at least 385 participants must be recruited. The calculation was based on 50 % response distribution, 5 % margin of error and 95 % confidence interval. The online software foundation is based on widely utilized descriptive studies sample size estimation formula. Setting the response distribution to 50% is the most conservative assumption. The assumption that the response rate is 50 % was based on the idea that both responses and response rates were completely unknown since only limited studies conducted in Malaysia which were similar to the current study and the response rate was more than 50%⁽⁸⁾. However, the research team have managed to recruit 1000 patients who were diagnosed as having hypertension by a specialist physician. The inclusion criteria were 1) Diagnosed as hypertensive by a physician; 2) Malaysian adult (age ≥ 18 years old); and 3) Malaysian citizen whereas the exclusion criteria were 1) Participants who were pregnant; 2) Participants who were mentally incompetent.; and 3) Participants who did not complete the questionnaire or refused to participate. Participants were selected randomly from hypertensive patients who had their follow-up at cardiology clinic in HKL. Participants started filling the questionnaires after taking their consent to participate in the study. The approximate time that each participant spent to complete the questionnaire was around 10-15 minutes. Upon receiving the questionnaire from the participants, researcher checked and ensured that all items of the questionnaire were answered.

Study instrument

The questionnaire for the survey was adapted from a previously validated literature study⁽⁸⁾ and tailored to the local population to ensure its applicability among Malaysian population. The original questionnaire was written in English; therefore, it was translated into Bahasa Malaysia using a forward and backward translation process. Before being finalised, the accuracy and meaning of the translated versions, both forward and backward, were checked by bilingual Malaysian expert then, any recommended amendments, wherever necessary, were discussed. It was pretested for content, design, readability, and comprehension on 20 individuals, and modification were made as necessary so that the questionnaire was simple to understand and easily to be answered by hypertensive population to give accurate responses.

The validity and reliability have been checked by conducting a pilot study on 30 hypertensive patients and the questionnaire was found to be reliable and valid in which Cronbach alpha value was 0.89. Prior to the application of the survey, sociodemographic information on the patients was collected: gender, age, race, marital status, education level, location and source of information about HTN. A blood pressure measurement was carried out following the latest recommendations of American Heart Association by classifying participants whose blood pressure is >130/80 as HTN. To evaluate the level of awareness, a score from 0 to 6 was awarded based on the 6 questions. A score of 0-2 was considered a poor level of awareness, a score between 3 and 4 was considered a fair level of awareness, and a score higher than 4 was considered a good level of awareness⁽⁹⁾.

Data analysis

The results obtained were recorded, scored, and tabulated into respective sections, with data described in the form of frequency and percentage, means and standard deviations as deemed on the nature of results and outcomes. The data was statistically analysed with SPSS version 25.0, and the significant level was determined when *p* is less than 0.05. Association between independent variables (demographic outcomes) and dependent variables (level of awareness) was presented in the form of cross tabulations. Multinomial logistic regression analysis was performed to predict the likelihood of association between awareness of the participants and their demographic variables. This test was used because dependent variable (level of awareness) has multiple categories (poor, fair, and high) in which the independent variables are participants' gender, age, race, location, and education level.

Ethical approval

The study was approved by the University Technology Mara (UiTM) Research Ethics Committee (UiTM/REC/366/18), as well as the Malaysian Ministry of Health Medical Research and Ethics Committee (NMRR-18-2591-43354).

Results

Demographic and professional characteristics of the study participants

The mean age of participants is 48±11.09 where over half of the respondents (52.5%) were less than 50 years, with majority of the respondents (62.1%) were female. The Malay race constituted the majority of the respondents (46.7%) followed by the Chinese and Indians. The vast majority (90.0%) of the respondents were from the urban areas. Participants reported that healthcare professionals were the most source of information regarding hypertension. Regarding marital status, majority of the respondents were married (55.6%) while minority was widowed (8.3%). About 39.2 % of

the participants had secondary education level as shown in Table 1.

Table 1. Sociodemographic characteristics of hypertensive patients who responded to the survey (n = 1000)

Variables	Frequency (%)
Age	
≤50	522 (52.2%)
>50	478 (47.8%)
Gender	
Male	379(37.9%)
Female	621 (62.1%)
Race	
Malay	467 (46.7%)
Chinese	288 (28.8%)
Indian	198 (19.8%)
Others	47(4.7%)
Location	
Urban	900 (90.0%)
Rural	100 (10.0%)
Marital status	
Single	248 (24.8%)
Married	556 (55.6%)
Divorced	113 (11.3%)
Widowed	83 (8.3%)
Education level	
Illiterate	57 (5.7%)
Primary school	122 (12.2%)
Secondary school	392 (39.2%)
Pre-university	246 (24.6%)
University	183 (18.3%)
Source of information about hypertension	
Healthcare professional	229 (22.9%)
Tv and radio	179 (17.9%)
Newspaper and magazine	131 (13.1%)
Leaflets	66 (6.6%)
School	22 (2.2%)
University/college	21 (2.1%)
Friends	79 (7.9%)
Family	94 (9.4%)
Internet	98 (9.8%)
Public health campaign	81 (8.1%)

Hypertension awareness of the participants

Just over half of the respondents (51.3%) have been informed by a doctor or a health care professional that they have hypertension. The majority of the respondents (66.3%) were also told what their ideal blood pressure reading will be by either a doctor or health care practitioner. However, most of the respondents indicated that they did not receive sufficient information from their physician regarding the correct level of systolic (63.5%) and diastolic (69.6%) blood pressure (BP). The hypertension awareness among respondents is recorded in Table 2.

Table 2. Awareness about Hypertension among Respondents (N=1000)

No.	Questions	Frequency of positive Answer, (N)	Percentage (%)	Frequency of Wrong Answer, N	Percentage (%)
1.	Have you ever been told by a doctor or health care provider that you have hypertension?	513	51.3%	487	48.7%
2.	Did your doctor or health care provider tell you what your personal blood pressure reading should be?	663	66.3%	337	33.7%
3.	If told, what should your top number (systolic) be?	365	36.5%	635	63.5%
4.	If told, what should your bottom number (diastolic) be?	304	30.4%	696	69.6%
5.	Has a doctor or health care provider ever told you that the top number is important to keep under control?	567	56.7%	432	43.2%
6.	Has a doctor or health care provider ever told you that the bottom number is important to keep under control?	569	56.9%	431	43.1%

Factors associated with the level of hypertension awareness

The factors associated with the level of hypertension awareness were also recorded among the respondents. Location, Marital Status and

Education Level have displayed the most significant score among the respondents with a p-value of 0.0001. The least significant factor was Gender which scored a p-value of 0.003. The factors associated with hypertension awareness are recorded in Table 3.

Table 3. Association between hypertension awareness and various factors

Factors	*Pearson chi-square value	df	P-value
Gender	5.43	2	0.003*
Age	13.42	2	0.0001*
Race	15.61	6	0.016*
Location	4.65	2	0.0001*
Marital status	5.90	6	0.0001*
Education level	1.51	8	0.0001*

Note: *Pearson chi-square test, $p < 0.05$.

Moreover, multinomial logistic regression test showed that Chinese respondents have around 5 times higher awareness towards hypertension compared to Malay and Indian race (OR 5.2, 95% CI 2.67-9.86, $P = 0.0001$). It was also seen that both female and urban participants were having almost

two times more likely to have awareness compared to their reference group (male and rural participants), respectively (OR 2.7, 95% CI 1.52-5.31, $P = 0.001$; OR 2.4, 95% CI 1.03-4.64, $P = 0.042$). Independent predictors for hypertension awareness are recorded in Table 4.

Table 4. Independent predictors for hypertension awareness

Independent Variables [#]	OR	95% CI for EXP (B)	*P (logistic regression)
Gender (female)	2.7	1.52-5.31	0.001
Age (>50 years)	3.1	2.27-6.51	0.004
Race (Chinese)	5.2	2.67-9.86	0.0001
Location (urban)	2.4	1.03-4.64	0.042
Education level (University)	4.1	1.98-8.37	0.0001

* $p < 0.05$; [#]Dependent variables: level of awareness

Discussion

The current study has filled the gap and provided a clear insight about the factors that play essential role in affecting the level of awareness towards hypertension among hypertensive population in Malaysia. Hypertension awareness is higher among the age group above 50 years old than in younger participants. While hypertension affects all age groups based on lifestyle habits and genetics, it is more often taken seriously by the elderly rather than the younger population. It is typically observed that as one grows older, they are more likely to take their health matters seriously than when they were younger⁽¹⁰⁾. This can be discussed in combination with the idea that the younger population has more physical capacity and energy to make lifestyle habits that lead to a healthier lifestyle, but according to the study of Zhang & Moran (2017), it is observed that these habits are often driven by aesthetic factors rather than by health-centric motivations^(5, 11).

From the respondents, it is noted that there is a great difference in population between the females and males that are hypertensive. Females constituted the majority of the hypertensive patients in the current study. This raises the question of whether gender is a risk factor for hypertension. A previous study elaborates on gender as a risk factor for hypertension. The study dismisses that women are more hypertensive than men, rather stating that women are less likely to be hypertensive with the proportion of 12% vs 27%⁽¹²⁾. The study of Reckelhoff (2018) also finds that women, though less hypertensive, are more aware of their hypertensive state than men with the proportion 32% vs 25%. This is consistent with another study which finds that women are faced with reproductive health issues monthly and therefore this prompts them to be more observant of their body changes and performance more than men⁽¹³⁾. Therefore, this brings to light that health care usage explains the difference in hypertension awareness based on gender in which women are more prone to hypertension than men. A possible explanation could be that the hormonal changes in females play an essential role in the mechanism of hypertension, which may lead to more disease prevalence in women than in men. Additionally, pathophysiological studies of hypertension in women indicated that the shorter stature and the obligatory shorter arterial tree in women may have an impact in increasing heart rates and earlier reflected arterial pulse waves. Hence, those factors may lead to the differences between males and females in systolic/diastolic blood pressure, pulse pressure amplification, and diastolic time⁽¹⁴⁾. Regular health care practice together with interaction with doctors and health care providers increases hypertension awareness. From the study, little information which patients have on hypertension was received from their consultation

with either doctors or health care providers. A previous literature study reported that regular follow-ups of hypertensive patients to their doctor can help to increase their knowledge and awareness toward their disease⁽¹⁵⁾.

There are other media through which people can access information on hypertension⁽¹⁶⁾. These include newspapers, social media, health care websites and even TV film and programmes. However, these media can only provide information to a certain extent⁽¹⁷⁾. The retention of information on healthcare which is acquired from these mediums is often limited. There is often a very casual behaviour in the way in which information on hypertension would be disseminated. While the information is informative, most people do not pay full attention as they would consider hypertension is not a critical disease and easily curable⁽¹⁸⁾. Thus, healthcare professionals as well as media should play an important role in raising awareness about the potential risk of hypertension if left untreated.

There is a rising trend on misrepresentation of information regarding hypertension in the media. According to the medical practice, there is a set of risk factors which are associated with hypertension⁽¹⁹⁾. Some of these factors include obesity, sedentary lifestyle, diets high in sodium and genetic factors. However, due to the wide access which people have to sharing information on the internet, there are overwhelming sources which disprove that the known risk factors of hypertension are valid⁽²⁰⁾. For example, there are overweight people who assert that they are healthy and not at risk of any disease. This is because many of young adults continue to have unhealthy lifestyles such as smoking or drinking alcohol without being aware about the risk that they bring to their health⁽²¹⁾. Therefore with this nature of influence in the media, hypertension awareness is impeded in young people, which are majority of the internet users⁽²²⁾. They end up acquiring information on hypertension which is less accurate and invalidates the known risk factors to hypertension.

Lower access to health care usage is another prevalent factor which affects hypertension awareness⁽²³⁾. It is noted that most people acquire their information on hypertension from doctors and health care providers. However, there are still areas where there is limited access to health care and there are also areas where health care is expensive. This excludes uninsured young adults, the less privilege and those with limited health insurance to have less access to the facilities from which they can gain information. Therefore, the issue of access to these facilities translates in the low levels of awareness which is noted in the population of this study. According to Fang et al (2019), when health care access and usage is high, it corresponds with the levels of awareness which the population has on hypertension, and their ability to receive preventive

care⁽²⁴⁾. However, this is disputed by the study of Omboni (2019) which asserts that awareness often depends on the primary perspective which an individual adopts towards major health issues, which then places emphasis on behavioural and biological risk factors⁽²⁵⁾.

Ethnicity is also discussed as a factor which affects hypertension awareness. It is essential to note that despite certain genetic differences, hypertension does not discriminate based on ethnicity⁽²⁶⁾. However, it is often related to the typical lifestyle habits which the race perpetuates, such as their major physical habits and dietary preferences. However, this is refuted by the study of Cuevas et al (2017) which asserts that the world is now a global village and major ethnic differences in lifestyle are now being erased. Ethnicities are living in diversity with emphasis on equal access to information and facilities thus hypertension awareness among ethnicities would not be dependent on this factor^(27, 28).

There is limited awareness on the actual relevance of the systolic and diastolic numbers in one's hypertension reading. In most cases, a patient would be notified of their reading, and given medical advice or even medication to lower the reading⁽²⁹⁾. Therefore, in most cases, the patients are more concerned with seeing their reading decrease numerically without the awareness of the relevance of the figure. This reflects a shallow and unproductive method of approaching healthcare⁽³⁰⁾. This is consistent with the study of Judy et al (2019) which indicates that most knowledge on public health tends to be shallow and number driven instead of addressing the biological and behavioural risk. Patients would be oblivious of the biological risk which they face thus they would not consider awareness on the disease with much importance⁽³¹⁾. This is reflected in the study of Palatini et al (2018) which revealed that one of the primary reasons which caused patients to abruptly stop their hypertension medication is having a lower reading without awareness on the repercussions of their actions, which stem from limited awareness⁽³²⁾. Hence, it is important for doctors to disseminate comprehensive information to their patients with diseases that place them at high risk of mortality. While some of the information may be too technical or scientific for patients to understand, there is need for this level of comprehensive awareness to avert incidences of patients acting out of this limited knowledge.

Urban location was indicated as a significant factor in hypertension awareness in the current study. This would suggest that residents of urban areas were at a more favourable position to have information on public health issues such as hypertension and access to facilities where they can get this knowledge⁽³³⁾. Following this basis, it would be logical to conclude that hypertension levels in

urban areas would translate to lower levels of hypertension in those areas. However, on the contrary, there are higher levels of hypertension in the urban areas than in the rural areas where there are significantly lower levels of awareness. This is rationalised in the study of Qi et al (2018) which found that while awareness is significant, what is more necessary is to measure whether the individual is exposed to the biological and risk factors. In the case of hypertension, a typical rural lifestyle exempts them from the major risk factors of hypertension⁽³⁴⁾. Due to subsistence farming the rural residents have more access to fresh food which has low levels of sodium. Due to lesser machinery and appliances around the house (i.e., less vehicles and transportation), their level of physical activity is moderately high and consistent⁽³⁵⁾. Therefore, these factors preclude them from being at the risk factors of hypertension, and awareness or lack of it would not be really significant in them becoming hypertensive.

Education level also proves to be a significant factor in hypertension awareness, with those who have reached university level in their study proving to be more knowledgeable about hypertension. Therefore, this would emphasize the importance of education as a tool of enlightening the public on issues which affect their livelihood. Furthermore, it would also reflect in having increased awareness of issues which affect the quality of life and an income to support their access to health care and information⁽³⁶⁾.

Overall, these factors have highlighted that the varying levels of awareness on public health matters can be traced to the inequalities which exist in society. Healthcare then can tend to be more accessible to the privileged in society while those which are struggling to make ends meet can find themselves susceptible to diseases which can be avoided.

Limitations

In terms of the limitations of the present study, it was conducted in a defined geographical area and did not represent whole Malaysia so that findings should be generalized with caution. Moreover, the questionnaire was made of close-ended questions which might have restricted the participants' ability to explain the underlying reasons for certain outcomes.

Conclusion

Hypertension awareness remains a cause for concern in Malaysia despite the increasing levels of public health and various mediums of disseminating information. Various factors played a significant role in increasing or decreasing the level of awareness about hypertension. It is recommended to encourage individuals to mostly consider information on public health which emanates from acknowledged authorities rather than going with popular and charismatic sentiments. It is

also recommended to counter the inequalities to access to health care, by revising the policies which regulate access to health care facilities despite income and education levels.

Conflict of interest

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