

J. Biol. Chem. Research. Vol. 40, No. 2, 48-57, 2023 (An International Peer Reviewed / Refereed Journal of Life Sciences and Chemistry) Ms 40/02/21/2023 All rights reserved <u>ISSN 2319-3077 (Online/Electronic)</u> <u>ISSN 0970-4973 (Print)</u>



http:// <u>www.sasjournals.com</u> http:// <u>www.jbcr.co.in</u> jbiolchemres@gmail.com

Received: 29/08/2023

Revised: 01/10/2023

RESEARCH PAPER Accepted: 02/10/2023

The Association between Different Temperaments and Musculoskeletal Anomalies in Young Non-Athletic Men Vida Doustkhah, *Saeed Vahedi and **Saba Zaidi

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ABSTRACT

Physical condition is one of the most important factors affecting a person's health during life, which always plays an effective role in reducing costs and increasing productivity. Individual differences are one of the factors that can play an effective role in causing or aggravating musculoskeletal abnormalities. In traditional Iranian medicine, temperament can be considered as the principle of individual differences. Therefore, the goal of this study is to determine how skeletal-muscular anomalies in young, non-athletic men of various temperaments relate to one another.

To carry out this research, 332 non-athlete men with (mean \pm standard deviation, age: 20.01 \pm 1.9 years, weight: 63.5 \pm 2.5 kg, without professional sports history) were selected as an available statistical sample and voluntarily participated in the present research. Temperament and type of upper body spine abnormalities were measured and the Shapiro-Vick test, correlation coefficient in software space (SPSS 23) was used for data analysis. In all tests, a significant level of p < 0.05 was considered.

The results indicated that the prevalence of musculoskeletal abnormalities of kyphosis in the samples decreases with the increase in temperamental heat and the scoliosis complication increases with the increase in temperamental heat. Moreover, the prevalence of kyphosis and lordosis should decrease with the increase in dry temperament, and the prevalence of scoliosis increases with the increase in dry temperament. Probably, people with cold and wet temperaments are prone to kyphosis and people with warm and dry temperaments are prone to scoliosis.

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Temperament can be considered effective in the physical structure of people and to improve the physical condition, temperament cannot be ignored.

Keywords: Musculoskeletal abnormalities, Temperaments, Iranian medicine, and non-athlete men.

INTRODUCTION

One of the most significant elements influencing a person's physical and mental health across their lifetime is their physical condition. Body posture usually refers to the relative arrangement of different parts of the body about each other. Optimal body posture is a state in which the nervous subsystems, active and passive, interact with each other to control the load on the body in the best way. This is even though repeated physical movements or stable positions in people cause postural abnormalities, leading to disorders in various subsystems, including activated and deactivated subsystems, and numerous complications such as pain, deformity, and reduced quality of life are following (Sahrmann et al., 2017). The stable body position and repetitive movements were indicated by Sahrmann as two inducers that will cause tiny injuries in the body tissues, followed by larger injuries due to adaptation in the neuro-muscular-skeletal tissues. And finally, they will cause disorder in the involved area. Therefore, according to the presented model, which Sahrmann calls the kinesiopathological model, disorders in the movement system of the body start from wrong positioning and repetitive movements and end in pathology (Sahrmann et al., 2017). The developed nations of the world now have extensive and detailed plans to educate the populace about the value of good posture, giving business owners and producers of items like tables, chairs, furniture, and clothing the advantage of adhering to scientific standards about their products (Saneh et al., 2009). The necessity of physical fitness for humans is demonstrated by the fact that a man must constantly consider how to move and be active, including how to sit, stand, and walk. Body posture during work is closely related to musculoskeletal disorders. The neck, back, shoulders, forearms, and knees are among the parts of the body that suffer the most adverse effects from poor posture. Doing work with an unfavorable body position leads to fatigue and chronic pain, so it may force a person to stop working and rest (Hasanvand et al., 2015). Choosing people who have fewer musculoskeletal abnormalities for jobs and work positions always has an effective role in reducing costs, increasing productivity, and better training. On the other hand, a person's physical condition is influenced by structural, physiological, psychological, pathological, occupational, environmental, social, cultural, emotional, and evolutionary factors, some of which are due to environmental conditions and some are due to hereditary conditions. In addition to structural, psychological, and physiological characteristics, individual differences can also be rooted in people's lifestyles and daily habits. Temperament, as a model of individual differences rooted in physiological, psychological, and structural dimensions, can also create unique habits in people's lifestyles (Zar et al., 2017, Safari et al., 2017). Temperament in Iranian medicine is examined under the title of individual differences, which is always subject to three psychological, physical, and physiological indicators, and heredity is its determinant. For example, people with a warm temperament are full of energy, productive and active, and express their feelings quickly and their sympathetic nervous system dominates the parasympathetic nervous system. If bilious (hot and dry) people have extreme irritability and get angry rapidly.

In warm-tempered people, there is a burning sensation in the organs and a sudden and unexplained feeling of heat, as well as dryness in the joints. People with cold temperaments, lack of energy, and feeling weak, as well as bone porosity, are common. Cold-tempered people show their emotions less (Khoonsard and Mehdizadeh, 2016, Doug et al., 2006). In Iranian medicine, in addition to the general temperament, there is also an organ temperament. In addition to the nature of the organ itself, the temperament of an organ is also affected by the general temperament, and the general temperament is determined by the main powers (heart, liver, and brain). For example, the heart has the warmest temperament and the main source is the intensity of a warm temper. The warmness of other organs like the liver, muscles, lungs, kidneys, spleen, arteries, and veins decreases according to the intensity of their temperament. Hair has the coldest and driest temperament in the body. The bones are colder than other organs. Cartilage, ligaments, membranes, tendons, nerves, the spinal cord, and the brain are other cold-tempered organs. Organs with wet temperament include fat or fatty tissue, lymphatic tissue, brain, spinal cord, lung, liver, spleen, kidney, and muscle, which has the moistest and most flexible temperament in the body. Members who have a dry temperament are members who not only do not need to be flexible, but also need to be firm. Hair and bone are the driest organs, and the other dry organs are cartilage, ligament or tendon, membrane, artery, vein, nerve, and heart (Avicenna, 1386, Syed Tariq, 2012). The two main problems in the healthcare industry are continually raising productivity and lowering expenses. Today's society knows how successful prevention and diagnosis are at cutting expenses and energy waste. (Raeisi Pouran, 1375). The principle of individual differences means skill and work coordination or something with individual characteristics that can play a significant role in reducing costs and increasing productivity, in addition to equipment. Discovering the relationship between the abnormality and physical injuries of people and their abilities and individual characteristics will lead society in the direction of better decision-making to approach its goal with the least possible loss of energy and damage (Shoja Aldin, 2002). Temperament, as a model of individual differences rooted in physiological, psychological, and structural dimensions, can also create unique habits in people's lifestyles (Zar et al., 2017, Safari et al., 2017). Javan et al. (2014) showed that the complication of shin splint, which is a pain in the lower part of the leg during running, was seen significantly more in people with dry temperaments than those with wet temperaments. While dry temperament has unique characteristics in terms of psychological, physical, and physiological characteristics (Javan et al. 2014). Moreover, Shahabi et al. (2008) showed that the sympathetic and parasympathetic nervous systems have significant differences in hot and cold temperaments, which can indirectly be effective in causing some musculoskeletal injuries and their recovery (Shahabi et al., 2008). Sardar et al. in 2016, during research, titled The Study of the Relationship Between the Prevalence of Sports Injuries and the Temperament of Athletes from the Perspective of Traditional Iranian Medicine in Heavy and Light Sports, concluded that according to the characteristics of the temperament of people, hot-tempered people have a greater desire to participate in sports activities and of course have more consequences and injuries than other groups, and cold-tempered people are less willing to participate in sports activities and always have fewer sports injuries due to their temperamental characteristics such as laxity and lack of willpower (Sardar et al., 2016).

Similarly, it was seen in the research of Mehdizadeh et al. that the level of physical activity of warm-tempered people is significantly higher than that of cold-tempered people (Mehdizadeh et al., 2013). Vahedi et al. (2017) in a study entitled Study of physiological indices in non-athletic men with different temperaments, concluded that the physiological indices and body composition of people with different temperaments have significant differences (Vahedi et al., 2018). Vahedi et al. (2022) during research titled Investigating the Relationship between Somatotype and Temperament of Young Non-athletes concluded that people with different temperaments significantly have unique body types (Vahedi et al., 2021). Therefore, individual differences in the temperament model, which can be shown easily and at a lower cost than genetic tests, can be of particular importance. For example, if it is possible to determine which organ (bone, cartilage, tendon, ligament, muscle, etc.) is more likely to develop or aggravate musculoskeletal abnormalities based on the clinical characteristics of people, then it is possible to predict the occurrence of injury. It negatively impacts psychological, physical, and economic dimensions. Therefore, the importance and necessity of examining the relationship between the amount and type of musculoskeletal abnormality with the temperament of people, which is considered the principle of individual differences in Iranian medicine and is rooted in heredity, is determined. The novelty of this subject has caused the lack of empirical foundations. However, the following studies can be mentioned: In 2015, Sardar et al. studied the relationship between the prevalence of sports injuries and the temperament of athletes from the perspective of Iranian traditional medicine in heavy and light sports and measured the number of injuries of 240 male athletes in two categories of heavy and light sports And They came to the conclusion that according to the characteristics and characteristics of people's temperament, warmtempered people are more willing to participate in sports activities and of course have more consequences and injuries than the other group, and cold-tempered people according to their temperamental characteristics such as lethargy and less willpower, less desire to participate in sports activities and of course fewer sports injuries (Sardar et al., 2016). Javan et al. (1395) during research titled Comparing the mood of people with shin splints and healthy in male and female students of Ferdowsi University, measured the mood of people with shin splints and healthy people, which were 238 people and concluded that people with shin splints Dry temperament is more prone to shin splints. Therefore, it is recommended to pay more attention to people's temperament to prevent overwork injuries such as shin splints (Javan et al., 2016). Other indirect research that can be related to sports injuries includes: In 2017, during research entitled "Evaluation of the role of temperament on the levels of muscle damage indicators after acute resistance activity in non-athletes, men with warm temperaments had higher strength than cold-tempered ones, but if they exercise for health" they should first start their training with a resistance exercise program with a lower percentage of a maximum repetition to reduce the damage to the muscles (Rahati et al., 2018). Shahabi et al. (2008) during research entitled "Investigation of the neuroendocrine system and cytokine pattern of people with hot and cold temperaments" concluded that warm-tempered people have a predominance of the sympathetic nervous system over the parasympathetic nervous system, and cold-tempered people have a predominance of the parasympathetic system. They have a sympathetic nervous system (Shahabi et al., 2007). Mehdizadeh et al. (2012) during research entitled "Investigating the relationship between temperament and physical activity level of non-athletic students",

concluded that the desire to do physical activity or engage in physical activity, which is a type of individual behavior, is related to the physical and mental characteristics of warmtempered people is aligned Therefore, it may be possible to consider a person's temperament as a characteristic for choosing athletes in different sports fields. However, the definitive discussion in this field needs more research (Mehdizadeh et al., 2013). Belchers (2007) investigated the structure of temperament and ways to overcome stress among professional football and basketball athletes. The purpose of this study was to investigate and describe the relationship between temperament structure and ways to overcome stressful situations. The study's findings demonstrated a strong link between temperamental traits and coping mechanisms, particularly in the case of coping through emotions associated with agility and several other elements (Blechars and Siekanska, 2007). According to online searches of both local and international scientific databases, it appears that this research is the first of its kind and could serve as a new foundation for the mechanisms developed in traditional Iranian medicine about exercise and temperament. Investigating the impact of skeletal-muscular anomalies in young, non-athletic men of various temperaments is thus important.

MATERIALS AND METHODS

This research is a semi-experimental type with a causal-correlation design. The statistical population in this research was young non-athlete men. The statistical population in this research was young non-athletes. The statistical sample of the research was 332 young men applying to enter the research and after the initial screening in terms of age and drug use status, they were selected based on the criteria for entering the research.

Inclusion Criteria of the subjects willing to participate in the study

- The subjects were in the age range of 19–24 years.
- The subjects' body mass index was between 18 and 25.
- They were not professional athletes.
- They did not have chronic diseases (cardiovascular, renal, thyroid gland, lung, diabetes).

• They had not done any heavy activity for at least 3 days before the initial assessment.

• The subjects did not use any special complementary medicine.

Exclusion Criteria of the Subjects not willing to participate in the study

- The subjects below the age of 19 years and more than 24 years.
- The subjects' body mass index was below 18 and more than 25
- Professional athletes
- Subjects having chronic diseases (cardiovascular, renal, thyroid gland, lung, diabetes)
- They had done any heavy activity for at least 3 days before the initial assessment.
- The subjects did not use any special complementary medicine

The research samples were classified into warm, cold, wet, and dry temperament groups by Salmannejad's standard temperament questionnaire (Salmannejad et al., 2016) who

previously voluntarily declared their readiness to participate in this research by completing the consent form to cooperate in the research work. Participants were homogenized for age (calendar), height (by SECA standing height meter), and weight. After collecting and entering the data in the SPSS version 23 environments, the raw data were analyzed to ensure the normality of the data using the Klomogrof-Spirnov test and the homogeneity of the variances using the Lunn test. The correlation coefficient is used for data analysis. The significance level of the test is P>0.05.

RESULT

For the descriptive analysis of the criteria, the average, standard deviation, and several indicators are examined (Table 1). According to Table 1, it can be seen that the number of samples in the research is 332 people, 133 people with kyphosis, 44 people with scoliosis, 127 people with Lourdes syndrome, 16 people with forward head disorder, and 5 people with shoulder droop. 10 people have an unequal shoulder problem. The average score of warmth and coldness of people is 51.64 and the standard deviation is 7.91, and it has a minimum value of 68 and a maximum value of 22. The score of dry and dry temperament has an average of 16.13 a standard deviation of 2.15 a minimum value of 10 and a maximum value of 23.

Variables	Number	Temperament	Mean ± Standard	Maximum	Minimum		
	(n)	group	deviation (M±SD)				
Kyphosis	133	Warm and	51.64±7.91	68	22		
Scoliosis	44	Cold score					
Lordosis	127	Wet and Dry	16.13±2.15	23	10		
Head	16	score					
forward							
Drooping	5						
shoulders							
Uneven	10	Total			332		
shoulder							

Table 1. Descriptive data.

Table 2. Correlation of abnormality and warmth and coldness of temperament.

Variables	Number (n)	Correlation coefficient(x)	Coefficient of determination (x ²)	Significance level (p)
Kyphosis		-0.285	0.081	0.0001*
Scoliosis		0.391	0.152	0.0001*
Lordosis	332	-0.017	-	0.760
Head		0.024	-	0.664
forward				
Drooping		-0.028	-	0.615
shoulders				
Uneven		0.082	-	0.082
shoulder				

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Spearman's correlation test was used to check the correlation of upper body spine abnormalities with temperamental warmth score (Table 2). According to Table 2, it can be seen that there is a significant correlation between the warmth score and kyphosis and scoliosis. In such a way that with the increase in the warm temperament score of the samples, their kyphosis complication is reduced and with the increase in the warm temperament score, the scoliosis complication is seen more and on the contrary with the increase in the cold temperament score of the samples, their kyphosis complication increases and with the increase in the coldness score, the scoliosis complication is less seen. Spearman's correlation test was used to check the correlation of upper body spine abnormalities with the score of wet and dryness of temperament (Table 3). According to Table 3, it can be seen that there is a significant correlation between the wet temperament score and the complications of kyphosis, scoliosis, and Lourdes. In such a way, the higher the wet temperament score of the samples, the more their kyphosis complications increase, and the higher the wet temperament score, the less scoliosis is seen and the higher the wet temperament score, the higher the Lourdes complication, and on the contrary, the more dry temperament score the samples are, the less their kyphosis is and the higher the dry temperament score, the more scoliosis is seen and The higher the dry temperament score, the lower the Lourdes complication.

Variables	Number (n)	Correlation coefficient (x)	Coefficient of determination (x ²)	Significance level (p)
Kyphosis		-0.469	0.219	0.0001*
Scoliosis		0.142	0.020	0.013 [*]
Lordosis	332	-0.399	0.159	0.0001*
Head forward		0.021	-	0.631
Drooping shoulders		-0.035	-	0.621
Uneven shoulder		0.079	-	0.091

Table 3. Correlation of abnormality and wet and dry temperament.

DISCUSSION

The results of this research indicated that there is a correlation between musculoskeletal abnormalities in the spine and temperament. As the kyphosis complication decreased significantly with the increase in the warm temperament score, the complication of scoliosis increased significantly. This correlation was observed in kyphosis and hot temperament, with a coefficient of -0.285 in the samples. Moreover, the correlation of scoliosis with warmth of temperament was seen with a coefficient of 0.391. Moreover, with the increase in dryness of temperament, kyphosis, and Lourdes complications decreased significantly, and also with the increase in dryness of temperament, the complication of scoliosis increased significantly. Correlation of dry temperament with kyphosis with a coefficient of -0.469, with scoliosis with a coefficient of 0.142 and with Lourdes syndrome with a coefficient of -0.399 was observed.

Because no research has been done on the relationship between musculoskeletal abnormalities and the temperament of men, we can refer to the research of Sardar et al., which investigated the amount of sports injuries and temperament of athletes from the perspective of Iranian traditional medicine in light sports and Sangin had studied that they measured the number of injuries of 240 male athletes in two categories of heavy and light sports and concluded that according to the characteristics and characteristics of people's temperament, warm-tempered people are more willing to participate in sports activities and always have consequences, and they have more injuries than the other group, and coldtempered people have less desire to participate in sports activities and, of course, fewer sports injuries due to their temperamental characteristics such as laxity, lack of will, and unrestricted less (Sardar et al., 2016). This research points to the role of temperament in the prevalence of sports injuries, which can be aligned with our research. Sports injuries can occur with the introduction of musculoskeletal abnormalities. Another research that can be mentioned is the research of Javan et al., titled Comparing the temperament of people with shin splints and health in male and female students. They measured the temperament of 238 healthy people with shin splints and concluded that people with dry temperaments are more prone to shin splints (Javan et al., 2016). This is indirectly aligned with the research and points to the role of temperament in causing damage. In the basics of Iranian medicine, people with a cold and wet temperament have unique characteristics, including laxity and lethargy, modernism, low mobility, low maximum strength, and prone to increased visceral fat. On the contrary, people with hot and dry temperaments have long and thin bodies, extroverts, low stimulation threshold, high muscle contraction speed, and low visceral fat (Shahabi et al., 2007). People with a warm temperament have more activity of the sympathetic nervous system than the parasympathetic nervous system (Shahabi et al., 2007). Therefore, a high resting heart rate, a high level of surface blood circulation, and, finally, muscles being ready to work for contraction can be expected in warm-tempered people compared to cold-tempered people. On the other hand, the musculoskeletal complication of kyphosis is both structural and functional, and the functional state itself can be subject to two causes, each of which may be independent of the other, which includes the shortening of the chest muscles and the stretching of the back and scapular muscles (Parno et al., 2020). Since the samples present in the research who had the musculoskeletal problem of kyphosis were not professional athletes and their pectoral muscles did not have high tonicity, the cause of this problem can be considered to be due to slouching and lack of movement, which is characteristic of people with a cold and wet temperament is one. In addition to that, in Iranian medicine, the wetness of the temperament increases flexibility, and as the dryness of the temperament of an organ increases, its fragility also increases in a way (Naseri et al., 2001). In Iranian medicine, muscle has a warm and wet temperament, and probably the higher it is wet, the lower its nervous reactions. Because the temperament of the nerve is firstly dry and then cold (Avicenna, 1386) and the lower the degree of dryness of the muscle, likely the nerve activity of the muscle will decrease in some way, and compared to the stretching and shortening of the muscle, Nerve messengers may not react optimally, and muscle tension in cold and wet people can be expressed in this way. Therefore, it is possible to consider the above-mentioned mechanisms as the possible cause of the correlation between the musculoskeletal disorder of kyphosis and the cold and wetness of people's temperament.

The musculoskeletal complication of scoliosis, which is known as the lateral curvature of the spine, can also be structural and functional (Parno et al., 2020). Because this complication in the study samples did not have structural scoliosis, one-sided contractions of the muscles around the spine can be considered the cause of its lateral curvature. People with hot and dry temperaments have better muscle activity than cold temperament people due to hot temperaments. Moreover, the warmth of the temperament is accompanied by the dryness of the temperament, which causes the improvement of peripheral nerve activities, which increases the amount of muscle contractions. Since the variety of muscles in terms of direction is greater in the spine than in other parts of the body, if this condition is accompanied by an incorrect movement pattern, it becomes an effective reason for musculoskeletal abnormalities such as scoliosis. For this reason, people with hot and dry temperaments compared to people with cold and wet temperaments had a significant positive correlation with scoliosis.

CONCLUSION

The prevalence of kyphosis musculoskeletal abnormalities in the samples decreases with the increase in warm temperament and increases with the increase in warm temperament in the case of scoliosis. Moreover, the prevalence of kyphosis and lordosis should decrease with the increase in the dryness of temper, and the prevalence of scoliosis should increase with the increase in the dryness of temper. We can conclude that people with cold and wet temperaments are prone to kyphosis, and also people with hot and dry temperaments are prone to scoliosis. Therefore, temperament can be considered effective in the physical structure of people, and to improve the physical condition, temperament cannot be ignored.

ACKNOWLEDGMENTS

We are highly thankful to all the subjects who participated in this study.

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