

# Clinical features and traditional medicine constitution types in students with palmar and plantar hyperhidrosis: A cross-sectional study at Hai Phong University of Medicine and Pharmacy

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## ABSTRACT

**Background:** Hyperhidrosis is a chronic disorder characterized by excessive sweating beyond thermoregulatory requirements, affecting approximately 1–3% of the global population and impairing quality of life. In Vietnam, palmar hyperhidrosis is among the most common forms. Traditional Medicine (TM) emphasizes constitution as a determinant of disease susceptibility, classified into nine types. Identifying constitution patterns associated with hyperhidrosis may provide insights into management strategies. **Objective:** To describe the clinical features of palmar and plantar hyperhidrosis among students and to determine the distribution of TM constitution types using the Constitution in Chinese Medicine Questionnaire (CCMQ). **Methods:** A cross-sectional descriptive study was conducted at Hai Phong University of Medicine and Pharmacy from January to November 2023. A purposive sample of 180 students with primary palmar/plantar hyperhidrosis was recruited from 580 screened individuals. Hyperhidrosis characteristics were recorded using structured questionnaires, and TM constitution was assessed with the validated Vietnamese version of the CCMQ. Data were analyzed using SPSS 20.0, applying descriptive statistics and Chi-square tests to explore associations. Ethical approval was obtained from the Institutional Review Board of Hai Phong University of Medicine and Pharmacy. **Results:** The mean age of participants was  $21.76 \pm 2.33$  years, with females accounting for 75.6%. Symptom onset occurred mainly in childhood (45%) or after puberty (42.2%). Sweating was most common in both hands and feet (45.6%) and was aggravated by hot weather (77.2%), psychological stress (80%), diet (41.7%), and contact with slippery objects (43.3%). Family history was reported in 19.4%. Among nine constitution categories, the most common were Balanced (26.7%), Qi Stagnation (22.2%), Qi Deficiency (19.4%), and Yang Deficiency (13.3%). **Conclusion:** Palmar and plantar hyperhidrosis in students was strongly associated with biased TM constitutions, particularly Qi Stagnation, Qi Deficiency, and Yang Deficiency. These findings suggest that targeted TM interventions, including regulating Qi, strengthening the spleen, and warming Yang, may be beneficial. Further multicenter and longitudinal studies are recommended to confirm these associations and guide integrative management approaches.

**Keywords:** Hyperhidrosis; Palmar sweating; Plantar sweating; Traditional Medicine constitution; CCMQ; Cross-sectional study

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## INTRODUCTION

Hyperhidrosis is an abnormal condition characterized by excessive sweating beyond what is required for thermoregulation under normal circumstances, and it cannot be voluntarily controlled [1]. Approximately 1–3% of the global population is affected by hyperhidrosis, which significantly impairs patients' quality of life by disrupting daily activities, occupational performance, and causing considerable psychological distress. In the United States alone, about 15.3 million individuals are estimated to suffer from hyperhidrosis [2]. In several Asian countries such as Japan, the prevalence ranges from 2.79% to 5.75% of the total population [3].

In Vietnam, according to Tran Ngoc Luong, the prevalence of hyperhidrosis is about 1% of the population, with palmar hyperhidrosis being the most common type [3]. Although not classified as a life-threatening disease, palmar hyperhidrosis severely compromises quality of life and exerts negative effects on almost all aspects of daily living, including physical, psychological, and social well-being.

The concept of body constitution has been recognized in Traditional Medicine (TM) for more than 2,000 years, first described in the Huangdi Neijing (The Yellow Emperor's Inner Canon). Ancient physicians stated that constitution is formed by congenital (innate) factors and acquired (postnatal) essence from food and drink throughout development. Constitution reflects an individual's relatively stable physical form, physiological function, and psychological state. According to Traditional Medicine, there are nine constitution types: Balanced, Qi Deficiency, Yang Deficiency, Yin Deficiency, Phlegm-Dampness, Damp-

Heat, Blood Stasis, Qi Stagnation, and Inherited Special Constitution [4].

Numerous studies have demonstrated a close association between specific constitution types, disease susceptibility, and lifestyle behaviors [5-8]. Traditional Medicine regards constitution as an intrinsic determinant influencing disease onset, progression, and prognosis. Therefore, studying constitution types may provide valuable insights for early recognition and, through lifestyle modification, reduction of risk factors associated with hyperhidrosis.

The key question is: What is the relationship between Traditional Medicine constitution types and hyperhidrosis characteristics? To address this, we conducted the study "Clinical Features and Traditional Medicine Constitution Types in Students with Palmar and Plantar Hyperhidrosis: A Cross-Sectional Study at Hai Phong University of Medicine and Pharmacy" with the following objectives:

1. To describe some clinical characteristics of palmar and plantar hyperhidrosis among students at Hai Phong University of Medicine and Pharmacy in 2023.
2. To determine the distribution of Traditional Medicine constitution types among these students with hyperhidrosis.

## METHODS

### Study design and settings

A cross-sectional descriptive study was conducted at Hai Phong University of Medicine and Pharmacy between January and November 2023.

### Study Population

From 580 students screened, 180 participants met the inclusion criteria and were recruited into the study.

### Diagnostic Criteria

Primary hyperhidrosis was diagnosed according to the International Hyperhidrosis Society (2004) and American Academy of Dermatology guidelines, requiring focal excessive sweating lasting at least 6 months without identifiable secondary causes, plus  $\geq 2$  of the following: (1) bilateral and symmetrical distribution; (2) interference with daily activities; (3) frequency  $\geq$  once per week; (4) onset before 25 years of age; (5) absence during sleep; (6) positive family history. [5]

#### **Inclusion criteria**

- Students of Hai Phong University of Medicine and Pharmacy.
- Voluntary participation.
- Diagnosis of primary focal palmar and/or plantar hyperhidrosis persisting for at least 6 months without identifiable underlying causes, with at least two of the following features:
  - + Bilateral and symmetrical sweating.
  - + Interference with daily activities.
  - + Occurrence at least once per week.
  - + Onset before 25 years of age.
  - + Absence of symptoms during sleep.
  - + Positive family history of primary hyperhidrosis.

#### **Exclusion criteria**

- Hyperhidrosis secondary to other medical conditions.
- Students unwilling to participate.

#### **Sample Size and Sampling Method**

A purposive sampling method was applied. Based on feasibility and prevalence estimates from previous studies, 180 students fulfilling the criteria were included, providing an adequate sample for descriptive and comparative analyses.

#### **Data Collection**

Data were collected through structured questionnaires, including:

*General characteristics:* age, sex, body mass index (BMI).

*Clinical features of hyperhidrosis:* age of onset, anatomical distribution, disease progression, and factors influencing sweating (temperature, psychological stress, diet, contact).

*Traditional Medicine constitution assessment:* The Vietnamese version of the Constitution in Chinese Medicine Questionnaire (CCMQ), previously validated for reliability and construct validity, was used to classify participants into one of nine constitution types (Balanced, Qi Deficiency, Yang Deficiency, Yin Deficiency, Phlegm-Dampness, Damp-Heat, Blood Stasis, Qi Stagnation, Inherited Special) [10]

#### **Data Analysis**

Data were entered and analyzed using SPSS version 20.0. Descriptive statistics were used to summarize demographic and clinical characteristics. Chi-square tests were applied to explore associations between constitution types and clinical features of hyperhidrosis. Statistical significance was set at  $p < 0.05$ .

#### **Ethical Approval**

Ethical approval was obtained from the Institutional Review Board of Hai Phong University of Medicine and Pharmacy. The study was approved under Decision No. 711/QĐ-YDHP, dated April 11, 2023, with approval code 212.

## **RESULTS**

### **General Characteristics of Participants**

*Table 1. General Characteristics of the Study Population (n = 180)*

Characteristic	Number (n)	Percentage (%)
<b>Gender</b>		
Male	44	24.4
Female	136	75.6
<b>Age group(n=180)</b>		
18–24 years	170	94.4
25–29 years	7	3.9
≥30 years	3	1.7
Average value ( $\bar{X} \pm SD$ )	21.76 ± 2.33 years	
<b>Academic stage</b>		
Pre-clinical (Year 1-3)	98	54.4
Clinical (Year 4-6)	82	45.6
Average value ( $\bar{X} \pm SD$ )	23.09 ± 2.69	

Among 180 students with primary palmar and plantar hyperhidrosis, the mean age was 21.76 ± 2.33 years. The majority were female (75.6%), and most participants belonged to the 18–24 age group (94.4%). By academic stage, the highest proportions were Pre-clinical students (54.4%).

### Clinical Features of Hyperhidrosis

*Table 2. Clinical Features of Palmar and Plantar Hyperhidrosis (n = 180)*

Feature	Number (n)	Percentage (%)
<b>Age of onset</b>		
Since childhood	81	45.0
After puberty	76	42.2
Others	23	12.8
<b>Anatomical distribution</b>		
Hands only	38	21.1
Hands + feet	82	45.6
Hands + feet + other site	62	33.3
<b>Aggravating factors</b>		
Hot weather	139	77.2
Psychological stress	144	80.0
Diet (spicy/greasy foods)	75	41.7
Contact with slippery objects	78	43.3
Family history positive	35	19.4

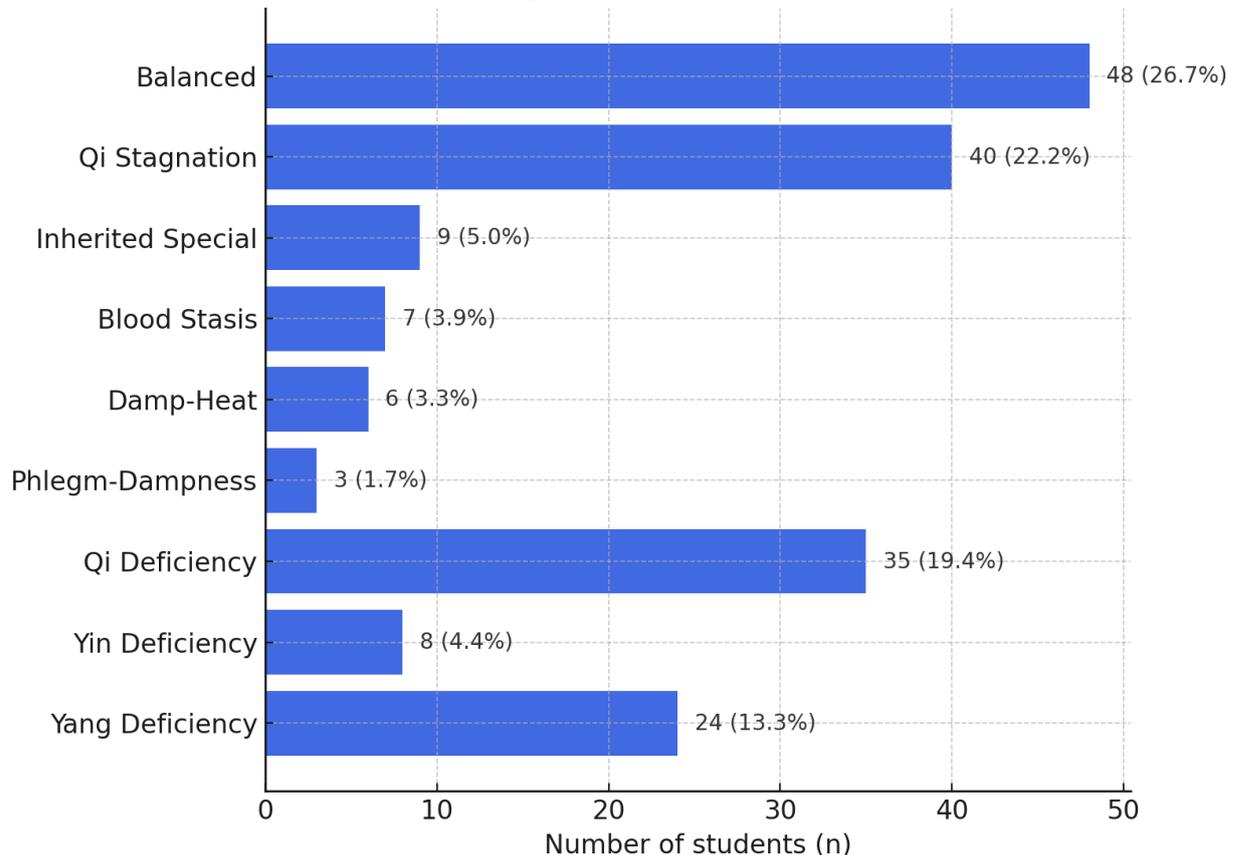
*Age of onset:* Symptoms began mainly in childhood (45.0%) or after puberty (42.2%), with only 12.8% reporting other onset times.

*Anatomical distribution:* Sweating occurred most frequently in both hands and feet (45.6%), followed by hands plus feet and other sites (33.3%), and hands alone (21.1%).

*Influence of temperature:* Sweating was aggravated in summer or hot conditions in 77.2% of cases, while 5.0% reported worsening in winter or cold conditions, and 17.8% reported no effect.

*Aggravating factors:* Hot weather 77.2%, Psychological stress 80.0%; Diet (Spicy/greasy foods) 41.7%; contact with slippery objects 43.3%. Family history positive 19.4%

### Traditional Medicine Constitution Types



**Figure 1.** Distribution of Traditional Medicine Constitution Types in Students with Palmar and Plantar Hyperhidrosis

Among the nine constitution categories assessed with the CCMQ, the most common types were:

- Balanced: 26.7%
- Qi Stagnation: 22.2%
- Qi Deficiency: 19.4%
- Yang Deficiency: 13.3%

Less common types included Inherited Special (5.0%), Yin Deficiency (4.4%), Blood Stasis (3.9%), Damp-Heat (3.3%), and Phlegm-Dampness (1.7%).

## DISCUSSION

This cross-sectional study demonstrated that palmar and plantar hyperhidrosis among medical students was characterized by early onset, female predominance, and aggravation by heat and psychological stress. The

findings of this study (Table 1) indicate that the majority of participants were aged 18–24 years (94.4%), followed by the 24–29-year group (3.9%). The youngest participant was 19 years old, while the oldest was 34. The mean age of the sample was  $21.76 \pm 2.33$

years. According to Nguyen Thi Thanh Tu and Nguyen Tuyet Trang (2022), in their study “Clinical characteristics of patients with palmar and plantar hyperhidrosis and the outcomes of HB herbal medicine in treatment”, the average age of patients was  $24.02 \pm 7.59$  years, ranging from 7 to 44 years, with the most common age group being 18–24 years (60%) [9]. Similarly, Tran Huu Vinh (2009), in “Study on endoscopic thoracic sympathetic ganglion ablation for treatment of palmar and axillary hyperhidrosis”, reported a mean patient age of  $23.4 \pm 7.8$  years [11]. Compared with these hospital-based studies, the mean age in our research was slightly lower. This difference can be explained by the study population: all participants in the present study were medical students, rather than clinical patients. Hyperhidrosis in students often manifests early, typically during adolescence, and remains stable or slightly fluctuates during adulthood. Therefore, the mean age of  $21.76 \pm 2.33$  years in our cohort is consistent with the natural course of primary hyperhidrosis in young adults. Furthermore, the predominance of the 18–24-year age group corresponds with findings from Nguyen Thi Thanh Tu’s study at Hanoi Traditional Medicine Hospital, where most patients developed symptoms during adolescence or early adulthood. This consistency suggests that hyperhidrosis tends to appear early and persist into the university years, particularly among individuals under prolonged psychological and academic stress. Thus, our results are representative of the characteristics of a student population rather than clinical patients typically found in hospital-based research. In terms of academic stage, hyperhidrosis was most common among Pre-clinical (Year 1-3) students (54.4%) and Clinical (Year 4-6)

students (45.6%) which represented the lowest proportion. The distribution across academic years was generally balanced, suggesting that the condition is not confined to a specific training stage. It is therefore likely that the observed differences reflect logistical rather than biological or environmental variations. Given that this study employed convenience sampling, random sampling across all academic years would be required in future research to obtain a more representative distribution of hyperhidrosis among students.

The study results (see Table 2) showed that the onset of hyperhidrosis mainly occurred in childhood, accounting for 45%, while onset after puberty accounted for 42.2%. According to Nguyen Thi Thanh Tu and Nguyen Tuyet Trang (2022) in “Clinical characteristics of patients with palmar and plantar hyperhidrosis and the outcomes of HB herbal medicine in treatment”, the age of onset was mostly under 12 years (76%), and the rate of onset during puberty was 18% [8]. Similarly, Tran Huu Vinh (2009), in “Study on the application of endoscopic thoracic sympathetic ganglion ablation for treatment of palmar and axillary hyperhidrosis”, reported that 78.9% of patients experienced hyperhidrosis before the age of 18 and 21.1% during adulthood [11]. Furthermore, Tran Ngoc Luong (2004), who investigated 131 cases of thoracoscopic sympathectomy for palmar hyperhidrosis, found that 85.5% of patients had onset before adulthood [6]. The consistency between these studies and our findings confirms that primary hyperhidrosis is a chronic condition that usually begins early in life and persists through adolescence and adulthood. The predominance of childhood or pubertal onset supports the hypothesis of an underlying genetic or constitutional predisposition, which may be

later influenced by emotional or environmental triggers.

Our findings showed that increased sweating was most commonly reported during hot weather or high temperatures, accounting for 77.2% of participants. Meanwhile, 17.8% reported no noticeable association with temperature, and 5% experienced exacerbation during cold weather. According to Tanja Schlereth et al. (2009) in their study “Hyperhidrosis—causes and treatment of enhanced sweating”, the mechanism of sweating in response to temperature changes involves activation of thermal receptors in the skin, which send impulses to the hypothalamus and spinal cord via the central nervous system [12]. Efferent signals then stimulate sweat glands, as well as thermoregulatory responses such as vasodilation and increased muscle activity. When body temperature rises above 37°C, thermoregulation is activated, and heat dissipation occurs via sweating and vasodilation. These mechanisms explain why hot environmental conditions or psychological stress can trigger excessive sweating in individuals predisposed to hyperhidrosis.

Constitutional type, in the framework of Traditional Medicine, refers to the relatively stable physiological and psychological characteristics of an individual that influence their reactions to the environment, disease susceptibility, and therapeutic responses. It represents the comprehensive result of both innate (genetic) and acquired (environmental and lifestyle) factors accumulated through growth and adaptation. Each person’s constitution is thus formed and continuously shaped throughout life. In this study, the observed diversity of constitutional types reflects the individual variation in physiological balance and adaptive capacity

among students. This diversity may explain the heterogeneity in clinical manifestations and symptom severity of hyperhidrosis across the study population.

The Traditional Medicine (TM) constitution is a fundamental concept reflecting the intrinsic characteristics of the human body in both structure and function, representing a relatively stable balance between Yin and Yang, physiological processes, and psychological states. Constitution is determined by both congenital (inherited) and acquired (environmental, lifestyle) factors accumulated through growth and adaptation. It characterizes an individual’s unique physiological pattern and responsiveness to environmental changes and social context [8].

The results of this study (see Fig 1) showed that among 180 medical students at Hai Phong University of Medicine and Pharmacy with palmar and plantar hyperhidrosis, the most common constitution type was Balanced (26.7%), followed by Qi Stagnation (22.2%), Qi Deficiency (19.4%), Yang Deficiency (13.3%), Inherited Special (5%), Yin Deficiency (4.4%), Blood Stasis (3.9%), Damp-Heat (3.3%), and Phlegm-Dampness (1.7%). A related investigation by Tang Khanh Huy (2022) titled “Distribution of Traditional Medicine Constitution Types among Residents in District 4, Ho Chi Minh City” reported that the four most common constitution types were Balanced (62.4%), Qi Deficiency (17.2%), Qi Stagnation (15.6%), and Inherited Special (8.9%) [13]. Similarly, in an international survey by Wang Qi (2009), approximately one-third of respondents had a Balanced constitution, while the three most common biased types were Qi Deficiency (13.4%), Damp-Heat (9%), and Yang Deficiency (9.8%) [8]. Although differences exist between our

findings and those of other studies, the predominance of the Balanced constitution type in this study is reasonable. The Balanced type represents physical and emotional stability, adaptability to environmental changes, and general good health—features that align with the young and educated student population. The observed distribution also supports the notion that most individuals in the community tend to maintain physiological balance under normal conditions. Nevertheless, our study also recorded relatively high proportions of biased constitutions, particularly Qi Stagnation (22.2%) and Qi Deficiency (19.4%). This finding is consistent with previous research and may be explained by the specific lifestyle of medical students. Prolonged study hours, heavy academic workload, and irregular schedules (including staying up late for assignments, experiments, or clinical rotations) often lead to stress, emotional suppression, and fatigue—factors that, from the TM perspective, disturb Qi movement and weaken organ function. Over time, such patterns can result in constitution bias toward Qi Stagnation or Qi Deficiency. Therefore, the constitution distribution observed in this study not only reflects general population tendencies but also highlights the influence of academic pressure and lifestyle habits typical of medical students. Recognizing these constitution imbalances may provide valuable guidance for preventive and supportive interventions, such as stress management, dietary adjustment, and traditional therapies aimed at regulating Qi and strengthening body resistance.

### LIMITATIONS

This study has several limitations. First, it was conducted exclusively at a single university, which may limit the

generalizability of findings to other populations. Second, constitution assessment relied on self-reported CCMQ questionnaires, which are subject to recall and reporting biases. Third, the cross-sectional design only describes associations and cannot establish causality between constitution types and hyperhidrosis. Finally, some potential influencing factors, such as detailed lifestyle and environmental conditions, were not fully investigated.

### CONCLUSION

This cross-sectional study of 180 medical students at Hai Phong University of Medicine and Pharmacy in 2023 described the clinical features and Traditional Medicine constitutions associated with palmar and plantar hyperhidrosis. The mean age was  $21.76 \pm 2.33$  years, with females accounting for 75.4%. Onset occurred mainly in childhood (45%) or after puberty (42.2%), and sweating most often affected the hands and feet (45.6%). The main aggravating factors were heat (82.2%), psychological stress (80%), spicy or oily foods (41.7%), and contact with smooth or sticky objects (43.3%), while 19.4% reported a family history of hyperhidrosis.

The most common Traditional Medicine constitution types were Balanced (26.7%), Qi Stagnation (22.2%), Qi Deficiency (19.4%), and Yang Deficiency (13.3%). Childhood onset was frequent among Balanced types, whereas post-pubertal onset predominated among Qi Stagnation and Qi Deficiency types.

Overall, hyperhidrosis in this population typically began early and was influenced by environmental and emotional factors. The predominance of Qi Stagnation, Qi Deficiency, and Yang Deficiency suggests underlying physiological imbalance and

psychosomatic stress, indicating that constitution-based assessment may help guide individualized prevention and management.

### RECOMMENDATIONS

Future research should employ multicenter, controlled, and longitudinal designs to clarify causal relationships. Incorporating constitution assessment into clinical practice may help tailor integrative treatment strategies that combine biomedical and Traditional Medicine approaches.

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