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Analysis of physical health status of faculty and staff in Jinhua

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Abstract

This study attempts to use the physique health test results of faculty and staff as a key issue, and based on the socio-ecological model, analyzes the socio-ecological factors affecting the differences in physical fitness between urban and rural, gender, and different in-service schools. Methods: The physical and mental health of 15 primary and middle schools in Jindong District, Jinhua City, Zhejiang Province (including 2 junior high schools, 4 primary schools, 4 township junior high schools, 4 township primary schools) and the faculty and staff of Jinhua Campus of Zhejiang Normal University were selected. Using SPSS23.0, the chi-square test, independent sample t-test and one-way variance were used to analyze the national physique health test data of the subjects, and the differences in physique between urban and rural areas and between primary and secondary schools were analyzed. Results: 1) In the comparative analysis of faculty and staff in large, middle and primary schools, it was found that body shape indicators are not explicit indicators that distinguish different school levels. There are significant differences in the physical function indicators of the faculty and staff of the large, middle and primary schools. The excellent rate of vital capacity of the university faculty and staff is significantly higher than that of the primary and secondary school teachers. The percentage of the university faculty and staff is generally higher than that of the primary and secondary school teachers. 2) In the physical quality index, the grip strength, the sitting body flexion, the closed eye standing on one leg, and the reaction are dominant indicators. Among them, the grip strength index showed three significant differences among the four groups of female faculty and staff. The seated body flexion test results only showed significant differences among the male faculty and staff over 40 years old. The difference in the step test index only existed in the primary school faculty and staff. Conclusion: The physique of university faculty and staff is significantly better than that of primary and secondary schools. This study attempts to analyze the causes of differences in physique and staff from five levels: individual, family, community, school, and society.

Keywords:

physical health;
faculty and staff;
Jinhua City

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1. Introduction

Health means that a person is in good shape in terms of physical, mental and social aspects. [1] Physical health is considered a common-sense definition of health, and physical fitness testing is a common means of assessing physical health. The student's physical fitness test and the national physique health test are important means for the government departments to evaluate the health of the national physique. However, the government and scientific research workers have different concerns about the two. Through CNKI, the "national health" and "student physical health" were used as keywords. The former can only retrieve 3 articles, while the latter has 3,498 searches. At the same time that Europe and the United States have introduced a relatively complete faculty health promotion plan, China's attention to the health of the national physique is relatively low, and domestic scholars have little research on the physique and health of faculty and staff [2]. Most of the research is aimed at college faculty and staff, and the research on the physical health of teachers in primary and secondary schools can be described as rare. The health of flowers as a motherland should be paid attention to, but as a hard-working "gardener", the physical health of the faculty and staff will directly affect the quality of teaching. Therefore, this study takes the physique health test results of faculty and staff as a key issue, and analyzes the factors affecting the differences in physical fitness between urban and rural areas, gender, and different job-seeking schools.

2. Research Method

2.1 Subjects

This study selected 15 primary and middle schools in Jindong District of Jinhua City, Zhejiang Province (including 2 junior high schools, 4 primary schools, 4 township junior high schools, 4 township primary schools) and the physical health status of the faculty and staff of Jinhua Campus of Zhejiang Normal University.

Table 1 Basic information of the research object

		Male		Female		total
		20-39（Age）	40-59（Age）	20-39（Age）	40-59（Age）	
primary school	city	20	13	131	52	216
	rural	43	29	161	64	297
junior high school	city	10	37	39	41	127
	rural	41	68	69	63	241
university		184	242	246	236	908

2.2.1 Data collection

The SPSS23.0 was used to analyze the national physique health test data of the subjects by independent sample t test and one-way ANOVA, and analyzed the differences in physical fitness between urban and rural schools and colleges and universities.

National physique health data mainly reflects the shape, function and quality indicators of the research objects. The items tested included: height, weight, reaction time, grip strength, vital capacity, closed-eye standing, sitting flexion, vertical jump and step index. At the same time, each project is divided into five levels of 1-5 points. [4]

2.2.2 Data analysis

In the data analysis process, the software SPSS16.0 is used.

3. Research results

3.1 Excellent rate of physical test results

According to the "National Physical Fitness Measurement Standardsof China", each test is set to a rating of 1-5 points (poor-excellent), and the percentage of each level can be used as a means of evaluating the physical health of the faculty and staff of the large, middle and primary schools. [5, 6] From the overall research results in Table 2, the comprehensive scores of university faculty and staff are higher, generally up to 87.8%, but the comprehensive scores of small and medium-sized faculty and staff are generally below 50%, and there are three groups. Significant difference ($\chi 2=386.03$, $P<0.05$). From the perspective of body shape, the excellent percentage of height and weight of the three groups of teaching staff is higher, more than 70%, and there is no significant difference between the three groups of data by chi-square test. In terms of bodily functions, the vital capacity of primary and secondary school teachers is generally 70.70% and 66.20%, which is quite different from 91.80% of college faculty and staff ($\chi 2=462.53$, $P<0.05$), and the step index is the same. In terms of physical fitness, the three items of push-ups, sit-ups, and vertical jumps generally accounted for a large percentage and high consistency. When the eyes were closed and the reaction was selected, the excellent rate of university faculty in the two projects was better. High, there is a significant difference with primary and secondary schools. The faculty's grip indicators show a higher proportion of

general, good, and excellent scores than those in primary and secondary schools.

Table 2 Comparative analysis of physical fitness evaluation of teachers in large, middle and primary schools

Index	Group	Poor	Fair	Average	Good	Excellent	Chi-square test
Height standard weight	A	9.40%		16.50%		74.10%	χ^2=9.96， P＞0.05
	B	10.60%		16.60%		72.80%	
	C	13.10%		15.20%		71.70%	
Vital capacity	A	9.40%	24.40%	30.50%	24.20%	11.50%	χ^2=462.53，P＜0.05
	B	9.50%	19.80%	29.40%	31.00%	10.30%	
	C	3.40%	4.80%	12.80%	24.20%	**54.80%**	
Step index	A	8.60%	31.20%	32.70%	20.70%	6.80%	χ^2=108.28，P＜0.05
	B	5.40%	33.70%	30.50%	22.80%	7.60%	
	C	4.80%	18.60%	**28.10%**	**29.20%**	**19.30%**	
Grip	A	9.40%	35.50%	31.30%	20.90%	2.90%	χ^2=24.84，P＜0.05
	B	7.30%	32.90%	29.30%	22.60%	7.90%	
	C	11.30%	30.90%	33.30%	19.00%	5.50%	
Vertical jump	A	0.90%	3.90%	15.80%	39.40%	40.00%	χ^2=20.03，P＞0.05
	B	0.60%	3.10%	15.80%	36.50%	44.00%	
	C	3.30%	3.10%	11.80%	36.20%	45.60%	
push ups	A	3.20%	7.90%	12.70%	41.30%	34.90%	χ^2=9.97， P＞0.05
	B	5.90%	5.90%	17.60%	37.30%	33.30%	
	C	7.90%	13.00%	19.80%	25.40%	33.90%	
Sit-ups	A	1.00%	2.40%	14.70%	34.60%	47.30%	χ^2=8.87， P＞0.05
	B	0.90%	0.00%	13.90%	35.20%	50.00%	
	C	0.40%	2.70%	13.50%	41.70%	41.70%	
Sitting body flexion	A	12.30%	23.60%	27.80%	24.00%	12.30%	χ^2=87.94，P＜0.05
	B	14.70%	23.10%	27.60%	22.60%	12.00%	
	C	6.90%	15.10%	22.90%	**31.00%**	**24.10%**	
Balance test	A	0.80%	12.70%	23.40%	36.60%	26.50%	χ^2=150.02，P＜0.05
	B	1.60%	9.20%	24.80%	38.30%	26.10%	
	C	0.40%	4.00%	14.20%	29.20%	**52.20%**	
Reaction test	A	1.20%	6.60%	22.00%	42.10%	28.10%	χ^2=386.03，P＜0.05
	B	0.80%	3.50%	25.60%	46.50%	23.60%	
	C	0.00%	0.70%	5.30%	24.00%	**70.00%**	
Overall	A	30.90%	34.40%	31.80%	2.90%		χ^2=847.03，P＜0.05
	B	28.50%	37.00%	31.20%	3.30%		
	C	0.20%	12.00%	24.30%	**63.50%**		

Note: A:primary school;B:junior high school;C:university

3.2 Urban-rural differences in the average physical fitness of primary and secondary school teachers and staff

It can be seen from Table 3 that the results of the physical test of the 20-39-year-old urban and rural primary school teachers can be seen that the step index of urban male faculty and staff is significantly higher than that of the rural (t=2.01, P<0.05), and the push-ups are presented. Similar differences (t = 2.09, P < 0.05). The grip strength of urban female faculty and staff was significantly higher than that of rural faculty and staff (t=2.44, P<0.05), and the response time test was superior to rural female faculty and staff (t=-3.14, P<0.05). It can be seen from Table 4 that the grip strength of female junior high school teachers in the 20-39-year-old city is significantly higher than that of rural faculty and staff (t=2.85, P<0.05). There is no urban-rural difference in other projects.

Tables 5 and 6 show the results of physical fitness tests of 40-59-year-old urban and rural primary and junior high school faculty members. The male faculty and staff in urban primary schools have significantly

lower sitting strength than rural areas (t=3.80, P<0.05), while urban junior high school male faculty and staff The flexion of the sitting position was significantly larger than that of the rural area (t=3.34, P<0.05), and the response time was significantly better than that of rural teachers (t=-2.16, P<0.05). The step index of female faculty and staff in urban primary schools was significantly smaller than that in rural areas (t=-2.22, P<0.05), while the female faculty in junior high school was significantly higher than female faculty members (t=-2.25, P<0.05).

Table 3 Difference analysis of physical fitness test between 20 and 39-year-old urban and rural primary school teachers

	Male		Female	
	City	Rural	City	Rural
Height	172.12±7.39	173.58±5.98	159.14±4.79	159.05±5.1
Body weight	74.43±9.32	73.38±9.71	54.39±5.11	54±8.41
BMI	25.15±3.00	24.37±3.11	21.5±2.05	21.31±2.88
Vital capacity	4164.75±790.24	4203.23±689.88	2566.67±534.38	2531.01±535.93
Step index	**57.26±7.7**	**53.28±7.11***	55.35±6.39	56.68±9.38
Grip	46.43±7	45.58±6.94	**27.83±4.19**	**26.6±4.36***
Vertical jump	46.5±9.88	43.78±8.84	26.8±5.24	26.38±4.73
push ups	**35.7±12.72**	**28.79±11.94***		
Sit-ups			27.45±9.38	28.2±9.26
Sitting body flexion	11.34±6.75	9.37±9.35	10.86±7.7	11.42±7.39
Balance test	66.45±45.47	55.98±45.6	57.13±33.01	58.28±62.14
Reaction test	0.4±0.04	0.41±0.04	**0.45±0.07**	**0.47±0.07****

Note: * indicates a significant difference between urban and rural areas, P < 0.05, the same below.

Table 4 Difference analysis of physical fitness test of 20-year-old 39-year-old urban and rural junior high school teachers

	Male		Female	
	City	Rural	City	Rural
Height	168.55±5.63	171.24±6.35	159.13±4.96	158.05±4.93
Body weight	69.52±6.57	71.63±14.31	54.64±5.61	54.98±7.91
BMI	24.57±2.98	24.36±4.33	21.62±2.43	22.01±3.05
Vital capacity	3829±838.88	3660.27±933.73	2605.74±441.48	2544.81±446.52
Step index	53.47±8.6	55.82±8.89	53.41±5.62	55.51±6.56
Grip	43.38±5.66	46.31±7.13	**28.83±4.82**	**26.19±4.57***
Vertical jump	41.35±9.53	40.87±9.52	26.15±5.31	26.68±3.8
push ups	26.5±9.54	28.73±12.27		
Sit-ups			25.92±8.27	27.09±9.37
Sitting body flexion	7.58±9.49	7.8±7.2	10.44±7.2	10.19±7.49
Balance test	51.8±41.21	59.88±90.94	60.69±41.41	60.68±91.88
Reaction test	0.43±0.07	0.43±0.05	0.46±0.07	0.47±0.06

Table 5 Difference Analysis of Physical Fitness Tests of 40-59-year-old Urban and Rural Primary School Teachers

	Male		Female	
	City	Rural	City	Rural
Height	169.5±3.95	167.2±4.48	157.24±5.11	156.71±4.91
Body weight	72.52±10.75	69.72±6.6	56.12±6.2	56.59±9.04
BMI	25.19±3.35	24.94±2.06	22.67±1.96	22.99±3.24
Vital capacity	3574.15±859.7	3104.07±749.65	1936.81±676.3	2046.73±520.41

Step index	53.5±9.03	55.96±7.65	**55.88±7.72**	**59.59±9.86***
Grip	45.15±6.46	42.81±5.96	27.9±6.69	27.99±4.88
Sitting body flexion	**-1.96±8.01**	**7.69±7.44***	6.53±9.71	7.66±8.11
Balance test	25.31±22.39	22.45±17.87	30.96±29.44	38.02±42.81
Reaction test	0.51±0.04	0.48±0.08	0.5±0.12	0.52±0.09

Table 6 Difference analysis of physical fitness test of 40-59-year-old urban and rural junior high school teachers

	男		女	
	城市	乡村	城市	乡村
Height	170.35±5.01	168.75±4.78	159.42±6.06	157.67±4.89
Body weight	72.74±7.56	70.31±7.47	59.76±7.15	57.05±7.78
BMI	25.04±2.11	24.71±2.6	23.52±2.48	22.93±2.86
Vital capacity	3440.97±956.28	3262.12±759.77	2129.2±673.5	2325.32±487.67
Step index	57.99±6.83	56.72±9.03	58.73±10.86	60.46±10.12
Grip	44.45±6.27	45.61±6.12	**30.47±7.14**	**27.86±4.67***
Sitting body flexion	**9.22±9.22**	**3.58±9.05***	8.15±9.00	8.36±8.56
Balance test	39.46±27.53	31.74±24.47	29.73±25.85	31.57±23.87
Reaction test	**0.46±0.06**	**0.5±0.09***	0.52±0.08	0.52±0.1

4. Analysis of research results

4.1 Analysis of explicit indicators of physique health differences among teaching staff

The study compares the excellent rate of indicators and the average of indicators in different groups by establishing large, middle, and primary schools, urban and rural areas, and age groups. In the comparative analysis of teachers and staff in large, middle, and primary schools, it is found that body shape indicators are not a different school. Horizontal dominant indicators; there are significant differences in the physical function indicators of the faculty and staff of the large, middle and primary schools, but the excellent rate of vital capacity of the university faculty and staff is significantly higher than that of the primary and secondary school faculty, and the university faculty's step test score is significantly higher than the above. Teaching staff in primary and secondary schools.

Grip strength, sitting body flexion, reaction time, push-ups, and step tests are dominant indicators in urban-rural differences analysis. Among them, there are three significant differences in the grip strength index among the four groups of female faculty and staff. The sitting body flexion test results only have significant differences among the male faculty and staff over 40 years old. The difference in the step test index only exists in primary school.

The factors affecting the physical health of faculty and staff can be divided into four aspects: genetic, environmental, social and behavioral. [7] The irreversibility of heredity determines that we mainly analyze the three aspects of environment, society and behavior in the process of inquiry. In the three aspects of environment, society and behavior, behavior is directly related to physical health, while environment and society are the main aspects that restrict behavior development. The study analyzes the factors that distinguish the physique and health of teachers and staff from five aspects: individual, family, community, school and society.

4.2 Analysis of the factors influencing the differences in physical fitness of teaching staff

4.2.1 Individuals and families

From an individual perspective, age, gender, education, cognition, and family care all have an impact on individual health. At the household level, the physical health and exercise behavior of spouses and children will have a certain impact on their physical health [3]. Some studies [8] pointed out that the time spent in the field of life is closely related to sports participation, which is one of the reasons why the comprehensive physical quality evaluation of university teachers is significantly higher than that of primary and secondary schools. In the survey of faculty and staff of elementary school students over 40 years old, the physical flexibility of male teachers in urban areas is lower than that in rural areas. The mental function of urban female faculty and staff is lower than that in rural areas. This may be due to the lower work pressure of rural faculty and staff. At the same time, the teaching burden of primary school faculty and staff is higher than that caused by junior high school faculty and staff [9]. At the same time, the physical health of the faculty and staff has a strong gender specificity. In this study, the significant difference in the grip index is only between

women, and the female faculty and staff in the city are more than the rural. The reason may be the rural female faculty. Have to spend more time to care for the family and children. In addition, studies have shown that the higher the level of education, the higher the frequency of participation in fitness activities [10]. Behind it is the result of differences in their own health concerns, economic and social status.

4.2.2 Community and school

The communities in which faculty and staff live generally surround the school. They are characterized by convenience and comfort. The nature of the work of the faculty and staff determines that their living areas must be distributed around the school. The residences of most township faculty and staff are villages owned by township schools, while the residences of faculty and staff in urban schools are mostly neighborhoods near the school. The natural environment in which the city and rural faculty live is relatively consistent, but the built environment (construction, transportation, greening, sports) Facilities vary widely, and studies have confirmed that a quality built environment is more conducive to promoting people's physical health [11]. At the same time, the natural environment has a significant impact on health. Environmental pollution can cause cognitive impairment in the elderly [12], and environmental pollution can also lead to health inequalities [13]. The difference between school and community sports facilities will directly affect the faculty's sports behavior. At the same time, the complete teaching activities of colleges and universities and the physique health test of faculty and staff also promote the healthy development of university faculty and staff to a certain extent.

4.2.3 Society

The introduction of the social environment and policies and regulations can effectively change the faculty's athletic behavior and enhance their physical health. At the same time, the evolution of urbanization and socialization will inevitably have a certain impact on the physique and health of faculty and staff. The rapid urbanization process will lead to the housing pressure and life pressure of faculty and staff. And faculty and staff of different ages and different teaching stages may have different social pressures. Young teachers may have burdens such as insufficient teaching skills, heavy teaching tasks, and high pressures on life, which may cause them to pay little attention to their physical health; middle age Teachers will face pressure from professional titles and children's education; older teachers will face pressure from their children's work and retirement, which will lead to a decline in their physical fitness.

5. Summary

To enhance the physique and health of faculty and staff, and to improve the efficiency of faculty and staff, it is necessary to strengthen the construction of faculty and conditions. From the five levels of individual, family, community, school and society, we can better understand the difference in physical fitness of teachers and staff caused by the difference between urban and rural, age, gender and social status.

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