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Survey of the TCM Constitution and exercise habits of 672 students in a college of Shaanxi province

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Abstract: *Objective: The purpose of this study is exploring the influence of physical exercise on the Traditional Chinese Medicine (TCM) constitution of college students and providing evidence for the intervention methods of college students' TCM constitution by the survey of the TCM Constitution and exercise habits of 672 students in the college of Shaanxi province. Methods: All 672 students who are from three grades in the university were investigated by using the Traditional Chinese Medicine Constitution Scale and the self-made questionnaire on exercise habits. Results: Among 672 college students, 203 students were in gentleness type (30.2%), 447 students were in biased types (66.5%).Among 447 biased types of students, 252 cases (37.5%) were in Yang-deficiency constitution, 236 cases (35.1%) were in Yin-deficiency constitution and 224 cases (33.3%) were in Qi-deficiency constitution. The probability of gentleness type of college students with exercise habit is higher than those doing little exercise, and the probability of biased types are lower than that without exercise habit. Among the college students who have the habits of exercising, the students doing aerobic exercises showed a lower level of biased types than those doing strength training or flexibility training. The exercise frequency was negatively correlated with Qi-deficiency constitution, Yang-deficiency constitution, Phlegm-dampness constitution and Qi-stagnation constitution (r=0.041, 0.003, 0.005, 0.024), the exercise time was negatively correlated with Phlegm-dampness constitution (r=0.026), and positively correlated with Special-diathesis constitution (r=0.038), all the differences were statistically significant (P<0.05, P<0.01). Conclusion: The distribution of biased types has a particularly prominent feature between college students who have exercise habit and those who have no exercise habits. Among the three common exercise modes, the improvement of aerobic exercise on biased types is better than strength training or flexibility training. The increase of exercise frequency and exercise duration are both beneficial to improve students' Phlegm-dampness constitution. It is of great significance to formulate corresponding non-drug health care intervention methods according to different TCM constitution types to improve college students' quality of life.*

Keywords: *College students, TCM constitution, sub-health, preventive treatment of disease, exercise*

1. Introduction

According to the Traditional Chinese Medicine (TCM) constitution, it is a relatively stable inherent characteristic of human body formed on the basis of natural endowment and acquired [1], which can be roughly divided into gentleness type (healthy state) and biased types (sub-health state).Due to individual differences, on the one hand, the individual will be susceptible to some diseases, on the other hand, it will make the individual have a certain tendency after the disease. In addition to relative stability, the TCM constitution also has dynamic variability, that is, in the life process of human growth, development, decline and aging, constitution will be affected by various factors such as individual internal or external environment and thus appear certain changes. Because of the positive influence, the TCM constitution gradually to the side of health, but also because of the negative influence, it will increase the probability of disease and affect human health. Therefore, it is urgent to find ways to prevent and improve biased constitutions. It is of great significance to regulate biased constitutions with the concept of "preventive treatment of disease" in traditional Chinese medicine for the health of sub-health people.

College students are in an important stage of growth and development. Due to many changes such as study pressure and living habits, the sub-health status of contemporary college students is becoming increasingly prominent. Modern medical research found that exercise of sub-health intervention has

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certain positive effect [2], so this research wants to through the standard of the Chinese Medicine Physique identification Scale, to explore the relationship between exercise and the TCM constitution, and the influence of different exercise habits on college students' TCM constitution, so as to improve the sub-healthy status of college students in exploring the new method.

2. Methods and Questionnaires

2.1 Methods

During October 2020,we carried out a cross-sectional survey based on the TCM Constitution and exercise habits in three grades (Grade 2020, Grade 2016 and Grade 2017) of college students which in Shaanxi University of Chinese Medicine using a cluster sampling approach. The research team was composed of graduate students with traditional Chinese medicine education background. An electronic questionnaire was used to obtain the data. After obtaining agreement from teachers and students, the research team sent the two-dimensional code of the electronic questionnaire to monitors through WeChat,, and the students filled it out independently.

2.2 Data collection

The questionnaire was composed of the TCM Constitution survey and the exercise habit survey. The first part adopted the "Classification and judgment of constitution of Traditional Chinese Medicine Constitution" [3] issued by China Association of Chinese Medicine in 2009. It consisted of 9 subscales with a total of 60 items, and each item was scored 1-5 points according to 5 alternative answers. The final conversion score (0-100 points) was obtained after adding up all the scores of items and using the formula to convert, which was used to judge the gentleness type and 8 bias types (Qi-deficiency type, Yang-deficiency type, Yin-deficiency type, Phlegm-dampness type, Damp-heat type, Blood-stasis type, Qi-stagnation type and Special-diathesis type). The Conversion score ≥40 points is judged to belong to this kind of TCM constitution. The second part is the self-made "exercise habits survey", including exercise habits, frequency, time and exercise style (aerobic exercise, strength training exercise, flexibility exercise), etc.

2.3 Statistical analyses

The TCM constitution scores were calculated by Excel software. The data processing were used by SPSS25.0 software. The distribution of the TCM constitution of college students under different exercise habits and different types of exercise was detected through chi-square test. The influence of different exercise time and frequency on the TCM constitution score was detected through linear-regression analysis. With $P < 0.05$ was considered statistically significant.

3. Results

3.1 Distribution of the TCM constitution

Among 672 college students enrolled in the survey,203 (30.2%) were in gentleness type, 447 (66.5%) were in biased types, and 22 (3.3%) did not meet any of the constitution standards, but most of them had 1~4 biased constitution tendencies (conversion score ≥30 points).As part of the students simultaneously see a variety of biased constitution, the total number of cases of each constitution type is more than the total number of this survey. The top three types of biased constitution were Yang-deficiency type (252 patients) (37.5%), Yin-deficiency type(236 patients) (35.1%), and Qi-deficiency type (224 patients) (33.3%), followed by Damp-heat type, Phlegm-dampness type, Qi-stagnation type, Blood-stasis type, and Special-diathesis type.

The number of students who have the habits of excising(called exercise group) is 556 (82.7%), and those who don't have the habits of excising(called non-exercise group) is 116 (17.3%).The probability of gentleness type was higher in the exercise group than in the non-exercise group ($P<0.05$).The probability of biased types were higher in the exercise group than in the exercise group, and the differences of Qi-deficiency type, Yang-deficiency type, Yin-deficiency type, Phlegm-dampness type and Qi-stagnation type were statistically significant (Table 1).

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Table 1: Distribution of TCM constitution types of college students under different exercise habits

Type	Exercise group(556)		Non-exercise group(116)		Total(672)	$\chi 2$	*P*
Gentleness type	183	(32.91)	20	(17.24)	203 (30.21)	11.181	0.001**
Qi-deficiency type	168	(30.22)	56	(48.28)	224 (33.33)	14.087	0.000**
Yang-deficiency type	191	(34.35)	61	(52.59)	252 (37.50)	13.614	0.000**
Yin-deficiency type	186	(33.45)	50	(43.10)	236 (35.12)	3.923	0.048*
Phlegm-dampness type	161	(28.96)	47	(40.52)	208 (30.95)	5.692	0.017*
Damp-heat type	170	(30.58)	41	(35.3)	211 (31.40)	1.014	0.314
Blood-stasis type	98	(17.63)	28	(24.14)	126 (18.75)	2.672	0.102
Qi-stagnation type	119	(21.40)	49	(42.24)	168 (25.00)	22.228	0.000**
Special-diathesis type	59	(10.61)	15	(12.93)	74 (11.01)	0.527	0.468
Undefined type	17	(3.06)	5	(4.31)	22 (3.27)	0.476	0.490

(*P<0.05, **P<0.01)

3.2 Influence of exercise types on the TCM constitution

In the exercise group, 508 (91.3%) often do aerobic exercise, 26 (4.7%) often do strength training, 22 (4.0%) often do flexibility training.Among them, the probability of gentleness type in aerobic exercise group was higher than that in strength training group and flexibility training group, and the probability of bias types in aerobic exercise group was lower than that in strength training group and flexibility training group, and the difference was statistically significant (Table 2).

Through the further analysis of the 8 bias types, the probability of Yin-deficiency type, Qi-deficiency type and Special-diathesis type in the aerobic exercise group was lower than that in the strength training group, and the difference was statistically significant (Table 3).

Table 2: Distribution of TCM constitution types of college students under different types of exercise

Type	Aerobic exercise(508)		Strength training(26)		Flexibility training(22)		Total(672)	$\chi 2$	*P*
Gentleness type	174	(34.3)	7	(26.9)	2	(9.1)	183 (32.9)	6.489	0.039*
Bias type	318	(62.6)	19	(73.1)	19	(86.4)	356 (64.0)	6.14	0.046*
Undefined type	16	(3.1)	0	(0.0)	17	(77.3)	33 (5.9)	0.042	0.607

(*P<0.05, **P<0.01)

Table 3: Distribution of Bias types of college students under different types of exercise

Type	Aerobic exercise(508)		Strength training(26)		Flexibility training(22)		Total(672)	$\chi 2$	*P*
Gentleness type	174	(34.3)	7	(26.9)	2	(9.1)	183 (32.9)	6.489	0.039*
Qi-deficiency type	151	(29.7)	10	(38.5)	7	(31.8)	168 (30.2)	0.923	0.630
Yang-deficiency type	175	(34.4)	7	(26.9)	9	(40.9)	191 (34.4)	1.508	0.589
Yin-deficiency type	159	(31.3)	16	(61.5)	11	(50.0)	186 (33.5)	12.977	0.002**
Phlegm-dampness type	146	(28.7)	10	(38.5)	5	(22.7)	161 (29.0)	1.568	0.456
Damp-heat type	150	(29.5)	12	(46.2)	8	(36.4)	170 (30.6)	3.583	0.167
Blood-stasis type	90	(17.7)	6	(23.1)	2	(9.1)	98 (17.6)	1.548	0.488
Qi-stagnation type	109	(21.5)	9	(34.6)	1	(4.5)	119 (21.4)	6.588	0.034*
Special-diathesis type	49	(9.6)	8	(30.8)	2	(9.1)	59 (10.6)	8.877	0.008**
Undefined type	16	(3.1)	0	(0.0)	1	(4.5)	17 (3.1)	0.042	0.607

(*P<0.05, **P<0.01)

3.3 Correlation analysis of exercise habit and the TCM constitution score

In order to explore the main sports factors affecting the scores of college students' TCM constitution type, the linear-regression analysis was carried out with the results of 9 kinds of TCM constitution scores as dependent variables and the frequency and time of exercise as independent variables (Table 4).

Table 4: Variable assignment table

Factor	Variable name	Assignment instructions
Exercise frequency	X1	Everyday = 5, 3-6 times a week = 4, 1-3 times a week = 3, 1-3 times a mounth = 2, no exercise = 1
Exercise time	X2	≥60 minutes = 5, 30-60 minutes = 4, 15-30 minutes = 3, ≤15 minutes = 2, no exercise = 1

The results of linear regression analysis show that:The higher the exercise frequency, the lower the

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score of Qi-deficiency type,Yang-deficiency type,Phlegm-dampness type and Qi-stagnation type (= -1.368, 95% CI: 2.679, 0.057, = -2.532, 95% CI: 4.17, 0.893, = -2.326, 95% CI: 3.955, 0.697, = -2.006, 95% CI: -3.744, 0.269, respectively) ; The longer the exercise time, the lower the score of Phlegm-dampness type (=-1.579,95%CI:-2.969,-0.19), and the higher the score of Special-diathesis type (=1.76,95%CI:0.101,3.42), the difference was statistically significant (Table 5).

Table 5: Correlation analysis between frequency and time of exercise and the TCM constitution

Type	Exercise frequency				Exercise time			
	r	95%CI	P	Sig	r	95%CI	P	Sig
Gentleness type	1.008	(-0.149,2.164)	0.087		0.922	(-0.19,2.034)	0.104	
Qi-deficiency type	-1.368	(-2.679,-0.057)	0.041	*	-1.128	(-2.262,0.006)	0.051	
Yang-deficiency type	-2.532	(-4.17,-0.893)	0.003	**	-1.408	(-2.835,0.02)	0.053	
Yin-deficiency type	-0.39	(-1.662,0.882)	0.547		-0.209	(-1.369,0.951)	0.723	
Phlegm-dampness type	-2.326	(-3.955,-0.697)	0.005	**	-1.579	(-2.969,-0.19)	0.026	*
Damp-heat type	-0.804	(-2.577,0.969)	0.327		-1.059	(-2.523,0.405)	0.155	
Blood-stasis type	0.215	(-1.704,2.135)	0.825		-0.218	(-1.741,1.304)	0.777	
Qi-stagnation type	-2.006	(-3.744,-0.269)	0.024	*	-0.859	(-2.375,0.657)	0.265	
Special-diathesis type	1.724	(-0.253,3.701)	0.086		1.76	(0.101,3.42)	0.038	*

(*P<0.05, **P<0.01)

4. Discussion

According to the investigation of the relationship between TCM constitution and exercise habits of students of different grades in Shaanxi University of Chinese Medicine, it is found that college students' TCM constitution is mainly biased constitution, and the distribution of the 8 biased constitutions of students is as follows: Yang-deficiency constitution, Yin-deficiency constitution, Qi-deficiency constitution, Damp-heat constitution, Phlegm-dampness constitution, Qi-stagnation constitution, Blood-stasis constitution and Special-diathesis constitution. This is similar to the results of the questionnaire survey conducted on 310 students of Fuzhou University of Traditional Chinese Medicine by the An et al. [4].

4.1 Analysis of TCM constitution causes

The formation of human body's TCM constitution is not only related to nature, but also related to human body itself. Inborn and acquired factors jointly affect the TCM constitution, and acquired factors are changeable [5].The results of this study show that the quality of Yang-deficiency occupies the first place in the biased constitution, which is mainly related to the living habits of contemporary college students. Shaanxi Province is located in the central part of northwest China which has four distinct seasons. The winter in Shaanxi Province is comparatively colder. In pursuit of fashion, college students often wear improper clothes, which are relatively thin, so cold pathogen it's easily to invade the body from the outside. The summer in Shaanxi Province is very hot, so people often like to eat raw and cold food and is easy to damage the spleen-yang. In summer, people often wear short sleeves or shorts and like to stay in air-conditioned rooms. When people are in a hot environment, pores will open to promote sweating. At this time, if people suddenly enter the air-conditioned room, it is easy to cause cold pathogen to invade the body through pores, and damage the Yang of Mingmen. In addition, college students often stay up late, often go to bed late and get up late. Traditional Chinese medicine believes that man and nature are a unified whole, the Qi of human yin-yang and the Qi of natural yin-yang are coordinate with each other. The defensive Qi ravels through the Yin channel, and when Yin Qi is full, people can fall asleep. College students often stay awake at midnight, the body can't store enough Yang at night, over time, Yang-qi cannot grow and develop adequately. This are easy to cause the Yang-deficiency constitution [6].Compared with students of other majors, medical college students have greater academic pressure. They often participate in experiments, project assignments, and have to deal with the assessment of clinical theory and other knowledge. They often worry too much and anxiety, and stress may lead to compromised health. In addition, diet preference also damage the spleen and stomach, and the proportion of Yin-deficiency and Qi-deficiency constitutions are also high.

4.2 The effect of exercise on TCM constitution

The constitution is not eternal, and the biased constitution can be improved through diet, emotion,

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exercise and so on [7].Exercise can mobilize the Yang-qi of human body, enhance metabolism, improve cardiopulmonary function and have a positive effect on the health. In this study, the scores of gentleness type in the exercise group were higher than those in the non-exercise group, while the scores of biased types in the non-exercise group were higher than those in the exercise group. This shows that appropriate exercise can achieve the purpose of strengthening physical fitness and improving biased constitutions, which has positive significance for disease prevention and resistance. *The move is long, use is not retreat. Life is movement.* This is the traditional concept of health and fitness of the Chinese nation. The consciousness of prevent treatment of diseases in traditional Chinese sports has long been embodied. Thousands of years ago, physical exercise has become a method to strengthen the body. The Guided maps unearthed from Mawangdui tombs of Changsha, there are many cases of diseases , such as deafness, splenic disease, that have been treated with guidance, it shows that at that time the method of gymnastics health care has been quite perfect. Therefore, the method of preventing diseases and enhancing physical fitness through traditional Chinese sports has been carried out in China for many years and has been accepted by the majority of people [8].

Exercise has a positive effect on the human body, but the different ways of exercise also have different effect on health. This study shows that compared with strength exercise and flexibility exercise, aerobic exercise is more effective in improving the TCM constitution of college students. Students who often do aerobic exercises have higher constitution scores than those who often do strength training and flexibility exercises. Modern research has found that aerobic exercise, such as Tai Chi, aerobics, jogging, brisk walking, cycling, can improve the function of the respiratory system and circulation system, enhance physical fitness and promote human health. As the saying goes: exercise helps digestion, contributes to the movement of Qi and blood, so diseases can not occur. Long-term aerobic exercise can also increase the volume load of the heart, improve the adaptability of the heart and blood vessels, increase the blood supply to the heart and promote the myocardial contraction to be more powerful [9].Traditional health sports, such as Taijiquan and Baduanjin, have become compulsory courses in most colleges and universities. Its start from integral adjustment, the body and mind can be adjusted simultaneously through the three aspects: to regulate the body, to regulate the respiration and to regulate the heart [10]. That is not limited by the site, and easy to learn. However, strength training, such as weight lifting, requires professional theoretical knowledge and the guidance of relevant professionals. College students usually fail to grasp the essentials of movements in their own training, and it is difficult to achieve the due training effect in the training process. Moreover, they may cause unnecessary injuries to their bodies because of improper exertion or incorrect use of equipment. For yoga, dance and other flexible movement training, it is necessary to have a certain movement basis, otherwise it may be difficult to achieve the effect of movement due to non-standard movements.

Through the linear regression analysis, it is found that both the frequency and time of exercise have an effect on the improvement of the TCM constitution of college students. Exercise frequency is negatively correlated with Qi-deficiency constitution, Yang-deficiency constitution, Phlegm-dampness constitution, Qi-stagnation constitution and other constitutions, it shows that the higher the exercise frequency, the lower the scores of these bias constitutions. Exercise time was negatively correlated with the Phlegm-dampness constitution, and positively correlated with the Special-diathesis constitution, so that the longer the exercise time was, the lower the score of the Phlegm-dampness constitution was, while the longer the exercise time was, the higher the score of the Special-diathesis constitution was. Among them, the score of the Phlegm-dampness constitution was affected by both the exercise frequency and the exercise time.

Exercise can mobilize Yang-Qi in the human body, conducive to the movement of Qi and blood throughout the body, nourish the viscera and muscles, allow Qi to run normally in the body. The essence, Qi, blood, fluid and liquid should be fully distributed to improve the state of Qi deficiency and Yang deficiency. Modern medical research shows that human body will promote the secretion of endorphins during exercise, resulting in the feeling of happiness [11], so increasing the frequency of exercise may have a positive effect on the improvement of Qi-stagnation constitution. The formation of college students' Phlegm-dampness constitution is mainly due to the invasion of cold and dampness pathogens, improper diet and lack of exercise, which lead to the disturbance of operation and transformation of the spleen and stomach. Stagnation of Qi, blood and body fluid, dampness and sputum, retention in the body and influence the functions of the viscera. Finally, Qi, blood, fluid and liquid will accumulating and forms phlegm in human body, which affects the function of the viscera. zang-fu organs. However, increase exercise time and frequency appropriately, can stimulate the Yang-Qi, help to sweat, promote metabolism, reduce Yin pathogen harm to the human body. Therefore, people in Phlegm-dampness constitution should insist on physical exercise for a long time to improve their physique and quality of life. The formation of the students which are in the Special-diathesis constitution is mainly due to congenital defects, or the

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influence of genetic factors, which are usually lack of healthy qi, or Zang Fu function is not fully developed, so they are ability to resist evil is poor, its ability to exercise is also relatively poor. This kind of person usually lake of healthy-qi, or Zang-Fu function is not fully developed, so the ability to resist pathogen is poor, the ability to bear the movement is relatively poor. This indicates that long-term exercise has a negative effect on the Special-diathesis constitution students, and with the increase of exercise frequency, the score also increased relatively. Although there is no statistical significance in this study, it is sufficient to indicate that the exercise with a higher frequency may not be conducive to the improvement of students' Special-diathesis constitution. The results of this survey are inconsistent with Wang Xiaojun [12] 's suggestion on the formulation of traditional Chinese medicine exercise prescription for people with Special-diathesis constitution, which suggests that the amount of exercise for a long time should be selected.

5. Conclusion

In conclusion, the majority of college students in Shaanxi University of Chinese Medicine have biased constitutions, and exercise has a positive influence on the improvement of biased constitutions. Appropriate exercise types, exercise frequency and time according to their different physiques are helpful to improve the constitution of college students. The same group has certain common characteristics, but the human body is in a dynamic change, people with different constitution have different physiological characteristics, so it may lead to different diseases. Through this study, the subjective feeling and objective experience of college students are combined in order to better understand the group health status of college students. The TCM constitution comes from nature and is influenced by nurture and has relative stability and dynamic variability at the same time. Through the intervention of different exercise mode, we can improve the condition of biased constitutions. According to different TCM constitution types, the appropriate exercise habits, exercise frequency and time can be selected to improve the constitution and the health status of contemporary college students. In this study, only the influence of exercise on physical fitness was considered, and the sample size was relatively small. Therefore, there are some limitations which need to be further discussed in the future.

References

[1] Wang Suqing. Preliminary investigation on the correlation between dysmenorrhea and TCM constitution in some female college students in Fuzhou area [D]. Fujian University of Chinese Medicine, 2010.

[2] Li Shanhua, Qu Honglin.Journal of Clinical Rehabilitation, 2007, 45: 9194-9197. (in Chinese with English abstract)

[3] China Association of Traditional Chinese Medicine.Classification and judgment of constitution of traditional Chinese medicine [M]. Beijing: China Press of Traditional Chinese Medicine, 2009.

[4] An Huiru, Zeng Dongmeng, Zheng Xuetang, et al.Study on the correlation between TCM constitution and physical examination parameters of college students [J]. China Journal of Traditional Chinese Medicine, 2018, 33(07): 3074-3077.

[5] TAN Xueju, LI Weihong, ZENG Yueqin, et al.Discussion on the application of constitution theory in the diagnosis and treatment of traditional Chinese medicine [J]. Time Zhen Traditional Chinese Medicine and Materia Medica, 2012, 23(12): 3143-3144.

[6] Huang Leihua, Gong Hongtao, Zhao Haoluo. Clinical Research of Traditional Chinese Medicine, 2014, 6(35): 81-82. (in Chinese)

[7] Huang Huaiji. A brief talk on the constitution theory in various theories of traditional Chinese medicine [J]. Shi Zhen Traditional Chinese Medicine and Medicine, 2000 (07): 637-638.

[8] Wu X. Traditional physical health and treatment of disease [J]. Shi Zhen Traditional Medicine and Materia Medica, 2012, 23(04): 1047-1048.

[9] SHAO Sheng, GONG Li, YAN Juntao, et al.Research progress in the effect of Yi jin jing on cardiac function [J]. China Rehabilitation, 2012, 27(01): 51-52.

[10] Ding Shengwei, Fan Tonggang.Research ideas of exercise prescription from the perspective of traditional physical health [J]. China Journal of Traditional Chinese Medicine, 20, 35(07): 3513-3517.

[11] Sun Pengcheng, Hu Yan, Fang Yanyi, et al.Wang Qi, a master of Chinese medicine, the clinical idea of differentiating qi stagnation and constitution in the treatment of diseases [J]. China Journal of Traditional Chinese Medicine, 2020, 35(11): 5633-5635.

[12] Wang Xiaojun.Chinese medicine exercise prescription theory and its treatment case study [D]. Beijing Sport University, 2011.