ความสัมพันธ์ระหว่างลักษณะทางการแพทย์แผนไทยกับพฤติกรรมสุขภาพในผู้ป่วยโรคความดันโลหิตสูง
Associations of Body Constituents in Thai Traditional Medicine with Health Behaviors in Patients with Hypertension

นิพนธ์ต้นฉบับ

ดอกไม้ วิวรรธมงคล, พัชร์กัลยกร พรหมพิทักษ์*, ผ่องพิมล ดาศรี, ทัพพ์เทพ ทิพยเจริญธัม, แม้นมาศ วรรณภูมิ และ ประวิทย์ อัครเสรีนนท์

สถานการแพทย์แผนไทยประยุกต์ คณะแพทยศาสตร์ศิริราชพยาบาล มหาวิทยาลัยมหิดล กรุงเทพมหานคร 10700

*** Corresponding author:** patkanyakorn.pro@mahidol.edu

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Original Article

Dokmai Wiwattamongkol, Patkanyakorn Prompituck*, Phongphimol Dasri, Thapthep Thippayacharoentam, Manmas Vannabhum and Pravit Akarasereenont

Center of Applied Thai Traditional Medicine Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok 10700, Thailand

*** Corresponding author:** patkanyakorn.pro@mahidol.edu

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บทคัดย่อ

วัตถุประสงค์: เพื่อศึกษาปกติลักษณะทางการแพทย์แผนไทย และความสัมพันธ์ระหว่างปกติลักษณะกับพฤติกรรมสุขภาพของผู้ป่วยโรคความดันโลหิตสูง **วิธีการศึกษา:** การศึกษาแบบภาคตัดขวางในผู้ป่วยถูกวินิจฉัยโรคความดันโลหิตสูงจากแพทย์แผนปัจจุบัน ที่คลินิกอายุรเวทแพทย์แผนไทยประยุกต์ โรงพยาบาลศิริราช 374 คน ให้ตอบแบบสอบถามข้อมูลทั่วไป ประเมินปกติลักษณะ และพฤติกรรมสุขภาพ ทดสอบความสัมพันธ์ด้วย Chi-square test หรือ Fisher extract test ตามความเหมาะสม **ผลการศึกษา:** ผู้ป่วยส่วนใหญ่มีปกติลักษณะเป็นเสมหะ ความเครียดพบมากในผู้ที่มีปกติลักษณะแบบปิตตะ-วาตะมากที่สุด ส่วนการกินอาหารที่เติมน้ำตาลหรือเกลือพบมากที่สุดในในแบบเสมหะ วาตะ-เสมหะ ปิตตะ-เสมหะ การออกกำลังกายอย่างหนักพบในแบบปิตตะ และวาตะ ส่วนการออกกำลังกายปานกลางสัมพันธ์กับแบบวาตะอย่างมีนัยสำคัญทางสถิติ (P-value = 0.016, 0.005, 0.006 และ 0.016 ตามลำดับ) ส่วนพฤติกรรมสุขภาพด้านอื่นไม่พบว่าสัมพันธ์ปกติลักษณะใด **สรุป:** ผู้ที่มีโรคความดันโลหิตสูงมีปกติลักษณะแบบเสมหะมากที่สุด และความเครียด การกินอาหารที่เติมน้ำตาลและเกลือ การออกกำลังกายทั้งหนักและปานกลางล้วนสัมพันธ์กับปกติลักษณะ สามารถไปเสริมการปรับเปลี่ยนพฤติกรรมสุขภาพให้เหมาะกับปกติลักษณะตามแนวทางแพทย์แผนไทยได้

คำสำคัญ: พฤติกรรมสุขภาพ, ปกติลักษณะ, การแพทย์แผนไทย, โรคความดันโลหิตสูง

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Abstract

Objective: To assess body constituents based on Thai traditional medicine (TTM) and its associations with health behaviors in hypertensive patiets. **Methods:** Cross-sectional study recruited 374 patients receiving at the Applied Thai Traditional Medicine Clinic, Siriraj Hospital. They were asked to complete questionnaires of demographic characteristics, body constituents, and health behaviors. Associations were tested using Chi-square test or Fisher's exact test as appropriate. **Results:** Most participants had body constituents of phlegm type, followed by water and water-wind types. Stress was found the most in persons with water-wind type, high risk of consuming foods with sugar and salt added with phlegm, wind-phlegm, and water-phlegm types, heavy exercise with water and wind types, and moderate exercise with wind type with statistical significance (P-value = 0.016, 0.005, 0.006 and 0.016, respectively). Other health behaviors were not associated with body constituents. **Conclusion:** Hypertensive patients had body constituent of phlegm type the most. Stress, consumption of food with sugar and salt, and heavy and moderate exercise were associated with certain body constituents. The findgings could be applied in TTM in promoting healthy lifestyle in accordance with the individuals' body constituent types.

Keywords: health behavior, body constituent, Thai traditional medicine, hypertension

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Introduction

Hypertension as a cardiovascular disease has been continuously increasing in prevalence with a rate of 30%.[1] Hypertension causes heart disease, kidney disease, and cerebrovascular disease leading to stroke and death.[2,3] According to the present clinical guideline for hypertension, the goal of treatment is to control blood pressure at a normal level. Since lifestyle modification is essential in preventing and controlling the disease, it is recommended to use lifestyle modification to control blood pressure and decrease the risk of complications and death which includes diet control, stress management, smoking cessation, and exercise.[4,5]

Health behavior is a crucial factor in individuals' health status by promoting health and prevention health problems such as stress management, diet control, exercise, and sedentary lifestyle avoidance such as smoking cessation and alcohol consumption control.[6,7] Previous studies showed that hypertensive patients had uncontrolled blood pressure and moderate level of health behavior attributable to poor stress

management, poor drug compliance, and uncontrolled blood pressure.[8] Dietary behavior plays a major role in blood pressure control. Hypertensive patients should take less low-sodium food and more foods rich in potassium, magnesium, calcium and fiber. Patients should exercise adequately to control weight, better manage stress, and abstain from smoking and alcohol to better control blood pressure and achieve good quality of life.[6,8] In this present study, we aimed to determine health behavior regarding stress, diet, exercise, and health-risk behaviors including smoking and alcohol.

Thai traditional medicine (TTM) has been used to treat and prevent illnesses, and rehabilitate the patient. The practice of Thai traditional medicine is based on the four elements of human body including earth, water, wind, and fire. The illnesses are formed with the “origins” or originating elements or defective element. Originating elements are ill elements that cause disease; while originating age is the age associated with frequent incident of the disease. Originating season is the season that enhances more illnesses, and originating time is the time that the disease is worse or exacerbated. Originating habitat is the living place, and lifestyle, behavior and emotion that allows the illness. All these originating entities cause element imbalance which further causes illness.[9,10] TTM does not view hypertension as a disease. On the contrary, TTM aims at analyzing separate abnormal or imbalance elements to find suitable treatment and advice. Previous studies indicated that hypertensive patients have their dominant element of the fire and no difference in the earth element by age or habitat.[11] In addition, TTM considers body constituents which is the element that express the individual’s characteristics and attributes. In Varayokasarn scripture, an Ayuravedic scripture defines the three originating elements (or defective elements) including phlegm, water, and wind. [10] Individual’s characteristics could be categorized into 7 elements including 1-phlegm, 2-water, 3-wind, 4-phlegm and water, 5-phlegm and wind, 6-water and wind, and 7-the combination of phlegm, water and wind (i.e., the gathering of elements).[12] In characteristic evaluation, TTM practitioners analyze whether the individual’s behavior and changes affect elements causing body imbalance. An individual’s behavior is analyzed to identify the cause of imbalance and to provide advice appropriate for behavior adjustment. However, there is a lack of information to help describe body constituents in hypertensive patients. There is also a lack of connection between body constituents and the individual’s health behavior. This information could be used in planning treatment, promoting health, and preventing illness combining with conventional medicine. The understanding about the body constituents and their relationships with health behaviors in hypertensive patients health behaviors could be fueful in providing a comprehensive care by incorporating lifestyle modification suitable for their body contituents. This study aimed to determine types of body constituents of hypertensive patients, and the assciations of each body constituents with each health behavior including stress, consumption of high-risk food, exercise, and cigarette smoking.

Methods

In this descriptive, cross-sectional, survey research, study population was hypertensive patients receiving care the Applied Thai Traditional Medicine Clinic, Siriraj Hospital, Mahidol University. The study sample was 374 individuals in the study population who received care between August 2015 to February 2016, a total of 6 months. To be eligible, the patient had to be 18 years old or older, diagnosed with hypertension by conventional medicine physician, and willing to participate in the study. Those with incomplete data were excluded.

Sample size estimation

At the clinic selected for study setting, there were 1,600 – 1 ,9 00 customers with hypertension receiving TTM service within the past period of 6 months. Based on Yamane (1967), with a 95% confidence level and a sampling error of 5%, a sample size of 333 participants was needed.

Research instruments

A questionnaire with 3 parts was used in the study. The first part collected demographic characteristics of the participants including sex, age, body mass index, present residence, and born residence. The second part asked about stress and health behaviors. Questions about stress were from the self-assessed stress test of the Department of Mental Health, Ministry of Public Health. The questions asked, for example, how often do you feel agitated, not happy or sad, and worthless. The response was a 4-point rating scale ranging from 0-never, to 1-occasionally, 2-often, and 3-always.

With 20 questions, the possible total score was 0 – 60 points where higher scores indicate higher stress level.

The health behavior questionnaire was the Health Behavioral Surveillance System (HBSS) of Department of Health Service Support, Ministry of Public Health. The nine questions about diet behavior asked, for example, how often the participants consumed bad foods such as sugary drinks, high-fat food, and high-coconut oil foods. The response was a 4-point rating scale ranging from 0-"1 day week or never," to 1-"2 – 4 days per week," 2-"5 – 6 days per week," and 3-"every day." With the possible total score of 0 – 27 points, higher scores indicate a higher level of risky diet behavior. There were 2 questions asking how often the participants add sugar and salt/salty condiments in their food with a response choice of 0-never, to 1-few times, 2-most of the time, and 3-every time. With the possible total score of 0 – 6 points, higher scores indicate a higher level of risky diet behavior.

For exercise, there were two questions, one for heavy exercise (exhaustive exercise with fast and heavy breath) and another for moderate (exercise with slightly rapid breath). For each question, the response was number of minutes per exercise and number of days per week exercising.

For cigarette smoking, frequency of smoking was categorized as response of less than 10, 11 -20, 21 – 30, more than 30 cigarettes per day.

The last part of the questionnaire assessed body constituents. These 35 questions were developed by the Aayuraveddhamrong School, Applied Thai Traditional Medicine Institute of Faculty of Medicine, Mahidol University.[12] It has good content validity with Index of Congruence of > 0.5 and good internal consistency reliability with a Cronbach's alpha coefficient of 0.85. [12] The questions assessed body constituents of phlegm, water, and wind. Responses for each item was different. For example, the item of "characteristics of skin" has the response choices of dry, slightly oily, evenly smoothly, course not smooth, tender, tender and moist, two-tone or dark, moderately dark, and fair color. On the other hand, the item "sweat" has the response choices of little sweating, a lot and easily sweating, and moderately sweating. The overall body constituent was categorized as follows. Among the three single constituents, if score of only a single constituent was more than 50%, the person was assigned as such constituent (either water, wind, or phlegm). For the water-wind, water-phlegm, and wind-phlegm combinations, there had to be one constituent with less than 50% and the other two prominent constituents. For the combination of water-win-phlegm, the person had to all three constituents less than 50% and comparable to each other.

Ethical consideration for participant protection

The study was approved by the Ethics Committee for Human Study, Faculty of Medicine, Mahidol University (approval number: Si 381/2015). The study was voluntary in nature. Written informed consent form was obtained before participation. Participants could withdraw from the study at any time. Data of participants were secured and presented as a summary.

Data collection procedure

After written informed consent was obtained, the participant was asked to complete the self-administered questionnaire which took about 20 minutes. For participants who were unable to read and write comfortably, the researcher read and wrote for them.

Data analysis

Descriptive statistics including mean standard deviation and frequency with percentage were used to summary demographic characteristics of the participants and study variable. Associations body constituents and each health behaviors were tested using Chi-square test or Fisher's exact test as appropriate. Statistical significance for all tests was set at a type I error of 5%. All statistical analyses were performed using SPSS statistical package version 20.0.

Results

Of the 374 hypertensive participants, majority was women (79.90%), 60 years old or older (61.76%), with level 2 obesity (74.87%), and living in the central Thailand (both present and born residence) (Table 1).

Body constituents of the participants

Of the 374 hypertensive participants, the most found body constituents was phlegm (111 participants, or 24.06%), followed by water (24.06%); the least found was water-phlegm and wind-phlegm (5.35% for both). Finally, the water-win-phlegm of the gathering was not found (Table 2).

Table 1 Demographic characteristics of participants (N = 374).

Characteristics	N	%
Sex		
Men	105	28.10
Women	269	71.90
Age (years)		
18 - 30	4	1.07
31 - 60	370	98.93
BMI (kg/m^2)		
Normal (18.5 - 22.9)	41	10.96
Level 1 obesity (30.0 - 34.9)	32	8.56
Level 2 obesity (35.0 - 39.9)	280	74.87
Level 3 obesity (40.0 or higher)	21	5.61
Present residence (region of Thailand)		
Eastern or northeastern	1	0.30
Northern	4	1.10
Southern	6	1.50
Central and western	363	97.10
Born residence (region of Thailand)		
Eastern or northeastern	6	1.60
Northern	7	1.87
Southern	10	2.67
Central and western	351	93.86

Table 2 Body constituents of the participants (N = 374).

Body constituents	N	%
Phlegm	111	29.68
Water	90	24.06
Wind	46	12.30
Water-wind	87	23.26
Water-phlegm	20	5.35
Wind-phlegm	20	5.35
Water-win-phlegm	0	0

Health behavior of hypertensive participants

It was found that most participants had no significant stress (82.90%), followed by low-level of stress (17.10%0. For diet behavior, almost all participants (99.47%) had low risk food, and the rest 2 participants consumed foods that need close monitoring (0.53%). Most participants did not exercise either heavy or moderate ones (97.33%). For smoking, most participants never smoked (98.93%).

Table 3 Health behavior of the participants (N = 374).

Health behavior		N	%
Stress	Stress	310	82.90
	No stress	64	17.10
Diet	Low risk	372	99.47
	Vigilant	2	0.53
Exercise	No exercise	364	97.33
	Exercise	10	2.67
Smoking	Never smoker	370	98.83
	Past smoker	4	1.07

Associations between health behavior and body constituent

Participants with stress were statistically significant related with body constituents (P-value = 0.016) where the highest proportion of stressed participants was found in water-wind type (91.95%). For diet behavior, there was no statistically significant proportions of participants with risky foods regarding constituent types (P-value = 0.329); while phlegm type had the highest proportion of participants consuming food with sugar and salt added (P-value = 0.005). No heavy exercise were found with the highest proportion in participants with water, phlegm and water-phlegm types (P-value = 0.006). For moderate exercise, the highest proportion of no exercise was found in participants with phlegm and wind-phlegm types (P-value = 0.016). Finally, cigarette smoking, the highest proportion of never-smokers was found in participants with phlegm, water-wind and wind-phlegm types (P-value 0.148) (Table 4).

Table 4 Associations between health behavior and type of body constituent (N = 374).

Health behavior	N (%) by constituent type							P-value*
	Wind	Water	Phlegm	Water-wind	Wind-phlegm	Water-phlegm	Wind-water-phlegm	
Stress								
Stressed	31 (67.39)	72 (80.00)	94 (84.68)	80 (91.95)	16 (80.00)	17 (85.00)	0 (0.00)	0.016
Normal or not stressed	15 (32.61)	18 (20.00)	17 (15.32)	7 (8.05)	4 (20.00)	3 (15.00)	0 (0.00)	
Consumption of high-risk food								
Low risk	45 (97.83)	90 (100.00)	111 (100.00)	86 (98.85)	20 (100.00)	20 (100.00)	0 (0.00)	0.329
High risk	1 (2.17)	0 (0.00)	0 (0.00)	1 (1.15)	0 (0.00)	0 (0.00)	0 (0.00)	
Consumption of food with sugar and salt added								
Low risk	41 (89.13)	85 (94.44)	111 (100.00)	86 (98.85)	20 (100.00)	20 (100.00)	0 (0.00)	0.005
High risk	5 (10.87)	5 (5.56)	0 (0.00)	1 (1.15)	0 (0.00)	0 (0.00)	0 (0.00)	
Heavy exercise								
No	42 (91.30)	86 (100.00)	111 (100.00)	86 (98.85)	20 (100.00)	19 (95.00)	0 (0.00)	0.006
Yes, ≤ 20 min / day and ≥ 3 days / week	4 (8.70)	4 (4.44)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	
Yes, ≥ 20 min / day and ≥ 3 days / week	0 (0.00)	0 (0.00)	0 (0.00)	1 (1.15)	0 (0.00)	0 (0.00)	0 (0.00)	
Moderate exercise								
No	42 (91.30)	85 (94.44)	111 (100.00)	86 (98.85)	19 (100.00)	19 (0.00)	0 (0.00)	0.016*
Yes, ≤ 30 min / day and 1 – 4 days / week	3 (6.52)	3 (3.33)	0 (0.00)	1 (1.15)	0 (5.00)	0 (0.00)	0 (0.00)	
Yes, ≥ 30 min / day and 1 - 4 days / week	0 (0.00)	2 (2.22)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	
Yes, ≥ 30 min / day and ≥ 5 days / week	1 (2.20)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (5.00)	0 (0.00)	
Cigarette smoking								
Never smokers	45 (97.8)	87 (96.67)	111 (100.00)	87 (100.00)	20 (100.00)	20 (0.00)	0 (0.00)	0.148
Past smokers	1 (2.17)	3 (3.33)	0 (0.00)	0 (0.00)	0 (5.00)	0 (0.00)	0 (0.00)	

* Fisher's exact test.

Discussions and Conclusion

In this cross-sectional study, body constituents of hypertensive participants and the associations with health behaviors were tested. It was found that most participants had phlegm type, followed by water and water-wind types. In Thai traditional medicine (TTM), the wind type reflects individuals with prominent health issues associated with mucus and semi-mucus in the body including blood, bile, mucus, sweat, lymph, fat, oil, tear, saliva, nasal mucus, urine, and joint fluid. These phlegm persons are usually overweight or fat.[10] Based on conventional or western medicine, these individuals with obesity are more likely to have hypertension.[5]

The second most body constituent was water type. Based on TTM, water type means the source of heat or energy such as body temperature.[10] The least found constituent was wind type which involves the wind or gas in the body such as gas in the gastrointestinal tract which forces food to move and to pass the gass.[10] The combination type of wind-water was also found. Based on TTM, wind and water support each other. The body of persons with wind-water combination would have heat from water type of which is even more heat easily from the win type. This condition allows for more circulation of blood and hence a higher chance of hypertension.

For associations between body constituents and health behaviors, significant associations were found in for behaviors including stress, consumption of foods with sugar and salt added, heavy exercise, and moderate exercise.

For stress, the highest proportion of participants with being stressed was significantly in those with water-wind type (91.95%). Based on TTM, persons with wind type is sensitive and easily anxious[11] which could lead to tress easily. Persons with wind type also moves fast.[11] The combination of water type which means the heat or energy could have persons with water-wind type face stress more easily.

For consumption of high-risk food, it was found that almost all of participants in each body type ate how risk food with no significant difference (P-value = 0.016). This means that most patients with hypertensin were highly aware of diet as recommended by healthcare providers. For consumption of food with sugar and salt added, the highest proportion of high-risk food was found in those with wind (10.87%), water (5.56%), and water-wind (1.15%) while other types had 0%. These differences were statistically significant (P-value = 0.005). Consuming more sugar and salt is common in a wide range of body types. The water body constituent refers to heat or energy to warm the body. It is also the fire to cause anxiety, to age a person, to digest and food.[10] For wind type of body constituent, it means the movement or circulation of blood and gas. High-risk food and foods with sugar or salt added therefore affect persons with water-wind, water, and wind types. These individuals are more likely to take high-risk food or foods with salt and sugar added.[10]

For heavy exercise, the highest proportion of exercise was found in those with wind (8.70%) and water (4.44%) with statistical significance (P-value = 0.006). Exercise or body movement could increase the fire element which lead to more wind element. For moderate exercise, the highest proportion of no exercise was found in those with phlegm and wind-phlegm types (100.0% for all) with significantly difference (P-value = 0.016). For moderate exercise, the highest proportion of those who exercised was those with wind type (6.52% for exercising not more than 30 min/day and 1 – 4 days per week, and 2.20% for exercising at least 30 min/day for at least 5 days/week). This wind type means the person moves the body fast. In this group of hypertensive patient, heavy exercise could activate the fire and wind element[10] which cold potentially raise blood pressure. Therefore, not many participants exercised either heavy or moderate one.

For cigarette smoking, not differences in proportions of persons who smoked. This could be because patients with hypertension were told not to smoke. Based on TTM, when the persons gets stressed they smoke. Smoking causes heat and therefore a higher blood pressure.[12]

Our study found that a moderate number of hypertensive participants had stress, a low number of them consumed risk food and food with sugar and salt added. However, the majority hardly exercised or smoked. This could be because this group of individuals are different from general public. These individuals could be those who seek healthy lifestyle. Individuals might have tried conventional or western medicine, and now are trying new ways of therapy and healthy lifestyle of TTM. More health promotion could be for more exercise.

The present study has certain limitations. The assessment tool were mostly subjective measures for behaviors. Scoring system of some of these scales could be more objective to obtain more reliable outcome. This study could be a starting point for study individuals with other illnesses which could help add value to the Thai traditional medicine.

In conclusion, most hypertensive individuals receiving Thai traditional medicine had body constituents of phlegm type, followed by water and water-wind types. Stress was found the most in persons with wind type, high risk of consuming foods with sugar and salt added with phlegm, wind-phlegm, and water-phlegm types, heavy exercise with water and wind types, moderate exercise with wind type with statistical significance. The findings could be applied in Thai traditional medicine in promoting healthy lifestyle in accordance with the individuals' body constituent types.

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