

Exercise Intervention on the Physical fitness and Mental Health of Physical Vulnerable Group

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Abstract: According to the physical fitness and mental health status of the physical vulnerable group students, the authors adopt documentation, psychological measurement, statistics and other research methods, studying the effect of the self-exercise, the contract exercise and the prescription exercise on the physical fitness and mental health of the vulnerable group students. The result shows, the self-exercise, the contract exercise and the prescription exercise contribute to the improvement of the physical fitness and the mental health, the prescription exercise significantly improves the students' physical fitness, the contract exercise significantly improves the student's mental health.

1. Introduction

The "Healthy China 2030" Planning Outline promulgated in October 2016 pointed out that the implementation of the Youth Sports Activity Promotion Program, the cultivation of young people's sports hobbies, and the basic realization of young people's proficiency in more than one sports skills, to ensure that students do not have daily physical activity time on campus less than 1 hour [1]. Looking at the literature at home and abroad, most of the research is aimed at the normal population [2-3], and there are few studies on the physical and mental health of the vulnerable group students [4], especially the programs that guide them on how to conduct science movements are rare.

2. Research object and method

2.1 Research object

This subject is studied in the 2015 sports health class students of three universities including Central South University, Hunan Normal University and Hunan University of Traditional Chinese Medicine. According to the test results of the "National Student Physical Health Standards" test data and the physical health status questionnaire [5] (PAR-Q) prepared for freshmen, combined with the definition criteria of students from disadvantaged groups, stratified randomization A sample of 200 girls was selected to form a study sample.

2.2 Research methods

2.2.1 Document literature

Review relevant literature and literature to provide theoretical material for this study.

2.2.2 Questionnaire Survey

Mental health measurements were performed using the Symptom Checklist 90 (SCL-90).

2.2.3 Measurement method

9 items including height, weight, vital capacity, vertical pulse and Stang test, sit-up, standing long jump, sitting body flexion, 800m running, etc. were selected for measurement and evaluation at the end of the first semester and the end of the second semester.

2.2.4 Experimental method

200 girls were randomly divided into autonomous exercise group (50 people), contract exercise group (50 people), department exercise group (50 people) and control group (50 people). During the extracurricular physical activity time, different exercise intervention programs were implemented for the experimental group girls (Table 2), and the control group was given regular physical activity extracurricular activities.

Exercise Intervention Program: Select students' extracurricular activities time, three times a week, scheduled for Monday, Wednesday, Friday afternoon, and last for two semesters from September 2016 to July 2017 for one academic year. According to the physical health status of related students and related research [4-7], the sports content selected in this study are fast walking, jogging, stretching flexibility exercises, soft volleyball, hand-held dumbbells and other strength exercises, in order to let the students Being able to persist for a long time, paying attention to fun and entertainment in the choice of sports content, adding sports games and skipping exercises. The exercise intensity is controlled in low to medium exercise intensity, i.e. $(220 - \text{age}) \times (55\% \text{ to } 70\%)$. Students wear a telemetry heart rate monitor and use the self-inductive force scale (RPE) to monitor exercise intensity immediately after exercise.

2.3 Mathematical Statistics and Analysis

All data were statistically processed and analyzed using SPSS 17.0 computer software. Data were expressed as $\bar{X} \pm S$, and paired t-test was used for comparison between groups. The significant level was $\alpha = 0.05$.

3. Results and analysis

3.1 The effect of exercise intervention on the physical health of students from disadvantaged groups

3.1.1 Body shape

Some investigations have shown that the school pays insufficient attention to the physical activities of the physically disadvantaged students, and the form is mainly self-exercise [6], which is also the reason for the group to set up an independent exercise group. There was no significant difference between the experimental group and the control group before the experiment; after one year of exercise intervention, the body weight of the students in the self-training group, the contract-based exercise group and the exercise group was significantly lower in terms of body shape. In the control group, there was a significant difference between the contract exercise group and the exercise group ($P < 0.05$).

3.1.2 Physical function

From the analysis of Table 5, it can be seen that the lung capacity of the students in the self-training group, the contract-type exercise group and the exercise group is significantly higher than that before the intervention, and there is a significant difference between the contract-type exercise group and the exercise group ($P < 0.05$); Compared with the control group, there was a significant difference in the vital capacity between the exercise group and the contract exercise group ($P < 0.05$). There was a significant difference in the resting heart rate among the students in the exercise group ($P < 0.05$).

Self-assessment is an exercise method for athletes using simple test methods or simple instruments to evaluate exercise health effects [5]. After the exercise, the experimental group had

significant differences in lung capacity, supine position pulse difference and Stein test. Tips for vertical pulse and Steiner test, as a simple and effective indicator for evaluating cardiac function and ventilator endurance, are suitable for students' self-assessment, which is also a powerful supplement to the national standard of physique health test organized by the school [7].

3.1.3 Physical quality

The students in the self-training group improved compared with the pre-intervention, but there was no significant difference. The students in the contract exercise group and the exercise group had a significant improvement in sitting position, sit-ups, standing long jump and 800m. ($P < 0.05$); Compared with the control group, the students in the exercise group had significant differences in the sitting position, sit-ups, standing long jump and 800m ($P < 0.05$).

The school pays insufficient attention to the physical health of students from disadvantaged groups. Without effective management and intervention, it is an important reason for their low physical fitness [5]. The results show that the physiology of college students in adolescence has greater plasticity, and guiding them to physical exercise in the short term is the most effective means to improve their physical fitness. Therefore, in order to comply with the sunshine sports, as soon as possible to improve the physical fitness of the physically disadvantaged group of students, we are more ideal means for sports prescription guidance for college students before the physical health test.

3.2 The impact of exercise intervention on students' mental health

Due to physical weakness, obesity or thinness and illness, students of physique and disadvantaged groups have relatively low exercise abilities, and psychologically have problems such as inferiority and narrow communication range [8].

Compared with the pre-experimental group, there were significant differences in somatization, interpersonal sensitivity, anxiety and paranoid factors among the students in the exercise group ($P < 0.05$). The students in the contractive exercise group were somatic, interpersonal, sensitive, depressed and anxious. There were significant differences in hostility and terror factors ($P < 0.05$). Compared with the control group, the contractive exercise group had significant differences in interpersonal sensitivity and anxiety factors ($P < 0.05$).

After one-way analysis of variance, the contractive exercise group had significant differences in somatization, interpersonal sensitivity and anxiety factors ($P < 0.05$). Studies have shown that physical exercise is a positive coping style. Participation in physical exercise can alleviate psychological stress. Exercise intervention is a means to effectively improve mental health with low economic expenditure, low risk and low side effects [9]. In the contractive exercise, the teacher pays attention to the student's subject status, respects the students' needs, abilities, background, personality and spiritual world requirements.

3.3 Scientific analysis of exercise intervention

It can be seen from Fig. 1 that the average monitoring value of the RPE is between 10-12. The subjective motor feeling is slightly tired, which is equivalent to the heart rate of 120-140 times $\cdot \text{min}^{-1}$. From the results of the study, it is directly related to the exercise effect of the exercise intensity of the students in the physical disadvantage group. The mode exercise group and the contract exercise group adopted low to medium exercise intensity, and the student's physical health level was significantly improved.

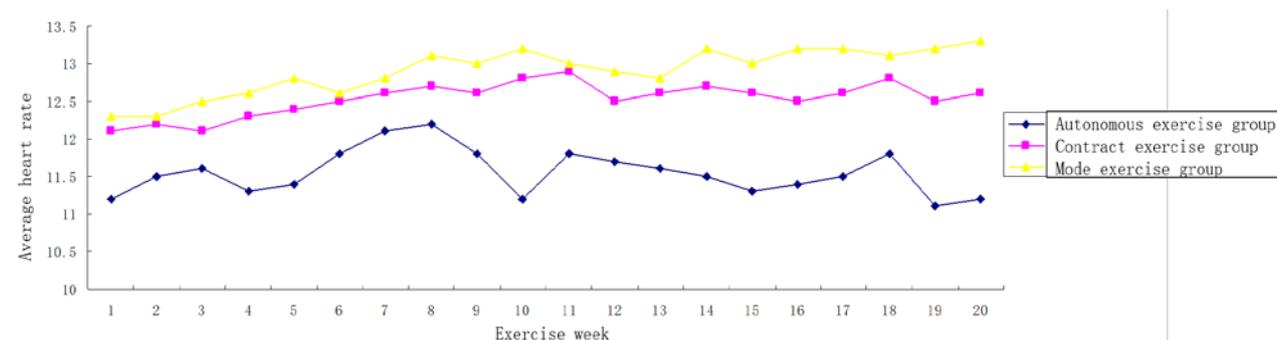


Figure 1. Statistical graph of RPE monitoring during physical exercise intervention

4. Conclusion

1) Physically disadvantaged groups students have achieved different levels of physical function, physical fitness and mental health after participating in autonomous exercise, physical exercise and contractual exercise.

2) The contract-type exercise group and the mode-based exercise group have higher levels of physique participation, and the physique health level of the physique-stricken group is more obvious. Especially, the exercise group is more effective in improving the cardio-respiratory function and physical quality of the students.

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