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Original article

A study on traditional medicine body constitution types in residential community of District 4, Ho Chi Minh City

Huy Khanh Tang[a*], Tien Cam Lam[a], Duong Thi Huong Nguyen[a], Thao Thu Le[a], Luu Bao Le[a]

[a]*Faculty of Traditional Medicine, University of Medicine and Pharmacy at Ho Chi Minh City, Ho Chi Minh City, Vietnam.*

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Abstract: ***Introduction:*** Body constitution (BC) is widely applied in daily clinical practice by Traditional Chinese Medicine (TCM) practitioners. The BC is innate depending on the intrinsic properties of the human body and is influenced by the environment. The most common diagnostic tool of physiological BC types is the Constitution in Chinese Medicine Questionnaire (CCMQ). This study was conducted to determine the proportion of nine TCM constitution types and comorbidities observed in the community of District 4, Ho Chi Minh City. ***Methods:*** A cross-sectional design was applied to collect data for this study. All the participants were classified as BC types by the CCMQ. The collected data were statistically analyzed with the SPSS 22.0 software. ***Results:*** There were 436 participants aged from 18 (163 males; 273 females) enrolled in this study from 05/2021 – 06/2021 in District 4. Five comorbidities were observed including hypertension (23.6%), cardiovascular diseases (13.1%), diabetes (11.5%), hyperlipidemia (8.3%) and obesity (4.1%). In participants, the prevalence of nine BC types were Neutral (62.4%), Qi-deficiency (17.2%), Qi-depression (15.6%), Inherited-special (8.9%), Yang-deficiency (8.3%), Blood-stasis (8.0%), Yin-deficiency (7.6%), Phlegm-dampness (6.4%), and Dampness-heat (5.7%). The Qi-deficiency type was significantly associated with ages, genders, hypertension and cardiovascular diseases while the Dampness-heat one was related to gender. ***Conclusions:*** Among the participants in District 4, Ho Chi Minh City, hypertension (23.6%) is the most common comorbidity. Neutral (62.4%) is the majority in BC types. The associations between BC types and ages, genders, jobs, five chronic diseases were different.

Keywords: traditional chinese medicine; body constitution; chronic diseases; Constitution in Chinese Medicine Questionnaire (CCMQ).

1. INTRODUCTION

According to the theory of TCM, the body constitution (BC) is innate depending on the intrinsic properties of the human body and influenced by nature and the social environment; connecting the morphological structure and physiological function with the psychological state, one's body constitution can also evolve and shift to adapt to deviations in the environment throughout a person's lifetime and indicate one's propensity to diseases, metabolism, and response to stimuli [1, 2]. In general, BC is split into a balanced constitution, also known as a Neutral constitution, and an unbalanced constitution which can additionally be divided into nine sub-types: Neutral, Qi-deficiency, Yang-deficiency, Yin-deficiency, Phlegm-dampness, Dampness-heat, Blood-stasis, Qi-depression, and Inherited-special. The fairly popular BC utility for categorizing physiological BC types based on one's symptoms presented was issued by the China Association for Traditional Chinese Medicine:

*Address correspondence to Huy Khanh Tang at the Faculty of Traditional Medicine, University of Medicine and Pharmacy at Ho Chi Minh City, 217 Hong Bang Street, District 5, Ho Chi Minh City, Vietnam; Tel: (+84) 978725166; E-mail: khanhhuy073@ump.edu.vn

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Constitution in Chinese Medicine Questionnaire (CCMQ) [1, 3, 4].

In recent years, chronic diseases such as cardiovascular disease, high blood pressure, and diabetes are the leading causes of death in low/middle-income countries [5]. The rapid growth of chronic diseases is placing a heavy burden on the health system and society. Obesity is also a leading preventable cause of mortality worldwide and it is linked to a variety of health issues, including cardiovascular diseases, diabetes, cancer, and asthma [2]. Through a number of trials and studies, it has been consistently shown a positive, continuous correlation between LDL cholesterol levels and the development of atherosclerotic plaques, subsequent vascular disease, and cardiovascular events [6].

From the point of view of the TCM therapeutic theory, it is of great significance to preserve one's health as well as diagnose development, and prognosis of one's diseases based on their BC status. Finding the potential components related to the Unbalanced BC types and then trying to eradicate the risks to maintain or achieve a new Balanced BC is the ultimate goal for keeping healthy or preventing diseases [1]. Previous studies have revealed that unhealthy conditions or diseases such as high blood pressure, diabetes, and cardiovascular disease are correlated with certain constitutional types; in which, the Neutral type and Yin-deficiency type were significantly correlated with hypertension and diabetes mellitus, Qi-deficiency type was correlated with cardiovascular diseases, Phlegm-dampness type was associated with obesity, and Dampness-heat type was correlated with hyperlipidemia [7]. These findings also recommend that the constitutional types presented in people with chronic diseases can provide the essential keys for the prevention and treatment of illnesses [8].

Although the CCMQ has been applied in many nationwide campaigns in China since 2008 – primarily in epidemiological investigations in the prevalence of BC types, it has rarely been used in populations outside of China where the disease patterns are entirely different [9]. In Vietnam, especially in its megacities, there has not been any BC studies being conducted within the community. Compared to other districts in Ho Chi Minh City, District 4 is the smallest area with the highest population density in 2019, which is a suitable place to take the first step to study the BC of the population in Ho Chi Minh City [10]. The aim of this study was to identify the proportion of BC types and the association of BC types with the five most prevalent chronic diseases, ages, genders, and jobs in this sample.

2. MATERIALS AND METHOD

2.1. Study design

The data of this study was obtained from a cross-sectional descriptive survey of 436 subjects in District 4, Ho Chi Minh City from May 2021 to June 2021. In our study, the eligible subjects were the participants aged 18 years old or above with self-reported chronic diseases: hypertension, hyperlipidemia, diabetes mellitus, cardiovascular diseases, and obesity. Participants with any of the following situations during the previous year were excluded: (1). Participants had cerebrovascular accidents, acute coronary syndrome, cancer, or other life-threatening serious illnesses; (2). Participants suffered from a severe mental disorder and did not cooperate with the researcher; (3). Participants with severe kidney and liver dysfunction and pregnant women.

Procedures. Prior to the commencement of the study, ethical approval was obtained from the Council of Ethics in Biomedical Research at University of Medicine and Pharmacy at Ho Chi Minh City. In our workshop, all potential participants were approached by a Traditional Medicine profession who gave them an introduction to BC first, then a well-trained research staff gave them a brief introduction of the study. Before the data was collected, written informed consent for participation was obtained, which was carried out both via a self-administered questionnaire and in a personal interview. Finally, the interviewer will take answering sheets into account whether there are non-responses or not. If any of the respondents does not answer all the questions in the questionnaire then that result does not count, whereas if the participant provides insufficient information about name, date then we will contact that one and complete the form.

To ensure the quality of the investigation, two important steps were taken throughout the investigation process. First, to ensure reliability among auditors and the consistency of this survey across locations and over time, the interviewers initially used the same procedures and standards to examine all participants. Second, each questionnaire was carefully evaluated and the questionnaires missing the key items were excluded.

The contents of the investigation. The contents of the investigation were listed in a structured questionnaire consisting of three key parts. The first one is socio-demographic information including ages, genders, jobs, weight, height; The second one included five chronic diseases that may influence on the formation of BC according to TCM theory, each disease was defined as a variable receiving 2 values (Yes/No); The final one is the CCMQ Scale. The original version of the CCMQ scale was developed by Prof. Wang and has proven to be sufficiently valid and reliable in previous studies [11, 12, 13, 14, 15]. It is considered as the standard estimation of people's BC types recommended by the China Association for Traditional Chinese Medicine [14] and has been well received in mainland China [9]. CCMQ is a self-assessment scale with 60 items that assesses 60 signs or symptoms that last longer than a year and are rated on a 5-point scale from 1 (not at all) to 5 (very strong). It contains nine subscales that individually assess a type of TCM constitution. A total number of points for each subscale, derived by adding up relevant items, was standardized from 0 to 100 and then converted into a total that was used to determine the constitution type. We used Vietnamese CCMQ version which is translated, studied and standardized in Vietnamese community at Ho Chi Minh City. The validity of this questionnaires includes content validity, face validity and criterion validity which are examined according to a cross-sectional study. The content validity is determined by 7 traditional medicine experts, the face validity is assessed by 30 residents in a pilot study. The criterion validity is confirmed by the correlation coefficient between Vietnamese CCMQ version and SF-36 questionnaire [15].

2.2. Sample size and sampling

The following formula was used to calculate the size of the required sample: $n = [Z^2p(1-p)]/d^2 = 385$ (participants). n is

the sample size; p is the estimated proportion of the population exhibiting the characteristic (as unknown, we use p = 0.5); Z is the confidence level according to the standard normal distribution (for a level of confidence of 95%, Z = 1.96); d is the tolerated margin of error (in this study, we want to know the actual proportion within 5%).

The systematic random sampling method was applied to select subjects in our study with the sample size being 445. District 4 has 18 wards, and the number of participants is divided equally among them, which means that there are 25 people for each one. From potential participants who satisfy the inclusion criteria, this research chose the first applicant according to the technique of starting the count at the selected starting point. The next applicants can be chosen by using the order number of the first/previous one plus 'k' which is called sampling interval (k = the number of all potential participants in each ward divided by 25).

2.3. Statistical method

The research data comprised basic demographic information (sex, age, and work status), chronic systemic conditions (hypertension, cardiovascular diseases, diabetes mellitus, obesity and hyperlipidemia) and 60 CCMQ questions in order to categorize participants as 9 body constitution types. Each question was constructed using appropriate frequency and intensity scale descriptors and scored using a 5-point Likert scale. If the total score of a subject satisfied the identification criterion of a constitution, the subject was considered to have that constitution. Therefore, the ordinal Likert data is transformed into binary scores for an analysis. Thus, we presented data in frequencies, percentage, or means with SDs [17]. Chi-square tests and Fisher's Exact tests were used to explore the possible associated factors of Body Constitution types. SPSS 22.0 software (IBM® SPSS®, released 2018, SPSS for Windows, Version 22.0, Chicago, IL, USA) was used to analyse the data and the critical value of statistical significance was set as 0.05.

2.4. Ethical considerations

This study was approved by the Council of Ethics in Biomedical Research at University of Medicine and Pharmacy at Ho Chi Minh City on December 29th 2020, No. 968/HĐĐĐ-ĐHYD. All the participants signed an informed consent form in which the personal identification of research object was not reported (name, address).

3. RESULTS

We estimate the refusal rate and none-achievement rate to be at around 15% (385 + 58 = 443, rounded to 445 people). Among 445 potential individuals who satisfied the inclusion criteria, there were 9 people excluded from our study including 6 who declined to participate and 3 who did not complete the questionnaires. Questions with incomplete answers include question 19 (1 person left this blank), question 38 (1 person left this blank), question 56 (1 person left this blank). These questions are independent and separate from the other questions in the survey (data missing completely at random) and the estimated sample size is large enough to not only exclude results containing missing data but also is the best way which does not jeopardize the sample size calculation [16]. The response rate is 98% (436/445) which is estimated within the design period and calculation.

Table 1. Clinical characteristics of the participants (N = 436)

Characteristics	Classification	Frequencies	Percentage (%)
Gender	Male	163	37.4
	Female	273	62.6
Age (years)	18 – 39	147	33.7
	40 – 59	181	41.5
	≥ 60	108	24.8
Job	Manufacturing jobs	111	25.5
	Office jobs	71	16.3
	Other jobs	254	58.3
Chronic diseases*	Hypertension	103	23.6
	Cardiovascular diseases	57	13.1
	Diabetes mellitus	50	11.5
	Obesity	18	4.1
	Hyperlipidemia	36	8.3

**Multiple Chronic diseases were allowed giving percentage >100%*

Clinical characteristics of the participants

The properties of the investigation participants are listed in Table 1. Total 436 participants (37.4% males and 62.6% females) were included in this study. The average age was 48.3 ± 15.7 years (46.9 ± 14.6 years in males and 49.2 ± 16.3 in females), with distributions of 18 to 39 years, 40 to 59 years, and older than 60 years constituting 33.7%, 41.5%, and 24.8% of the participants, respectively. Of the 436 participants, 71 (16.3%) were employed in office jobs, 111 (25.5%) in manufacturing jobs, and 254 (58.3%) in other jobs; the numbers of participants with obesity, hyperlipidemia, diabetes mellitus, cardiovascular diseases, and hypertension were 18 (4.1%), 36 (8.3%), 50 (11.5%), 57 (13.1%), and 103 (23.6%), respectively (Table 1).

Distribution of body constitution types among the participants

In the sample population (436 participants), the proportion of the Balanced constitution (Neutral type) was 62.4%, the proportion of Unbalanced constitutions was 37.6%. The order of the descending proportions of the Unbalanced constitutions was as follows: Qi-deficiency type (17.2%), Qi-depression

type (15.6%), Inherited-special type (8.9%), Yang-deficiency type (8.3%), Blood-stasis type (8.0%), Yin-deficiency type (7.6%), Phlegm-dampness type (6.4%), and Dampness-heat type (5.7%) (Table 2). Among participants with the Unbalanced constitution, 19.0% had mixed constitutions (with at least two constitutions).

Table 2. Distribution of Body Constitution types among the participants (N = 436)

Body Constitution types*	Frequencies	Percentage (%)
Yang-deficiency type	36	8.3
Yin-deficiency type	33	7.6
Qi-deficiency type	75	17.2
Phlegm-dampness type	28	6.4
Dampness-heat type	25	5.7
Blood-stasis type	35	8.0
Qi-depression type	68	15.6
Inherited-special type	39	8.9
Neutral type	272	62.4

**Multiple body constitutions in CCMQ were allowed giving percentage >100%*

Table 3. Correlations between Body Constitution types and five chronic diseases

Chronic diseases	Body Constitution types								
	Yang-deficiency	Yin-deficiency	Qi-deficiency	Phlegm-dampness	Dampness-heat	Blood-stasis	Qi-depression	Inherited-special	Neutral
Hypertension	0.15	0.17	**< 0.01**	0.86	0.67	0.12	0.07	0.76	0.60
Cardiovascular diseases	0.09	0.71	**< 0.01**	0.53	0.66*	0.83	0.41	0.15	0.65
Diabetes mellitus	0.54*	0.9*	0.18	0.27	0.58*	0.27	0.62	0.80*	0.71
Obesity	0.19*	0.74*	0.48	0.07*	0.32*	0.63*	0.75	0.21*	0.54
Hyperlipidemia	0.20	0.34*	0.7	0.23*	0.15*	0.18	0.85	0.12	0.87

**: p-value of Fisher's Exact Test*

Statistics with significant differences are bold

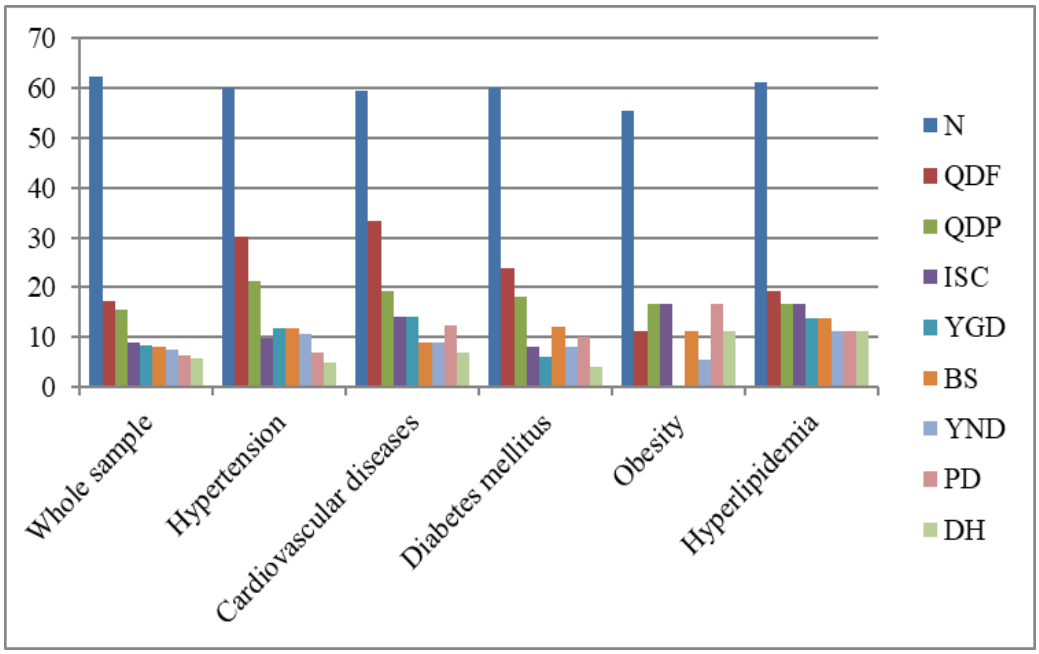

Figure 1. Prevalence of Body Constitution types among various five chronic diseases

N, Neutral; QDF, Qi-deficiency; QDP, Qi-depression; YGD, Yang-deficiency; YND, Yin-deficiency; PD, Phlegm-dampness; DH, Dampness-heat; BS, Blood stasis; ISC, Inherited-special

Prevalence of body constitution types among five chronic diseases

There were no statistically significant correlations of eight types of Body Constitution, including Neutral type, Yang-deficiency type, Yin-deficiency type, Phlegm-dampness type, Dampness-heat type, Blood-stasis type, Qi-depression type, and Inherited-special type, with five chronic diseases ($p>0.05$); on the other hand, the Qi-deficiency type was significantly related to hypertension and cardiovascular diseases ($p<0.05$). Chi-square tests showed both hypertension ($\chi^2 = 15.75$, $p = 0.00$) and cardiovascular diseases ($\chi^2 = 11.98$, $p = 0.01$) were risk factors of Qi-deficiency type (Table 3).

Prevalence of body constitution types among sociodemographic characteristics

There were no statistically significant correlations of seven types of Body Constitution, involving Neutral type, Yang-deficiency type, Yin-deficiency type, Phlegm-dampness type, Blood-stasis type, Qi-depression type, and Inherited-special type, with sociodemographic characteristics ($p>0.05$). However, the rest of constitution types, Qi-deficiency and Dampness-heat, had significant relationships with sociodemographic characteristics ($p<0.05$). Either female gender or people aged over 60 years old were found to be risk factors of Qi-deficiency type; besides, male gender appeared to be a risk factor of Dampness-heat type according to the Chi-square tests (Table 4).

Table 4. Prevalence of Body Constitution types among various characteristics

Sociodemographic characteristics (Variables)		Yang-deficiency type n (%) 36 (100)	Yin-deficiency type n (%) 33 (100)	Qi-deficiency type n (%) 75(100)	Phlegm-dampness type n (%) 28(100)	Dampness-heat type n (%) 25 (100)	Blood-stasis type n (%) 35 (100)	Qi-depression type n (%) 68 (100)	Inherited-special type n (%) 39 (100)	Neutral type n (%) 272 (100)
Age (years)	18 –39	10 (27.8)	10 (30.3)	**20 (26.7)**	6 (25.1)	13 (52.0)	13 (37.1)	21 (30.9)	14 (35.9)	94 (34.6)
	40 –59	14 (38.9)	15 (45.5)	**25 (33.3)**	11 (39.3)	9 (36.0)	9 (25.7)	26 (38.2)	15 (38.5)	120 (44.1)
	≥ 60	12 (33.3)	8 (24.2)	**30 (40.0)**	11 (39.3)	3 (12.0)	13 (37.1)	21 (30.9)	10 (25.6)	58 (23.1)
	p	0.44	0.87	**< 0.05**	0.14	0.10	0.09	0.45	0.92	0.91
Gender	Male	11 (30.6)	9 (27.3)	**17 (22.7)**	12 (42.9)	**15 (60.0)**	14 (40.0)	22 (32.4)	15 (38.5)	110 (40.4)
	Female	25 (69.4)	24 (72.7)	**58 (77.3)**	16 (57.1)	**10 (40.0)**	21 (60.0)	46 (67.6)	24 (61.5)	162 (59.6)
	p	0.38	0.21	**< 0.05**	0.54	**< 0.05**	0.73	0.35	0.88	0.09
Job	Manufacturing jobs	9 (25.0%)	4 12.1)	20 (26.7)	6 (21.4)	7 (28.0)	9 (27.5)	21 (30.9)	9 (23.1)	67 (24.6)
	Office jobs	3 (8.3)	5 (15.2)	9 (12.0)	5 (17.9)	5 (20.0)	8 (22.9)	7 (10.3)	10 (25.6)	50 (18.4)
	Other jobs	24 (66.7)	24 (61.5)	46 (61.3)	17 (60.7)	13 (52.0)	18 (51.4)	40 (58.8)	20 (51.3)	155 (57)
	p	0.37	0.15	0.54	0.88	0.28	0.52	0.26	0.25	0.31

Statistics with significant differences are bold

4. DISCUSSION

The BC is used to identify a person's health status and susceptibility to incessant disease and to assist TCM practitioners in making decisions about treatment methods. In this way, BC has possible applications in public health management, infection anticipation, and personal disease prognosis. An increasing number of studies have investigated the epidemiology and prevalence of chronic diseases associated with BC in Asia, but only a few have been conducted in Vietnam. The findings of this study strengthen the BC theory, improve our understanding of the guiding role of BC in the avoidance of chronic diseases, and offer a reference for future investigations.

With the distribution of BC types, the result in our research indicates that the majority of residents of District 4, Ho Chi Minh City possessed a Neutral type. Additionally, the two most common types of unbalanced BC were Qi-deficiency and Qi-depression. In comparison with the research of Zhu et al. (2017), people with Neutral type accounted for the highest percentage (22.56%), followed by Qi-deficiency (19.1%), Yang-deficiency (8.65%), and Yin-deficiency (8.46%) [7]. Another survey by Wang and Zhu (2009) showed that one-third of the participants were Neutral, two-thirds people with unbalanced BC types in which there were three types having the largest share included Qi-deficiency (13.42%), Dampness-heat (9.08%) and Yang-deficiency (9.04%) [9]. Huang's study reported approximately half of the respondents in Hong Kong had the Neutral type while the proportion of unbalanced BC types predominated in descending order of magnitude, were Yang-deficiency (9.88%), Qi-deficiency (9.59%), and Dampness-heat (8.22%) [18]. Although there is a difference in the distribution of BC types between our study and other relevant ones performed abroad, what all the studies have in common is that the Neutral is the primary type. Among the unbalanced BC types, Qi-deficiency had the highest percentages. This finding was consistent with theory of TCM which suggested that the majority of people in community are the Neutral type (embodies an overall healthy state) [1]. In many types of unbalanced state, the Qi-deficiency is more popular than the others in modern world of sedentary lifestyle. One of the most common unbalanced types in our research is the Qi-depression; based on the theory of "too much repression hinders Qi", the process of the constitutional formation of Qi-depression is tightly linked to the energetically stressed lifestyle which is very common in industrialized centers including Ho Chi Minh City.

In the association between chronic diseases and types of BC, the results of our study showed that hypertension and cardiovascular diseases were risk factors of Qi-deficiency type. In fact, our research had yielded similar results with previous studies. A community-based cross-sectional study was carried out by Li et al in China lasting 4 years to assess the relationship between BC types and hypertension, people with a BC type of Qi-deficiency were more prone to hypertension than those without this BC type [19]. In further study, Huang et al analyzed the BC types in 1,108 hypertensive patients, the author found that Qi-deficiency had

the highest percentage accounting for 13.18% [20]. Our findings also showed that Qi-deficiency was related to cardiovascular diseases ($p<0.01$), concurring with Zhu's conclusion [7]. Li et al [21] conducted a BC survey of 178 elderly ischemic stroke patients and found that the most frequent BC type were Qi-deficiency. Thus, considering TCM constitutional characteristics may help prophylactic management of patients with cardiovascular diseases or hypertension more precise, authorized, and efficient than ordinary procedures while providing new ideas and approaches to managing cardiovascular disease in the community.

In the association between gender groups and types of TCM constitution, the results of our study showed that the male was relevant to Dampness-heat type. A study based on data from 108,015 Chinese illustrated that the rate of Unbalanced BC types in males ages 15 to 64 were Dampness-heat (16.6%) and Qi-deficiency (13.6%) [22]. These results were consistent with TCM theory, that is to say, the consumption of alcoholic beverages as well as greasy and sweet foods occurring mainly in male subjects tends to produce damp-phlegm and heat in the body, which causes the Dampness-heat type. The research findings also showed that there was a relationship between females and the Qi-deficiency, which are consistent with those in the studies of Sun et al and Bai et al. The study by Sun et al, a sample of 944 women aged 30 to 65 enlisted from 18 districts in Hong Kong, identified 764 people (80.9%) with an unbalanced BC type, and Qi-deficiency was the most common type (53.9%) [23]. Bai et al also analyzed the characteristics of BC types in the Chinese population, the two most popular BC types among women aged 15 to 64 were Yang-deficiency (20.6%) and Qi-deficiency (13.6%) [22]. These results clarified TCM theory, that is, the common influencing factors such as obesity, stressful mental work, inadequate emotional living and poor overall health in females have been identified as the related factors contributing to development of the Qi-deficiency type.

In the association between age groups and BC types, the results of our study confirm that people older than 60 years old had the higher proportion of Qi-deficiency compared to the rest of age groups ($p<0.05$). In another research by Chen with 2,168 subjects, it was found that older adults had a higher proportion of Qi-deficiency than younger ones [24, 25]. Wang et al also evaluated the distribution of BC types of people from 60 to 69 years old and came to the conclusion that the proportion of Neutral type was the highest (36.70%), followed by Yang-deficiency (16.00%) and Qi-deficiency (15.10%) [26]. Actually, as people get older, the body's Jing, Qi and Blood also gradually decline, this is the physiological cause that explains the prevalence of Qi deficiency symptoms in the elderly.

There are some limitations of our study. Firstly, this study was conducted in personal, no blinding interviews. However, the interviewers in here are all doctors who have Master's degree and have reached a consensus on the method and procedure, which ensures the objectivity and accuracy of the answers. Secondly, this is the first research project which was conducted on a large community in Vietnam in order to study the BC, so we used cross-sectional study design which is convenient and useful for us to determine the innate state at the time of interview. Consequently, additional longitudinal studies are essential to confirm this new discovery in the future. They are necessary due to TCM theory, BC of an individual could change over time depending on effects of the environment and the society. Longitudinal researches will help us understand more about the changes of an individual's BC. This better understanding could lead to an accurate diagnosis and more practical treatments for each individual patient. Besides, the calculated sample size was 385 subjects while we actually interviewed 445 participants, that meant the demand was satisfied, but study sample was recruited from District 4 only. The reason is it has the highest population density and similar disease patterns compared with that of general Ho Chi Minh City [27, 28]. In other words, District 4 is the most ideal choice to take the sample representing for Ho Chi Minh City population. We expect that future researches investigating types of BC might recruit volunteers from the general population of all 24 districts of Ho Chi Minh City, with the aim that survey samples would be representative of the total population in this city. Finally, our research examined the relationship between BC types and common diseases in the community. Nonetheless, BC types also correlate with other factors such as eating habits, personalities, geographic locations, climate and other chronic diseases. Hence, future studies need to examine and further analyze the correlation between BC types and other relevant factors.

Conclusion

In summary, this study was conducted to determine the proportion of nine TCM constitution types and comorbidities observed in the community of District 4, Ho Chi Minh City. The data was obtained from a cross-sectional descriptive survey of 436 subjects; the associations of TCM constitution types with the five chronic diseases in participants were different. Hypertension (23.6%) was the most common comorbidity. Neutral (62.4%) was the majority of BC types and the two most common types of Unbalanced BC in our study were Qi-deficiency and Qi-depression. The Qi-deficiency was associated with hypertension, cardiovascular diseases, females and people over 60 years old; the Dampness-heat type was related with males. This research is the premise for future longitudinal studies performed in the general population of all 24 districts of Ho Chi Minh City.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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ORCID ID

Huy Khanh Tang https://orcid.org/0000-0002-4521-7698
Tien Cam Lam https://orcid.org/0000-0002-2515-8408
Duong Thi Huong Nguyen https://orcid.org/0000-0002-8238-783X
Thao Thu Le https://orcid.org/0000-0002-2570-9708
Luu Bao Le https://orcid.org/0000-0002-1951-9529

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