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The Effects of After-School Activity Patterns of Different Sports Programs on the State of Mind of Secondary School Students

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Project Title: Tianjin Education Science Planning Project (HBE220175): Practical Exploration of Improving Students' State of Mind in Secondary Schools' Specialized After-school Sports Activity Models under the Background of "Double Reduction".

Abstract: The use of profile of mood states(POMS) is to examine the forms of physical activity of secondary school students during their school years, and to understand the changes and differences in the students' psychological state under different sports programs and activity modes. In the context of "Double Reduction", POMS can be used to provide scientific suggestions for secondary school students' daily physical exercise and improvement of their physical and mental health, as well as a reference basis for schools to better introduce school-based programs for physical activities.

Keywords: Secondary school students; Sports program; After-school activity mode; State of mind

1. Introduction

According to a number of national policy documents and education documents issued by the Ministry of Education and other local governments, the proportion of physical education courses has been greatly increased. With the continuous promotion of the "Double Reduction" policy, students have more after-school time for physical activities during school. An important task for schools is to explore how to provide students with a more reasonable and suitable mode of special after-school physical activities in the more independent after-school hours of schools. Under the premise of respecting their independent right to choose, based on students' interests, students' internal drive is mobilized to change physical activities from passive to active and consciously engage in after-school physical exercise. The purpose of this study is to explore the impact of different sports programs and modes of after-school sports activities on the state of mind of secondary school students. This study aims to explore the effects of different sports programs and modes of after-school sports activities on the state of mind of secondary school students, and to provide practical support for secondary schools to better prepare after-school sports activities under the background of "Double Reduction".

2. Research Objects and Methods

2.1 Research Objects

2.1.1 Basic Information of Research Subjects

Random clusters were selected from the 2022 and 2023 high school students of a middle school in Tianjin, of which 320 were male and 300 were female, aged between 16 and 17 years old. Differential analysis is based on the data of the physical fitness test for school entrance, and there is no significant difference in physical fitness.

2.1.2 Homogeneity Test of Profile of Mood States (POMS) for Study Subjects

Measurement of the profile of mood states (POMS) and statistical analysis of inter-group variability of TMD scores of the questionnaire for all students before the experiment ($F=0.29, p=0.75>0.05$) showed that there was no significant difference between participants in all sports, indicating that the homogeneity of the state of mind of the students in each group was high, which ensured the accuracy of the study.

2.2 Measurement Tools

The Profile of Mood States (POMS) [1] was developed by NcNair and translated and revised by Prof. Zhu Beili of East China Normal University as a Chinese norm. The profile of mood states is used to measure individual mood states and mood changes, including seven dimensions: energy and self-esteem are positively scored, and all other dimensions are negatively scored. The Total of Motional Disturb ((TMD) score was calculated as the total score of the five negative moods minus the total score of the two positive moods, and the score plus a correction value of 100 was the final total score. The Cronbach's α for this scale with each dimension in this study was 0.802-0.934.

2.2.1 Experimental Procedures

The students participating in the action research independently chose the sports programs, activity time, and participation methods according to their own actual situation. The programs involved include soccer, volleyball, basketball and badminton, running, street dance and aerobics. Since there were fewer male students in the street dance group and only female students in aerobics, all the participants in these two sports were set to be female, and the male students who chose street dance were coordinated to join the basketball and soccer programs respectively. In between, 12 weeks of action practice is required.

2.2.2 Data Processing

SPSS 22.0 for Mac statistical software was used to analyze the data and test the difference between the experimental group and the control group for each variable.

3. Research Results

3.1 Differences in Profile of Mood States(POMS) of Students Before and After Control

After 12 weeks of formal teaching experiments, the two control groups did not carry out targeted teaching practice interventions, and compared with the data from 12 weeks ago, the results showed that the total score of the students' state of mind ($t=1.333$, $p>0.05$) in control group 1 (non-participation in sports), did not show significant differences, and the scores in the dimensions were also all non-significant differences. The total score of students' state of mind ($t=2.695$, $p<0.05$) in control group 2 (free exercise group), showed a significant difference, along with significant differences in the dimensions of tension and depression ($t=4.862$, $p<0.05$; $t=2.381$, $p<0.05$).

Control group 1 and control group 2, after 12 weeks of intervention in teaching practice, the total score of students' state of mind ($t=3.406$, $p<0.05$), control group 2 showed a significant difference with control group 1 in the total score of TMD, and in the dimension of self-esteem ($t=2.178$, $p<0.05$), and in all other dimensions showed a significant improvement, but did not show a significant difference .

3.2 Differences in Profile of Mood States (POMS) between Control and Experimental Group Students

After the 12-week teaching practice intervention, significant differences were presented between the two control groups, so in the process of testing the differences with each experimental group, the differences were tested only with control group 2. The results showed that all seven experimental program groups presented non-significant differences with control group 2 ($p>0.05$), and under each dimension, only self-esteem presented a significant difference in the test of difference between the seven experimental program groups and control group 2 ($t=4.872$, -2.13 8,3.077,2.317,2.629,2.178,3.406, $p<0.05$), and under

the other dimensions, no significant differences were presented.

To further verify the differences of the experimental program groups, the experimental data were divided into two groups of “systematic training” and “free exercise” before the statistical data were collected to test the differences of the two groups, and the results showed that no significant differences were shown between the two groups, and the results showed that the differences between the two groups in the “energy” and the “energy” of ball games were not significant. The results showed that there was no significant difference between the two groups, but ball games showed a significant difference in the dimension of “energy” ($p<0.05$); aerobics and street dance showed a significant difference in the dimension of “panic” ($p<0.05$).

3.3 Effects of Different Sports Programs on State of Mind

3.3.1 Effects of Different Sports on Participants' State of Mind

After playing soccer, the participants' sense of “fatigue” decreased significantly ($t=4.432$, $p<0.005$), reaching a highly significant level. After participating in basketball, the participants had a significant effect on the improvement of their positive mood, increasing their “energy” ($t=-3.415$, $p<0.005$) and “self-esteem” ($t=-4.039$, $p<0.005$). 0.005). The volleyball program had an effect on the participants' negative emotions, significantly improving their “nervousness” and total TMD score ($t=6.277$, $p<0.005$, $t=4.195$, $p<0.005$), but also showed an increase in their “panic” state ($t=3.415$, $p<0.005$, $t=-4.039$, $p<0.005$) and “self-esteem”. panic” state increased ($t=-11.281$, $p<0.005$). Badminton sport had a significant change in improving participants' depression as well as total TMD score ($t=9.165$, $p<0.005$, $t=8.825$, $p<0.005$). In comparison to traditional ball games, the aerobics program was able to improve negative emotions, especially “tension” and “anger” ($t=6.603$, $p<0.005$, $t=3.442$, $p<0.005$) to a significant level, and was also able to improve the total score of depression and TMD ($t=9.165$, $p<0.005$, $t=8.825$, $p<0.005$). Significantly, the program also significantly increased the positive emotion of “self-esteem” ($t=-3.551$, $p<0.005$). The Body Dance program also significantly increased participants' self-esteem ($t=-2.612$, $p<0.05$) and improved participants' total TMD scores. Participants who joined the long-distance running training significantly improved the negative emotions of “nervousness” and “depression” ($t=4.852$, $p<0.005$, $t=2.136$, $p<0.05$), but for the participants, “fatigue” was significantly improved ($t=-2.612$, $p<0.05$), as well as the total TMD score. “Fatigue” also showed a significant negative effect ($t=-2.032$, $p<0.05$).

3.3.2 The Effect of Participants' Gender and the Result of the Match on Participants' State of Mind in Different Programs

In soccer and badminton sports, the total state of mind TMD scores as well as the dimensions did not show significant differences in terms of gender. After participating in basketball, girls were significantly higher than boys in the dimensions of “fatigue” and “self-esteem” ($t=-2.612$, $p<0.05$, $t=-2.031$, $p<0.05$), while boys were significantly higher than boys in the dimensions of “depression” and “self-esteem” ($t=-2.031$, $p<0.05$). “depression” and ‘energy’ dimensions were significantly higher than girls ($t=2.332$, $p<0.05$, $t=2.441$, $p<0.05$). Volleyball sport program has more significant differences in gender, especially in “tension”, “depression”, “fatigue”, “energy” and “self-esteem”. “ and “sense of self-esteem” were significantly higher than boys ($t=-2.534$, $t=-1.976$, $t=-2.076$, $t=-2.875$, $t=-2.693$, $p<0.05$), whereas boys were significantly higher in “anger “ and “panic” dimensions were significantly higher than girls ($t=2.988$, $p<0.05$, $t=2.659$, $p<0.05$). In the long-distance running event, boys were significantly higher than girls in the increase of “fatigue” ($t=3.661$, $p<0.005$), while girls were significantly higher than girls in the dimensions of “energy” and “self-esteem” ($t=2.988$, $p<0.05$, and $t=2.659$, $p<0.05$, respectively). “ dimensions were significantly higher than boys ($t=-2.852$, $p<0.05$, $t=-2.734$, $p<0.05$).

In competitive sports, winning and losing have a greater impact on the participants' state of mind, and at the end of the 12-week systematic practice intervention, competitions in different sports are organized, and the participants are administered a state of mind questionnaire after the competitions. The results showed that after the competitions in the four ball games and the long-distance running program, the “energy” and “self-esteem” and the total TMD scores of the participants who won the competitions were significantly higher than those of the participants who lost the competitions ($p<0.05$), whereas among the negative emotions, the “energy” and “self-esteem”

of the participants in the four ball games and the long-distance running program were significantly higher than those of the participants who lost the competitions ($p<0.05$). Fatigue" and 'Anger' were significantly lower ($p<0.05$) in the four ball games than in the losing games, while 'Fatigue' and 'Anger' were not significantly higher ($p<0.05$) in the long-distance running games, even if they did not achieve good results in the games. There were no significant differences in "fatigue" and "anger" for long-distance running even if the participants did not achieve good results in the competition, and there were no significant differences in the other dimensions for all the programs.

3.3.3 Relevant Factors Affecting Participants' State of Mind in Sports Programs

Four factors, namely, sports, enjoyment, intensity and self-evaluation, were analyzed in relation to the state of mind and the dimensions. The results showed that the state of mind of "fatigue" was significantly positively correlated with the program (r=0.245*), negatively correlated with the degree of enjoyment of the sport (r=-0.274**), positively correlated with the intensity of the sport (r=0.223**), and had no significant correlation with self-evaluation; "Anger" and "nervousness" were only significantly positively correlated with self-assessment (r=0.202**); "depression" was significantly negatively correlated with activity program preference (r=-.202**); and "depression" was significantly negatively correlated with activity program preference (r=-.274**). The state of "depression" was significantly negatively correlated with the activity program and the level of preference (r=-.201**, r=-0.151*), and significantly positively correlated with the participant's self-evaluation (r=.255**); the states of "self-esteem" and "energy" were significantly positively correlated with the program of activity, the intensity, the level of preference, and the self-evaluation of the participant. The positive affective states of "self-esteem" and "energy" were significantly positively correlated with activity program, exercise intensity, preference, and self-evaluation (r=.220**, r=0.229**, r=.203**, r=0.179*); the total TMD score was significantly positively correlated with self-evaluation only (r=.185*).

4. Educational Recommendations

In the context of "Double Reduction" education, how to efficiently carry out students' favorite sports programs at the school level and the operation mode are the focus of this study. Based on the results of the action research, it can be concluded that, firstly, students must maintain the time for sports during the school period, whether it is free activities or systematic or non-systematic training at the specified time, or other forms of sports, as long as the students are seriously engaged in sports, they can significantly improve their state of mind and reduce the level of negative emotions, which is consistent with the peak of the results of the research [2]. Secondly, the organization of colorful forms of sports, expanding the intersection of sports disciplines and other disciplines, appropriate sports festivals, fine-tuning the organization of different sports competitions, can enhance the positive emotions of the participants, consistent with the results of Huang Zhijian's research [3], and at the same time the need to take into account the losing side of the psychological guidance to guide the participants in the competition program to experience the role of positive emotions [4], and can master the disposition of negative emotions. Third, from the school level to give institutional support, strengthen the sports time as well as sports venues, regular regular opening of sports venues, create a physical environment for sports, and vigorously create a school sports culture, can be set up by the teacher or class mutual support group, drive students who do not want to participate in sports by running, the establishment of a regular punch card activities, to create an atmosphere of good sports environment in permanent schools.

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