

Research on the Physical Attributes Evaluation Criterion of College Students

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Purpose: to improve the college students' enthusiasm to participate in physical training and thus enhance students' physical fitness; to provide the reference for the education administrative departments' decisions and further improving the college physical teaching in our city. **Methods:** the paper did analysis with the sample of 19 - 22 years old college students' health monitoring data in 2009 in Chongqing, applying the method of percentiles to establish the physical attributes evaluation criterion of college students in Chongqing. **Results:** develop the score sheets of single physical attributes' index evaluation, comprehensive evaluation and physical attributes evaluation form for the Han college students in Chongqing. **Conclusion:** the physical attributes score sheets, evaluation form are applicable to the college students in Chongqing, and they can be popularized to other universities in Chongqing.

Keywords: Physical Attributes; Evaluation Criterion; College Students

Introduction

Physical attributes refer to the body's abilities while doing exercise. To some extent, these abilities can also be seen as the integrated representation of human body morphology and function level. Physical attributes evaluation of college students is paid more and more attention by the physical educators. Therefore, how to use the result to give a comprehensive evaluation for the students' physical attributes is an important research task that needs to be solved in the physical fitness field and receive much attention from the sports workers. Since 1997, for various reasons, Chongqing has not established the physical attributes evaluation system for the local college students, which is entirely disproportionate to the social economic development of Chongqing. For this reason, the paper did analysis with the sample of three colleges' 7206 students health monitoring data in 2009 in Chongqing, and established the physical attributes score sheets, evaluation form for the college students in Chongqing according to the widely used evaluation methods. The goal of this research is to allow students to learn the place of the level of his/her physical fitness in the same age group, and enhance the students' motivation to exercise. Meanwhile, it can provide reference for the education administrative departments' decisions and further improving the college physical teaching in our city.

Subject and Methods

Subjects

The study adopt cluster sampling method according to the requirements of "2005 Implementation Plans of Physical Fit-

ness and Health Investigation on National College Students", and randomly selected 7206 Han students whom are aged 19 - 22 from Southwest University, Chongqing Normal University, and Chongqing Industry Polytechnic College. There are 3983 boys (1048 aged 19, 1236 aged 20, 748 aged 21, and 951 aged 22), 3223 girls (778 aged 19, 715 aged 20, 909 aged 21, and 821 aged 22).

Test Methods and Content

The study made physical attributes tests according to "2005 Inspection Detail Instruction of Physical Fitness and Health Investigation on National College Students". The tests included 50-meter race, standing long jump, 1000-meter race (boys), 800-meter race (girls), sit-and-reach, and throwing medicine ball.

Statistic Evaluation Method

The study employed the methods of percentiles to establish the single index and comprehensive evaluation criteria. The analysis was done with the help of SPSS. With the analysis of variance, physical attributes' indexes of all age groups of boys and girls showed no significant differences. So the data of age groups were merged according to the gender.

Results

Establishment of Single Physical Attributes' Index Evaluation Criterion

Grading of Single Physical Attributes' Index Evaluation Criterion

The grading of single physical attributes' index evaluation

criterion using time as the measuring unit (standing long jump, sit-and-reach, throwing medicine ball) (Table 1) was similar to those the time was not used as the measuring unit (50-meter race, 1000-meter race , 800-meter race), the two were different in the reverse rank order.

Establishment of Single Physical Attributes' Index Evaluation Criterion

The percentiles 3, 10, 25, 75, 90, 97 of boys' and girls' physical attributes were calculated respectively (Tables 2 and

3). Later, the evaluation forms of physical fitness were established (Tables 4, 5).

Establishment of Physical Attributes Comprehensive Evaluation Criterion

Physical attributes comprehensive evaluation was converting the results of the five physical attributes' indexes into the unified scores, and then graded the total points of the five physical attributes' indexes (Tables 6, 7).

1) The differences of percentiles 3 and 97 of boys' and girls'

Table 1. Grading of Single Physical Attributes' Index Evaluation Criterion not using Time as the Measuring Unit.

Grading	Criterion	Percentage/%
High	$X_i > P_{90}$	10
Better than Average	$P_{90} > X_i > P_{75}$	15
Middle	$P_{75} > X_i > P_{25}$	50
Lower than Average	$P_{25} > X_i > P_{10}$	15
Low	$X_i < P_{10}$	10

Table 2. Percentiles of Physical Attributes of Boys in Chongqing.

Index	P ₃	P ₁₀	P ₂₅	P ₇₅	P ₉₀	P ₉₇
50-Meter Race/s	8.6	8.0	7.6	7.0	6.8	6.5
Standing Long Jump/cm	187.0	205.0	215.0	241.0	256.0	270.0
1000-Meter Race/s	316.0	302.0	265.6	227.0	214.0	200.5
Sit-and-Reach /cm	1.7	4.5	10.0	18.0	21.1	24.2
Throwing Medicine Ball/m	6.5	7.4	7.9	9.8	10.0	12.0

Table 3. Percentiles of Physical Attributes of Girls in Chongqing.

Index	P ₃	P ₁₀	P ₂₅	P ₇₅	P ₉₀	P ₉₇
50-Meter Race/s	10.0	9.6	9.2	8.6	8.2	7.9
Standing Long Jump/cm	143.0	158.0	161.0	180.0	198.0	220.0
800-Meter Race/s	282.0	260.0	250.0	226.0	216.4	206.0
Sit-and-Reach/cm	4.1	9.3	12.8	18.8	21.2	24.0
Throwing Medicine Ball/m	3.9	4.2	4.8	6.1	6.8	8.1

Table 4. Evaluation Criterion of Physical Attributes of Boys in Chongqing.

Index	High	Better than Average	Middle	Lower than Average	Low
50-Meter Race/s	<6.8	6.8 - 7.0	7.1 - 7.6	7.7 - 8.0	>8.0
Standing Long Jump/cm	>256.0	241.0 - 256.0	215.0 - 240.9	205.0 - 214.9	<205.0
1000-Meter Race/s	<214.0	214.0 - 227.0	227.0 - 265.6	265.6 - 302.0	>302.0
Sit-and-Reach/cm	>21.1	18.0 - 21.1	10.0 - 17.9	4.5 - 9.9	<4.5
Throwing Medicine Ball/m	>10.0	9.8 - 10.0	7.9 - 9.7	7.4 - 7.8	>7.4

Table 5. Evaluation Criterion of Physical Attributes of Girls in Chongqing.

Index	High	Better than Average	Middle	Lower than Average	Low
50-Meter Race/s	<8.2	8.6 - 8.2	8.7 - 9.2	9.3 - 9.6	>9.6
Standing Long Jump/cm	>198.0	180.0 - 198.0	161.0 - 179.9	158.0 - 160.9	<158.0
800-Meter Race/s	<216.4	216.4 - 226.0	226.1 - 250.0	260.0 - 250.1	>260.0
Sit-and-Reach/cm	>21.2	18.8 - 21.2	12.8 - 18.7	9.3 - 12.7	<9.3
Throwing Medicine Ball/m	>6.8	6.1 - 6.8	4.8 - 6.0	4.2 - 4.7	<4.2

Table 6.
Score Sheet of Physical Attributes' Index for the College Students in Chongqing.

Score	50-Meter Race/s		Standing Long Jump/cm		Throwing Medicine Ball/s		1000-Meter Race (boys)/s, 800-Meter Race (girls)/s		Sit-and-Reach/cm	
	Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl
1	8.6	10.0	187.0	143.0	6.5	3.9	316.0	282.0	1.7	4.1
2	8.5	9.9	191.4	147.1	6.8	4.1	311.0	278.0	2.9	5.2
3	8.4	9.8	195.7	151.1	7.1	4.3	305.9	274.0	4.1	6.2
4	8.3	9.7	200.1	155.2	7.4	4.6	300.9	270.0	5.2	7.3
5	8.2	9.6	204.5	159.2	7.7	4.8	295.9	266.0	6.4	8.3
6	8.1	9.5	208.9	163.3	8.0	5.0	290.9	262.0	7.6	9.4
7	7.9	9.3	213.2	167.3	8.2	5.2	285.8	258.0	8.8	10.4
8	7.8	9.2	217.6	171.4	8.5	5.4	280.8	254.0	10.0	11.5
9	7.7	9.1	222.0	175.4	8.8	5.7	275.8	250.0	11.1	12.5
10	7.6	9.0	226.3	179.5	9.1	5.9	270.7	246.0	12.3	13.6
11	7.5	8.9	230.7	183.5	9.4	6.1	265.7	242.0	13.5	14.6
12	7.4	8.8	235.1	187.6	9.7	6.3	260.7	238.0	14.7	15.7
13	7.3	8.7	239.4	191.6	10.0	6.5	255.6	234.0	15.9	16.7
14	7.2	8.6	243.8	195.7	10.3	6.8	250.6	230.0	17.0	17.8
15	7.1	8.5	248.2	199.7	10.6	7.0	245.6	226.0	18.2	18.8
16	7.0	8.4	252.6	203.8	10.9	7.2	240.6	222.0	19.4	19.9
17	6.8	8.2	256.9	207.8	11.1	7.4	235.5	218.0	20.6	20.9
18	6.7	8.1	261.3	211.9	11.4	7.6	230.5	214.0	21.8	22.0
19	6.6	8.0	265.7	215.9	11.7	7.9	225.5	210.0	22.9	23.0
20	6.5	7.9	270.0	220.0	12.0	8.1	220.5	206.0	24.1	24.1

Table 7.
Comprehensive Evaluation Criterion of Physical Attributes' Index for the College Students in Chongqing.

Gender	High	Better than Average	Middle	Lower than Average	Low
Boy	>75	68 - 75	43 - 67	33 - 42	<33
Girl	>69	59 - 69	40 - 59	31 - 39	<31

physical attributes were calculated respectively, then divided by 19 and obtained the value when every point added or decreased.

2) Dividing the evaluation criterion of single physical attributes' index into 20 score sections, the total score was 20. The result of percentiles 97 of physical attributes' index evaluation criterion not using time as the measuring unit was 20; there is a corresponding drop of one score when a section score decreased. The result of percentiles 3 of physical attributes' index evaluation criterion using time as the measuring unit was 20; there is a corresponding drop of one score when a section score increased.

3) Obtain the summation of the results of every student's physical attributes' indexes.

4) Calculating the percentiles 10, 25, 5, 90 of the total scores of boys' and girls' physical attributes' indexes and establish the comprehensive evaluation criterion.

Usage of Evaluation Method

1) Identifying the score sheets of single physical attributes' index and physical attributes evaluation form according to the

gender, and find the corresponding scores and grade.

2) Comprehensive evaluation of physical attributes is calculating the total points of the single physical attributes' indexes, and then identifies the grade from the corresponding comprehensive evaluation form of physical attributes' index.

Conclusions

1) In this work, through the measurements of physical attributes' indexes of three colleges' 7206 Han students in 2009 in Chongqing, we established the physical attributes evaluation criterion for college students in Chongqing according to the method of percentile.

2) The physical attributes score sheets, evaluation form are applicable to the college students in Chongqing, and they can be popularized to other universities in Chongqing.

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