

Therapeutic Effect of Yang's Sixteen Styles Tai Chi on Cervical Spondylopathy of High School Students

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Keywords: Cervical Spondylosis, Rehabilitation Effect, Clinical Medicine, Tai Chi, Observation Curative Effect

Abstract: With the improvement of people's material level, people's awareness of health is gradually becoming stronger. The high pressure of learning has caused a general outbreak of cervical spondylosis among high school students. This study mainly explored the effect of Yang's 16-style Tai Chi on cervical spondylosis of high school students. In response to people's concerns, this study explored the high school students' proficiency in Yang's 16-style Tai Chi and the clinical medical rehabilitation rate of Yang's 16-style Tai Chi during the experiment. In the course of the experiment, a total of 140 students with cervical spondylopathy were randomly selected from three senior students of Datong Experimental Middle School for clinical medical experiments. The students were randomly divided into 7 groups of 20 people each. One group was a controlled experiment without Tai Chi training. The other 6 groups recorded the students' proficiency in learning Yang's 16-style Tai Chi and the rehabilitation of cervical spondylosis under the same environment effect. During the experiment, strictly control the students' diet and work and rest rules, and require detailed records for the data. On the 5th day of the experiment, the students' mastery of Yang's 16-style Tai Chi was as high as 96%, and the recovery rate of cervical spondylosis was as high as 86% when the adherence was 6th day. The entire experiment was conducted without the interference of irrelevant factors. The research results show that Yang's 16-style Tai Chi has a significant therapeutic effect on cervical spondylosis of high school students. High school students have a positive effect on the mastery of Yang's 16-style Tai Chi and the rehabilitation effect of high school students' cervical spondylosis.

1. Introduction

1.1. Background and Significance

With the intensification of competition now, the situation of comparison is getting more and

more serious. Many parents began to report various tutoring classes for their children. This has also caused students to gradually increase their academic pressure, learn more and more knowledge, and take a long time. Looking down at a book led to a concentrated outbreak of cervical spondylosis among high school students, and the health problems of high school students are now attracting attention.

In response to the current problems commonly encountered by students, the application of Yang's 16-style Tai Chi has brought benefits to the majority of high school students. Looking down at the book for a long time will inevitably lead to more serious neck compression. Yang's 16-style Tai Chi can promote blood circulation and remove blood stasis, and moving muscles and bones can relieve the nerve's long-term pressure. Not only that, students can also relax the whole body while exercising, which is more conducive to the flexible learning of knowledge [1].

1.2. Related Work

Lindberg, P. G studied the structure of the spinal cord in patients with cervical spondylopathy who could not show spinal cord injury with previous MRI. A cross-sectional study was conducted on patients with cervical spondylosis in the past with MRI and without healthy controls. Spinal cord diffusion tensor imaging (DTI), precision grip and foot tracking tasks, and neurological symptoms evaluation were used for the study. Finally, DTI showed that due to the maximum compression level (lowest puff ratio), partial anisotropy (FA) and radial diffusion (RD) of the spinal cord decreased ($P < 0.05$). Patients who do not see neurological symptoms have the same spinal cord defect. Finally, it is concluded that the grip strength and leg tracking error (low accuracy) are related to the maximum compression level ($P \leq 0.01$) and the increase in the RD of the lateral spinal cord [2]. The study concluded that the key factor for the increase in RD, but the lack of a control group experiment during the experiment. Bartels, C believes that many patients with cervical spondylosis will have one or more unshaped symptoms such as dizziness, heart disease, headache, vertigo, memory loss, and nausea. But it is not known whether the operation of cervical spondylosis can effectively relieve these symptoms. In order to confirm whether the anterior cervical discectomy and fusion (ACDF) has an additional positive effect on patients with cervical spondylosis. Investigate whether long-term treatment of ACDF can alleviate some undefined symptoms associated with cervical disease or nerve root disorders. In the treatment of ACDF, 67 patients with cervical spondylosis and radiculopathy all complained of a variety of untyped symptoms, and were followed for 26 to 145 months after surgery [3]. The study is only an investigation of the study of spondylosis, and there is no in-depth experiment. Zheng, B believes that ACDF is the single-stage gold standard for the treatment of cervical disc herniation. However, due to regional biomechanical deviations, it is possible to cause the adjacent level to drop. TDR has been a satisfactory result for more than 10 years, but no one thinks IT is safer and more effective than ACDF. In order to compare the efficacy and safety of TDR and ACDF in the treatment of single-stage cervical disc herniation. The continuous operation time, intraoperative blood loss, VAS wrist and neck pain scores, ROM, ODI, SF36 and patient satisfaction were compared in 145 patients. Postoperative follow-up operation time was 64.6 ± 20.7 minutes in the ACDF group, 69.4 ± 19.3 minutes in the TDR group, intraoperative bleeding was 67.2 ± 14.3 ml in the ACDF group, and 70.7 ± 18.6 ml in the TDR group [4]. The study did not explore further the safety aspects of TDR and ACDF.

1.3. Innovation and Content

This research is based on the research background at home and abroad, from the students' mastery of Yang's 16-style Tai Chi and the clinical recovery rate of Yang's 16-style Tai Chi.

Observation of the curative effect of cervical spondylosis, which can not only improve the learning rate of high school students, but also help the clinical observation of Yang's 16-style Tai Chi in medicine. The specific work content is as follows:

(1) Starting from the research background at home and abroad, in-depth discussion of the clinical medical value of Yang's 16-style Tai Chi.

(2) Discuss the treatment methods of cervical spondylosis and the development status of cervical spondylosis, and develop a preliminary understanding of the value of cervical spondylosis to facilitate the further advancement of this research.

(3) Experiments on Yang's 16-style Tai Chi in the treatment of cervical spondylopathy. During the experiment, pay attention to the students' work and rest laws and dietary habits.

(4) In-depth discussion on the rehabilitation of students with cervical spondylosis through data aggregation and image drawing.

2. Cervical Spondylosis

2.1. Development Status of Cervical Spondylosis

Cervical spondylosis refers to the degenerative change of the cervical intervertebral plate, stimulating or compressing adjacent tissues, such as the corresponding blood vessels and soft tissues, causing related symptoms or secondary changes in symptoms. In studies abroad, the neck pain symptoms of the general population are as high as 10%. Obviously, cervical spondylosis has a serious impact on human health. The pain of cervical spondylosis is the initial stage of the onset of all types of spondylopathy. Early clinical effective treatment and intervention are widely seen to help improve the prevention of cervical spondylosis [5].

CSM is a common disease that threatens the health of middle-aged and elderly people, and it is the most serious cervical spondylosis. Based on the pathological basis of cervical degeneration, CSM can cause spinal cord compression or blood supply occlusion, as well as discomfort during walking or corresponding exercise. Animal experiments show that axial neck traction is the most important factor causing cervical spinal cord injury. Prolonged bowing or sitting for a long time will lead to obstacles to the corresponding blood circulation. The symptoms of cervical spondylopathy will affect the function of the spinal cord. Therefore, surgical treatment must be performed as soon as possible to eliminate spinal cord compression. The general recovery time takes ten hours. It is necessary to pay attention to the cervical spine lesions during exercise [6].

2.2. Tai Chi's Treatment Concept

Tai Chi is very prominent in the treatment of cervical spondylosis. In sports, emphasis is combined with breathing and consciousness. Tai Chi exercise will reduce sympathetic excitability of hypertensive patients and reduce brain activity. One of the causes of cervical spondylosis is the central nervous system dysfunction. The functions of the sympathetic and parasympathetic nerves have not been adjusted, and obstacles have occurred in the transmission of the nervous system. Cervical spondylosis is a chronic disease. In order to stabilize the patient's blood pressure and prevent and treat complications, in addition to the usual drug therapy, exercise therapy is also recommended. Exercise therapy helps improve patients' blood pressure management and prevent various complications. Compared with aerobic exercise abroad, Tai Chi is more effective in the treatment of cervical spondylosis. Therefore, it should be scientifically evaluated that Tai Chi is used to treat cervical spondylosis during routine walking to provide a very efficient exercise method for young and elderly patients with spondylosis. It can play a protective role in patients with hypertension, and is especially suitable for health management.

Tai Chi is very effective in promoting blood circulation. Nail microcirculation is the circulation of nipple blood formed by the skin process covering the scaly upper cortex of the nail. The tonicity inside the waveform of the nail is generally composed of several capillaries. Because the capillaries are circulating, the wrinkles of the nail are also called the capillary circulation or the wrinkle capillary circulation of the nail. The most commonly used method now is to understand the human microcirculation, and to study the microcirculation of nail wrinkles is one of the main symptoms of many diseases. Tai Chi is very beneficial in promoting microcirculation of nail capillaries [7].

2.3. Relationship between Tai Chi and Cervical Spondylosis

When practicing Tai Chi, the brain will release the active substances carbon monoxide and substance T, which are considered to be the strongest vasoconstrictors, usually involving the regulation of vascular resistance and blood volume throughout the body, especially internal microcirculation. The increased activity of substance T accelerates the formation of fibrous tissue and hinders the formation of nitrogen sulfide, which may lead to the onset and formation of atherosclerosis in atherosclerosis. The binding of substance T to the smooth muscles of specific receptors can strengthen the sensitivity to calcium, and vascular smooth muscles continue to contract. In addition to the activation of related substances, they can also strengthen the contraction of blood vessels and hinder the occurrence of hypertension in the body. Under pathological conditions, the release of pediatric amine and amino acid II also enhances the body's response to substance T, resulting in increased blood circulation. With the deepening of research, the myocardium itself can control the release of substance T, and there are substance T-specific receptors in the cell membrane. Atrial expansion and mechanical traction can promote the synthesis and release of substance T and hinder the onset of hypertension [8].

Related ligaments and related nerve tissue in the human body protect the cervical spine at all times. In order to ensure the movement of each small vertebra in the normal range, only the ligaments and other soft tissues are not damaged, it will not cause damage to the soft tissues around the dislocation and pathological inflammation, edema, leaching, and deformable arthrosis. Spinal nerve roots and sympathetic nerves caused by double stimulation of inflammation are awakened and will show clinical symptoms related to the spine. In general, the lesion will cause local tissue changes due to mechanical conduction. If it cannot be resolved in time, the lesion will affect the fascia. Because the cutaneous nerve under the muscle membrane is the most sensitive nerve, patients will experience severe pain and other symptoms. In order to relieve pain, it is necessary to start with the spine theory. Many organizations will consider in the treatment, which has no corresponding effect on the elimination of disease [9].

2.4. Treatment of Cervical Spondylosis

The incidence of cervical spondylosis is high, and finding the best treatment is very useful for clinical medicine or for the majority of teenagers.

(1) Massage method. Traditional Chinese medicine massage, as an important means of preservation therapy, has the advantages of relatively simple operation and rapid and accurate treatment effect in the treatment of cervical spondylosis, so patients and clinicians consider it the first choice of non-surgical treatment. Massage is widely used in clinical diagnosis and treatment, and its effect has been confirmed by many clinical trials and research institutions. There are obviously different standards in the neck type massage for the treatment of cervical spondylosis, the standardization of the corresponding operation, the patient's satisfaction, there are many ways to continuously improve the patient's symptoms in a short period of time, and the massage method can also be done It is simpler, safer and more effective, and it becomes an important problem to solve

the application of simple replication for doctors. Therefore, to further optimize the implementation plan of massage, promote the improvement of massage methods, and further improve the clinical effectiveness of cervical spondylopathy treatment, it is worthy of relevant discussion [10-11].

(2) Cervical keyboard fusion method. The previous cervical keyboard fixation method improved the complete removal of the disc from the front and relieved the compression of the nerve roots. However, due to intraoperative exposure and traction limitations, the nerve root compression cannot be completely reduced under direct vision, and intraoperative bleeding can cause the accumulation of postoperative inflammatory substances, affecting the effectiveness of postoperative surgery. The improved cervical keyboard fixation is a low-invasive procedure. The mechanism is mainly to release nerve root compression and eliminate inflammatory traits. Taking the compressed nerve root as the target, the working nerve tissue directly determines the target [12]. Due to the need for preoperative disc staining for the first time, the surgeon was able to clearly identify the nucleus pulposus tissue of the microscope during the operation. Only by removing the nucleus pulposus compressed by the nerve root through the microscope tool can the pain of cervical spondylosis be fundamentally eliminated. There is little interference in the nucleus pulposus of the intervertebral disc, but it may relax around the rupture of the annulus to eliminate the degeneration of the nucleus pulposus, use radiofrequency to form the annulus under low temperature contraction, eliminate the sensory nerve endings, and further repair and nutrition related to the cervical spine. supply. In addition, continuous use of physiological saline can effectively remove various inflammatory substances, reduce the accumulation of by-products caused by high-frequency heat treatment, and reduce the incidence of infection.

(3) Moxibustion treatment. Relatively speaking, the forms of acupuncture and moxibustion for cervical spondylopathy are gradually diversified. Traditional methods of use can be divided into direct moxibustion or indirect moxibustion. The most classic direct moxibustion is the moxibustion of wheat grains. According to the recommendations of relevant experts, the previous moxibustion therapy of wheat grains was improved, and a new type of micro-moxibustion therapy was summarized. The use of indirect moxibustion, warm moxibustion therapy, and heat sensation are the corresponding moxibustion treatments to the acupuncture points to improve the treatment effect of the traditional moxibustion therapy network, and the warm acupuncture treatment is a combination of acupuncture and moxibustion, which has a good analgesic effect on acute and chronic pain . Moxibustion is a non-combustible moxibustion method in moxibustion treatment. This method is simple and effective. The research results show that Linnan's traditional prescription of moxibustion has a good effect on the treatment of cervical spondylosis. Moxibustion therapy is safe and effective with simple operation. However, according to the pain caused by tobacco moxibustion and the scars that may remain after moxibustion, some patients show cervical spine contraction, and their promotion and application are limited .

(4) Nerve stimulation method. In the process of vertebral artery activity, due to various external stimulations to nerves, innervation and influence on various nerves, especially on sympathetic nerves and astral ganglia, are likely to cause arterial constriction and affect some nerves around the ganglia The distribution of arteries and nerves, which affects the blood circulation state, and the contraction of vertebral artery vascular smooth muscle can cause symptoms such as brain stem ischemia, dizziness, and headache. The ganglion block can significantly improve the blood flow of the vertebral cerebral artery. According to the clinical data and image data of spinal artery ischemia in many young patients, some bone spurs are relatively light. Even if no bone spurs are formed, they will cut off the sympathetic nerves of the vertebral artery and hinder the excitability of the stellate ganglia, thereby improving clinical symptoms. It is therefore important that the type of vertebral artery is a further exploration of cervical spondylopathy and peripheral nerve stimulation.

(5) Cervical spine combined surgery. In one stage of neck combined surgery, the patient's

posture must be changed from abdominal supine to pre-abdominal surgery. If the patient is still under anesthesia during the position change, a corresponding anesthesia accident may occur. In the clinical trials of relevant scholars, the relevant neuromodulation factors, the basic steps of blood circulation and the cervical spine lesions were analyzed. As a result, hemodynamics becomes unstable. Then, the patient's neck was protected by the neck blade, but the muscles around the neck were completely relaxed under anesthesia, and the neck was still in a state of no support and protection. If the posture changes, it is easy to hurt the patient's neck. Therefore, this method pays more attention to the position adjustment of the patient, but in actual clinical medicine, the operation of position adjustment still has difficulties.

3. Cervical Spine Rehabilitation Experiment

3.1. Experimental Equipment

The relevant data needs to be collected at the beginning of the experiment. At this time, the experimental equipment and equipment used in the experiment are shown in Table 1.

Table 1. Experimental equipment and equipment used in the experiment

Experiment equipment	Number of equipment	Production source
Data statistics	7	USA
Computer	10	United Computer Corporation
Health measuring instrument	5	Capital Medical Corporation
Clock	10	Clock Company
Video display	5	France

Use a data analyzer to comprehensively record the daily exercise data, diet and daily life data of the students during the experiment. The role of the computer is to assist in solving problems in the rehabilitation process and to prevent errors during manual recording. The function of the health analysis instrument is to measure the rehabilitation of students. Only through the overall measurement of the student's rehabilitation can the experiment be better followed. The clock is to solve the problems of healthy living for high school students. On the other hand, you can also use the clock to exercise regularly. The video display is to provide students with a teaching environment and to speed up the efficiency of high school students learning Tai Chi. Through the display of the characters in the video, students can experience the relief of cervical spine pain and extra relaxation caused by Tai Chi.

3.2. Control of Experimental Variables

In the training process of Tai Chi, those who automatically quit halfway are deemed to give up automatically. The final test results are not included in the final statistical quota. During the experiment, pay attention to the regular diet of all experimenters and reasonable living time to prevent other things from happening during the experiment. During the training process of Yang's 16-style Tai Chi, the basic progress should be reasonable to ensure that every experimenter can normally learn Tai Chi's moves. When training, prevent accidents and prepare medical drugs at any time.

3.3. Experimental Process

In the course of the experiment, a total of 140 students with cervical spondylopathy were randomly selected from three senior students of Datong Experimental Middle School for clinical medical experiments. Strictly control the ratio of men to women at a one-to-one level. The students

were randomly divided into 7 groups of 20 people each. One group was a controlled experiment without Tai Chi training. The other 6 groups recorded the students' proficiency in learning Yang's 16-style Tai Chi and the rehabilitation of cervical spondylosis under the same environment effect. During the experiment, strictly control the students' diet and work and rest rules, and require detailed records for the data.

4. Analysis of Cervical Spine Rehabilitation Effect

4.1. Summary of Experimental Data

The changes in the proficiency of high school students practicing Tai Chi with time when the data is summarized after the experiment are shown in Table 2.

Table 2. Changes in high school students' proficiency in practicing Tai Chi over time when the data is summarized after the experiment

Proficiency (%) Number of groups	Time(d)					
	1	2	3	4	5	6
Group1	52	67	75	88	76	69
Group2	45	58	66	79	86	67
Group3	36	48	58	71	70	62
Group4	25	43	48	64	60	49
Group5	14	35	33	55	96	78
Group6	13	21	21	45	88	47

The high school students' proficiency in practicing Tai Chi is not only related to the usual practice time, but more importantly also related to the way students practice Tai Chi. Finding a suitable practice method is very important for improving the progress of Tai Chi practice. At the beginning, most students are still in the fatigue stage of Tai Chi, and they don't really want to learn Tai Chi. Therefore, the mastery of Tai Chi is relatively slow at the beginning, as time goes on the high school students' mastery of Tai Chi gradually improved, and their proficiency began to rise slowly. After this period of time, the proficiency of high school students learning Tai Chi will gradually decline, and there has been a gradual decline in the proficiency of learning Tai Chi.

The changes in cervical spine rehabilitation of high school students over time are shown in Table 3.

Table 3. Changes in cervical spine rehabilitation of high school students over time

Recovery rate (%) Number of groups	Time(d)					
	1	2	3	4	5	6
Group1	9	8	10	9	11	7
Group2	35	25	28	28	27	33
Group3	35	34	46	43	56	32
Group4	73	76	55	60	78	86
Group5	15	36	36	55	70	77
Group6	14	28	29	49	61	69

The recovery rate of high school students with cervical spondylosis is not only related to Tai Chi proficiency, but also has a very important relationship with whether students are willing to participate in Tai Chi training. Normally, if students are willing to cooperate with Tai Chi exercises, the recovery of cervical spondylosis among high school students will be very rapid. If the students are only proficient in Yang's 16-style Tai Chi, and do not practice hard, it can only have a double effect. Therefore, high school students also need to practice more when participating in the training of Yang's 16-style Tai Chi, which is also beneficial to the treatment of cervical spondylosis while consolidating.

4.2. Experimental Data Analysis

The changes of students' proficiency in mastering Tai Chi with time during the experiment are shown in Figure 1. Students' mastery of Tai Chi is only an auxiliary research object of the experiment. The ultimate goal of the experiment is to understand the rehabilitation of the students. From the data in the figure, there is a clear difference in the proficiency of students in mastering Tai Chi over time. As the number of days increases, student proficiency begins to increase, but after a period of time, there will be a general decline in data. Relatively speaking, such a situation will appear in a corresponding mitigation after a period of time. The main reason is that students will have a period of fatigue before and after learning. After this time, the fatigue period will pass.

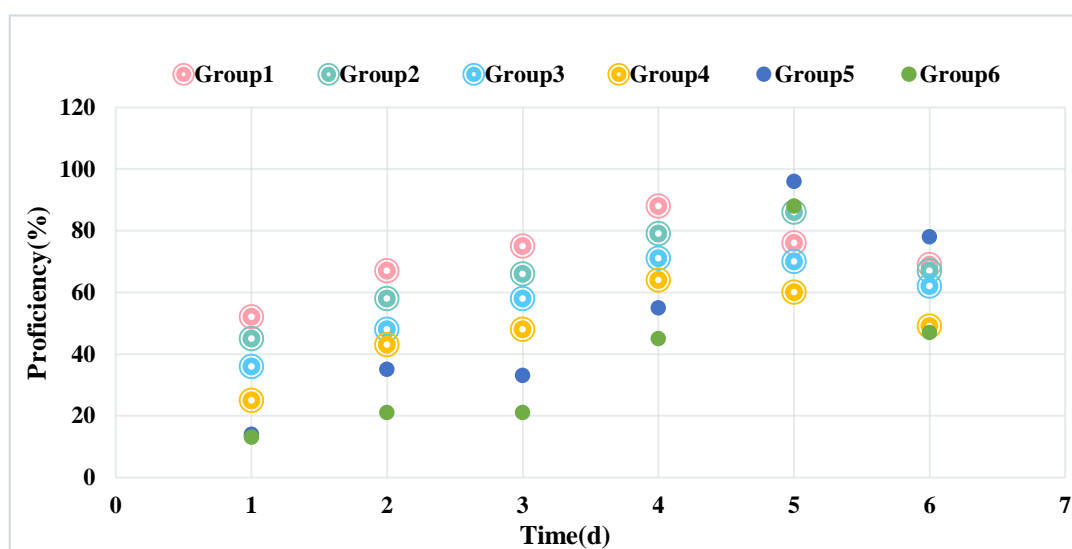


Figure 1. The change of students' proficiency in mastering Tai Chi over time during the experiment

Figure 2 shows the difference between students practicing Tai Chi over time. According to the data in the figure, on the fifth day of the experiment, the students' mastery of Yang's 16-style Tai Chi has reached 96%. When the number of groups is fixed, the proficiency of students in Group 1 in mastering Yang's 16-style Tai Chi is generally relatively high. This may be related to environmental factors. Generally speaking, a person's performance may affect the surrounding environment, and then bring positive changes to the surrounding environmental factors. Judging from the number of days, the high school students on Day 5 have relatively the highest proficiency in Tai Chi, followed by a decline. And the proficiency of the first day is the lowest.

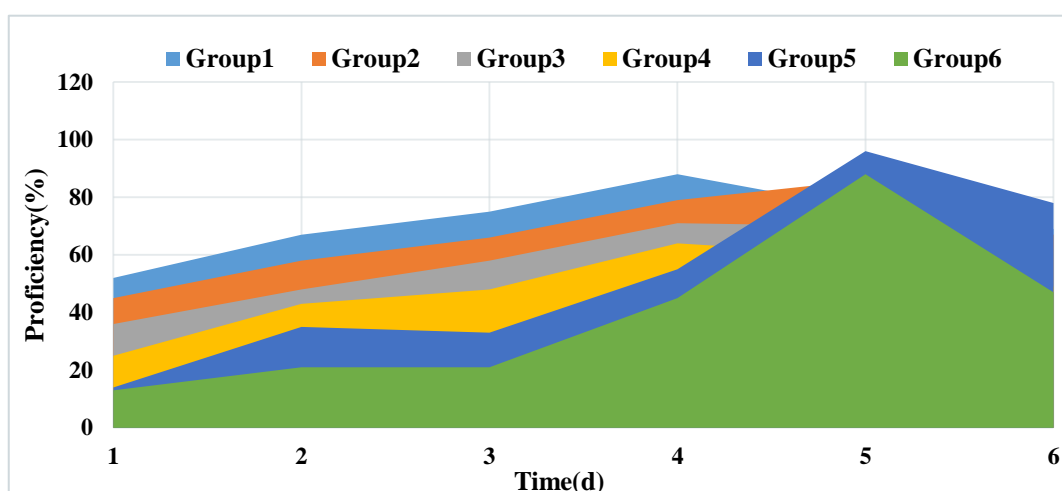


Figure 2. The difference of the students who practiced Tai Chi over time

The recovery of high school students in each set of data is shown in Figure 3. The larger the data value, the better the rehabilitation treatment of the student, and the larger the area formed by the corresponding image range. From the figure, the area enclosed by each data in the fourth group is the largest, indicating that the rehabilitation situation of this group of students is also the best. The area enclosed by the first set of data is the smallest, indicating that the recovery rate of this group of students is relatively poor. This situation is not only related to the individual differences of each group, but the bigger question is whether the students master the proficiency of Yang's 16-style Tai Chi and whether they can complete the Tai Chi training on time. The index of students practicing Tai Chi is positively correlated with rehabilitation.

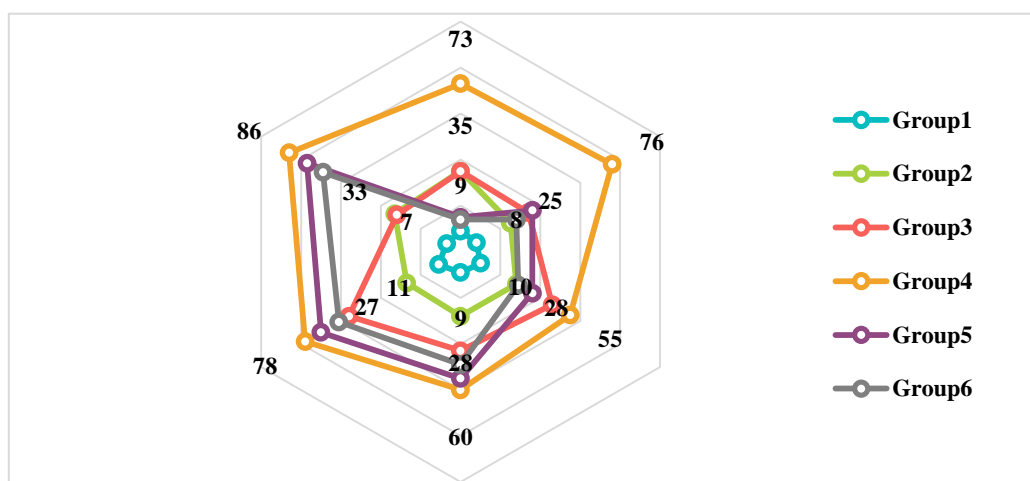


Figure 3. Rehabilitation of high school students in each group of data

The changes of rehabilitation situation with time of high school students practicing Tai Chi are shown in Figure 4. When insisting on the sixth day, the recovery rate of cervical spondylosis was as high as 86%. Judging from the graph of the time trend, the rehabilitation of cervical spondylosis during the practice of Tai Chi is gradually increasing, indicating that practicing Yang's 16-style Tai Chi is very beneficial to the rehabilitation of students. The lowest recovery rate in the first set of data is 9%. Most of the reasons are related to the students' inactivity and inability to master Tai Chi. On the 6th day, except the data values of the fourth and fifth groups are relatively high, the other

values are relatively low. Explain that the ground group and the fifth group are outstanding in the mastery of Tai Chi and in practice.

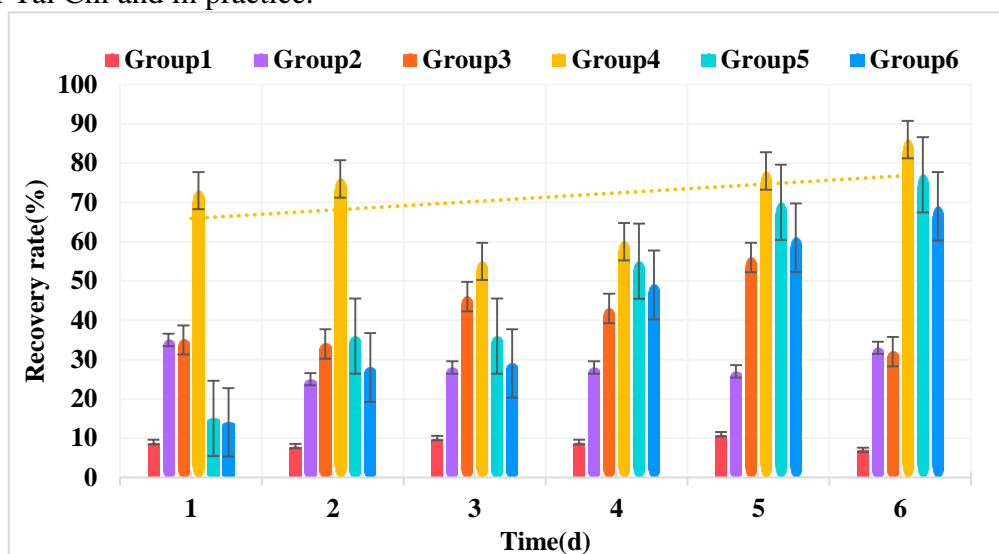


Figure 4. Changes in rehabilitation status of high school students during the practice of Tai Chi

5. Conclusion

Based on the research background of Yang's 16-style Tai Chi at home and abroad, this research constructs the preliminary research concept of Yang's 16-style Tai Chi exploration, and then further explores Yang's 16-style Tai Chi. From the students' mastery of the study of Yang's 16-style Tai Chi and the rehabilitation of the students during the practice, the main research point is that Yang's 16-style Tai Chi has a positive treatment for the rehabilitation of students' cervical spondylosis relationship.

With the increasing number of students' studies, sitting down for a long time will inevitably lead to cervical spondylosis. There are also various treatment options for cervical spondylosis. This study carries out comprehensive physical fitness training for students on the basis of sports. It is very meaningful for the healthy growth of teenagers and the treatment of cervical spondylosis.

Cervical spondylosis is generally treated with medicine or direct acupuncture, which is unavoidable for physical harm. The Yang's 16-style Tai Chi exercise and fitness therapy adopted in this study can not only strengthen the body but also prolong the life, and has very weak side effects on the body.

Funding

This article is not supported by any foundation.

Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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