Effects of Short-Term Physical Training on Physical Fitness of Female College Students

Zhang Jie

Department of Physical Education, Shaanxi University of Chinese Medicine, Xianyang 712046, China

Keywords: Short-term physical training, Female students, Physical fitness, Analytic hierarchy process, Analysis of influence

Abstract: Health is the foundation of everyone's work and study. However, most college students are trying to avoid physical exercise, especially female college students. Their physical condition is not optimistic. This article discusses the basic principles of short-term physical exercise. According to the survey, in order to improve the physical condition of female college students, a short-term physical exercise program was proposed. Analyzed the impact of short-term physical exercise on the physical fitness of female college students using AHP. It can be concluded that short-term physical exercise can improve the physical fitness of girls. It can also improve the ability to fight disease.

1. Introduction

The modern society is becoming increasingly competitive, and the pace of urban life is accelerating. All people are working hard. They spend most of their time and energy on study and work. Physical exercise is always overlooked or forgotten. For female college students, physical exercise is their trouble. Most girls rarely participate in physical exercise unless physical exercise is necessary. Secondly, the physical training facilities and venues of major universities are mostly set up for boys. There are fewer sports facilities and venues for girls. This is also one of the reasons for girls' lack of physical exercise time [2]. Therefore, the physical condition of modern female college students is worrying. After all, the increasingly fierce competition in modern society is the competition for talents. This article uses the analytic hierarchy process to analyze the effect of physical exercise on the physical fitness of female college students.

2. The Physical Fitness Synopsis of Current Female College Students

Currently, most college students' physical exercise was inadequate. In this paper, we used questionnaire to count and analyze the participation of university students in physical exercise. It included nine colleges and universities in the northern, central and southern of china which involved nine different levels of economic development cities. The results are shown in Table 1.

Table 1 the Participation of Exercise Questionnaire of College Students in Teaching Day and Weekend

Teaching day	The total number	Male	Female	Total
	The exercise number	1052	780	1832
	Percentage	86.4	67.9	77.4
Weekend	The total number	Male	Female	Total
	The exercise number	970	635	1605
	Percentage	8305	54.4	65.3

In Table 1, it can be seen that the number of people participate in physical exercise in the usual lectures day is more than the weekend. This suggests that many college students are only take part in physical exercise in class and they participate in physical exercise in their spare

  DOI: 10.25236/iwass.2020.055

time is less [3]. At the same time, the survey results show that a considerable part of the college female students do not want to participate in physical exercise.

3. Research Steps

The testers involved in one or two hours of training a week for 16 weeks. They first had 10 minutes warming up and carried out the main activities for 40 minutes (tensile, general and muscle strength training, stamina, agility and power). The recovery time lasted for 10 minutes. This training program started with low strength training, and then gradually continued high strength. In order to prevent injuries and be more familiar with test, they went through tests at the start before physical training program. The physical training program is shown in Table 2.

Table 2 the Short-Term Physical Stamina Training Plan Project Table

Number	Purpose of measurement	Training project
1	cardiopulmonary health	1600 m walking and running
2	flexibility	proneness test
3	abdominal strength and endurance	Sit-ups
4	shoulder strength and endurance	push-ups
5	Muscle strength	vertical jump

4. The Basic Principles and Manners of the Short-Term Physical Training

The process of physical training is the process that human body consumes the nutrient. This process follows the law of energy metabolism. In the process of body movement, it mainly consumes glucose, oxygen-free phosphonic acids and blood lactate etc. We use it to provide the energy consumption of body in physical training [4, 5]. In this paper, we use blood lactate as an example to illustrate the basic principles of the short-term physical training as shown in Figure 1.

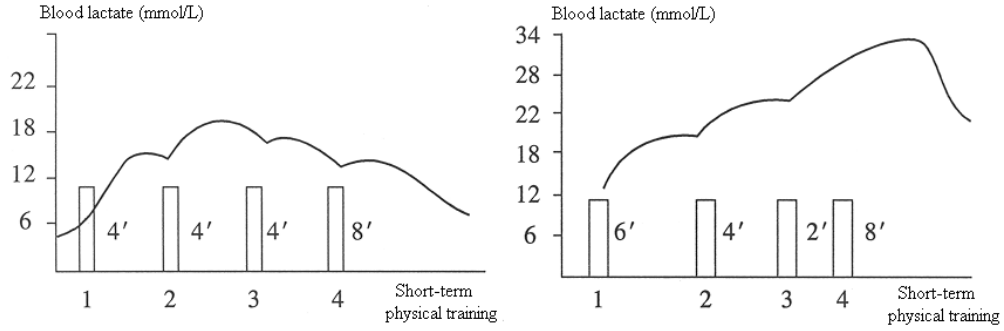

Fig.1 Schematic Diagram of Blood Lactate Consumption in Short-Term Physical Training

The short-term physical training is used to improve the motor function and physical fitness through the flexibility and durability exercise of the various parts of human body. This process need to exert some exercise load to the trainees when they are taking physical training. The body will consume energy to adapt to the stimulus when it is stimulated by external load. So the entire process can also be regarded as the energy consumption and recovery process.

5. The Impact of Physical Training on the Physical Fitness of Female College Students Based on Analytic Hierarchy Process

Assuming that the impact factors of physical training on the physical fitness of female college students is U . For each level of impact factors, there will be the next level influencing factors u_1 . We can make it as $U = \{u_1, u_2, ..., u_k\}$, and it must meet $\cup_{i=1}^{k} U_i = U$, $U_i \cap U_j = \Phi$.

We can get the proportion value of all levels influencing factors through the calculation of the survey data results. So we can get the evaluation matrix of each level impact factors. The assessment results can be derived by the following formula $B = A \cdot R$. We can get the impact factors value of physical training on the physical fitness of female college students through the survey and calculation as shown in Table 4.

Table 4 Distribution Table of the Physical Training Impact Factors on the Physicalf Itness of Female College Students

First-level factors	Second-level factors	Third-level factors
Physical condition $u_1(0.45)$	Physical illness $u_{11}(1/3)$	
	Emotional factors $u_{12}(1/3)$	
	Menstrual period $u_{13}(1/3)$	
Training intensity $u_2(0.2)$		
Training facilities $u_3(0.15)$	Indoor facilities $u_{31}(0.5)$	
	Outdoor facilities $u_{32}(0.5)$	
external environment $u_4(0.2)$	Weather conditions $u_{41}(0.4)$	Area $u_{421}(0.5)$
	Site conditions $u_{42}(0.6)$	Shape $u_{422}(0.5)$

We can see from Table 3, the impact factors of the physical training on the physical fitness of female college students can be divided into three. Namely:

The first-level: $U = \{u_1, u_2, u_3, u_4\}$;

The second level: $u_1 = \{u_{11}, u_{12}, u_{13}\}, u_3 = \{u_{31}, u_{32}\}, u_4 = \{u_{41}, u_{42}\}$;

The third level: $u_{42} = \{u_{421}, u_{422}\}$;

The appraisal of factors influencing is done by level

(1) $U = \{u_1, u_2, u_3, u_4\}$

The proportion set is $A = \{0.45, 0.2, 0.15, 0.2\}$. So the assessment results are:

$$B = A \cdot R = A \cdot \begin{pmatrix} B_1 \\ B_2 \\ B_3 \\ B_4 \end{pmatrix} = (0.45 \quad 0.2 \quad 0.15 \quad 0.2) \cdot \begin{pmatrix} 0.901 & 0.825 & 0.78 & 0.662 \\ 0.92 & 0.901 & 0.85 & 0.548 \\ 0.87 & 0.921 & 0.754 & 0.813 \\ 0.854 & 0.687 & 0.648 & 0.756 \end{pmatrix} = (0.81, 0.84, 0.8, 0.72) \tag{1}$$

(2) $u_1 = \{u_{11}, u_{12}, u_{13}\}$

The proportion set is $A_1 = \{1/3, 1/3, 1/3\}$. So the assessment results are:

$$B_1 = A_1 \cdot R_1 = A_1 \cdot \begin{pmatrix} B_{11} \\ B_{21} \\ B_{31} \\ B_{41} \end{pmatrix} = (1/3 \quad 1/3 \quad 1/3) \cdot \begin{pmatrix} 0.921 & 0.84 & 0.647 \\ 0.824 & 0.645 & 0.725 \\ 0.765 & 0.821 & 0.851 \end{pmatrix} = (0.82, 0.74, 0.75, 0.68) \tag{2}$$

We can carry out the assessment of influencing factors to $u_3 = \{u_{31}, u_{32}\}$, $u_4 = \{u_{41}, u_{42}\}$, $u_{42} = \{u_{421}, u_{422}\}$ by turns. The results are shown in the following: Short-term physical training program can improve the heart and lung function of female students well. It can also improve lung capacity, blood pressure, pulse and other physiological indicators of female students. Meanwhile, it can also reduce the weight of the female students and make their body curves more perfectly. The most important thing is that short-term physical training can improve the ability of female students to fight disease. It can also improve the physical fitness of female students.

6. Conclusion

Physical fitness is an important aspect of future talent competition. A healthy body is the guarantee of successful study and work. In view of the low conditions of female college students, it is proposed that schools and the government should increase investment in campus sports facilities and physical education teachers. Carry out various sports courses and sports activities to guide students to actively participate in fitness activities. At the same time, college students should also pay attention to their own health. They should not waste a lot of time on games and entertainment. They should regularly participate in sports activities organized by schools, community organizations and classes to maintain good health.

References

[1] Po-Yu Chen, Joanna McKittrick, Marc André Meyers, “Biological materials: Functional adaptations and bioinspired designs“, Progress in Materials Science, Vol. 57, No. 8, pp. 1492-1704, 2012.

[2] V. Racic, A. Pavic, J.M.W. Brownjohn, “Experimental identification and analytical modelling of human walking forces: Literature review“, Journal of Sound and Vibration, Vol. 326, No. 1–2, pp. 1-49, 2009.

[3] Su Rui, Xun Ma, “The Impact of Title Event Sponsorship Announcements on Enterprise incomings Based on Background of China”, AISS, Vol. 4, No. 19, pp. 438-442, 2012

[4] Lael Gershgoren, Gershon Tenenbaum, Aaron Gershgoren, Robert C. Eklund, “The effect of parental feedback on young athletes' perceived motivational climate, goal involvement, goal orientation, and performance“, Psychology of Sport and Exercise, Vol. 12, No. 5, pp. 481-489, 2011.

[5] Mark H. Anshel, Norman L. Weatherby, Minsoo Kang, Tiffany Watson, “Rasch calibration of a unidimensional perfectionism inventory for sport“, Psychology of Sport and Exercise, Vol. 10, No. 1, pp. 210-216, 2011.