



## Development of Training Program to Improve Specific Fitness and Wushu Taolu Skills for Youth Athletes

Shen Yinan<sup>1</sup>, Wisute Tongdecharoen<sup>2</sup> and Prakrit Hongseanyatham<sup>3</sup>

<sup>1-3</sup>Faculty of Sports Science and Technology, Bangkokthonburi University, Thailand

<sup>1</sup>E-mail: 2186686967@qq.com, ORCID ID: <https://orcid.org/0009-0009-1617-6071>

<sup>2</sup>E-mail: wisute.ton@bkkthon.ac.th, ORCID ID: <https://orcid.org/0009-0008-5233-7533>

<sup>3</sup>E-mail: prakitsport@gmail.com, ORCID ID: <https://orcid.org/0009-0009-2196-0258>

Received 06/09/2024

Revised 13/09/2024

Accepted 13/10/2024

### Abstract

**Background and Aims:** Nowadays, whether it is an amateur training team or a professional training team, they only use special training methods and some conventional training methods to strengthen athletes' Specific fitness and quality, focusing more on muscle strength exercises. Such training methods are not systematic or comprehensive. Traditional Specific fitness training may have adverse effects on athletes' performance in some cases. Overemphasis on specific fitness training and neglect of comprehensive training can lead to imbalances and increase the risk of injury. The purpose of this study was to develop of training program to improve specific fitness and Wushu Taolu skills for youth athletes.

**Methodology:** This study was a mixed method; it combines quantitative and qualitative research. The sample of this study consisted of 8 experts and 30 male youth Wushu athletes aged between 9-12 years old. They were divided into 2 groups by systematic method. Training program design begins with an analysis of factors affecting specific fitness and Wushu Taolu skills. After that, the information was synthesized and consulted with experts through a focus group method. The content validity value (IOC) was 0.87. The experiment duration was 8 weeks. Wushu Taolu's skills and specific fitness were tested by pre-test and post-test and compared using the independent t-test. As for Wushu Taolu skills were tested by pre-test, mid-test, and post-test using the comparison analysis one-way ANOVA repeated measures, then pairwise with Bonferroni post hoc ( $*p < .05$ )

**Results found that:** 1) Before the experimental the specific fitness result between groups of standing long jump test results was a significant difference ( $*p < .05$ ). Post experimental the specific fitness result between groups of shuttles run test results was not a significant difference. The test result between the experimental group and control group of Wushu Taolu skills, before the experiment found that all Wushu Taolu skills pairwise were not significantly different. Post experimental found that all Wushu Taolu skills pairwise were significantly different ( $*p < .05$ ). The comparison of the Wushu Taolu skills test within the experimental group found that all Wushu Taolu skills in the experimental group had a significant difference ( $*p < .05$ ).

**Conclusion:** The training program can improve specific fitness and Wushu Taolu skills for youth athletes.

**Keywords:** Training Program, Specific Fitness, Wushu Taolu Skills; Youth Athletes.

### Introduction

Specific fitness quality is a comprehensive expression of various physical qualities of the human body and occupies an important place in Wushu Taolu training. Bit. Expansion and expansion, flashing and leaping, ups and downs, priorities, etc. are indispensable body skills in the process of Wushu Taolu training (Yang, 2021) These all require sensitive qualities to support. In a period of rapid development of competitive sports, if athletes want to achieve excellent results, they must not only have good innate physical fitness, but more importantly, they must use scientific training methods to train and strive to improve their physical fitness and sports performance in order not to be defeated. Disuse. Physical fitness is a comprehensive display of an athlete's physical fitness. It includes strength, speed, endurance, Agility, flexibility, and body coordination. As a type of physical fitness, Specific fitness occupies an important position in competitive sports. An athlete's Specific fitness is not only their flexibility during exercise, but also a comprehensive display of their balance, coordination, and other abilities (Jin C, 2023). Wushu Taolu events not only require athletes to have good movement skills but also Specific fitness, which is an important factor for Wushu Taolu athletes to show their athletic ability. In Wushu Taolu drills, most of the movements are flexible and changeable, such as Changquan events. There are many graceful and flexible





movements in the routine drills such as jumping, leaping, and leaping, ups and downs, etc. These technical movements require athletes to have relatively good skills.

High Specific fitness to support. Specific fitness quality is a comprehensive display of the physical fitness of Wushu Taolu athletes (Yang, 2022). It can directly show the strengths and weaknesses of Wushu Taolu athletes' speed, strength, coordination, flexibility, and other physical qualities during the training process. Enhancing athletes' Specific fitness quality can enable the athletes to give referees subjective feelings of lightness, flexibility, sufficient strength, and fullness of spirit during routine drills, and the performance scores will also increase accordingly. Specific fitness quality is particularly important in the training of Wushu Taolu athletes. Nowadays, whether it is an amateur training team or a professional training team, they only use special training methods and some conventional training methods to strengthen athletes' Specific fitness and quality, focusing more on muscle strength exercises. Such training methods are not systematic or comprehensive (Xie, 2012). Traditional Specific fitness quality training lacks personalized customization is difficult to quantify progress and lacks real-life situation simulation. Traditional sensitive quality training may be deficient in cultivating comprehensive abilities. It focuses too much on the improvement of specific skills and ignores the cultivation of comprehensive qualities. It may not be able to effectively respond to the increasingly complex and changing needs of modern society (Tian, 2021). Traditional Specific fitness training may have adverse effects on athletes' performance in some cases. Overemphasis on specific fitness training and neglect of comprehensive training can lead to imbalances and increase the risk of injury. In addition, the lack of comprehensive quality training may cause athletes to Insufficient ability to deal with changing scenarios during competition. Therefore, balanced, and scientific training methods are more important (Ma, 2021).

This study will try to integrate the concept and training methods of specific training into the Specific fitness quality training process of competitive Wushu Taolu athletes, provide a theoretical basis for Specific fitness quality training for the Wushu Taolu training team through experiments, and formulate a formula that is suitable and conducive to improving young Wushu Taolu athletes. The Specific fitness quality training program improves athletes' Specific fitness through Specific fitness training.

## Objectives

1. To study the training current situation of Wushu Taolu athletes.
2. To develop the training program to improve specific fitness and Wushu Taolu skills.
3. To compare the mean effects of a training program on specific fitness and skills between the group and within the experimental group (pre-test, mid-test, and post-test).

## Literature Review

### 1. Wushu Taolu skills

Wushu Taolu skills refer to the arrangement of a variety of Wushu Taolu movements, techniques, or stances in a certain order and combination to form a complete sequence of movements. These skills can contain various technical elements such as basic skills, punches, kicks, grappling techniques, wrestling techniques, etc., and are designed to develop a Wushu Taolu artist's physical coordination, technical proficiency, and combat resilience. Wushu Taolu skills are usually an important part of Wushu Taolu training and one of the main elements in Wushu Taolu competitions and performances. In Wushu Taolu's skills, the choice, sequence, and consistency of movements are of vital importance. A good Wushu Taolu skills need to consider not only technical integrity and fluency but also its practicality and aesthetic effect (Xie, 2012). Through repeated practice and rehearsal of Wushu Taolu skills, Wushu Taolu artists can improve their technical skills, physical fitness, and fighting ability. The forms and characteristics of Wushu Taolu skills can vary among different Wushu Taolu schools and styles, reflecting a variety of different traditions, cultures, and technical styles. The practice of Wushu Taolu skills also develops a Wushu Taolu artist's concentration and endurance, as completing a set usually requires continuous movement and concentration. In addition, by practicing against a partner or opponent, Wushu Taolu artists





can test and improve their skills in real-world situations, enhancing their response and fighting skills (Chen, 2019).

Wushu Taolu's skills are also one of the focuses of attention for judges and spectators in competitive matches and performances. Performers need to demonstrate their level of understanding and mastery of the routines, as well as their technical prowess and expressiveness. Therefore, for Wushu Taolu artists, proficiency in Wushu Taolu skills is one of the keys to improving their competitive level and winning audience recognition. In the process of practicing Wushu Taolu skills, Wushu Taolu artists can also improve their creativity and imagination by constantly challenging themselves and trying new skills and variations. This helps them to be more flexible in responding to various situations and opponents' attacks in actual combat. The design and performance of Wushu Taolu skills can reflect the creativity, imagination, and artistic cultivation of the Wushu Taolu artists, so when evaluating the routine combinations, we should not only consider the technical accuracy and fluency but also pay attention to its aesthetic effect and expressive power (Yang, 2021)

**The specialized skills of Wushu Taolu designed for this study were: Single slap kick - Pubu lungi - Circle arms into smash fist - Single slap kick - Turn waist over (International Wushu Federation, 2013).**

### **1. Single slap kick**

A Wushu Taolu Single slap kick is a specific maneuver that is usually used to switch stances or to complement other movements in a Wushu Taolu. When performing a single slap foot maneuver, the Wushu Taolu artist raises one foot so that it makes contact with the ground and fires it in an instant to produce a clear sound. This movement can be used to emphasize the sense of rhythm and strength in a routine, as well as to add variety and layers to the routine. The execution of the Single slap-kick movement requires the Wushu Taolu artist to have good body control and balance to ensure the accuracy and stability of the movement. In a routine, the single-tap foot is usually used in conjunction with other movements, such as turns, kicks, or attacking movements, to add variety and complexity to the routine. In Wushu Taolu performances or competitions, single-tap foot movements can also increase the audience's visual effect and auditory experience, making the routines more vivid and infectious. Therefore, the Single slap-kick movement is not only a technical requirement but also an artistic expression and performance skill.

### **2. Pubu lungi**

The Pubu lungi in a Wushu Taolu is a common combination of movements that combines foot movement and arm swinging. This maneuver usually consists of the following steps: 1. Pūbù: The pūbù is a footwork technique that is often used to reposition the body or to complement other movements. In this movement, the Wushu Taolu artist will take a step forward with one foot to move the center of gravity of the body forward and maintain a stable posture. lun bi: is an arm-swinging technique, usually used to deliver power or to defend against attacks. In this maneuver, the Wushu Taolu artist makes a large swing with one arm to generate speed and power, usually forward or to the side. This movement can be a one-handed swing or a two-handed swing, depending on the requirements and design of the routine. The combination of the Servant Step Swing can be adapted to different scenarios and requirements by varying the tempo and strength of the swing. This combination is common in many Wushu Taolu and is one of the most important parts of a Wushu Taolu skills and power.

### **3. Circle arms into smash fist**

The Circle arms into smash fist is a common combination of movements in Wushu Taolu formulas that combines arm swings and punching motions. In this maneuver, the Wushu Taolu players make a large swing with one arm, usually forward, to the side, or upward. The power generated by this maneuver can be used to attack an enemy or to defend oneself. A Wushu Taolu player will make a quick punching motion with one arm, usually a forward slam. The purpose of this maneuver is to use the power of the first to strike the enemy, causing damage or interrupting the opponent's attack. The Circle arms into smash fist punch combination can be adjusted with different rhythms and strengths to suit different fighting scenarios





and enemy reactions. This movement combination is common in many Wushu Taolu and is one of the most important parts of a Wushu Taolu artist's display of skill and power.

#### 4. Turn waist over

The Turn waist over is a maneuver in a Wushu Taolu that combines a body roll with a hand slapping motion. It is a physical technique used to quickly change the position of the body or to avoid an attack. In this maneuver, the Wushu Taolu artist will utilize the flexibility and strength of the body to perform a quick side or back roll flipping motion, allowing him or her to quickly evade an attack or adjust position. Tapping the ground is a hand movement used to make a sound or release power. In this maneuver, the Wushu Taolu artist makes a quick slapping motion with the palm or arm, usually toward the ground or another object. The purpose of this movement can be to make noise, scare off an opponent, or release internal power. The combination of flipping and slapping the ground is usually used in Wushu Taolu as a combat technique or performance move. In actual combat, a Wushu Taolu artist can use the waist flip to quickly avoid an opponent's attack, and then use the ground slap to create a distraction or counterattack. In performance, the waist flip and ground slap can increase the variation and visual effect of the routine, making the performance more vivid and interesting. Overall, the Waist Turning and Ground Slapping is a practical and aesthetically pleasing Wushu Taolu. Through repeated practice and rehearsal, Wushu Taolu artists can master this combination of movements and improve their technical level and fighting ability.

#### 5. Specific fitness for Wushu Taolu

Wushu Taolu demands a well-rounded physical fitness profile. Core strength and lower body power generate explosive force for kicks, jumps, and dynamic movements. Excellent flexibility allowing full range of motion and muscle length for high kicks, splits, and postures. Exceptional static and dynamic balance, proprioception, and body control for precise technique execution during transitions and acrobatic elements. Coordination and agility facilitate seamless complex movement sequences with rapid changes in direction. High levels of aerobic and anaerobic endurance fuel the sustained high-intensity bouts throughout routines. An optimal body composition with increased lean muscle mass enhances power production and muscular endurance. Developing this comprehensive physical preparedness maximizes performance in competitive Wushu Taolu (Li, 2028).

Wushu Taolu are choreographed sequences of Wushu Taolu techniques that require a combination of strength, flexibility, coordination, and cardiovascular endurance. The specific physical fitness components for Wushu Taolu can be defined as follows:

##### 1. Muscular Strength and Power:

- Core strength: A strong and stable core is essential for executing and controlling the intricate movements, rotations, and balance requirements in Wushu Taolu.
- Lower body strength and power: Explosive power in the legs is crucial for generating force in kicks, jumps, and dynamic movements.
- Upper body strength: Arm strength is necessary for performing techniques such as punches, blocks, and overhead movements.

##### 2. Flexibility:

- Joint mobility: Wushu Taolu involves a wide range of motion and dynamic postures, requiring excellent joint mobility in the hips, shoulders, and spine.
- Muscle flexibility: Adequate muscle flexibility is crucial for executing high kicks, and splits, and maintaining proper technique in various stances and positions.

##### 3. Balance:

- Static balance: The ability to maintain balance and control in static postures and stances is essential for stability and technique execution.
- Dynamic balance: Many Wushu Taolu movements require dynamic balance control during transitions, spins, and acrobatic elements.
- Proprioception: Awareness of body positioning and control in space is crucial for precise technique execution and injury prevention.





#### 4. Coordination and Agility:

- Kinesthetic awareness: The ability to coordinate complex movement patterns and sequences seamlessly is essential for Wushu Taolu's performance.
- Foot and body control: Precise foot placement, body positioning, and control are required for executing techniques with accuracy and fluidity.
- Agility: Rapid changes in direction, footwork patterns, and body positioning demand excellent agility and body control.

#### 5. Cardiovascular Endurance:

- Aerobic endurance: Wushu Taolu can be physically demanding, requiring sustained periods of high-intensity movements.
- Anaerobic endurance: The explosive and powerful movements in Wushu Taolu rely on anaerobic energy systems for short bursts of high-intensity activity.

Training methods for developing strength, power, endurance, flexibility, and agility are essential for athletes and individuals aiming to improve their overall physical fitness. Various training techniques and programs have been studied to determine their effectiveness in enhancing these physical attributes. This synthesis will present key insights from multiple research papers on the most effective training methods for these fitness components.

#### 3. Training for Wushu Taolu

Training was first widely used in the field of rehabilitation. Its main role was to improve the recovery of injured athletes. Mobilize to return to the field as soon as possible, restore physical functions and competitive abilities, and avoid the probability of recurrence of sports injuries as much as possible. Then, after its effectiveness was confirmed, it was slowly applied in the field of competitive sports. To this day, the role of training in competitive sports has been recognized by the public. However, many experts and scholars have their own unique opinions on the concept of training (Zhao, 2012).

In 1990, Gray, known as the "Father of Training", first presented the concept of training to the public. Gray proposed that training compares the movement process of the human body to a chain. Like a bicycle chain, each link, interlocking and moving as a whole. If one link stops or is damaged, the function of the entire chain will be affected. Just like the movement of the human body, each joint is like a chain link. The stagnation of any joint will lead to the failure of the entire movement. He called it the "kinetic chain". When the human body moves, every joint and every muscle is a participant in human movement and part of the movement function. Focus on training the flexibility and stability of each joint in the chain. It's like the sayings in Wushu Taolu "one hair moves the whole body" and "one place moves, and nowhere else moves".

(Michael, 2011) believes that the essence of training is a training method that enables athletes to effectively control the body in any movement surface or movement axis, which can be understood as purposeful training. Chinese scholars (Dong et al, 2010) believe in "Understanding of Vibration, Core and Strength Training": Strength training in the training system is only one aspect of the system, which mainly emphasizes the training of athletes. Training related to strength in the entire training system, strength training, and other aspects of training, such as speed, endurance, and other training systems are collectively called training systems. (Li, 2011) "Functional Training: Interpretation and Application" believes through research that for athletes to achieve the best sports results, athletes need to carry out scientific and comprehensive physical training, thus improving athletes' competition performance. The specific training method is to pay more attention to other body parts during the athletes' physical training process and provide comprehensive and systematic training guidance to improve sports performance and promote the athletes' physical fitness level.

"Core Training of Competitive Sports": To make athletes' neuromuscular systems operate more efficiently, it is necessary to focus on strengthening the training of athletes' core strength in daily training and enhancing athletes' performance in competition. Speed change and balance and stability ability, think about the corresponding training methods from multiple perspectives, and formulate a training program

that meets the athletes' special sports abilities. Functional training was first used by Yamamoto and his colleagues in 1975 to help soldiers recover as quickly as possible after injury. The initial training is complexly designed to make soldiers less painful. The training mode is mainly static and is mainly used to strengthen the stability and flexibility of injured joints (Yamamoto et al, 2009)

Hedrick (1992) proposed that to improve the sports recovery effect of injured athletes, we should follow the exercise load that the athlete can accept and find out the optimal amount of exercise load that the athlete can bear in order from small to large, to improve the sports recovery of injured athletes. The efficiency is consistent with the gradual increase, step by step, as the load increases.

In the process, physical fitness and technical movements are effectively improved, and sports injuries can be prevented. In 1995, Gray Cook and Lee Burton developed 7 movements that can diagnose dysfunctional parts, which became the Functional Movement Screen (FMS). FMS can diagnose the athlete's injury site or whether there is a weak link, and then provide corrective treatment training to the athlete based on the screening results (Cook, 2006). Michael Boyle believes that training is more effective in increasing the practitioner's sense of balance and proprioception. It is a training in various planes and angles that mostly uses the feet as support points without equipment and relies on its gravity. Utilize training methods to promote and improve the agility of athletes' proprioceptors, and strengthen athletes' ability to coordinate and control neuromuscular and the body.

#### 4. Summaries of literature and research review

To sum up, Specific fitness training can comprehensively demonstrate the physical fitness of athletes and plays an important role in the training process of athletes. Training methods are used in training for most sports and have proven effectiveness. There is a large amount of literature confirming the importance of Specific fitness quality in athlete training, but so far there are few documents that integrate training and Specific fitness quality training and explore them at the same time. Training methods are introduced into Wushu Taolu-specific fitness quality training. The literature is even sparse. Wushu Taolus are competitive sports that require high comprehensive quality athletes. They adhere to the principles of "high", "difficult" and "beautiful". The "new" and "stable" sports characteristics require higher agility. The peak period for the development of the human body's Specific fitness quality is in the growth stage of adolescence. Therefore, this article will use this as an entry point to conduct experimental research to find a Specific fitness training program suitable for Wushu Taolu.

### Conceptual Framework

The research title "Development of Training Program to Improve Specific Fitness and Wushu Taolu Skills for Youth Athletes" was designed as follows athlete.

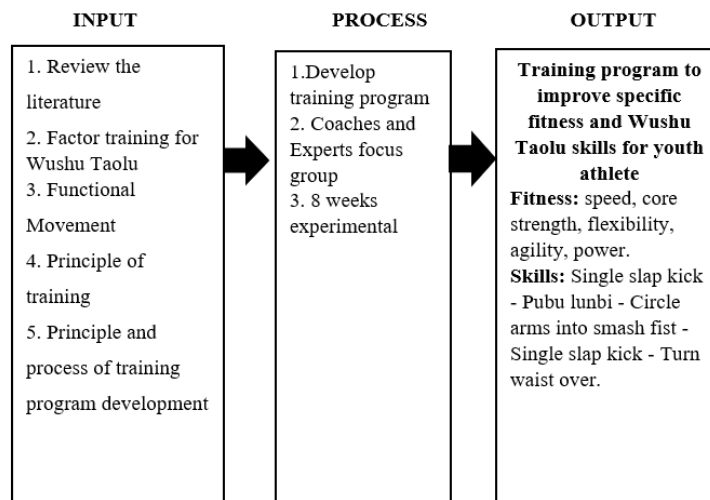


Figure 1 Conceptual Framework



## Methodology

### Population

A total of 187 athletes from the Xi'an Physical Education University Competitive Sports School were screened to find out 58 male athletes aged 9-12 years old who had experience in practicing competitive Wushu Taolu, who could skillfully and accurately rehearse the basic movements of Wushu Taolu, and who did not have any major injuries or illnesses.

### Sample

The researcher will use the G\*power3.1 to analyze the sample size and pre-setting the effect size was 0.7 and preset statistical test power  $1-\beta=0.8$  with a significance level of 0.05 (Chen (2019) After calculation, a sample size of 30 people is required. They were divided into an experimental group and a control, with the experimental group consisting of 15 athletes and the control group consisting.

### The process of dividing experimental objects into groups

1. The researcher will have 58 male athletes test their Wushu Taolu skills (Forward front kick, Pubu lunbi, Jump flying kick. Scoring will be done by three referees by the Wushu Set Competition Rules and Judging Law 2012).

2. Then take the Wushu Taolu skills scores and arrange them in order from low to high. By arranging the scores of 30 athletes.

3. The scores were divided into two groups using the systematic method. Finally, there will be 15 male athletes in each group.

4. Representatives of athletes were again drawn by lottery to be divided into experimental groups and control groups.

### Inclusion criteria:

1. participate in the test and be able to implement the training plan carefully.
2. At present, no injuries are approved by a doctor.
3. Signing the consent of the participating researcher voluntarily.

### Eliminate criteria:

1. During the 8-week experiment, less than 90% participating in the experiment.
2. The subject did not complete the test at the time stipulated by the researchers.
3. Some subjects have poor physical condition during the experiment or are injured during the experiment, which will not continue to participate in the experiment.
4. The subject himself applied to leave this research project

### Research Participates

1. 8 experts were used to evaluate drafts of the training program. Which consists of 2 sports scientists, 2 physical fitness doctors, 2 Wushu coaches, and 2 national Wushu athletes on focus group method.

2. 5 experts were used to validate the functional training program (IOC) include: 1 International Wushu Referee, 1 International Wushu Set Coach, 1 Chinese Wushu Sets All Games Champion, 1 Sports Scientist, and 1 Team doctor for Shaanxi sports teams.

### Research Instrument

#### 1. Training program.

The process of developing a training program begins with studying relevant documents and a focus group with 8 experts. After that, a draft training program was created and quality (validity and reliability) was tested before the experiment. The duration of using the program is not more than 50 minutes, divided into 10 minutes to warm up and 10 minutes to cool down, divided into 3 days per week in week 1-6 (Monday, Wednesday, Friday) and 5 days per week in week 7-8 (Monday to Friday). A total of 15 athletes.

#### 2. Fitness test

- 2.1 Strength: 30 Seconds Sit-up
- 2.2 Flexibility: Sit and reach test
- 2.3 Agility: Shuttle run





2.4 Power: Standing long jump

2.5 Speed: 50-meter sprint

### 3. Wushu Taolu skills test

Single slap kick - Pubu lungi - Circle arms into smash fist - Single slap kick - Turn waist over, then turn around and repeat the combination 5 times.

The chief referee of the Shaanxi Provincial Wushu Circuit Championship will judge and score the subject's combination movements by the scoring standards through the Wushu Circuit Competition Rules and Refereeing Laws, 2012 Edition.

#### Data collection

1. Study the current problems by studying relevant documents and analyzing factors important to Wushu training.

2. A focus group with 8 experts was used to gather recommendations for improving the training model created by the researcher.

3. Test basic information about the subjects: gender, height, weight, years of practicing Wushu Taolu, and any major injuries or illnesses.

#### 4. Pre-test

1) The data of Anaerobic capacity, Core Strength, Flexibility, Agility, and Power of the experimental subjects in the Pre-test side.

2) The experimental group participated in a pre-test of their Wushu Taolu skills.

#### 5. Mid-test (After 4 weeks)

1) The experimental group participated in the Mid-test of their Wushu Taolu skills.

#### 6. Post-test (After 8 weeks)

1) The data of Anaerobic capacity, Core Strength, Flexibility, Agility, and Power of the experimental subjects in the Post-test side.

2) The experimental group participated in a Post-test of their Wushu Taolu skills.

#### Data Analysis

1. The numerical data are expressed as Mean and Standard Division.

2. The independent sample t-test was used for comparison data between groups.

3. Comparison analysis within groups uses one-way repeated-measures

4. ( $P < 0.05^*$ , which means it has significant difference;  $P > 0.05$  means no significant difference).

#### Research Process

##### Phase 1: Review literature and research

1) Literature collection about the functional training program

2) Determine the important factors affecting specific fitness and Wushu Taolu skills for youth Wushu Taolu athletes.

##### Phase 2: Construct a functional training program

1) Study factors affecting specific fitness and Wushu Taolu skills for youth Wushu Taolu athletes and then draft the functional training program by the researcher.

2) The 8-week training plan was submitted to 8 experts to review, evaluate, and revise in the focus group method. The researcher revised the training program according to the recommendations of experts.

3) Training program validity test by 5 experts (IOC).

4) Training program reliability test (try out with 5 and 9 Wushu Taolu athletes who were not in the experimental group).

##### Phase 3: Experimental

1) Basic information about the subjects was collected: gender, height, weight, years of practicing Wushu Taolu, and any major injuries or illnesses.

2) Pre-test





- 2.1 The data of Anaerobic capacity, Core Strength, Flexibility, Agility, and Power of the experimental subjects in the Pre-test side.
- 2.2 The experimental group participated in a pre-test of their Wushu Taolu skills.
- 3) Mid-test (After 4 weeks)
  - 3.1 The experimental group participated in the Mid-test of their Wushu Taolu skills.
- 4) Post-test (After 8 weeks)
  - 4.1 The data of Anaerobic capacity, Core Strength, Flexibility, Agility, and Power of the experimental subjects in the Post-test side.
  - 4.2 The experimental group participated in a Post-test of their Wushu Taolu skills.
- 5) Analyzing Data
  - 5.1 At the end of the 8-week training program, test data from each phase of the experiment were compared and analyzed between the experimental and control group experiments.
- 6) Conclusion
  - 6.1 Conclusions were drawn after comparing and analyzing the test data of the experimental and control groups at each stage of the experiment.

## Results

### The conclusion of the results from the focus group

Most experts gave their opinion that Long-distance running should be eliminated because it is unlikely that there will be any results from experimental. Maintain the 5 items of a physical fitness test, which were: Sit and reach more, standing long jump, sit-up for 30 seconds, shuttle run, 50 meters sprint, and long-distance running should not be underestimated. Because it is unlikely to be related to a Wushu skill training program.

The opinions of 8 experts mostly agreed that the frequency of using the program should be 3 times/week and 3 experts agreed on training 5 times a week. Therefore, the researcher concluded the training program that in weeks 1-6, there would be training only 3 days a week and in weeks 7-8, practice 5 days a week, and each time should not exceed 50 minutes.

All experts consider appropriate warm-up movements include: Head turning pose, lung expansion pose, side leaning pose, arm, wrist, and finger exercise, up-down shoulder exercise, shoulder exercise, side body exercise, and exercises for the waist, back, and body. The cool-down movements that all experts consider appropriate include core exercises, head tilts, ankle stability exercises, exercise body and arms, exercise the muscles of the shoulders and arms, exercise the shoulders and arms, exercise the shoulders, wrists, and core.

**Table 1** The training program for weeks 1-6.

Day	Training Contents	Set*Rep (minute)	Time to rest between set	Total Time (minute)
Monday	<b>Warm-up</b>			10
	- Sit and reach 2 minutes - Sit up 10 times - Standing long jump 5 times - Jogging around the sports ground			
	<b>Training</b>	5*3	30 Second	15 (Does not include rest time between sets and between movements)
	- Single slap kick skill (Try practicing slowly)			





Day	Training Contents	Set*Rep (minute)	Time to rest between set	Total Time (minute)
	- Pubu lungi skill (Try practicing slowly)	5*3	30 Second	15 (Does not include rest time between sets and between movements)
	<b>Cool down</b> - Sit and reach 2 minutes - Sit up 10 times - Standing long jump 5 times - Jogging around the sports ground			10
<b>Wednesday</b>	<b>Warm-up</b> - Sit and reach 2 minutes - Sit up 10 times - Standing long jump 5 times - Jogging around the sports ground			10
	<b>Training</b> - Circle arms into smash fist skill (Try practicing slowly)	5*3	30 Second	15 (Does not include rest time between sets and between movements)
	- Turn waist over skill (Try practicing slowly)	5*3	30 Second	15 (Does not include rest time between sets and between movements)
	<b>Cool down</b> - Sit and reach 2 minutes - Sit up 10 times - Standing long jump 5 times - Jogging around the sports ground			10
<b>Friday</b>	<b>Warm-up</b> - Sit and reach 2 minutes - Sit up 10 times - Standing long jump 5 times - Jogging around the sports ground			5
	<b>Training</b> - Single slap kick skill (Try practicing slowly)	3*3	20 Second	10 (Does not include rest time between sets and between movements)
	- Pubu lungi skill (Try practicing slowly)	3*3	20 Second	10 (Does not include rest time between sets and between movements)





Day	Training Contents	Set*Rep (minute)	Time to rest between set	Total Time (minute)
	- Circle arms into smash fist skill (Try practicing slowly)	3*3	20 Second	sets and between movements) 10 (Does not include rest time between sets and between movements)
	- Turn waist over skill (Try practicing slowly)	3*3	20 Second	10 (Does not include rest time between sets and between movements)
	<b>Cool down</b> - Sit and reach 2 minutes - Sit up 10 times - Standing long jump 5 times - Jogging around the sports ground			10

**Table 2** The training program for weeks 7-8.

Day	Training Contents	Set* Rep (rounds)	Time to rest between set	Total Time (minute)
<b>Monday-Friday</b>	<b>Warm-up</b> - Sit and reach 3 minutes - Sit up 15 times - Standing long jump 10 times - Jogging around the sports ground			10
	<b>Training</b> - Single slap kick skill - Pubu lungi skill - Circle arms into smash first skill - Single slap kick skill skill - Turn waist over skill (Continuously and at normal speed)	4*5	10 Second	30 (Does not include rest time between rounds)
	<b>Cool down</b> - Sit and reach 3 minutes - Sit up 15 times - Standing long jump 10 times - Jogging around the sports ground			10





**Results of the experiment by using the specific fitness and Wushu Taolu skill training program for male youth Wushu athletes.**

**Table 3** The characteristics of male youth Wushu athletes (n=30).

Variable	Experimental Group (n=15)	Control Group (n=15)
	M ±SD	M ±SD
Weight (Kg)	35.47±1.75	35.47±2.14
High (Cm)	124.56±3.96	124.56±4.05
BMI (%)	22.40±0.24	22.40±0.50

Table 3 found that the average weight, height, and body mass index of male youth Wushu athletes in the experimental group were 35.47±1.75 kilograms, the average height was 124.56±3.96 centimeters, and the average body mass index (BMI) was 22.40±0.24, respectively. In the control group was 35.47±2.14 kilograms, the average height was 124.56±4.05 centimeters, and the average body mass index (BMI) was 22.40±0.50, respectively.

**Table 4** Mean and standard deviation of Wushu Taolu skills test of the experimental and control groups.

Variable	Experimental Group (n=15)			Control Group (n=15)		
	Pre-test	Mid-test	Post-test	Pre-test	Mid-test	Post-test
	M ±SD	M ±SD	M ±SD	M ±SD	M ±SD	M ±SD
Wushu Taolu skill	6.83±0.39	7.51±0.59	8.32±0.52	7.01±0.46	7.02±0.52	6.98±0.51

Table 4 shows that: The Wushu Taolu skills test was conducted on two groups: an experimental group and a control group. The tests measured various components of Wushu Taolu's skills circle, including a Single slap kick -Pubu lungi -Circling the arm into a smashing fist- Single slap kick- And turning the waist over. The experimental group had 6.83±0.39, 7.51±0.59, and 8.32±0.52 scores, respectively. The Control Group was 7.01±0.46, 7.02±0.52 and 6.98±0.51 scores, respectively.

**Table 5** Mean compared between the experiment and control groups with the pre-test of the Wushu Taolu skills test, by t-test independent.

Variable	Experimental Group (n=15)	Control Group (n=15)	95% Confidence Interval of the Difference		t	p
	M ±SD	M ±SD	Lower	Upper		
Wushu Taolu skill	6.83±0.39	7.01±0.46	-0.14	0.50	1.13	0.26

\*p<0.05

Table 5 shows that all of Wushu Taolu's skills (Single slap kick -Pubu lungi -Circle arm into smash fist- Single slap kick- Turn waist over) pairwise were not significant differences with a p-value = 0.26.



**Table 6** Mean comparison between the experiment and control groups with the mid-test of the Wushu Taolu skills test, by t-test independent.

Variable	Experimental Group (n=15)	Control Group (n=15)	95% Confidence Interval of the Difference		t	p
	M ±SD	M ±SD	Lower	Upper		
Wushu Taolu skill	7.51±0.59	7.02±0.52	-0.90	-0.06	-2.38	0.24

\*p<0.05

Table 6 shows that all of Wushu Taolu's skills (Single slap kick -Pubu lungi -Circle arm into smash fist- Single slap kick- Turn waist over) pairwise were not significant differences with a p-value = 0.24.

**Table 7** Mean comparison between the experiment and control groups with the post-test of the Wushu Taolu skills test, by t-test independent.

Variable	Experimental Group (n=15)	Control Group (n=15)	95% Confidence Interval of the Difference		t	p
	M ±SD	M ±SD	Lower	Upper		
Wushu Taolu skill	8.32±0.52	6.98±0.51	-1.72	-0.95	-7.05	0.01*

\*p<0.05

Table 7 shows that all of Wushu Taolu's skills (Single slap kick -Pubu lungi -Circle arm into smash fist- Single slap kick- Turn waist over) pairwise were significant differences with a p-value = 0.01.

**Table 8** Mean compared between the experiment and control groups with the pre-test of the specific fitness test, by t-test independent.

Variable	Experimental Group (n=15)	Control Group (n=15)	95% Confidence Interval of the Difference		t	p
	M ±SD	M ±SD	Lower	Upper		
50 m sprint	12.69±0.42	12.52±1.27	-0.87	0.53	-0.49	0.62
Standing long jump	96.92±0.90	95.65±0.86	-1.93	-0.60	0.92	0.01*
30 second sit up	14.93±1.98	14.93±1.83	-1.42	1.42	0.00	1.00
Sit and Reach	3.81±0.96	3.60±0.32	-0.11	0.95	1.60	0.12
Shuttle run	16.83±3.16	16.38±0.63	-1.85	1.55	-0.18	0.85

\*p<0.05

Table 8 shows that there were no significant differences in the specific fitness, including 50 m sprint, 30-second sit up, sit and reach, and shuttle run with a p-value>0.05. The specific fitness of standing long jump test result was a significant difference with a p-value = 0.01.

**Table 9** Mean comparison between the experiment and control groups with the post-test of the specific fitness test, by t-test independent.

\*p<0.05

Table 9 shows that there were significant differences in the specific fitness, including 50 m sprint, standing long jump, 30-second sit-ups, and sit and reach with a p-value < 0.05. The specific fitness of the shuttle run test result was not a significant difference with a p-value = 0.17.

**Table 10** Mean comparison of Wushu Taolu skills tests within the experimental group by using one-way ANOVA repeated measurement and Bonferroni post hoc.

Dependent variables/test		Mean Difference	Bonferroni Std. Error	p	M ±SD	F	p
Wushu Taolu Skill (Single slap kick -Pubu lungi -Circle arm into smash fist- Single slap kick- Turn waist over)							
Pre-test	Mid-test	-0.68	0.75	0.01*	6.83±0.39	238.70	0.01*
	Post-test	-1.49	0.69	0.01*			
Mid-test	Mid-test	0.68	0.75	0.01*	7.51±0.59	238.70	0.01*
	Post-test	-0.81	0.60	0.01*			
Post-test	Mid-test	1.49	0.69	0.01*	8.32±0.52		
	Post-test	0.83	0.60	0.01*			

\*p<0.05

Table 10 shows that all of Wushu Taolu's skill in the experimental group has a significant difference with a p-value < 0.05 between the pre-test, mid-test, and post-test.

### Summary of the results

1. The specific fitness and Wushu Taolu skill training program that received advice for improvement and editing from experts, consists of the following programs: The duration of using the program is not more than 50 minutes, divided into 10 minutes to warm up and 10 minutes to cool down, divided into 3 days per week in week 1-6 and 5 days per week in week 7-8.

2. After experimental the result of the specific fitness test of male youth Wushu athletes there were significant differences in the specific fitness, including 50 m sprint, standing long jump, 30 seconds sit up, sit and reach with a p-value < 0.05. The specific fitness of the shuttle run test result was not a significant difference with a p-value = 0.17.

Variable	Experimental Group (n=15)	Control Group (n=15)	95% Confidence Interval of the Difference		t	p
	M ±SD	M ±SD	Lower	Upper		
50 m sprint	11.38±1.83	12.60±1.14	0.34	2.09	2.86	0.01*
Standing long jump	118.44±2.06	95.71±0.70	-23.88	-21.57	-40.28	0.01*
30 second sit up	18.13±2.16	15.26±1.53	-4.27	-1.46	-4.18	0.01*
Sit and Reach	7.48±1.43	4.11±0.40	-4.15	-2.58	-8.77	0.01*
Shuttle run	15.30±3.24	16.49±0.36	-0.55	2.93	1.40	0.17

3. After the experiment the results of the comparison of the Wushu Taolu skills test within the experimental group by using one-way ANOVA repeated measurement and Sphericity post hoc were significantly different at the.05 level. The comparison of mean effects of specific fitness and Wushu Taolu



skill training programs on Wushu Taolu skills between the experimental group and the control group were significantly different at the .05 level.

## Discussion

The research result found that the training program to improve specific fitness and Wushu Taolu skills duration of using the program is not more than 50 minutes, the last 2 weeks, the male youth athletes will practice every skill in a round (5 sets/round), resting 10 seconds between sets, which will take approximately 40 seconds/round, the training program for the last 2 weeks will be consistent with Rules for International Wushu Taolu Competition (2005) was said that Children's Group: 6 to 12 years old. In this category, the competition time for Tai Chi events is 2 minutes to 2 minutes 30 seconds, and the competition time for other events is 30 seconds to 40 seconds. Chen (2019) mentioned in "A Brief Analysis of the Importance of Children's Specific Fitness Quality Training in Wushu Sports" that the different styles of Wushu Taolu are very important for Specific fitness. The manifestations of qualities are also different, which fully demonstrates the importance of the performance of Specific fitness in Wushu Taolu. Therefore, Specific fitness training needs to be fully applied in children's Wushu Taolu training to improve children's agility.

The experimental results of the specific fitness of pre-test standing long jump test result were a significant difference. The post-test results of the shuttle run test result were not a significant difference. Such physical fitness is important to Wushu training will be consistent with the Journal of Sports Science and Medicine (2018) was explored the relationship between physical fitness and skill performance in Wushu athletes. The findings suggested that physical fitness components, such as muscular strength, power, and flexibility, were positively associated with better technical execution and scoring in Wushu competitions. Gao Xiaoli (2016) also emphasized in "Exploring the Importance of Physical Training for Young Competitive Wushu Taolu Athletes" that the performance of physical fitness involves some aspects of athletes. In Wushu Taolu Competition Rules and Judgment Methods (2012) the chapter on practice level scoring points out the criteria for judging athletes' performance level, including sufficient strength, smooth force, accurate force points, clear rhythm, Specific fitness quality a comprehensive display of athletes' strength, speed, coordination, flexibility, endurance, and other physical qualities.

The final results of the comparison of specific fitness and Wushu Taolu skill training programs within the experimental group were significantly different at the .05 level. The results are consistent with physical functional training has a positive impact on improving athletes' physical fitness and sport special technical abilities.

## Recommendations

1. Should have more opportunities to practice activities involving the use of the arms. In the form of playing sports that enhance the ability of the arms and legs, such as swinging, throwing, pulling, dragging, flexibility training, all of which enhance the ability to use the arms and legs.
2. Schools should organize physical fitness testing twice a year, with testing at the beginning of every semester. and the end of the semester to know the results of physical fitness
3. Development of various sports training programs There must be guidelines that are appropriate for the athlete's physical condition.
4. Use more sports equipment to be used as motivation to increase students' physical fitness testing abilities to be more effective.

### Suggestions for future research

In the next research, it should be used to develop a variety of sports programs that will lead to the development of physical fitness in other dimensions, such as football, basketball, and badminton.





## References

- Chen, S. (2019). A brief analysis of the importance of children's Specific fitness training in Wushu Taolu. *Sports Science and Technology*. (1), 33-35.
- Cook, G., Burton, L., & Hoogenboom, B. (2006). Pre-participation screening: the use of fundamental movements as an assessment of function - part 1. *N Am J Sports Phys Ther*. 1(2), 62-72.
- Dong, D. Wang, W. & Liang, J. (2010). Understanding of vibration, core, and functional strength training. *Journal of Beijing Sport University*, 5, 105-109.
- Gao, X. (2016) *Exploring the Importance of Physical Training for Young Competitive Wushu Taolu Athletes*. Wushu Taolu Competition Rules and Judgment Methods.
- Hedrick, A. (1992). Exercise Physiology: Physiological Responses to Warm-Up. *Strength & Conditioning Journal*. 14 (5), 25-27.
- International Wushu Federation. (2013). *Wushu Taolu competition rules and refereeing methods*. International Wushu Federation
- Jin, C. (2023). the research progress of functional training in physical training of different sports programs. *Contemporary Sports Technology*. 5, 1-10.
- Li, D., Hu, F., & Hu, X. (2011). Functional training: interpretation and application. *Journal of Shandong Institute of Physical Education*. 27 (10), 71-76.
- Li, Y. (2008). Research on physical training for competitive aerobics. *Journal of Beijing Sport University*. 11, 141- 143.
- Ma, Y. (2021). Analyzing the similarities and differences between physical functional training and physical quality training. *Sports supplies, and technology*. 6, 6-15.
- Michael, B. (2011). *Advances in functional training*. On Target Publications.
- Tian, J. (2021). Philosophical Thinking on Functional Training Research. *Journal of Hebei Institute of Physical Education*. 1, 7-10.
- Xie, H. (2012). A brief analysis of the influencing factors and development of Wushu Taolu athletes' Specific fitness quality. *Wushu Taolu Research*. 4, 47-48.
- Yamamoto, K., Kawano, H. & Gando, Y. (2009). Poor trunk flexibility is associated with arterial stiffening. *AJP Heart and Circulatory Physiology*. 297 (4), 1314-1318.
- Yang, M. (2021). *The application of functional Training in Wushu Routine Training*. Contemporary Sports Technology.
- Yang, S. (2022). *Applied Research in Functional Training*. Youth Sports.
- Zhao, X. (2012). On the concept and classification of sports agility. *Journal of Wuhan Institute of Physical Education*. 46 (8), 92-95.
- Zhao, X. (2015). *Experimental study on the impact of " soft ladder training " on the Specific fitness and ability of young Wushu Taolu athletes*. Hebei Normal University.

