

# **Thai Women's Perceptions of the Causes of Hypertension Based on Age and Educational Level**

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**Abstract:** To date, perceptions among hypertensive Thai women regarding causes of hypertension is poorly understood. Therefore, the purpose of this study was to examine, in 253 Thai women, their perceptions (external and internal) of the causes of their hypertension based on age and educational level. An external cause of illness was perceived to be the result of something from outside of the body (e.g. germs or viruses, diet, pollution, chance, other people and/or poor medical care), while an internal cause was considered the result of something within the body (e.g. heredity, stress, personal behavior, and/or state of mind). Data were obtained using a demographic data record and an illness perception scale. Data analysis included the use of descriptive statistics, ANOVA, MANOVA, MANCOVA, Wilks' lamda multivariate test, and the Scheffé test and/or Games-Howell test.

The results revealed Thai women with lower educational levels reported significantly greater external causes of their hypertension than did Thai women with higher levels of education. No differences were found between the external and internal causes of hypertension based on age. These findings suggest the need for educational health programs designed for hypertensive Thai women with low levels of education so they can better understand the cause of their illness and, thereby, increase their ability to better control their blood pressure.

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**Key Words:** Age; Educational level; Illness perceptions; Hypertension; Thai women

## **Introduction**

Hypertension is a prevalent health problem throughout Thailand. Previous research has found only 13.9% of treated patients with hypertension maintain blood pressure readings of less than 140/90 mmHg.<sup>1</sup> According to Thailand's Ministry of Public Health,<sup>2</sup> approximately 57% of Thais, 60 years of age and older, are hypertensive. In addition, Thai women have been found to be 1.62 times more likely to have hypertension than Thai men.

Prior research has noted demographic factors, such as age and educational level, are related to blood pressure control. For example, a Portuguese study

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reported older people, compared to younger people, were less likely to control their hypertension despite a higher awareness of their illness.<sup>3</sup> In addition, a Thai study found higher educational levels to be related to better blood pressure control.<sup>4</sup> However, it is not known whether age and educational level are related to perceptions of the cause of hypertension, especially among Thai women.

## **Literature Review**

The “Commonsense Model of Illness Representations (i.e. illness perceptions)”<sup>5</sup> suggests illness perceptions are made up of five components (i.e., identity/symptoms, cause, timelines, consequences, and control) that people use to respond to and/or cope with issues related to their illnesses. Example of responding to or coping with an illness is taking prescribed medications or exercising on a regular basis. Prior research has examined the various components of illness perception among individuals with chronic illnesses.<sup>6, 7, 8</sup> However, most illness perception research has examined the cause of illness separately from the other four components of illness perceptions (identity, timeline, consequences, and control). In addition, these studies tended to use different operational definitions for the perception of the cause of illness.<sup>7, 9</sup> For example, Weinman and colleagues<sup>7</sup> analyzed illness perception of cause by comparing each specific cause among various kinds of chronic illnesses (diabetes, rheumatoid, chronic fatigue syndrome, and pain). The findings revealed virus and pollution were the most frequently reported perceived causes of illness by patients with chronic fatigue syndrome.<sup>7</sup> Gump and colleagues,<sup>9</sup> by comparison, studied coronary heart disease patients to compare illness perception of cause (i.e., old age, genetics and health damaging behavior [alcohol and smoking], health protective behavior [exercise and diet], stress, anxiety, anger, depression and bad luck according to the age group). Significant differences in the mean scores of the various causes

were noted for old age, genetics, alcohol, diet, stress, anxiety, and anger.

Other investigators, using a qualitative research approach, have worked to clarify the perceptions of the cause of illness. Goodman and colleagues<sup>10</sup> interviewed clients with systemic lupus erythematosus and found they perceived viruses, stress, social factors, and heredity as causes. A study, using open-ended questionnaires to interview 21 individuals with chronic obstructive pulmonary disease, examined various perceptions, including the cause of illness,<sup>11</sup> and found a major cause of the illness was perceived to be smoking. Other causes were found to include bacterial infections, tuberculosis, stress, and being a second-hand smoker.<sup>11</sup>

The relationships among demographic factors and the perception of the cause of illness also have been examined. An English study investigated 330 asthma patients, between 17 and 87 years of age, regarding associations among illness perceptions, perception of emotions, and current adherence and intention to adhere to medications.<sup>12</sup> The results showed internal causes (e.g. diet, smoking, personal behavior, and state of mind) were positively related to external causes (e.g. a germ or virus, pollution, chance, other people, poor medical care, work environment, anesthetics, and previous chest illnesses), consequences (another component of illness perceptions), and emotions. In addition, external causes were found to be positively related to consequences and emotions. Although these findings showed associations among some components of illness perceptions and other factors, no associations were examined in regards to age or educational level and the perceived causes of illness (internal and external).

Previous studies also have reported the relationships among four (identity, timelines, consequences, and control) of the five components of illness perceptions in individuals with hypertension, but have failed to thoroughly examine the illness perception component of cause.<sup>4, 13</sup> As a result, the

relationships among perceived cause of hypertension, age and educational level have not been examined, particularly among Thai women. Thus, based on prior research and the lack of research, in Thailand, on women's perceptions of the cause of hypertension, the purpose of this study was to examine whether age and educational levels in Thai women with hypertension were associated with illness perceptions of cause (external and internal).

In this study, the definition of illness cause was defined as the external and internal causes of hypertension as perceived by an individual. External causes were defined as those that came from the outside of the body (e.g., diet, germs or viruses, pollution, by chance, other people, and/or poor medical care), while internal causes were considered to be those that came from inside the body (e.g., heredity, stress, personal behavior, and/or state of mind). Although illness "perceptions" and illness "representations" have been used interchangeably in the literature, the terms, "illness perceptions," were used to facilitate a better understanding, among the study subjects, regarding the content under examination.

## **Method**

**Design:** This study was a quantitative secondary analysis of data obtained from a previous larger study.<sup>4</sup>

**Ethical Considerations:** Prior to implementation, approval to conduct the study was obtained from the Institutional Review Board where the larger study was conducted and from the Ethical Clearance Committee on Human Rights Related to Research Involving Human Subjects at the principal investigator's (PI) institution. All study subjects were informed about: the purpose of the study; what was involved in study participation; confidentiality and anonymity issues; the right to refuse to participate; and, the right to withdraw from the study at any time. Subjects willing to participate were asked to sign a consent form.

**Sample and Setting:** A convenience sample was recruited from the out-patient clinic of one large governmental hospital in Bangkok, Thailand. This hospital was selected because its clinic staff treated a large number of women with hypertension. The names of potential subjects were obtained, with assistance from the clinic staff, via the clinic schedule. The inclusion criteria consisted of: being a Thai woman; being at least 25 years of age; having hypertension that was diagnosed by a physician; receiving treatment in the out-patient clinic used as the study site; taking an anti-hypertensive medication for at least 6 months; not having any other serious physical or mental illness; and, being able to understand and communicate in Thai.

Based upon Kline's suggestion,<sup>14</sup> the ratio of the number of cases to the number of model parameters was set at 10 to 1. Because there were 25 parameters, in this study, the appropriate sample size was determined to be at least 250 subjects. To allow for attrition, 263 potential subjects initially were approached. Only ten (3.95%) of them refused to participate, resulting in a total of 253 subjects. The low level of refusal to participate is common among Thais due to the cultural custom of cooperating with Thai healthcare professionals.

The women ranged in age from 33 to 83 years, with a mean age of  $61.04 \pm 9.32$  years. The majority had: a fourth grade education or less ( $n = 127$ ; 50.2%); no personal income ( $n = 96$ ; 37.9%); and, one to four persons living in their household ( $n = 163$ ; 64.4%). In addition, they were: Buddhist ( $n = 244$ ; 96.4%); on antihypertensive medications for five years or more years ( $n = 118$ ; 46.6%); and, financially able to purchase their antihypertensive medications ( $n = 215$ ; 85%).

**Procedure:** Once potential subjects checked in for their appointments and were waiting to be seen, they were approached by the PI and informed about all aspects of the study. The women also were encouraged to ask questions about the study at this time. Those

meeting the selection criteria and consenting to take part in the study were invited to a private area of the clinic where they were asked to complete two self-report questionnaires. Completion of the questionnaires took approximately 15 minutes.

**Instruments:** The questionnaires used in the study consisted of the Demographic Data Record (DDR) and the Illness Cause Scale (ICS). The DDR contained 14 items that sought information regarding each subject's: age; educational level; income; number of persons in the household; religion; ethnicity; number of years of taking anti-hypertensive medications; and, sufficiency of finances to purchase anti-hypertensive medications.

The ICS was adapted, by the PI, from the 10-item "Illness Perception Questionnaire" developed by Weiman and colleagues.<sup>7</sup> Adaptation of the "Illness Perception Questionnaire," to create the ICS, consisted of simply changing the term, "illness," to the terms, "high blood pressure." For example, the item "A germ or virus caused my illness" was changed to "A germ or virus caused my high blood pressure." The purpose of the ICS was to determine what factors subjects believed were internal or external causes of their hypertension. The scale consisted of ten items that had possible responses ranging from 1 = strongly disagree to 5 = strongly agree. The items, for both the internal and external causes of illness, can be found in **Table 1**. Mean scores were calculated for each external cause item and each internal cause item by summing the response scores for each item, across respondents, and then dividing by the number of respondents. Since the ICS was adapted from an instrument originally written in English, the items required translation from English into Thai, by the PI, and then back-translation from Thai to English by another bilingual person. The original English version of the instrument items and the back-translated version were compared to assure no changes in meaning occurred during the translation process.

The determination for which types of causes, in the ICS, should be classified as internal or external was made with the assistance of five experts in medical nursing and nursing research, in accord with the recommendations made by the developers of the original scale (i.e. treat each item as an independent and specific causal belief).<sup>7</sup> The experts agreed that five items in the scale were external causes (germs or viruses; diet; pollution; actions of others; and poor medical care), while two items were internal (one's heredity and state of mind). However, the experts were unable to come to consensus regarding whether stress, chance, and one's own behavior were internal or external causes of illness. Since no prior studies could be located, regarding external and internal causes of illness among Thais, these three items were classified, through a review of the literature by the PI, as follows: "by chance" was an external cause;<sup>12</sup> "my own behavior" was an internal cause;<sup>12</sup> and, "stress" was an internal cause.<sup>15</sup> The experts' classifications, along with the PI's literature review, resulted in six items (i.e., germ or virus, diet, pollution, by chance, by others, and poor medical care) being determined as external causes of illness and four (i.e., heredity, stress, my own behavior, and state of mind) being determined to be internal. Although the larger study,<sup>4</sup> from which the data for this study were obtained, found the internal reliability of the external ( $= .62$ ) and internal ( $= .58$ ) causes to be less than 0.70, they had tolerable internal reliabilities. Thus, the data obtained from the ICS, for use in this study, were considered acceptable.

**Data Analysis:** Demographic data were analyzed using descriptive statistics (frequency distribution, mean, and standard deviation). ANOVA, MANOVA, and MANCOVA were used to compare the mean differences between the external and internal causes according to age and educational level. An alpha level of .05 was an accepted level of the significance, and the external and internal causes were treated as dependent variables for analyses of all

inferential statistics. In ANOVA, age and educational level were treated as independent fixed factors. In MANOVA, age and educational level were treated as two interactive fixed factors. In MANCOVA, age and educational level were treated as an alternative for the covariate. The Wilks' lambda multivariate test, the most popular multivariate test used in MANOVA, was utilized to approximate the F value in order to obtain a significance level. The Scheffé test, for multiple comparisons of age and educational levels with equal variances, was conducted if significant differences among groups were found. The Games-Howell test was performed if the homogeneity of unequal variance of age and educational levels was found.

## Results

As shown in **Table 1**, most subjects did not agree that the causes contributing to hypertension were: germ or virus (Cause1), pollution (Cause3),

by chance (Cause5), other people (Cause8), or poor medical care (Cause9). However, the majority agreed that diet (Cause 2), heredity (Cause4), stress (Cause 6), own behavior (Cause7), and state of mind (Cause 10) contributed to hypertension.

ANOVA revealed (see **Table 2**) no differences among the mean scores of the external and internal causes of illness, according to age. However, the mean scores of the external causes were found to significantly differ according to the subjects' level of education ( $F=5.88$ ;  $df=3/249$ ;  $p=.001$ ). No differences were found in the mean scores of the internal causes, according to the subjects' level of education, ( $F=.32$ ;  $df=3/249$ ;  $p= ns$ ). On the other hand, the Scheffé test showed that subjects who had less than a 6<sup>th</sup> grade education ( $M=2.85$ ;  $SD = .71$ ) had higher mean scores for external causes than those with a baccalaureate/other professional equivalence ( $M=2.55$ ;  $SD = .50$ ;  $p= .04$ ) or a masters'/doctoral degree ( $M=2.15$ ;  $SD = .54$ ;  $p=.009$ ).

**Table 1** Disagreements and Agreements Regarding External and Internal Causes of Illness (n=253)

External Causes	Percentage (%) of Responses		
	Disagreements	Agreements	Neutral
Cause 1: A germ or virus caused my high blood pressure.	85.5	4.2	10.2
Cause 2: Diet played a major role in causing my high blood pressure.*	7.1	73.5	10.2
Cause 3: Pollution of the environment caused my high blood pressure.	55.2	22.2	22.6
Cause 5: It was just by chance that I became hypertensive.	56.7	29.6	13.7
Cause 8: Other people played a large role in causing my high blood pressure.	50.8	30.9	18.3
Cause 9: My high blood pressure was caused by poor medical care in the past.	83.8	8.5	7.7

Internal Causes	Percentages (%) of Responses		
	Disagreements	Agreements	Neutral
Cause 4: My high blood pressure is hereditary--- it runs in my family.	38.8	44.0	17.2
Cause 6: Stress was a major factor in causing my high blood pressure.	5.2	85.4	9.5
Cause 7: My high blood pressure is largely due to my own behavior.	13.2	64.6	22.2
Cause 10: My state of mind played a major part in causing my high blood pressure.	18.7	59.5	21.8

Note: \* = Total is less than 100% due to missing data

**Table 2** Mean Scores on Causes 1 and 5 as a Function of Educational Level (n=253)

Scheffé Test		
Educational level		
Cause 1 <sup>a</sup>	Mean	SD
1. No education to Grade 6	2.10	0.86
2. Grade 7 to Grade 12	1.81	0.45
3. Baccalaureate or other professional equivalence	1.82	0.75
4. Masters or doctoral degree	1.09	0.30
1>2*; 1,2,3 > 4***		
Cause 5 <sup>b</sup>	Mean	SD
1. No education to Grade 6	2.87	1.19
2. Grade 7 to Grade 12	2.76	1.21
3. Baccalaureate or other professional equivalence	2.25	1.06
4. Masters or doctoral degree	1.27	0.65
1>3**; 1, 2 > 4***; 3> 4**		

**Note:** \* =  $p < .05$ ; \*\* =  $p < .01$ ; \*\*\* =  $p < .001$

<sup>a</sup> = "A germ or virus caused my high blood pressure."

<sup>b</sup> = "It was just by chance that I became hypertensive."

Using MANOVA, the tests between subject effects revealed no differences between the mean scores of the external and internal causes, according to age. However, a significant difference was found in the mean score of external causes according to educational level ( $F = 3.88$ ;  $df = 3$ ;  $p = .01$ ). The Wilks' lambda multivariate test for overall results showed the educational level of the subjects was statistically significant ( $p = .03$ ). In addition,  $R^2$  was found to be 0.08. Although age was treated as a covariate, using MANCOVA, a significant difference was found in the mean score of the external causes according to educational level ( $F = 5.06$ ;  $df = 3$ ;  $p = .002$ ).

The Games-Howell test, used in the post-hoc analyses of ANOVA when looking at a single item of external cause, revealed subjects who had a maximum of a 6<sup>th</sup> grade education (primary school) reported a higher mean score on the item, "Germs or virus caused my high blood pressure (Cause 1)," than those with a 7<sup>th</sup> to 12<sup>th</sup> grade education. Also, those with a maximum of a 6<sup>th</sup> grade education (i.e., 7<sup>th</sup> to 12<sup>th</sup> grade education, and those with a baccalaureate degree or other professional equivalence), had higher mean scores on the Cause 1 item than those with a masters' or doctoral degree. Furthermore, subjects with a maximum of a 6<sup>th</sup> grade education reported a higher mean score regarding "It was just by chance that I became ill (Cause 5)" than those with a baccalaureate degree or other professional equivalence. The women with a maximum of a 6<sup>th</sup> grade education and those with a 7<sup>th</sup> to 12<sup>th</sup> grade education also had higher mean scores with respect to the Cause 5 item than those with a masters' or doctoral degree. Subjects with a baccalaureate degree or other professional equivalence also reported a higher mean score regarding the Cause 5 item than those with a masters' or doctoral degree.

## **Discussion**

The findings reveal significant differences in the mean scores of external causes according to the subjects' level of education. In addition, subjects with more education had significantly lower mean scores (better perception of cause) of external causes than those with less education. This might be because those with more education could have received more information about hypertension and more readily adapted their illness perceptions. Thereby, their perception of the external causes of illness would have readily differed from those with less education and information. Moreover, those with less education might have integrated their personal beliefs from previous experiences, rather than from factual knowledge, to build their unique and different perceptions of illness.

Just as Jessop and Rutter<sup>12</sup> found no association between the cause component and age, among asthma participants, the findings of this study revealed no differences in the mean scores for either the external or internal causes among the age groups. However, these findings do not support those of Gump and colleagues,<sup>9</sup> who found, in an American population, an association between the cause of illness and age. This may be due to the fact that the scale used in this study significantly differed from the one used by Gump and colleagues. In addition, the subjects in the two studies were from distinctly different cultures, possibly resulting in different perceptions of the cause of illness.

The fact that subjects with lower educational levels reported higher mean scores (an inaccurate perception) for external Cause 1 ("A germ or virus") and external Cause 5 ("By chance"), than those with higher educational levels, suggested subjects with lower levels of education may not actually have known what causes hypertension or if they did know, they needed more accurate information. Having more accurate information could assist in enhancing these

subjects' logical perceptions and in modifying their health behavior related to better blood pressure control.

### **Limitations and Recommendations**

The strength of this study was the thorough statistical analyses that yielded useful information that can be used to guide health care providers' practices regarding hypertensive Thai women with low levels of education. The limitations of the study, however, were: a) the use of a homogeneous sample of hypertensive Thai women from one out-patient clinic; b) use of only self-report data; c) use of data only from women; and, d) lack of consensus among the expert judges regarding categorization (internal or external cause) of three of the scale items. A homogeneous sample, overall, shows equal variances of the investigated variable, which makes it difficult to show significant findings. Self-report responses may not be reliable due to participants' emotions or biases. Use of data only from hypertensive women limits the applicability of the findings to males with hypertension. Finally, because the experts had difficulty coming to consensus on whether "stress," "own behavior," and "chance" were internal or external causes, the PI had to rely on the use of a literature review to categorize these three items. Thus, the findings from these three items need to be used with caution since they were categorized by one individual who may have a different perception about illness causes compared to others.

Future studies need to use: a) a more diverse sample; b) both male and female subjects; c) more than one data collection site; d) multiple sources of data (not just self-report information); and, e) an instrument that experts can agree upon regarding what illness causes are internal or external. In addition, studies focusing on the effectiveness of hypertension educational programs for women with low levels of education need to be carried out.

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## การรับรู้ของผู้หญิงไทยเกี่ยวกับสาเหตุของความดันโลหิตสูง จำแนกตามอายุ และระดับการศึกษา

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**บทคัดย่อ:** จากการทบทวนวรรณกรรมในปัจจุบันนี้ การรับรู้ความเจ็บป่วยในผู้หญิงไทยที่มีภาวะความดันโลหิตสูงโดยศึกษาจากสาเหตุภายนอกและภายในในยังขาดความเด่นชัด จุดประสงค์ของการศึกษานี้ต้องการตรวจสอบสาเหตุภายนอกและสาเหตุภายในในของการรับรู้ความเจ็บป่วยของผู้หญิงไทยที่ได้รับการวินิจฉัยว่าเป็นความดันโลหิตสูง จำแนกตามอายุ และระดับการศึกษา โดยใช้ข้อมูลทุกข้อมูลของการศึกษา ก่อนหน้านี้ สาเหตุภายนอกคือ การรับรู้ความเจ็บป่วยของสาเหตุจากภายนอก ร่างกายและจากลิ้นแวดล้อม เช่นจากเชื้อโรคหรือไวรัส อาหาร ผลกระทบต่างๆ โอกาสการเกิดความเจ็บป่วยหรือโรคจากผู้อื่น และจากการรักษาที่ไม่ดี ส่วนสาเหตุภายในในคือ การรับรู้ความเจ็บป่วยของสาเหตุจากภายนอกในร่างกาย เช่นจากพัณฑุรกรรม ความเครียด พฤติกรรมการปฏิบัติตัวของตนเอง และจิตใจ ข้อมูลทุกข้อมูลประกอบด้วย ผู้หญิงไทยที่ได้รับการวินิจฉัยว่าเป็นความดันโลหิตสูงจำนวน 253 คน อายุ ระดับการศึกษา และแบบสอบถามการรับรู้ความเจ็บป่วยที่เป็นฉบับแปลภาษาไทย ในการศึกษานี้วิเคราะห์ด้วยสถิติเชิงพรรณนาและสถิติเชิงอ้างอิงได้แก่ สถิติ ANOVA สถิติ MANOVA และสถิติ MANCOVA โดยศึกษาความแตกต่างของสาเหตุภายนอกและสาเหตุภายในของภาวะความดันโลหิตสูงในผู้หญิงไทยที่ได้รับการวินิจฉัยว่าเป็นความดันโลหิตสูง จำแนกตามอายุ และระดับการศึกษา

ผลการศึกษาวิจัยพบว่า ผู้หญิงไทยที่มีระดับการศึกษาต่ำรับรู้การเจ็บป่วยจากสาเหตุภายนอกมากกว่าผู้หญิงไทยที่มีระดับการศึกษาสูงอย่างมีนัยสำคัญทางสถิติ อย่างไรก็ตามไม่พบความแตกต่างของคะแนนเฉลี่ยสาเหตุภายนอกและสาเหตุภายในเมื่อจำแนกตามอายุ ในระดับการศึกษาที่ต่างกันของผู้หญิงไทยมีผลต่อการรับรู้ความเจ็บป่วยของสาเหตุการเกิดความดันโลหิตสูง ดังนั้นการจัดโปรแกรมการศึกษาด้านสุขภาพสำหรับผู้หญิงไทยที่มีระดับการศึกษาต่ำอาจช่วยให้เข้าใจสาเหตุของ การเกิดความดันโลหิตสูงและเพิ่มชีดความสามารถในการควบคุมระดับความดันโลหิตได้ดีขึ้น

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