

Correlation Analysis of Physical Health Measurement Indexes

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Abstract: According to the physical health measurement data of 5219 students in Changchun Guanghua University in 2019, the X² and the P of each index of male and female students were calculated by SPSS20.0 and Excle, and the measurement indexes were comprehensively analyzed. Binary logistic regression analysis was used to analyze the correlation of internal factors between the total score and each measurement index. Correlation analysis was used to study the Correlation between male and female students. Using the partial correlation analysis between related to various physical indicators, in 50 meters without controlled variable male run, standing long jump in succession, crook proneness and lung capacity, 50 meters, standing long jump with a significant linear relationship between the various measure, after the control of height, weight, weighted linear relationship between the various physical indexes, correlation degree is high, this shows a greater influence on the correlation between height and weight of each index.

<<National Student Physical Health Standard>> (hereinafter referred to as "standard") is the national fundamental guidance and the education quality of school education work basic standards, is the evaluation of students' comprehensive quality assessment of school work and the important basis for gauging the progress of the local education from this standard body form body function and physical quality comprehensive evaluation of students' physical health level, is the evaluation of individual student physical health standard.[1] The data of this study are derived from the original data of physical health test conducted by the school on students. The purpose of this study is to analyze the measurement indicators of students so as to explore the relationship between the measurement indicators and provide theoretical basis for better improving students' physical fitness and making better exercise plans

1. Research objects and methods

1.1 Research object

The physical health measurement data of 5219 students in Changchun Guanghua University were analyzed, among which 1698 were male and 3521 were female

1.2 Methodology

1.2.1 Mathematical statistics

According to the national standards for students' physical health, the items to be measured are height, weight, lung capacity, sitting forward bend, standing long jump, 50m run, 800m run (female), sit-ups (female), 1000m run (male) and pull-ups (male). Filtered through Excle to measure all the data and eliminate data is not complete, and of the students who apply from measuring data, through SPSS20.0 on body mass value (BMI), lung capacity in succession, crook proneness, standing long jump, 50 meters, 800 meters (female), sit-ups (female), 1000 - meter run (male), pull-ups (male) are analyzed.

1.2.2 Binary linear regression

SPSS20.0 was used to analyze the correlation between the total test score and each measurement index based on the characteristics of each measurement index. [2]

1.2.3 Partial Correlations

SPSS20.0 was used to take height and weight as the control variable, and the correlation analysis of each physical quality was carried out purely. In this way, the existence of interference factors was greatly excluded, and the correlation degree of each index could be better seen

2. Results

2.1 Statistical results of men and women

The physical examination data of 5219 students were obtained, among which 1698 were male students and 3521 were female students. The number of qualified male was 1282, and the number of qualified male accounted for 75.5; the number of qualified female students was 3155, and the number of qualified female accounted for 89.6. According to the data, the proportion of female students passing the exam is relatively high. SPSS was used to describe the statistics ($X^2=178.903a$, $P=0.000$). According to the description of P value in statistics, this data is statistically significant.

Table 1 Basic situation analysis of male and female.

Male	Pass	Flunk	Total	Pass rate (%)	X2	P
Male	1282	416	1698	75.5	178.903a	.000
Female	3155	366	3521	89.6		
Total	4437	782	5219	85		

2.2 Partial correlation analysis of each test index

2.2.1 Partial correlation analysis of each measurement index after controlling variables for male students

Partial correlation analysis was used to control and weight the height and weight of male students, analyze the correlation between lung capacity, 50-meter run, standing long jump, sit forward, one-kilometer run and pull-up. As can be seen from table 4, the P value between lung capacity, 50-meter run, standing long jump, sit-up bend, one-kilometer run and pull-up was 0.000, It indicated that after controlling for height and weight, each index was correlated with each other and had statistical significance.

2.2.2 Partial correlation analysis of each measurement index after controlling variables for female students

Partial correlation analysis was used to control and weight the height and weight of female students, Analyze the correlation between lung capacity, 50-meter run, standing long jump, sit-in bend, 800-meter run and one-minute sit-up, As can be seen from table 5, the P values of female' lung capacity, 50-meter run, standing long jump, sit-in forward bend, 800-meter run and one-minute sit-up were all 0.000, It indicated that after controlling for height and weight, each index was correlated with each other and had statistical significance.

3. Analysis and discussion

3.1 The difference of physical health data between male and female students

The passing rate of male students is 14.1 less than that of female students, which indicates that the physical health of female students is higher than that of male students.[3] Binary logistic

regression was used to analyze the OR value of pull-ups for male students and the OR value of one-minute sit-ups for female students were 0.068 and 0.253 respectively. Compared with the two, they contributed more to the total score of the test for female students, which also caused significant differences in the passing rate between male students and female students. The OR value of male standing long jump is 0.086, and that of female is 0.229. There is a large gap between male and female students in the same test item, which also causes the difference in the pass rate of male and female students. The standing long jump mainly tests the students' lower limb strength, explosive power and coordination ability of the body. [4] The female students' coordination ability is better than the male students, while the female students are poorer in strength but slightly superior in relative strength. The difference in grades also has a certain relationship with the living habits of college students. The comfortable life in college makes many male keen on smoking, drinking, playing games, ordering takeaway, etc., with little physical exercise, while the female are relatively diligent, which also causes the high physical health of the female.

Table 2 Partial correlation analysis of each measurement index after controlling variables for male students (N=1698).

Control variables		lung capacity	50-meter run	standing long jump	sit-up bend	one-kilometer run	pull-up	
Height and weight	lung capacity	correlation	1.000	-.146	.240	.154	-.103	.110
		Significant	.	.000	.000	.000	.000	.000
	50-meter run	correlation	-.146	1.000	-.357	-.102	.245	-.219
		Significant	.000	.	.000	.000	.000	.000
	standing long jump	correlation	.240	-.357	1.000	.259	-.279	.275
		Significant	.000	.000	.	.000	.000	.000
	sit-up bend	correlation	.154	-.102	.259	1.000	-.170	.172
		Significant	.000	.000	.000	.	.000	.000
	one-kilometer run	correlation	-.103	.245	-.279	-.170	1.000	-.220
		Significant	.000	.000	.000	.000	.	.000
	pull-up	correlation	.110	-.219	.275	.172	-.220	1.000
		Significant	.000	.000	.000	.000	.000	.

Table 3 Partial correlation analysis of each measurement index after controlling variables for female students (N=3521).

Control variables		lung capacity	50-meter run	standing long jump	sit-up bend	800-meter run	one-minute sit-up	
Height and weight	lung capacity	correlation	1.000	-.140	.191	.151	-.128	.104
		Significant	.	.000	.000	.000	.000	.000
	50-meter run	correlation	-.140	1.000	-.359	-.100	.339	-.181
		Significant	.000	.	.000	.000	.000	.000
	standing long jump	correlation	.191	-.359	1.000	.190	-.275	.223
		Significant	.000	.000	.	.000	.000	.000
	sit-up bend	correlation	.151	-.100	.190	1.000	-.099	.097
		Significant	.000	.000	.000	.	.000	.000
	800-meter run	correlation	-.128	.339	-.275	-.099	1.000	-.191
		Significant	.000	.000	.000	.000	.	.000
	one-minute sit-up	correlation	.104	-.181	.223	.097	-.191	1.000
		Significant	.000	.000	.000	.000	.000	.

3.2 The influence of BMI on students' physical health

By partial correlation analysis, the comparison before and after the control variables of students' height and weight showed that the double-tailed probability values all changed, which indicated that BMI had a certain influence on each measurement index. Male vital capacity and a kilometre, pull-ups P values have changed, after control BMI variables $P = 0.000$, with significant, vital capacity, the greater the aerobic ability is stronger, the corresponding a kilometre result also will be better, the male lung capacity P value explain male physical health is influenced by BMI, this also with the boy to weight control on slightly less have a certain relationship.[5]

4. Suggestion

In the level of job of undergraduate course of common colleges and universities teaching evaluation of middle school students' physical health test is part of the assessment, many colleges and universities for image in order to achieve standard project, to really is not hard to improve the students' physical qualities, which requires the school leader can seriously, test teachers can is responsible earnestly, physical education teachers to reasonably arrange the student's exercise, it will really improve the students' physical quality, it will also improve school physical health test qualified.[6]

Strengthen the control of students' after-class exercise, carry out the combination of in-class and out-of-class exercise, carry out mandatory control of students' after-class exercise, combine extracurricular physical exercise with physical education scores, focus on improving students' cardiorespiratory endurance and strength training, and improve students' physical quality.

Put forward in the "healthy China 2030" plan for young students to participate in sports activities every week to moderate intensity more than 3 times, the national standard of student physique healthy standard excellence rate more than 25%, which puts forward higher requirements for the school sports, exercise more encouragement policies to attract students, enthusiasm, improve their health level. In recent years, with the improvement of living standards and the change of life style, the obesity rate of college students has been increasing, the performance of endurance projects is low, the lack of strength, which has seriously affected the performance of various indicators of physical health test. College life is relatively relaxed, which allows students to make a good exercise prescription after four years of study, improve students' sports ability, and choose suitable sports programs, so that they can benefit for life. The data collected this time are the data of one academic year, which will be analyzed after the new measurement data. Through more data analysis, we will find the influencing factors among various test indicators, reasonably arrange training plans, and improve students' physical fitness.

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