

<https://doi.org/10.48047/AFJBS.6.15.2024.10292-10303>



African Journal of Biological Sciences

Journal homepage: <http://www.afjbs.com>



Research Paper

Open Access

## **Somatotype difference in sanguine and choleric temperaments: A Comparative study based on Unani literature and Heath-Carter anthropometric method**

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Volume 6, Issue 15, Sep 2024

Received: 15 July 2024

Accepted: 25 Aug 2024

Published: 25 Sep 2024

[doi: 10.48047/AFJBS.6.15.2024.10292-10303](https://doi.org/10.48047/AFJBS.6.15.2024.10292-10303)

**Abstract:**

**Background and objectives:** In Unani Medicine, health is understood as the balance among four humors giving rise to a balanced temperament for the individual while illness represents a deviation from this moderation. Accurate diagnosis and treatment of disease require evaluation of the correct temperament of the individual with reference to normal or abnormal. In the case of abnormal temperament, it is necessary to know how much it has deviated from its normal state so that measures to correct it are taken accordingly. Traditionally, Unani Medicine determines temperament using ten variables: skin texture, hair characteristics, color, body size ratio, response to heat, cold, and dryness, speed of action, quality of excretions, sleep and wakefulness patterns, nervous state, and body composition. Of these, body size ratio and body composition (*Lahm wa Shahm*) are particularly significant in assessing an individual's temperament. This study aims to correlate the modern Heath-Carter method of somatotype determination with traditional Unani literature, providing a more precise assessment of body build and muscle mass than visual analysis alone.

**Methodology:** This study used random sampling to select 40 healthy male volunteers aged 18 to 35, with Choleric and Sanguine temperaments. Participants were selected through detailed history, physical examination, and a temperament-determining questionnaire based on Unani literature (*Ajnas-e-Ashra*). After informed consent, volunteers were categorized into Sanguine (*Damvi Mizaj*) and Choleric (*Safravi Mizaj*) groups. Standard anthropometric measurements were collected to determine somatypes using the Heath-Carter Anthropometric Somatotype Method 1980.

**Conclusion:** The results suggest that individuals with the highest mesomorph, moderate ectomorph, and the lowest endomorph scores could be classified as having a Choleric temperament. In contrast, those with high mesomorph and moderate endomorph scores, indicating an average amount of body fat and not being overly thin, may be categorized as Sanguine. Thus, these findings could serve as indicators for identifying Choleric and Sanguine individuals based on their physical traits.

## Introduction

Unani Medicine is rooted in the concept of temperament, known as *mizaj*. Unani Medicine defines *mizaj* as the dominant feature or quality of a compound formed by the interaction of qualities (*haraarat, baroodat, ratoobat and yaboosat*) of primary components (*arkan*). The four fundamental elements—air (*hawa*), water (*ma'a*), earth (*ard*), and fire (*naar*)—interact in diverse proportions, leading to the emergence of a wide range of new qualities (*kaifiyaat*)<sup>(1)</sup> The specific state or balance of these emergent qualities is referred to as temperament (*mizaj*). Allama Nafees says that "When elements combine, they react with each other, resulting in the emergence of a novel intermediate quality that falls between the four original attributes. This newly formed quality is denoted as '*mizaj*'.<sup>(2)</sup> Therefore, any animate or inanimate quantity has its specific temperament (*Mizaj*) which is the result of reaction among its constituents.

Like any other physical quantity human body is also an outcome of series of chemical reactions among biomolecules. As molecules have their own temperament, human body also has its unique temperament which is resultant of the interaction between biomolecules and their qualities.<sup>(1)</sup> Temperament arises from the interaction between opposite qualities, known as *kaifiyati fai'lah* and *kaifiyati munfa'ilah*, which are associated with the four primary elements. <sup>(6)</sup> While the term "temperament" is often used interchangeably with the Unani term "*mizaj*," they are not entirely synonymous. In modern scientific disciplines, "temperament" primarily refers to the behavioral and psychological characteristics of an individual. In contrast, "*mizaj*" in Unani Medicine is a broader concept that encompasses the combined temperament of various organs, reflecting the overall physiological and psychological state of a person. *Mizaj* or temperament can be regarded as the mirror image of internal environment and chemical balance (homeostasis) of the human body. <sup>(7)</sup> In the Unani Medicine (USM), the foundation of diagnosis and treatment is grounded in the concept of *Mizaj* (Temperament). Determining an individual's temperament is thus a fundamental aspect of USM. The evaluation and classification of different temperaments are based on the relative proportions of the four humors: blood (*dam*), phlegm (*balgham*), yellow bile (*safra*), and black bile (*sauda*). Scholars of the Unani Tibb have mentioned the humors and their associated qualities as (i) *Dam* (blood) as 'hot and moist'; (ii) *Safra* (yellow bile) as 'hot and dry'; (iii) *Balgham* (phlegm) as 'cold and moist' and; (iv) *Sauda* (black bile) as 'cold and dry'.<sup>(6)</sup> The predominance of a particular humor in an individual allows for the categorization of individuals

into one of the four temperaments: sanguine, phlegmatic, choleric, and melancholic. According to Unani theory, individuals with sanguine and choleric temperaments are considered to have a "hot" temperament (*haar mizaj*), while those with phlegmatic and melancholic temperaments are regarded as having a "cold" temperament (*barid mizaj*). This classification is based on the inherent qualities of the dominant humor in each temperament type.

These temperaments not only influence various physiological functions but also define morphological characteristics of an individual. The level of heat and moisture in a body significantly influences its composition, as heat promotes muscle development and moisture encourages fat accumulation. It is important to note that, the levels of these two factors differ among temperaments, the body composition of someone with a sanguine temperament will differ from that of someone with a choleric temperament. This difference in composition of body plays a key role in the determination of the actual temperament of an individual and thus directs the strategy for treatment in case of disease, as a disease is a result of deviation from the moderation of temperament specific for the individual and treatment lies in the restoration of this moderation.

Somatotyping is a unique method for the classification of body composition and its physique which was first invented by Sheldon et al. (1940) and later on modified by Heath and Carter (1967) It reflects an overall outlook of the body and conveys a meaning of the totality of morphological features of the human body. (3) Sheldon suggested that human body types can be categorized into three groups: ectomorphic, mesomorphic, and endomorphic. Ectomorphs have slim bodies with long, thin muscles and limbs and do not easily store fat or build muscle. Mesomorphs have muscular bodies with medium bones, and a solid torso, and are inclined to build muscle but not store fat. Endomorphs have larger bone structures, wide waists, and tend to store fat. ((4)

In this study, we aimed to compare the body composition of individuals with sanguine and choleric temperament using anthropometric measurements obtained via the Heath-Carter method. Although both temperaments are categorized under hot temperaments, there is a distinction in the degree of heat (*hararat*) between the two groups due to the differing temperamental qualities associated with yellow bile (*safra*) and blood (*damm*).

## **Materials and methods**

### **Sample**

Due to constraints, it was not possible to collect data from the entire population. Therefore, in this study, 40 healthy male volunteers with choleric and sanguine temperament were selected randomly from different sources like Ajmal Khan Medical College, other departments of Aligarh Muslim University and Aligarh City to collect the required information. Students residing in hostels were preferred because of their uniform environment and nutritional conditions.

For the selection of candidates, a detailed history and physical examination was done along with the determination of the temperament using a self-designed questionnaire based on ten determinants designed in the light of classical Unani literature (*Ajnas-e-Ashra*).

### **Inclusion Criteria**

This study specifically included healthy male volunteers aged 18 to 35 with Choleric or Sanguine temperaments.

### **Exclusion criteria**

- Individuals engaged in athletic activities, intense exercise, or gymnastics were excluded from the study.
- Participants with a history of radiotherapy, chemotherapy, significant accidents, surgery, or prolonged steroid use were not included.
- Volunteers suffering from conditions like Malnutrition, Diabetes Mellitus, Poliomyelitis, Tuberculosis, Hyperthyroidism, Hypothyroidism, or any illness affecting body shape and size were also excluded.

### **Categorization of individual**

After determination of the temperament, selected volunteers were divided into two groups according to their temperament.

Group A: Sanguine (*Damvi Mizaj*)

Group B: Choleric (*Safravi Mizaj*)

After the volunteers were sorted into categories, various body measurements were collected to determine their somatotypes using the Heath-Carter Anthropometric somatotype Method (1990).(5)

### **Informed Consent**

Prior to commencing any surveys or assessments, we provided all volunteers with an informed consent form. This ensured that participants had full knowledge of the study's objectives, methods, potential risks, and advantages before giving their consent to take part.

### Anthropometric Measurements

Measurements were taken following the Heath-Carter method for somatotyping (1990). The data were evaluated using the method's formulas to determine the endomorphic, mesomorphic, and ectomorphic characteristics of each person.

### Statistical Results

In order to draw conclusions from the current empirical study, we organized the raw data into a table and conducted descriptive statistical analysis to determine the average and variability. The t-test was then performed to assess statistical differences in values between the Choleric and Sanguine temperamental profiles.

The information gathered in this research was subjected to statistical analysis, the results of which are provided below.

**Table-01**

**Indicating Endomorph of volunteers expressed as Mean  $\pm$  SD\* and t-value**

Temperament	Number of Volunteers	Mean $\pm$ SD*	Significance
Sanguine	20	3.36 $\pm$ 0.64	t =3.5, p < .001
Choleric	20	2.45 $\pm$ 0.98	

\*Standard Deviation

Significant at the level of p<.05

Present study revealed that the mean value of Endomorph was lower in Choleric than Sanguine individuals as shown in Table-01. Also, the present study exhibited that the variability between Endomorph of Sanguine and Choleric was highly significant.

**Table-02**

**Indicating Mesomorph of Volunteers expressed as Mean ± SD\* and t-value**

Temperament	Number of Volunteers	Mean ± SD*	Significance
Sanguine	20	4.40 ± 0.60	t = 1.5, p > .05
Choleric	20	4.10 ± 0.65	

\*Standard Deviation

Significant at the level of p<.05

Present study showed that the mean value of mesomorph was slightly higher in Sanguine than Choleric individuals as displayed in Table-02 however, statistically the difference was not significant.

**Table-03**

**Indicating Ectomorph of Volunteers expressed as Mean ± SD\***

Temperament	Number of Volunteers	Mean ± SD*	Significance
Sanguine	20	2.11 ± 0.45	t =5.9, p < .001
Choleric	20	3.11 ± 0.77	

\*Standard Deviation

Significant at the level of p<.05

The results revealed that the mean value of ectomorph was higher in Choleric whereas it was comparatively lower than the value of ectomorph in Sanguine as shown in Table-03 and after statistical analysis, the variability of ectomorph between Sanguine and Choleric was highly significant.

**Table-04**

**Indicating Descriptive Statistics of Somatotypes of Sanguine and Choleric Volunteers**

Somatotypes	Mean	±	SD* in	Mean	±	SD* in
	Sanguine volunteers			Choleric Volunteers		
Endomorph	3.36	±	0.64	2.45	±	0.98
Mesomorph	4.40	±	0.60	4.10	±	0.65
Ectomorph	2.11	±	0.45	3.11	±	0.77

\*Standard Deviation

Present study showed the dominance of mesomorph in both Sanguine and Choleric volunteers. In Sanguine individuals' dominant mesomorph was followed by endomorph and ectomorph respectively whereas in Choleric individuals it was followed by ectomorph and endomorph respectively as shown in Table-4

**Table-5**

**Showing Comparison of Somatotypes in Sanguine and Choleric Individuals**

Somatotypes	Significance in Sanguine	Significance in Choleric

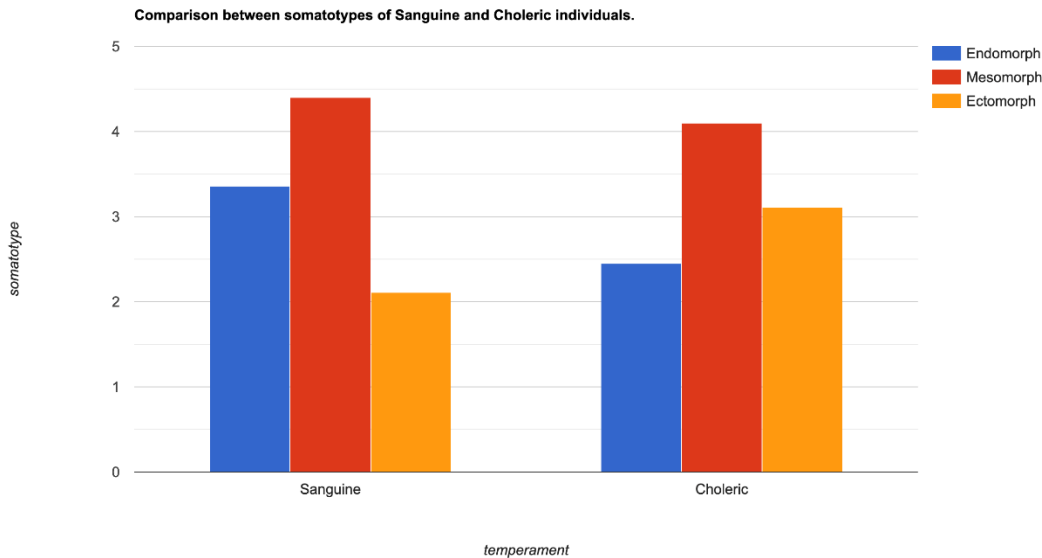


<b>Endomorph vs Mesomorph</b>	t = 5.5, p < .001	t =6.3, p < .001
<b>Endomorph vs Ectomorph</b>	t = 7.3, p < .001	t =2.4, p < .05
<b>Mesomorph vs Ectomorph</b>	t = 13.5, p < .001	t =4.5, p < .001

Significant at the level of  $p < .05$

Statistics provided sufficient evidence to ensure that the variability between endomorph and mesomorph, between endomorph and ectomorph and between mesomorph and ectomorph for Sanguine individuals was highly significant as shown in Table-5. It was also evident from statistical analysis of data that there was significant difference between mesomorph and endomorph and between mesomorph and ectomorph for Choleric individuals as shown in Table 5 and Figure 1.

**Figure 1: Comparison between Somatotypes of Sanguine and Choleric individuals**



## Discussion:

The statistical analysis showed that the findings aligned with Unani literature concerning body composition related to various temperaments.

The inherent qualities of Sanguinous temperament are hot and moist (*Haar Ratab*) (2), which pertain to the relatively increased basal metabolism (BMR) and higher fluid content in the body. On the contrary inherent qualities of Choleric temperament are hot and dry (*Haar yabis*) (2) which indicates increased basal metabolic rate but decreased body fluids. This difference in the fluid content among the two is held to be the reason for the difference in the body composition of Sanguine and Choleric temperaments.

Endomorph refers to the relatively higher fat content. As per Unani literature, fat is characterized by a humid (*Ratab*) temperament and hence derives its nourishment from liquid fraction of blood (*Ratoobat*) (2). Consequently, individuals with a sanguine temperament, due to dominance of blood (*dam*) tend to accumulate fat more readily than those with a choleric temperament. The relatively dry temperament of the choleric individuals, results in less fat accumulation. This explains the dominance of endomorph (relative fatness) in sanguine temperament.

In contrast, both sanguine and choleric temperaments exhibit a comparable degree of warmth. This is because the physiological characteristics associated with blood and yellow bile correspond similarly in terms of thermal qualities (2). It is important to note that the development of muscle mass is primarily influenced by heat; thus, individuals with sanguine and choleric temperaments tend to have similar muscle mass, although individuals with sanguine temperament have slightly higher muscle mass pertaining to their moist temperament along with hot temperament. This accounts for the close proximity observed in mesomorphic body type in both temperaments in the present study.

Lastly, ectomorph refers to linearity in physique. Individuals with higher ectomorph tend to have more linear body shape meaning they have typically narrow shoulders, narrow hips and low amount of fat. The linearity indicates lack of bulkiness or roundness in the body as opposed to more curvaceous forms seen in endomorphic individuals. Since the fat content is substantially less in choleric temperament (7), they possess more linearity in comparison to sanguine temperament. This explains the higher ectomorph in individuals with choleric temperament in our study.

Based on our analysis and discussion, we conclude that the findings of this study are consistent with the descriptions of physical characteristics associated with different temperaments as detailed in Unani literature. This concordance between empirical data and classical Unani descriptions suggests the potential for further investigation into the temperamental typologies outlined in ancient Unani texts. This alignment not only validates historical observations but also opens avenues for integrating classical knowledge with modern scientific inquiry.

## **Conclusion**

From the results it can be concluded that the subject who obtained highest score of mesomorph, moderate ectomorph and lowest score of endomorph, may be of Choleric temperament and those who tend to have highest amount of mesomorph but moderate endomorph i.e. moderate fat and are not very linear may be sanguine. Therefore, these results may be used as a parameter to determine Choleric and Sanguine individuals from their physical characteristics.

### **Further research**

This study, limited to 40 volunteers, indicates the need for further research with larger sample sizes to provide more comprehensive insights into temperament determination. Future studies should explore the correlation between somatotypes and temperaments, validate the Heath-Carter Somatotype Method, and consider demographic variables, including cross-cultural contexts. Future research could explore these temperamental frameworks in greater depth, potentially providing a more nuanced understanding of the physiological and psychological correlates of each temperament as described in Unani Medicine.

### **Acknowledgement**

We would like to express our sincere gratitude to library staff of Ajmal Khan Tibbya College for their invaluable support throughout this research. We are also thankful to the Ajmal Khan Tibbya College Institute for providing the necessary resources and facilities to conduct our research. Special thanks to our all our colleagues for their constructive feedback and to our families for their unwavering support during the course of this study.

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