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Effects of Lower Limb Strength Training Program on Wushu Taijiquan Balance for Athletes in Lanzhou City

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Abstract

Background and Aim: Taijiquan is a kind of martial arts routine that contains both the connotation of fighting and combines with the performance posture. It has an extensive river basin and many factions. Its technical points are often very abstract, such as virtual collar, back pull, waist loose, shoulder heavy, wrist suspension, etc., which is difficult to quantify and describe with objective indicators, it is difficult for beginners to master, the training quality is difficult to evaluate, and the training effect cannot be guaranteed. The purpose of this study was to examine the effect of a lower limb strength training program on the balance of Wushu Taijiquan in Lanzhou athletes.

Materials and Methods: This study is quasi-experimental. The study can be divided into five study groups. (1) 50 Wushu Taijiquan athletes aged 18-21, and 6 Wushu Taijiquan coaches were selected from Lanzhou University Wushu Club, all of whom were interviewed. (2) Interview 6 coaches to understand the current situation and problems, (3) consult 5 experts, accept face-to-face and telephone email, and (4) analyze the martial arts training plan through the focus group discussion results of 12 experts. (5) The experiment was conducted by using the lower limb strength training method for 8 weeks. The training time is three days a week, Monday, Wednesday, and Friday, 90 minutes each week. The experiments were performed using standard means of variance, one-way analysis of variance (One-way ANOVA), and t-test. A questionnaire survey is a tool for collecting data.

Result: Stand on one foot with your eyes closed and the third test was. The first result of the Cross the boundary with single leg jump is, and the third test result is. It can be seen that both the mean and the standard deviation have increased significantly. It shows that the balance ability of Wushu Taijiquan athletes can be improved, and the 0.05 level is statistically significant. Consistent with the interpretation of the study

Conclusion: The results showed that both the mean and the standard deviation of the test items were significantly improved. Multiple method comparisons of single-legged standing with closed eyes and cross-boundary single-leg jumping showed significant anterior, middle, and posterior tests with $P < 0.001$, indicating a more significant improvement in performance during the experimental intervention.

Keywords: Lower Limb Muscle Strength; Wushu; Taijiquan; Balance

Introduction

Wushu is the representative of traditional Chinese national sports, the treasure of Chinese national culture, and the quintessence of China. It integrates self-defense, fitness, self-cultivation, religion, philosophy, aesthetics, ethics, military science, traditional Chinese medicine, and traditional literature and art. Native martial arts can be said to be a microcosm of the five thousand years of Chinese civilization, which needs to be inherited and developed. After the founding of the new China, with the development of China's politics, economy, and culture, the Eastern and Western cultures constantly communicate, collide, and integrate. Under this background, competitive martial arts, which adapts to the trend of The Times and represents the development direction of martial arts, emerged. Competitive martial arts is the brilliance of modern martial arts, which takes the high difficulty and the new development direction, mainly including two forms of routine and sanda. This paper discusses the competitive martial arts routine as the research object. After half a century of development, competitive martial arts have moved out of Asia to the world and developed into 120 member states in five continents and four oceans. Up to now, the competitive martial arts routines have become the official events of the Asian Games, East Asian Games, Southeast Asian Games, South Asian Games, and the World Mass Sports Games. The World Wushu Championship has been successfully held nine times, and the competitive martial arts routines have met the requirements of entering the Olympic Games. On July 13, 2001, Beijing won the right to host the 29th Olympic Games (Dong, 2008)

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Under the influence of the traditional Chinese philosophical theory of Yin and Yang, Taijiquan is a martial arts routine that contains both the combat connotation and combines with the performance posture. It has an extensive river basin and many factions. The exercise of Taijiquan emphasizes the coordination of hands, eyes, bodies, methods, and footwork. Combined with the breathing rhythm, it requires complex physical and mental exercise skills such as loose, heavy, round, and active movements. Its technical points are often very abstract, such as virtual collar, back pull, waist loose, shoulder heavy, wrist suspension, etc., which is difficult to quantify and describe with objective indicators, it is difficult for beginners to master, the training quality is difficult to evaluate, and the training effect cannot be guaranteed. (Li & Fan, 2018) From the perspective of the research and progress direction of the whole Chinese Taijiquan, the positive influence of Taijiquan posture on the coordination and balance ability of the whole body can mainly improve the coordination sensitivity of lower limb vestibular muscles and proprioception of lower limb joint muscles.

As the training base of high-quality talents, colleges, and universities play a very key role in the process of national construction and development. From the perspective of recent developments, the physical health level of college athletes is declining day by day, the state advocates the development of quality education activities, so that the comprehensive quality level of college athletes has been comprehensively improved and carries out targeted training of cross-century talent construction. (Wang, 2016) Taijiquan, as a traditional Chinese culture and health exercise, is a treasure of Chinese martial arts. Its movements are relaxed, and comfortable, with health care and medical effects. Long-term adherence can improve the function of the respiratory system, cardiovascular system, and other organs of the human body, and delay aging. In the process of Taijiquan, physical activities can be comprehensively controlled, emphasizing the use of breathing, hand and eye cooperation, etc. Not only the balance ability can be effectively exercised, but also the physical coordination will be relatively better. The influence of Taijiquan on balance and coordination has become a concern in relevant research areas. At present, more and more people try to use Taijiquan to exercise the balance and coordination ability of college athletes. Balance ability plays a vital role in life, sports, competition, and other aspects. Although the exercise is slow, it can promote the lower limb balance of the participants through practice. This paper adopts the literature data method, taking Taijiquan, lower limb, and balance ability as the keywords of this paper to review and analyze the literature, hoping to provide a more theoretical basis for the research of improving the lower limb balance ability of Taijiquan exercise in China and have an important influence on the future development of Taijiquan and the balance ability of the human body. (Yang & Liu, 2019) Taijiquan, as a common sports course in universities and higher learning, may have a good promoting role in improving the static balance ability of college athletes. We should actively advocate for college athletes to use their spare time to practice more Taijiquan, to achieve the ideal physical function training effect and lay a solid physical foundation for future study and life. Taijiquan practice participants in the plantar pressure test found that more than 6 months in Taijiquan practice plantar pressure is much higher than no practice, plantar pressure center trajectory, Taijiquan group left, and right feet present a consistent trajectory, and no exercise group left foot result of track asymmetry. The muscle strength of the lower limbs is the key to affecting the balance ability. When practicing Taijiquan, emphasizes the change of the center of gravity and grasps the center of gravity while enhancing muscle strength. Therefore, Taijiquan has a positive effect on the balance ability of the lower limbs. (Liu, 2013) The displacement of the plantar pressure center in the horizontal plane will change the muscle torque of the ankle, hip, and knee joints accordingly. Therefore, Taijiquan helps to enhance the muscle strength of the lower limbs, enhance the stability of the lower limbs, and then improve the balance ability. (Maccrae et al, 2013) measured the gait stability, lower limb muscle strength, and homoeostatic balance of the balance ability of obese college athletes. The results found that Taijiquan exercise can improve the gait stability of obese college athletes through 12 weeks of Taijiquan.

Objectives:

Main objective

To study the effects of lower limb strength training program on wushu Taijiquan balance for athletes in Lanzhou.

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Subsidiary objective

To study the current situation and the problems of wushu Taijiquan balance in athletes.

To draft a lower limb strength training program on wushu Taijiquan balance for athletes in Lanzhou.

To Wushu Taijiquan lower limb strength training program experiment.

Literature Review:

EMG analysis of the effects of Taijiquan on lower limb balance ability

Sports biomechanics research is an important research means and method is the EMG test, it is through the muscle fibers in the movement unit action potential in time and space, to detect different states, different parts of the muscle, and finally get in the strength of the human muscle activity, time and the relationship between the muscles. (Liu & Huang, 2013) et al. detected the electromuscular activity of lower limbs of white crane wing action in Taijiquan. In the study of Taijiquan beginners and Taijiquan athletes, the results found that support leg tibialis anterior muscle, biceps, gluteus middle muscle EMG activity athletes group than beginners group, virtual step leg rectus femoris and gastrocnemius also appear, athletes, then beginners show active EMG activity state, this preliminary explains the long-term practice Taijiquan can significantly improve the participants of the lower limb muscle strength, and can further improve the balance of the lower limbs. In the study of the balance of gait stability, lower limb muscle strength, and dynamic and static balance indicators, the results found that Taijiquan exercise can improve the gait stability of obese athletes, through 12 weeks of taijiquan practice, subjects' static balance ability significantly enhanced, lower limb gastrocnemius, tibialis anterior muscle strength also increased significantly. (Yang & Liu, 2019)

What is muscle strength:

Muscle strength refers to the ability of human muscles to continuously do work, that is, the ability to fight fatigue. Muscle strength, like muscle strength, cardiopulmonary strength, body composition, and flexibility, is a healthy aspect. The narrow sense of muscle strength refers to the absolute strength of muscle, and the broad sense of muscle strength contains the absolute strength of muscle, explosive force, and muscle strength. An example is convenient to understand: we do push-ups then times, then the muscle strength, we then the maximum weight of the bench press, then the absolute power, we then the standing long jump then the explosive force. For athletes in many events, muscle strength is an important factor in their training level. Do pull-ups without weight, so many times can not count (not to say that they can do countless times, more means that the difficulty is too small, repeated many times), which shows the terror of their muscle strength (CAI Tantan, 2014)

1. For ordinary fitness enthusiasts, the training of muscle strength is more to make the muscle strength more lasting, so that the muscle has more strength to bear the load, just like usually carrying a bucket of water, carrying a bag, which is very helpful for daily life.

2. good muscle strength will help us both in life and work, to maintain a longer good and correct body posture, to prevent back pain, cervical spondylosis, and lumbar disc prolapse lesions.

3. Good muscle strength is an important part of our physical health, and it is one of the criteria for our physical health and strength. In recent years, many of the popular "CrossFit" competitions have been competing for muscle strength.

4. Definition: Muscle strength training is a training method to enhance muscle strength and fatigue resistance by performing multiple groups and performing a high number of repetitive exercises. It mainly targets the aerobic capacity of the muscles, the energy supply, and the metabolic mechanism required by the muscle during prolonged sustained exercise.

5. Principle: Muscle strength training mainly increases muscle strength and fatigue resistance by increasing the amount of muscle fiber, improving the type of muscle fiber, and improving the energy reserves in the muscles. Long, low load, and high number of training can promote muscle adaptation and increase mitochondrial density, improve myoglobin content, and increase the activity of anaerobic metabolic enzymes.

What is strength training:

Wang Qing put forward a new view on the principle of strength training, he believed that the various means of strength training can be classified and examples of how to use these training methods

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can be used effectively. The literature on strength training divides strength into three categories: (1) Absolute force: the ultimate force produced by a muscle or muscle group to overcome some resistance. (2) Strength: the ability of muscles or muscles to withstand fatigue and work continuously for as long as possible under a certain load 3. Strength speed (elastic force, explosive force): a muscle or muscle group produced, in a certain negative The ability to contract at a lower high speed. (Wang,1989)

The role of Taijiquan on lower limb strength

Martial arts emphasize the combination of the waist and horse, less than the more importance is the lower limbs to be stable, to stabilize must have strength, so the strength of the lower limbs is very important. We all know that if someone is unstable in a competition, the probability of losing will be very large, so lower limb strength is very important. In Taijiquan our traditional martial art, the lower limb exercise has a big role, why say Taijiquan looks slow but often wins, because seemingly slow upper limb movements have great lower limb strength as a foundation, you hit the somebody else ten, because the lower limbs strength, very stable, the somebody else did not move, and somebody else hit you, because your lower limbs strength not instability, will be down, so practice Taijiquan chuan to improve the lower limb strength is a great effect. When practicing Taijiquan, due to the characteristics of Taijiquan, movement is slow, so this requires a posture for a long time, the same lower limbs should remain for a long time, over time will be the lower limb leg muscle exercise, discover the potential of muscle, muscle will exercise more and more strong, more and more powerful, lower limbs will become very stable. At the same time, the long breathing brings sufficient oxygen, increases blood circulation, and provides energy to the legs, and the leg muscles can get better exercise, which is also an important reason why Taijiquan makes the lower limb strength exercise better than other martial arts. (Cui, 2018)

Conceptual Framework

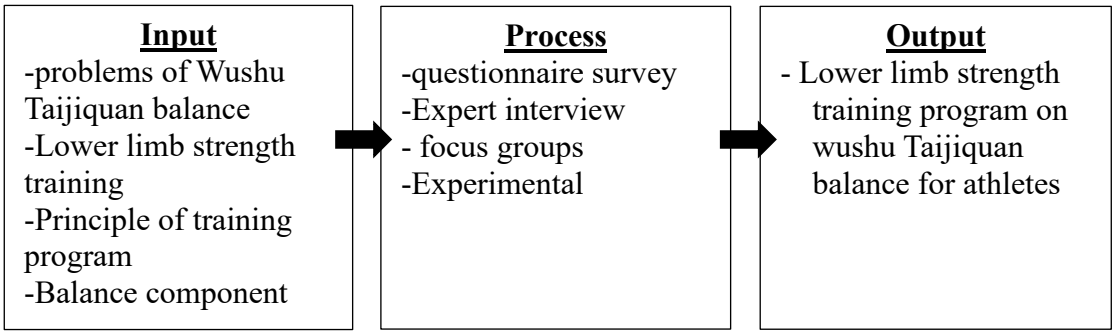

Figure 1 Conceptual Framework

Methodology:

The study used a mixed methods approach including questionnaires, coach interviews, expert interviews, and focus groups, providing a multifaceted view of a topic.

Population: This study included 50 Wushu Taijiquan athletes from Lanzhou University Wushu Club, aged 18-21 years, and 6 Wushu Taijiquan coaches (all coaches conducted interviews).

Sample: All 50 athletes were initially screened, and the last 30 Males were voluntarily enrolled to take the test, 30 male athletes were scheduled for the Cross the Boundary with single leg jump test. This test item is standing with their eyes closed and their scores will be recorded. Based on the ranking score, the 20 athletes with the lowest test scores were selected as the sample group for this study.

The selection criteria for the athletes participating in the experiment are summarized as follows: (1) Willing to volunteer for the experiment. (2) Physical and mental health and was ready to participate in the experiment.

The criteria for excluding the withdrawal experiment are as follows: (1) The body itself has injuries. (2) Absent from over 80% of the training sessions. (3) Voluntary request for withdrawal from the training program.

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The questionnaire was sent to all athletes to study the problems and barriers that athletes encountered during lower limb strength training.

Research Participation

Expert for IOC: Through the purposive sampling method, 3 professional coaches of the Wushu team were selected to check the quality of the questionnaire and interview form.

Expert for interview: A total of 5 experts were selected by the objective sampling method. There are 3 martial arts coaches and 2 university professors. Through interviews, telephone calls, and email, they gained insight into the movement of lower limb strength training and finally determined the movement of lower limb strength training.

Experts for focus group: Through the purposive sampling method, 12 experts were selected to discuss the training program. There are 4 professional martial arts coaches, 4 martial arts teachers from Lanzhou University, and 4 physical education professors. They have rich experience in martial arts and physical training, providing excellent views to develop the training program.

Research Instrument

1. athlete questionnaire

A questionnaire survey was conducted on athletes to understand athletes' ideas, questions, and suggestions. Consulting 3 experts to test the reliability and credibility of the questionnaire.

2. Coach interview form

Status and questions through interviews and telephone interviews.

3. Expert interview

Through telephone and email interviews, we can deeply understand the lower limb strength training and finally determine the movements of the lower limb strength training.

4. Stand on one foot with your eyes closed

One leg balanced as its name sounds, one leg in balance, the other raised, and the knee toward the chest for as long as possible. Record the measured data. During the 8 weeks of lower limb strength training, the tests and pretests, intermediate tests and posttests were compared, and conclusions were drawn

5. Cross the boundary with single leg jump

Start by standing on one leg and making a small jump forward. After the control, pause for 2-3 seconds, and then jump backward. See how many moves each foot can get in balance. Record the measured data. During the 8 weeks of lower limb strength training, the tests and pretests, intermediate tests and posttests were compared, and conclusions were drawn.

6. Lower limb strength training program

The lower limb strength training program was developed by expert interviews and focus group discussion, with 8 weeks of training. The training was conducted in 9 weeks, 3 days a week, and for 90 minutes each day.

Data collection

1. questionnaire:1.1 Ask 3 coaches to evaluate and determine the questionnaire content and feasibility. 1.2 The questionnaire was distributed to 20 athletes to determine the problems and difficulties in the training, and the athletes agreed to accept the test.

2. Coach interview: By collecting coach suggestions, build a training plan that can improve the balance of martial arts Taijiquan

3. Expert interview: 5 Through interviews, telephone, and email, the experts deeply understand strength training, and finally determine the movements of strength training.

4. Training program: The lower limb strength training program was developed based on the results of focus group discussions with 12 experts. Ensure the implementation of the training program, training intensity, and physical fitness requirements are suitable.

5. Experiment: The experiment was performed using the lower limb strength training method for 8 weeks. The training time is three days a week, Monday, Wednesday, and Friday, 90 minutes each week. Single-eye single-foot balance test and crossover single-leg jump test were performed before, after 4 weeks of training, and after 8 weeks of training to assess balance ability.

6. Summary: The first data was collected, 4 weeks after comparing the data with the second trial, and the data from the third trial after 8 weeks to conclude the experiment. A total of three tests

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were performed. The test results are obvious, and it can be determined that the study meets the study hypothesis.

Data Analysis: This study primarily utilized a software package for data analysis:

1. For the questionnaire, mean and standard deviation were employed to analyze the data gathered from the questionnaire survey.

2. The content validity of the questions in both the athlete questionnaires and the expert interview form was evaluated using the Index of Item-Objective Congruence (IOC), with the IOC value for the athlete questionnaires being 0.825, IOC value for Interview coach was 0.92, IOC value for expert interview form was1.00.

3. Focus groups: Content analysis was used to summarize recommendations for coach interviews and expert interviews and analysis with focus groups.

4. The results from the pre-test, after 4 weeks of training, and post-test (after 8 weeks of training) were analyzed using one-way repeated measures ANOVA.

5. Dependent T-tests were conducted to compare the test results between (1) the pre-test and after 4 weeks of training, (2) after 4 weeks of training and the post-test, and (3) the pre-test and post-test.

6. A significance level of p = 0.05 was used in this research.

7. To determine the mean scores of the athlete questionnaire, the investigators were assessed using the Likert scale. (Likert 1932).

The meanings of 5 scale evaluation are 1 = Very Poor, 2 = Poor, 3 = Moderate, 4 = High, 5 = Highest. The details of the score criteria are as follows:

Fraction	Average score range	Meaning
1	1.00 - 1.79	Very Poor
2	1.80 – 2.59	Poor
3	2.60 – 3.39	Moderate
4	3.40 – 4.19	High
5	4.20 – 5.00	Highest

Results

Questionnaire results

Through the results of the athletes' questionnaire, I affirmed both my idea and the feasibility of the training plan. The following athlete survey questionnaire results table.

Table 1 The results of the balance of athletes. (=20).

ITEM	$\bar{X}$	S.D.	Result
Do you think lower limb training can improve balance?	5.00	0.00	Highest
Are you willing to train Taijiquan?	5.00	0.00	Highest
Do you know anything about Taijiquan?	5.00	0.00	Highest
Do you think Taijiquan is helpful to the body?	5.00	0.00	Highest
Willing to share the experience of Taijiquan training with others	4.67	0.65	Highest
Is the improvement of balance helpful to the body??	5.00	0.00	Highest
Does Taijiquan have an impact on balance??	5.00	0.00	Highest
Have you been exposed to lower limb strength training?	4.90	0.30	Highest

We used the Likert scale for our evaluation. Performed data collection yielded this result. The five meanings of the scale evaluation are 1= very poor, 2= poor, 3= medium, 4= high, and 5= highest.

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As can be seen from the data results in the table, our questionnaire has been unanimously agreed by everyone and very much agreed.

Coach Questionnaire Results:

In the coach questionnaire survey, 6 coaches, 1 senior coach, 3 intermediate coaches, and 2 junior coaches were selected, and they made outstanding contributions to this questionnaire. Provide a strong help for the following study, and quite agree with this study. Here is a summary of the six coaches' recommendations:

Coach 1: Taijiquan can be a lifelong sport, and it is also urgent to change the balance ability.

Coach 2: The improvement of lower limb strength contributes to human health, and improves your physical ability in life and exercise.

Coach 3: The improvement of balance is helpful for sports performance, and it is also guaranteed in daily life.

Coach 4: very willing to encourage college athletes to practice martial arts Taijiquan, and should promote it as much as possible.

Coach 5: Agree to build the training plan and ensure the safety of the training.

Coach 6: to choose the training content and action, we must be careful, not only to ensure safety but also to effectively improve the balance ability.

Results of expert interviews

After interviews and questionnaires with 5 experts, they affirmed the study and put forward valuable suggestions. They agreed to innovation and practice, not only for safety but also to effectively improve the balance ability. It gave me more confidence to proceed.

Summary of the essence of the expert advice:

Expert 1: Expert 1: Taijiquan requires extremely strong leg strength in the process of practice, so strength training is very needed when practicing Taijiquan balance.

Expert 2: The practice process of Taijiquan, is often practiced slowly. Through a long time of practice, it develops its strength and also strengthens its strength.

Expert 3: Balance is the longest word we use when training Taijiquan. If we want to practice balance stability, we should start from the cerebellum, vestibulum, and proprioception.

Expert 4: Studying the movements of your strength training, is worth studying, which not only exercises the balance but also expands the balance of the training.

Expert 5: Balance is crucial for both the elderly and the young, not only to prevent falls in the elderly but also to control the balance.

Focus groups

The training program was set up by the expert panel. Here is the expert advice:

Expert 1: First of all, we need to construct specific training programs to improve athletes' balance.

Expert 2: Determine the training goal: First of all, it needs to be clear that the goal of the training is to improve the balance of college athletes.

Expert 3: Develop the training plan: according to the training objectives, develop the training plan, including the time of each training, training content, training intensity, and training amount. Three times a week for approximately 90 minutes.

Expert 4: Arrange the training content: including basic exercise training and small combination training. It is necessary to choose the appropriate training content according to the athletes' ability and the actual situation.

Expert 5: Arrange the training intensity and training amount: the training intensity and training amount should be properly controlled to avoid excessive fatigue. In general, each movement or movement requires 2-4 groups, each group is repeated 8-20 times, each movement interval of 30 seconds to 1 minute.

Expert 6: Evaluation and adjustment: During the training process, it is necessary to evaluate the training effect regularly and make appropriate adjustments according to the evaluation results.

Expert 7: Pay attention to the injuries during the practice. Practice well, but also do not get hurt. The auxiliary training of athletes and strengthening strength training can be used as research value.

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Expert 8: Standing with one foot closed is very good, the field is not in high demand, but it can be directly trained to balance.

Expert 9: The training time can be extended appropriately, to speed up the training effect, but not too much, otherwise it is easy to cause the rejection of the training.

The researcher discussed the above information in a group, and all experts conducted this study and gave suggestions. As a result, all experts agreed on the training content, which can be used as the training content of this experiment.

Develop the training program:

1. Training was divided into 3 stages

The first stage is: week1-2, mainly master the training content stage. The second stage is weeks 3-5, of further advanced training, strengthening the training difficulty, and improving the strength. The third stage is week6-8. In the final stage of the test, the test will comprehensively improve the training standards to meet the standards.

Experimental result:

The results showed that the athletes significantly improved their body balance after 8 weeks of systematic training, and the improvement in standing with one foot closed was more obvious in the experiment.

Table 2 Stand on one foot with your eyes closed and cross the boundary with a single leg jump Results of the three anterior, middle, and posterior tests.

Stand on one foot with your eyes closed.		
	$\bar{X}$ (S)	**S.D**
Pre-test	20.80	6.26
4 weeks	39.70	6.17
post-test	63.22	5.70
Cross the boundary with a single-leg jump.		
	$\bar{X}$ (X)	**S.D**
Pre-test	3.10	0.64
4 weeks	4.75	0.64
post-test	5.85	0.37

Shows the test results of the athletes after the first test, after 4 weeks of training, and after 8 weeks of training. Twenty athletes were tested after standing on one foot with their eyes closed and crossing boundary jumping. The mean and standard deviation of the Stand on one foot with your eyes closed and cross the boundary with single leg jump test results in the sample group are as follows:

Before training using the developed specific training program, the Stand on one foot with your eyes closed result was (20.80±6.26), After completing the training at week 4, the results were (39.70±6.17), After completing the training at week 8, the results were (63.22±5.70).

Before training using the developed specific training program, Cross the boundary with single leg jumps were (3.10 ± 0.64,4.75 ± 0.64) after training at week 4, and (5.85 ± 0.37) at week 8.

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Table 3 Analysis results of the anterior, middle, and post-tests of Stand on one foot with your eyes closed

Source of group	SS	df	MS	F	p
Within group	38.750	42	0.923	12.548	0.000
between group	1.250	17	0.074		
Total	40.000	59			

*p < 0.05

Shows the detailed analysis results of Stand on One Foot with your eyes closed, and the pre-test, mid-test, and post-test results differ greatly. It proves that the study of lower limb training programs can indeed improve the balance of martial arts Taijiquan.

Table 4 Comparison of test results for front, middle, and post Cross the boundary with single leg jump.

Source of group	SS	df	MS	F	p
Within group	76.633	2	38.317		
between group	18.100	57	0.318	120.666	0.000
Total	94.733	59			

*p < 0.05

Can see the detailed analysis results of the Cross the Boundary with single leg jump test, and the results of the pre-test, intermediate test, and post-test are quite different. It proves that the study of lower limb training programs can indeed improve the balance of martial arts Taijiquan.

Discussion

The comparison of the results of three tests after 8 weeks of training, fully demonstrated that lower limb strength training can improve the balance of martial arts Taijiquan. When the lower limb muscle strength is improved, it can effectively improve the balance ability of the body. Thus improving the ability to control the body. The author Yang Lei detected the EMG activity of the lower limbs in the Taijiquan movement "white crane bright wing". In the study of Taijiquan beginners and Taijiquan athletes, the results found that support leg tibialis, biceps, and gluteus EMG activity athletes group than beginners group, virtual leg rectus femoris, and gastrocnemius also appeared, athletes, then beginners show active EMG activity state, this preliminary explains the long-term practice Taijiquan can significantly improve the participants of the lower limb muscle strength, and can further improve the balance of the lower limbs. (Yang & Liu, 2019) has also indirectly proved that my research on lower limb muscle training can improve the balance of martial arts Taijiquan. They say that balance ability refers to the ability of the human body to maintain and correct the balance state of the body under various gestures or activities. The balance ability of the human body can reflect the body's ability to process information about the vestibular organs, muscles, tendons, proprioceptors, and the visual system, and it is very meaningful to measure and evaluate it. However, the current domestic measurement methods and tools generally focus on static balance, ignoring the key dynamic balance ability. Indeed, a person remains still standing for very little time, and most are in dynamic activity. The evaluation of dynamic balance is to measure the human body's ability to control the body balance in activities under the influence of the external environment. Therefore, it is of great value to summarize the domestic and foreign evaluation methods of dynamic balance and compare the reliability and validity of different evaluation methods. (CAI Tantan, 2014) The test action I designed had not only static balance but also dynamic balance, which also made a breakthrough contribution to the balance research. I used the one-eye-closed stand-up test used in the article published by the authors Yuan Jinfeng, Zhang Qiuxia, and other researchers. (Yuan et al, 2013), proved that it can improve the balance of martial arts Taijiquan through experiments, which also proves that my test method is certified.

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Recommendation

Practice Recommendation

1. Teachers and coaches should pay special attention to and guide athletes 'practice movements in the whole teaching work and athletes' training and learning, to facilitate a better degree of training to promote the continuous improvement of athletes' movement balance ability.

2. In the physical education teaching practice and peacetime training work, teachers and sports coaches can also try to achieve individualized teaching according to the different stages of the development of individual motor balance ability, focusing on cultivating the training of static balance ability or physical dynamic balance regulation ability or ankle muscle strength.

3. athletes are required to pay special attention to the basic specifications of the learned exercise movements in the process of learning and exercise and should be strictly by the quality standards of the exercise movements, to achieve better exercise effect.

4. In the process of practice, athletes can also consider choosing the weaker part of their balance practice ability according to the specific situation of their balance practice ability.

Further Recommendations

1. It is suggested that authors study this direction can think about the trunk or upper limb direction. To make diversity for balance research, and to make more contributions to the direction of research.

2. Exercise needs to pay attention to perseverance, need to adhere to long-term moderate exercise, and not blindly rush for success. In the process of practice, we can also adjust the amount of training plan according to the field situation and the body center according to the need, to obtain the appropriate amount of exercise at the same time and achieve the exercise effect we want.

References

CAI Tan, T., & Meng, Z. (2014). *Evaluation of human dynamic balance ability.* 2014 Guangzhou International Symposium on Sports and Health.

Cui, Y. (2018). Effect of Tai Chi on cardiopulmonary and lower limb strength. *Western Leather,* 40 (16), 1-10.

Dong, F. (2008). *Research on the development of competitive Wushu routines*. Doctoral dissertation, Shandong Normal University.

Li, Y., & Fan, A. (2018). Study on the evolution of Taijiquan schools [D]. Shanxi Normal University

Liu, Q., & Huang, Q. (2013). Effects of Taijiquan on EMG activity of lower limbs. *Medical biomechanics,* 28 (3), 6-10.

Liu, R. (2013). Effect of Taijiquan exercise on the immune balance ability of non-PE major female college athletes. *Shandong Sports Science and Technology,* 35 (5), 87-90.

McCrae, R. R., & Costa, P. T., Jr. (2013). Introduction to the empirical and theoretical status of the five-factor model of personality traits. In T. A. Widiger & P. T. Costa, Jr. (Eds.), *Personality disorders and the five-factor model of personality* (3rd ed., pp. 15–27). American Psychological Association. https://doi.org/10.1037/13939-002

Wang, J. (2016). Characteristics and rules in the evolution process of Taijiquan schools. *Journal of Shanghai Institute of Physical Education*, 18 (4), 4-10.

Wang, Q. (1989). Review of strength training studies. *China's Sports Science and Technology*. 7, 17-26.

Yang, L., & Liu, Y. (2019). A review of the effects of Tai Chi on lower limb balance ability. *Contemporary Sports Technology. 36*, 2-12.

Yuan, J., Zhang, Q., & Lu, A. (2013). Application of the single-closed method in physical fitness test. *Tissue Engineering Research in China, 17* (33), 6049

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