Comparative Study on Cardiopulmonary Function of College Teachers

--Taking Ningbo University as an Example

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Abstract: objective: to compare the differences in cardiopulmonary function between teachers of different genders and different age groups, and to provide a scientific basis for developing health promotion intervention strategies for college teachers. Methods: 548 teachers who participated in the physical examination of Ningbo University in 2018 were taken as the research object. Cardiopulmonary function indicators (systolic blood pressure, diastolic blood pressure, and maximum oxygen uptake) were measured and calculated. Non-parametric tests were used to analyze the statistical data. Results: the systolic and diastolic blood pressure in all age groups were higher in men than in women ($p < 0.01$). The systolic and diastolic blood pressure in middle-aged female teachers was higher than that in young people ($p < 0.01$). The maximum oxygen uptake of male and female teachers the amount was higher in the young group than in the middle-aged group ($p < 0.05$). Conclusion: the cardiopulmonary ability of college teachers needs to be improved, and it is necessary to pay attention to the implementation of sports intervention strategies.

1. Introduction

College teachers are the core strength of scientific research in colleges and universities. A healthy physique is not only the foundation for college teachers' commitment to education, but also a necessary condition for their continued work. In recent years, the sudden deaths of college teachers have been frequent, and the cases of young teachers dying prematurely are common. This is not only related to the development of education but also the loss of national talents. At present, most of the researches on the physical condition of college students are focused on the students, and there is less literature on the physical condition of college teachers. Existing studies on the physical condition of teachers are mostly based on pathological data to investigate the prevalence of related diseases. In the context of a healthy china strategy, we responded to “passive treatment” as “active management” and formed the concept of “treating the disease”.

2. Research Objects and Methods

2.1 Research Objects

The research object is the group of teachers who participated in the physical fitness test of Ningbo University in 2018. There were 757 measured sample data, and 548 valid sample data were obtained by excluding some samples with missing information. The gender distribution was 221 males and 327 females. In this study, the actual samples were divided into youth group (25-39 years) and middle-age group (40-60 years) by age.

2.2 Research Content

The computer enters the basic information such as the test subject's name, gender, and age, and generates the corresponding test number, and makes a personal record card for each test subject to save its test information.

The electronic sphygmomanometer was used to record the subject's systolic and diastolic blood pressure. The Monark 928E power bicycle was used to measure the subject's maximum oxygen uptake using the Astron and Rhyming method.

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Testing is performed by professionals in accordance with strict relevant procedures.

2.3 Statistical Analysis

All data were entered and sorted using Microsoft Excel 2013, and the data was analyzed using SPSS 25.0 statistical software. Measurement data description statistics are represented by P50 (P25 ~ P75). Mann-Whitney U test was used. $P < 0.05$, the difference was considered statistically significant, and $P < 0.01$ was considered a highly significant difference.

3. Research Results

The results show (Table 1) that there is a significant difference in systolic blood pressure and diastolic blood pressure between teachers of different genders in the young and middle-aged groups ($p < 0.01$), which are both higher in men than women; female teachers have systolic and diastolic blood pressure in the middle-aged group Significantly higher than the young group ($p < 0.05$); the maximum oxygen uptake of both male and female teachers was significantly higher in the young group than in the middle-aged group ($p < 0.05$).

Table 1 Basic Physical Functions of Subjects of Different Genders and Age Groups

	Youth group		Middle age group	
	Male (n=109)	Female (n=154)	Male (n=112)	Female (n=173)
Systolic pressure (mmHg)	130.0(119.3~136.0)	111.0(103.5~119.0)*	126.0(118.0~136.5)	119.0(110.0~130.0)*▲
Diastolic blood pressure (mmHg)	77.5(71.0~82.0)	68.0(64.0~74.0)*	79.0(73.0~86.0)	73.0(68.0~79.0)*▲
Oxygen uptake (ml/kg/min)	37.9(32.0~47.0)	38.5(32.0~47.4)	33.2(30.7~41.8)▲	34.0(31.4~40.3)▲

Note: * $p < 0.01$, compared with male; ▲ $p < 0.05$, compared with the same-sex teacher in the youth group

4. Discussion

By analyzing the blood pressure indicators of college teachers, it was found that the systolic and diastolic blood pressures of male teachers were higher than that of females, and the differences were significant. It can be predicted that male teachers have more hypertension than female teachers, which may be related to the different lifestyles of men and women. Male teachers often have bad habits such as smoking history, excessive drinking, preference for high-fat foods, and high-salt diets; most female teachers have healthier eating habits. The study also found that systolic blood pressure and diastolic blood pressure were higher in the middle-aged group of female teachers than in the young group, and the differences were significant. It can be seen that most of the female teachers with hypertension are in the middle-aged group, and it can be seen that the blood pressure index increases with age. The results are similar to previous studies [1]. Hypertension is an important risk factor for cardiovascular and cerebrovascular diseases, which can cause many complications such as cerebral thrombosis, cerebral hemorrhage, and heart failure. Due to the nature of their work, college teachers have become vulnerable to hypertension and at the same time have become a high-risk group of cardiovascular and cerebrovascular diseases.

Cardiopulmonary function is a powerful predictor of cardio-cerebral vascular health and life health [2]. The maximum oxygen uptake is the gold index for judging cardiopulmonary function. Many studies have shown that increasing the maximum oxygen uptake through aerobic exercise not only helps to improve the risk of cardiovascular and other chronic diseases, but also can prevent and treat diseases [3] [4] [5]. This study found that there is no significant difference between male teachers and female teachers in maximum oxygen uptake, but studies have shown that gender is an

important factor affecting cardiopulmonary function. Men of the same age have better cardiopulmonary function than women [6]. The consideration may be due to the existence of individual outliers that cannot be excluded from the maximum oxygen uptake data in this study and the fact that women often exercise more than men teachers. However, in the comparison between different age groups, it was found that the male and female teachers' cardiopulmonary function decreased significantly with age, which is consistent with the existing research conclusions [7]. Cardiopulmonary function has been shown to have a highly negative correlation with the incidence of diabetes, all-cause mortality, and cardiovascular disease mortality, that is, the lower the cardiopulmonary function, the higher the prevalence and mortality of some diseases [8] [9] .

5. Conclusion

The overall level of cardiopulmonary function of college teachers is not high, and it tends to decrease significantly with age. And the teacher group is vulnerable to hypertension, which indirectly led to this group becoming a high incidence of cardiovascular and cerebrovascular diseases.

Therefore, active intervention is particularly important. Colleges and universities should establish a complete exercise prescription library, and provide teachers with reasonable intervention plans (appropriate exercise programs, scientific exercise intensity, exercise duration and frequency, etc.) based on their own athletic ability and health status.

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