



Research on physical activity assessment and health intervention for special group students in colleges and universities

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Abstract: Although the health level of physical activities among college students has gradually improved in recent years, the health level of physical activities among special groups in colleges and universities is not satisfactory. The purpose of this study is to improve the health level of students' physical activities through physical activity assessment and health intervention of special groups of students in colleges and universities. Firstly, this study evaluated the physical activities of special groups of students in colleges and universities with literature research, questionnaires and qualitative analysis to understand their physical activity health levels and analyze the reasons for their physical inactivity. Secondly, this study also explored measures to implement health interventions in the following five areas: adjusting students' awareness of physical activities; increasing students' physical activities; providing personalized physical activity exercise programs; adjusting physical education assessment standards and improving the physical activity environment. Finally, this study also put forward a series of recommendations to optimize students' physical activities and improve their physical activity health.

Key words: special groups in colleges and universities; physical activities; assessment; health intervention

1 Introduction

With the expansion of college enrollment and the gradual improvement of enrollment policies for students of special groups in colleges and universities, the number of special groups of students with a certain degree of movement disorders is also increasing year by year. To develop the education for special groups and ensure that the students of special groups enjoy equal education, the State has issued various laws and regulations, such as Article 10 of the *Teaching Guideline for Physical Education Courses in National Colleges and Universities*, which stipulates that physical education courses for rehabilitation and health care should be offered to students of special groups like some physical abnormalities, sickness, disability and individual senior students, and the *Provisional Regulations for Special Education Schools*, etc., which provide strong support for the development of physical education of special group students in colleges and universities. These laws and regulations provide a strong legal basis and documentary support for the development of physical education for students of special groups in colleges and universities. In this paper, the special group students referred to those with special physical conditions (such as those with disabilities or various diseases, that are not suitable for strenuous sports through medical examination), students recovering from surgery or illness and students who have difficulties in sports due to obesity or thinness.

The physical education classroom in colleges and universities is the main place for students' physical activities in school, and there are still many problems in teaching physical education for special group students [1]. At present, it is difficult to choose the special group physical education curriculum content of general colleges and universities to meet the requirements of special groups [2][3]. In addition, the research on physical education for special groups of students in general colleges and universities in China is still immature, which is mostly at the spontaneous stage and lacks in-depth research [4][5][6].

Based on the above reasons, this study takes the physical activity status of special groups of college students as the research object, and scientifically designs the exercise intervention with personalized rehabilitation function training as the main means to provide new ideas for physical health improvement, physical education and health curriculum reform of special groups of students in general colleges and universities.

2 Purpose and significance of the study

First of all, this study adopts the physical activity questionnaire to quantitatively evaluate the physical activities of students with special needs in general colleges and universities. The evaluation can comprehensively and accurately reflect the level of daily physical activities and physical energy consumption of special groups of students in general colleges and universities, which can draw more scholars' attention to the physical health problems of special groups of students caused by insufficient physical activities and also provide new ideas to explore the reform of physical education curriculum for special groups of students in general colleges and universities.

Secondly, this study adopts functional training as a means of physical activities in the field of athletics and rehabilitation, which is a purposeful training to improve their abilities. The introduction of functional training into physical education for special groups of students in general colleges and universities is an application of this training method to the general public and student groups other than elite and professional athletes, which has increased its intervention in the field to some extent.

In addition, the physical health condition of special group students in colleges and universities varies greatly, so the physical health intervention through questionnaire survey and personalized rehabilitation functional training can "prescribe the right medicine", effectively improve the subhealth condition of special group students in general colleges and universities, and improve their physical health level.

3 Research subjects and methods

3.1 Research subjects

In 2022, a survey was conducted on a small number of colleges and universities in Shaoxing with special groups of college students as the target group. A total of 1,165 students including 692 male students and 473 female students, were selected through physical education teachers.

3.2 Questionnaire survey methods

The basic information of the research subjects was collected through an Excel sheet, including age, gender, major, grade, and physical condition. The IPAQ short paper was selected as the survey tool to investigate the form of physical activities and the cumulative time of each physical activity of the subjects every week. A total of 7 questions were put forward, 6 of which were based on the inquiry of individual physical activities of the surveyed students, divided into low intensity (e.g., walking), moderate intensity, and high intensity. The frequency and cumulative duration of physical activities of different intensities within seven days were investigated, and recorded continuously for one week. The known duration and frequency of physical activities per week were multiplied by the metabolic equivalent value (MET) of the individual when performing a certain intensity of physical activities, and then the level of physical activities at a certain

intensity was calculated. The physical activity level of the respondents was divided into three levels, i.e., low, medium and high, according to the energy expenditure. In addition, the intensity of physical activities was categorized as low intensity, i.e., walking, moderate intensity, and high intensity, where the metabolic equivalent of low intensity represented by walking was 3.3 MET, the metabolic equivalent of moderate intensity physical activity was 4 MET, and the metabolic equivalent of high intensity physical activity was twice as high as moderate intensity, i.e., 8 MET. The calculation formula was: physical activity level = metabolic equivalent (MET) × activity time (min/d) × days of activity (d/w) [7]. The individual total physical activity level of the studied subjects = low intensity + medium intensity + high intensity. The students of the subjects were uniformly trained, and the questionnaire forms were distributed in school classrooms. The students were instructed on how to fill out the questionnaires, and one person was responsible for regular questionnaire visits and post-questionnaire recovery and finishing.

3.3 Mathematical statistics

Excel and SPSS21.0 software were chosen to establish a database for statistical analysis of the data. The physical activity information was mostly non-normally distributed. The physical activity time and energy expenditure data were analyzed descriptively using median and interquartile range (IQR), and the non-parametric rank sum test was used for the comparison of physical activity time.

4 Results and analysis

4.1 Basic information

1,165 respondents completed this physical activity questionnaire, excluding 82 unqualified ones. The final number of valid questionnaires was 1,083, accounting for 92.96%, and the average age of respondents was 21.34±1.34.

4.2 Physical activity form statistics

Table 1. Statistics on the form of physical activities of the respondents

Number of weekly exercise	Classroom exercise	Independent exercise outside classroom	Private physical exercise	Hospital rehabilitation training	Household activities
0	77.10%	45.34%	94.55%	78.76%	17.64%
1	22.90%	24.19%	3.60%	1.20%	36.29%
2	0	18.1%	1.85%	15.14%	32.69%
3	0	8.96%	0.6%	4.9%	2.95%
4	0	3.41%	0	0	2.4%
5	0	0	0	0	8.03%

According to the statistical table of the subjects' personal physical activities 7 days a week, it can be found that the highest percentage of zero weekly exercise was private physical training, followed by hospital rehabilitation training, classroom physical exercise and extracurricular independent exercise, accounting for 94.55%, 78.76%, 77.10% and 45.34% respectively. There are few students in rehabilitation training, the participation rate of domestic activities was higher than other physical activities, and the number of participants was also more.

According to the above analysis, the physical activities of the special group students were affected to some extent. First of all, their participation in physical activities was significantly lower than that of normal students. As shown in Table 1, it can be seen that the students from special groups rarely participate in various physical activities and exercises, only

very few of them are willing to participate in sports and most of their physical activities mainly originate from domestic activities required or forced by life. Secondly, it can be seen from the proportion of rehabilitation training that students of special groups have little awareness of post-operative and other physical rehabilitation training, and their overall participation is not high.

4.3 Physical activity level

In a university, the total number of special group students surveyed with high-level sports activities is 24, accounting for 0.22%; the total number of those with medium level of physical activities was 386, accounting for 35.6%, and the total number of those with low level of activities was 673, accounting for 62.1%. In addition, the survey results also show that the physical activities of special group students in colleges and universities present the following characteristics: First, the medium and high intensity physical activities were dominated by male students, while female students were mainly for medium and low intensity. Second, the physical activity level of students in special groups tends to decrease with age or grade, reflecting the specificity of age change in the physical activity level of the special groups. Third, the form of physical activities is mainly reflected in the form of daily life, and the energy consumption of physical activities obtained from physical exercise inside and outside classroom is relatively small, especially the intensity of physical activities in the classroom.

4.4 Duration of physical activity

Table 2. Duration of physical activity of the interviewees

Duration (min/d)	≤15	15≤30	30≤45	45≤60	60≤90	90≤120	≤120
Walking	1.19%	11.46%	73.05%	12.32%	1.19%	0.68%	0.11%
Medium Strength	15.03%	37.82%	45.22%	1.93%	0	0	0
High Strength	75%	16.67%	8.33%	0	0	0	0

The daily physical activity hours of the respondents were categorized according to the intensities. Among them, the length of walking activity was longer. Most of the respondents were able to complete at least 15 minutes of walking per day, 73.05% of respondents could walk for about 45 minutes per day, nearly 12.32% could reach about 1 hour per day, and a very small number of people could complete more than 2 hours of walking per day. The number of moderate intensity physical activities was concentrated in the range of 15 to 45 minutes per day, dropping to 1.93% for 45 to 60 minutes and almost none for more than 60 minutes. Fewer students participated in high intensity and the duration is relatively short.

The percentage of physical activity hours with various intensities among the respondents shows that students in special groups spent significantly less time in physical activities than normal students. In particular, the duration of high-intensity physical activities was significantly lower than that of normal students' physical activities. Due to their physical conditions, most of the students' daily physical activities and physical exertion originated from walking.

5 Health intervention measures for physical activities of college students from special groups

5.1 Strengthening the health awareness of students from special groups

Currently, many students who undergo medical examination due to various diseases not suitable for vigorous exercise choose to refuse sports activities because they have a vague or erroneous concept or awareness, and they do not have a clear definition of the concept of "not recommended for strenuous exercise" certified by their doctors, so they simply choose not to exercise. The second common phenomenon in the survey is that students in this special group, who are recovering from surgery or illness, often lack knowledge of the importance of rehabilitation training and mastery of rehabilitation tools, so they are also extremely physically inactive. Therefore, addressing the special group students'

awareness of the importance of health interventions should be done throughout the physical education process, and the school campus physical education knowledge culture should also be strengthened to enhance the personal health awareness of special group students.

5.2 Enhance the physical activities of special group students

First of all, we should make good use of the existing physical health classes in colleges and universities. In addition to teaching students relevant health care theoretical knowledge, we should consider adding more physical practice teaching links and teaching forms suitable for special group students to enhance their physical strength and improve their physique [8][9]. Secondly, according to the physical characteristics of special group students, more interesting physical practice activities like light sports events should be carried out. Thirdly, we should make good use of the exercise mode of internal and extra-curricular exercise to enhance the amount of physical activities and improve their physical fitness and physical quality.

5.3 Personalized functional training program

Tailored physical exercise program should be made for special group students. Through the FMS functional movement test, the personalized functional training programs are designed by combining the physical characteristics of special group students, and the training programs are dynamically adjusted according to students' physical recovery or changes and other conditions [10]. The exercise program should incorporate the recommendations and opinions of rehabilitation doctors, and physical education teachers should give students guided exercise and encouragement to shorten the recovery period of students' diseases, promote the rehabilitation process and enhance the motor ability of injured parts so as to realize the gradual recovery of the body.

Behind the personalized functional training program, there should also be a personalized rehabilitation training service. Schools should increase the strength of teachers and motivate them to provide more personalized services to students with an encouragement system.

5.4 Adjustment of physical exercise assessment system for special groups

Change the status quo of light physical exercise for special groups in colleges and universities from the perspective of assessment system adjustment and optimization. It is suggested to lower the assessment standards and establish independent assessment standards according to different degrees of students' physical specialities. Use quantifiable achievements to affirm the partial sports ability of special group students, enhance sports confidence and improve students' sports interest.

5.5 Improve the physical exercise environment for students of special groups

Their physical activities are also affected by the environment. For example, the school environment is less than ideal, and the family environment also affects the physical activities. Parents are not care much about their children's physical activities, and some parents even forbid their children to participate in sports. In conclusion, the physical activities of students from special groups are affected by the environment, and they should be given more attention and help to promote their physical activities.

6 Conclusion

To improve the physical activity level of special group students in colleges and universities, first of all, we should make good use of teaching resources in colleges and universities, enhance their awareness of the importance of physical activities from the ideological level, and require them to complete the total amount of physical activities within a week after practical teaching, then include it in the assessment of physical performance. In addition, schools and families should support and encourage special group students to actively participate in physical rehabilitation training from the practical

point of view, establish special group teachers and student service teams, increase the number of rehabilitation training teachers, provide more accurate exercise programs for special group students' physical exercise to enhance their exercise confidence.

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Conflicts of interest

The author declares no conflicts of interest regarding the publication of this paper.

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