



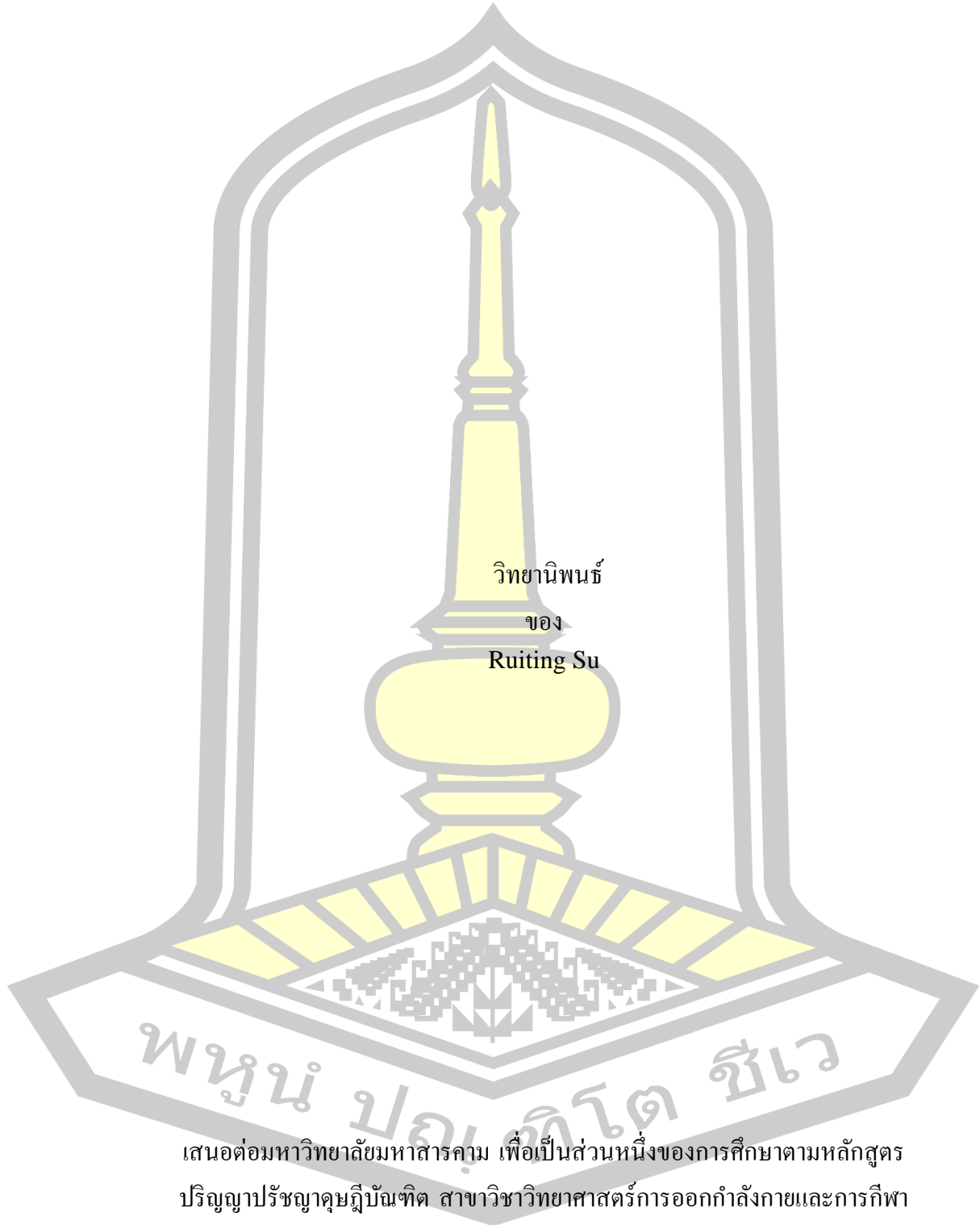
Mindfulness Training on Psychological Characteristics of Pre-Match Competitive Tai Chi Athletes

Ruiting Su

A Thesis Submitted in Partial Fulfillment of Requirements for
degree of Doctor of Philosophy in Exercise and Sport Science
December 2024

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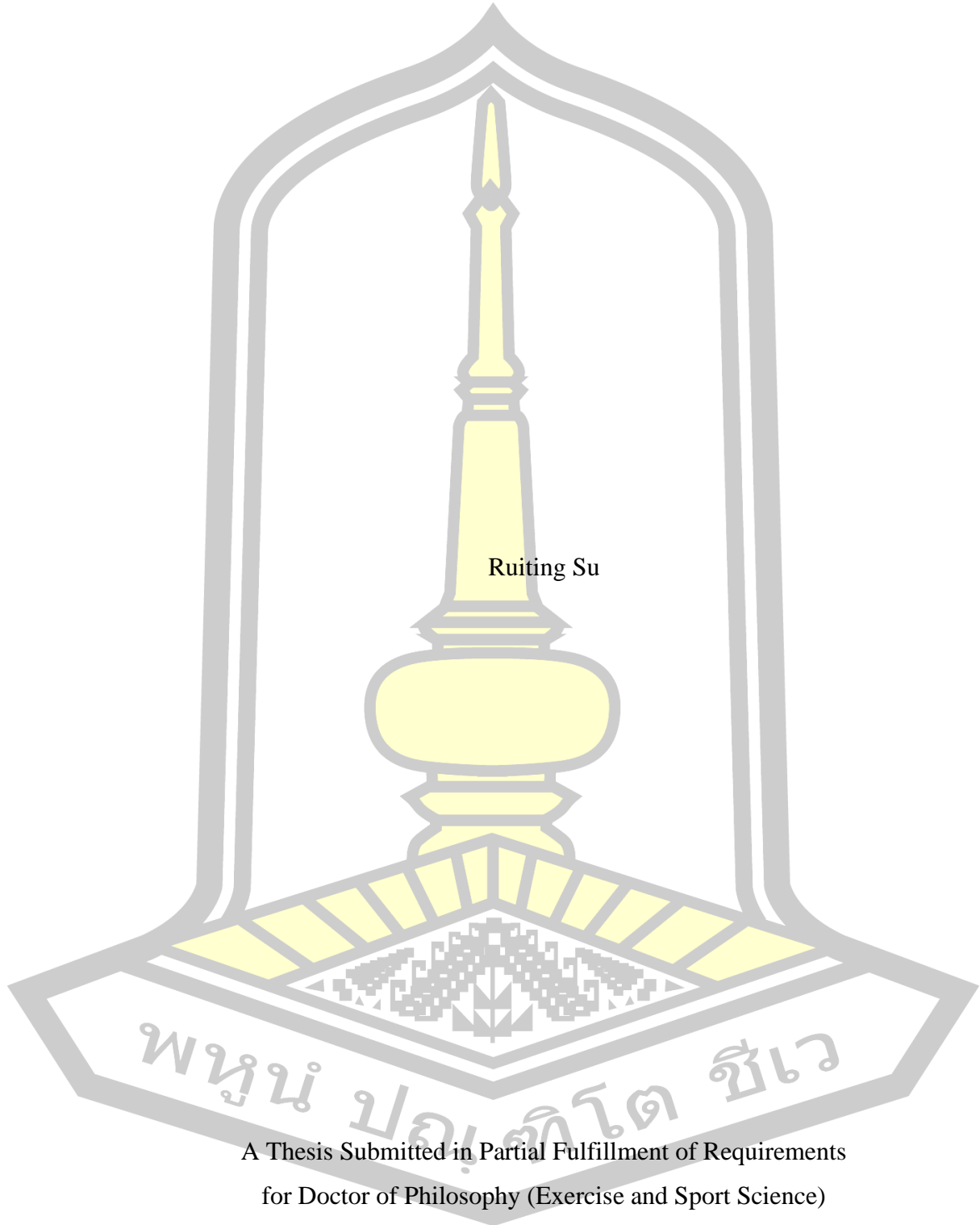
วิทยานิพนธ์
ของ
Ruiting Su

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ลิขสิทธิ์เป็นของมหาวิทยาลัยมหาสารคาม

Mindfulness Training on Psychological Characteristics of Pre-Match Competitive Tai
Chi Athletes



Ruiting Su

A Thesis Submitted in Partial Fulfillment of Requirements
for Doctor of Philosophy (Exercise and Sport Science)

December 2024

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The examining committee has unanimously approved this Thesis, submitted by Ms. Ruiting Su , as a partial fulfillment of the requirements for the Doctor of Philosophy Exercise and Sport Science at Maharakham University

Examining Committee

- | | |
|--|-----------|
| (Assoc. Prof. Tanida Julvanichpong ,
Ph.D.) | Chairman |
| (Wannaporn Sumranpat Brady ,
Ph.D.) | Advisor |
| (Asst. Prof. Chairat Choosakul ,
Ph.D.) | Committee |
| (Asst. Prof. Yada Thadanatthaphak ,
Ph.D.) | Committee |
| (Assoc. Prof. Sumattana Glangkarn ,
Ph.D.) | Committee |

Maharakham University has granted approval to accept this Thesis as a partial fulfillment of the requirements for the Doctor of Philosophy Exercise and Sport Science

- | | |
|---|---|
| (Assoc. Prof. Chowwalit
Chookhampaeng , Ed.D.)
Dean of The Faculty of Education | (Assoc. Prof. Krit Chaimoon , Ph.D.)
Dean of Graduate School |
|---|---|

TITLE	Mindfulness Training on Psychological Characteristics of Pre-Match Competitive Tai Chi Athletes		
AUTHOR	Ruiting Su		
ADVISORS	Wannaporn Sumranpat Brady , Ph.D.		
DEGREE	Doctor of Philosophy	MAJOR	Exercise and Sport Science
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ABSTRACT

The aims of this study were to investigate pre-match psychological characteristics of competitive Tai Chi athletes and compare the effect of mindfulness training on the psychological characteristics of competitive Tai Chi athletes before and after 12 weeks and compare with control group after 12 weeks. There were 40 competitive Tai Chi athletes, aged 19-24 years old at the School of Physical Education of Zhengzhou University in Zhengzhou, Zhengzhou, China. They would participate in the "2024 National Wushu Taolu Championship" from 22 to 29 June ,including 20 males and 20 females. Forty participate were stratified random sampling into two group. Mindfulness training group (N=20) and control group(N=20), with mixed gender and level similarly in each group. Both groups participated in the intervention for 90 minutes once a week for 12 weeks. Statistically significant was defined as $p < 0.05$.

Results as the following :

(1)Through the analysis of pre-test data, it can be seen that in the pre-match psychological characteristics survey, the high level competitive Tai Chi athletes were better than the low level Tai Chi athletes in the data of each dimension of each questionnaire, and there were significant differences in the five-factor mindfulness questionnaire, the contest anxiety questionnaire and the trait sports self-confidence scale (TSCI-PL).There was no significant difference in positive mood among competitive Tai Chi athletes at each sports level on the mood measurement scale, but there was a significant difference between national athletes and second level athletes in the negative mood dimension. There was a significant difference between first level and second level athletes in terms of total TMD scores. There were some differences in the pre-match psychological characteristics of competitive Tai Chi athletes of different genders, but there was no significant difference. This was consistent with hypothesis of the research 1. In terms of gender, there were significant .differences in weight and height among athletes of different genders, and the weight and height of male competitive Tai Chi athletes were significantly higher than those of female competitive Tai Chi athletes. There were no significant differences in other data. The higher the score of the five-factor mindfulness

questionnaire, the more obvious the effect of mindfulness training, and the lower the negative it was. A higher score on the mood measurement scale indicates a negative state of mind for the athlete and vice versa. Higher scores on the contest anxiety questionnaire indicate higher cognitive and somatic anxiety and state self-confidence. The higher the exercise self-confidence score, the more confident the subject was. The maximum value of the five-factor mindfulness questionnaire in this test was 115 points, the maximum value of the mood measurement scale was 131, the maximum value of the contest anxiety questionnaire was 25, and the maximum value of the exercise self-confidence scale was 37.

(2) 12 weeks of mindfulness training can improve all pre-match psychological characteristics, which was consistent with hypothesis of the research 2, specifically, in the comparison of pre-test and post-test data in the mindfulness training group, the effect of mindfulness training on the psychological characteristics of competitive Tai Chi athletes was very significant, and the five dimensions of the five-factor mindfulness questionnaire show significant changes. The results of the contest anxiety questionnaire showed that the post-test anxiety level of the mindfulness training group was significantly reduced in the two dimensions of "cognitive state anxiety" and "somatic state anxiety", while the score of "state self-confidence" was significantly improved. In the trait motor self-confidence scale, the mindfulness training group showed significant improvement in the three dimensions of "trait motor task confidence", "trait motor coping confidence" and "total motor self-confidence score".

(3) 12 weeks of mindfulness training improved all pre-match psychological traits more than the control group, which was consistent with hypothesis of the research 3 of this study, specifically, in the mindfulness training group compared with the control group, the mindfulness training group was significantly higher than the control group in the "observation" dimension of the five-factor mindfulness questionnaire, the mindfulness training group was higher than the control group in the "description" dimension, and the mindfulness training group was higher than the control group in the "non-judgment" dimension; In the mood measurement scale, the mindfulness training group was lower in the "positive mood" than the control group, and the mindfulness training group was significantly lower in the "negative mood" than the control group. contest anxiety questionnaire: the mindfulness training group was significantly lower than the control group in terms of state self-confidence, and significantly lower than the control group in the other two dimensions. In the trait motor self-confidence scale, the mindfulness training group scored higher scores on "trait motor task confidence" and "trait motor coping confidence" than the control group. The effectiveness of mindfulness training in improving athletes' mental state and self-confidence has been demonstrated.

Keyword : Competitive Tai Chi Athletes, Pre-Match Psychological Characteristics, Mindfulness Exercise Group

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During my doctoral studies, my supervisor not only helped me sort out the research ideas and framework of my dissertation, but also carefully gave me a lot of encouragement and gave me a lot of learning opportunities, provided various learning materials to help me understand during my study, and paid attention to my various loves in life, so that I gained valuable knowledge during my study in Thailand, and these precious practical experiences have benefited me for life. In my future studies and life, I would always take my supervisor as an example, have a rigorous research attitude in scientific research, be meticulous in my work, and care for students' physical and mental health in life, so that students can have a better sense of belonging.

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In the experimental data collection stage, I would like to thank the leaders, teachers and college students of the School of Physical Education of Zhengzhou University for their help and cooperation, so that I can complete the experiment well. I would also like to thank all my classmates who studied together at Mahasarakan University and who also gave me a lot of support in the process of writing my dissertation.

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TABLE OF CONTENTS

	Page
ABSTRACT.....	D
ACKNOWLEDGEMENTS.....	F
TABLE OF CONTENTS.....	G
LIST OF TABLES.....	I
LIST OF FIGURES.....	J
CHAPTER I INTRODUCTION.....	1
Background.....	1
Research questions.....	5
Objectives of the research.....	6
Hypothesis of the Research.....	6
Scope of the study.....	6
Significant of Study.....	7
Definitions of the term.....	9
Conceptual framework.....	10
CHAPTER II REVIEW OF RELATED LITERATURE.....	11
1. Competitive Tai Chi.....	11
2. Pre-match psychology-related literature.....	13
3. Psychological Training before sport competition.....	30
4. Mindfulness training.....	48
CHAPTER III RESEARCH METHODS.....	63
Phase I:.....	63
1. The methodology of the phase I.....	63
2. Instrumentals.....	65
3. Instrumentals.....	65
4. Data Collection Procedure.....	68

5. Data analysis	69
Phase II:	70
1. Subjects	70
2. Phase II	70
3. Instrumentals	73
4. Interventions	73
5. Data collecting procedure.....	75
CHAPTER IV RESEARCH RESULTS	77
Phase I:.....	78
Phase II:	89
CHAPTER V DISCUSSION AND CONCLUSION	95
Discussion.....	96
Conclusion	114
Limitations of the study	116
Suggestion.....	117
REFERENCES	119
APPENDIX.....	138
APPENDIX A Measuring Tools	139
APPENDIX B Mindfulness training program	152
APPENDIX C IOC Expert Scoring And Evaluation Form	183
APPENDIX D Ethical Materials	194
APPENDIX E Test--Retest And Experimental	211
APPENDIX E Experimental.....	217
BIOGRAPHY	221

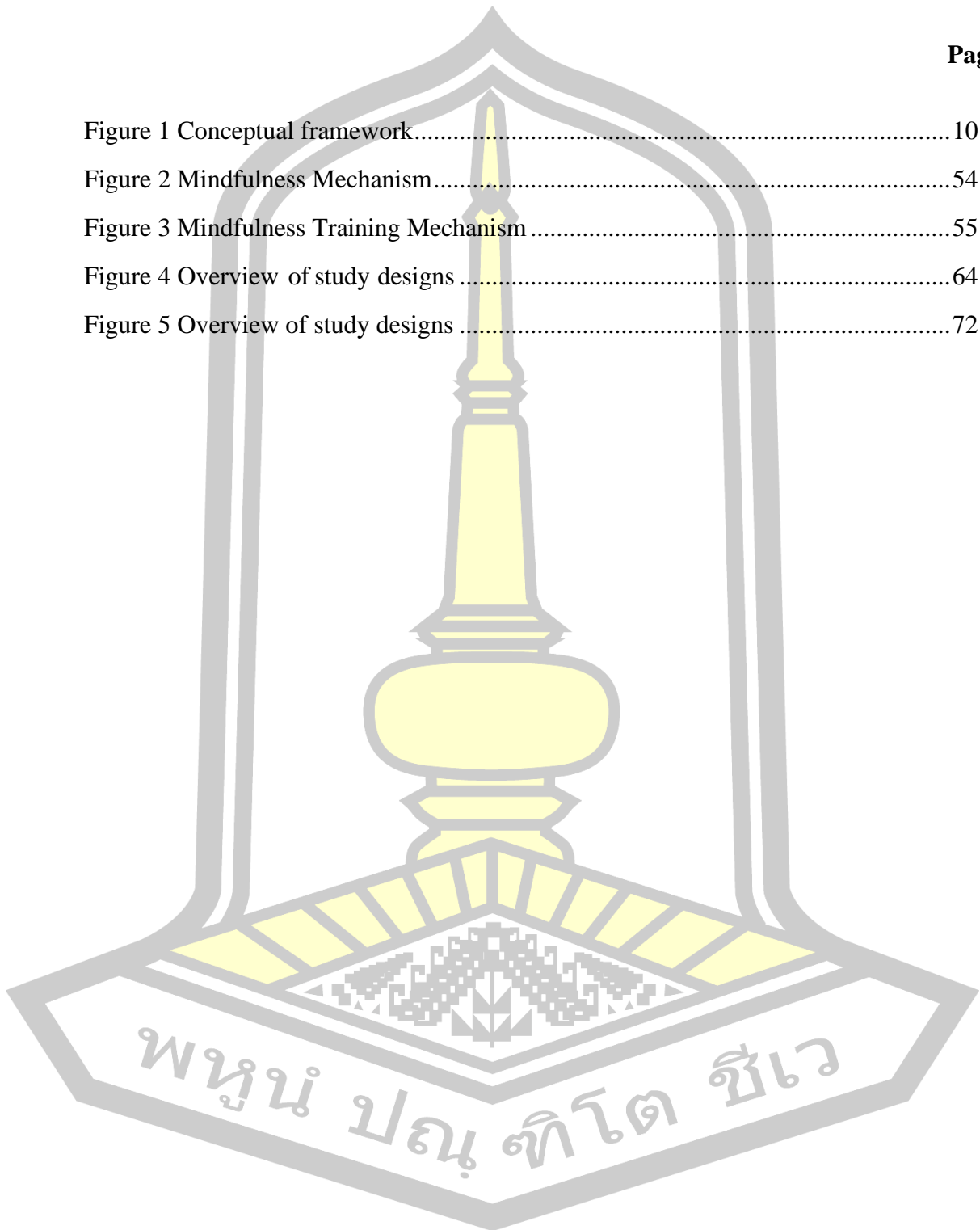
LIST OF TABLES

	Page
Table 1 Athlete Rating.....	11
Table 2 Training design of Mindfulness training group and control group.....	74
Table 3 Characteristics of competitive Tai Chi athletes	78
Table 4 Comparison of the outcome measurements of competitive Tai Chi athlete between gender	79
Table 5 Comparison of the outcome measurements of competitive Tai Chi athlete between gender in each level	80
Table 6 Comparison of the outcome measurements of competitive Tai Chi athlete between gender in each level	81
Table 7 Comparison of the outcome measurements of competitive Tai Chi athlete between gender in each level	82
Table 8 Comparison of the outcome measurements of competitive Tai Chi athlete between gender in each level	84
Table 9 Comparison of the outcome measurements of competitive Tai Chi athlete between levels.....	86
Table 10 Characteristics of two groups competitive Tai Chi athletes	89
Table 11 Pre-assessments scores of all measurements between groups	90
Table 12 Comparison of all variables within both groups	91
Table 13 Comparison of all variables between groups.....	93

พหุ ประถมศึกษา

LIST OF FIGURES

	Page
Figure 1 Conceptual framework.....	10
Figure 2 Mindfulness Mechanism.....	54
Figure 3 Mindfulness Training Mechanism.....	55
Figure 4 Overview of study designs.....	64
Figure 5 Overview of study designs.....	72



CHAPTER I

INTRODUCTION

Background

Tai Chi is divided into traditional Tai Chi and competitive Tai Chi (General Administration of Sport of China, 2019). Traditional Tai Chi is based on the core ideas of Tai Chi and Yin-Yang dialectical concepts in traditional Chinese Confucian and Taoist philosophy. It integrates multiple functions such as self-cultivation, physical fitness, and martial arts confrontation. It combines the changes of Yin-Yang and the Five elements mallets of Yi Xue, traditional Chinese medicine meridian science, and ancient The Daoyin and Tuna techniques form a traditional boxing technique that is both internal and external, soft, slow, light and flexible, and combines hardness and softness (General Administration of Sport of China, 2019). competitive Tai Chi is a new form of Tai Chi routines developed on the basis of traditional Tai Chi. It is born for competitions and pursues "high, difficult, beautiful, and new". It is standardized, difficult, performative, and artistic, and is popular among The martial arts competition rules are governed by the rules and are the product of the combination of martial arts and modern competitive sports models (General Administration of Sport of China, 2019).

Pre-match psychological characteristics refer to the mental state and characteristics of athletes before the start of a competition or competitive activity. These characteristics directly affect the athlete's performance in the competition, ability to cope with pressure, and final competitive results (Qu Ping, 2023). The innate unconditioned reflex instinct in psychological characteristics can provide physiological driving force for the formation of mental state. The acquired conditioned reflex instinct, skills, physical fitness and other abilities can provide the potential possibility of completing tasks for the mental state, while personality can provide the potential for completing tasks. Accomplishing group and long-term goals provides individuals with unique habitual attitudes and behavioral responses (ErinA,

2022). The pre-match psychological characteristics in this article refer to the emotional experience of athletes caused by various internal and external stimuli and the athletes' cognition of various stimuli before participating in the competition. The psychological characteristics of athletes before competition mainly include the following aspects: Anxiety level is a common mental state of athletes before competition. Moderate anxiety can help athletes improve their attention and concentration, but excessive anxiety will affect the performance of athletes. Confidence levels are an important factor in an athlete's success, and confident athletes are more likely to perform at their best. Emotional state will affect the competitive state of athletes. Positive emotions such as appointment and excitement are helpful for athletes to perform at their best, while negative emotions such as anger and sadness will affect athletes' performance. Cognitive status will also affect an athlete's competitive status. Clear thinking and quick reactions will help athletes make correct judgmental and decisions. Psychological adjustment ability refers to the ability of athletes to adjust their mental state in a timely manner according to the situation during the competition. Good mental adjustment ability can help athletes maintain a positive and optimistic attitude when encountering difficulties and setbacks, so as to perform at their best level. Questionnaire measurement revealed that athletes often face tremendous pressure during competitions, which may come from winning the competition, not wanting to lose the competition, or fear of expectations and pressure. This pressure can lead to anxiety and tension, affecting athlete performance (TanYibin, 2023). Previous research using the Eysenck Personality Scale found that competition anxiety can manifest as nervousness, worry, restlessness, and even nausea. This emotional state may affect athletes' attention and execution abilities (PeterK, 2023). Previous research has found through interviews and observations that competitive athletes' confidence levels are critical to their performance. Under confidence may lead to poor performance, while overconfidence may also lead to problems (HuangYajuan, 2023). Previous studies combined qualitative and quantitative research methods, from in-depth interviews to biofeedback to psychological tests, to gain a more comprehensive understanding of athletes' pre -

match psychological characteristics and use multi-level and multi-angle research methods to reveal the psychological pressure athletes may face before competition and challenges (Wang Huanli, 2010; Wang Qinglong, 2010; XuemalegS, 2023).

Other studies have shown that social and emotional factors play a key role in psychological problems. By understanding the social support system and emotional state of athletes, factors related to psychological problems can be accurately identified. Multidisciplinary research provides a more comprehensive perspective, combined with The knowledge of sports psychology, neuroscience and biology can help to deeply understand the psychological mechanism of athletes. (EmilyK, 2023; YuXinyang, 2023; KatherineA, 2022; KearnanM, 2022; M.SC, 2022).

Mindfulness is a concept from the Buddhist tradition that has been widely used in modern psychology and psychotherapy. Mindfulness training is a systematic approach that helps individuals improve emotional management, enhance self-awareness and improve mental health through continuous practice and cultivation of mindfulness. Before the emergence of mindfulness training, in order to improve athletes' competitive skills, European and American countries hoped to improve their psychological quality through psychological intervention. They mainly adopted psychological training such as goal setting, image training, arousal control, attention training, and self-talk. methods, and the use of one or several methods in combination, no more professional psychological training method for psychological intervention has been born (LiangyuZ, 2022). As research and practice have discovered, the training effect is gradually becoming unsatisfactory, so foreign psychologists are also looking for breakthroughs. In 2001, after mindfulness-based acceptance therapy (MAC) was invented and used in other fields, it was gradually introduced into training to improve athletes' psychological quality (RyanJK, 2022).

This study is based on the current status and trends of martial arts competitions, combined with the characteristics of Tai Chi projects, starting from the personality and psychological characteristics of competitive Tai Chi athletes, and applying the "Eysenck Personality Scale" to analyze them. The results show that competitive Tai Chi What kind of personality psychological characteristics do athletes

have and what impact do they have on their pre-match psychological state (Zhang Tingting, 2013); and the application of the "mental State Scale" (short form POMS) to measure the pre-match psychological state of competitive Tai Chi athletes (Zhang Tingting, 2013), the results can show the typical psychological characteristics of competitive Tai Chi athletes before competition, and conduct mindfulness training intervention on them to improve the pre-match training system of competitive Tai Chi athletes, thereby improving the competitiveness and competitiveness of competitive Tai Chi sports. Appreciation, competitive level, sports performance and health care value promote the comprehensive development of competitive Tai Chi athletes at a higher psychological level and provide theoretical basis and practical reference for it.

Competitive Tai Chi is different from traditional Tai Chi in that it emphasizes competitiveness and competition. Athletes need to demonstrate high levels of technique, strength and flexibility during competition. However, they may also face psychological issues such as competition stress and anxiety, self-confidence issues, concentration and attention control. To help competitive Tai Chi athletes overcome these psychological issues, sports psychologists can provide interventions similar to those in other sports, including cognitive behavioral therapy, relaxation techniques, emotion management training, and mindfulness training. In addition, mental training programs specifically targeted at competitive Tai Chi can help athletes perform well in competitions (Zhang Junjie, 2022). Cao Hui solved a single psychological problem of college football players through mindfulness training and provided comprehensive psychological benefits (Cao Hui, 2023). Chen Zhengjie found that basketball free throws require a high degree of concentration, and mindfulness training can help improve basketball players' concentration and attention control capabilities, allowing them to better cope with competitive pressure (Chen Zhengjie, 2022). Through mindfulness training, Liu Fuqu has effectively improved the mental toughness of badminton players, enabling them to better cope with setbacks and difficulties. This is crucial for success in a long-term competitive sports career (Liu Fuqu, 2020). Huang Gang has effectively improved the emotional management, anxiety reduction, stress management and mental health of young shooters through mindfulness training

(Huang Gang, 2023). Feng Guoyan used mindfulness training to improve the self-awareness of synchronized swimmers and help athletes better perceive body signals and emotional experiences (Feng Guoyan, 2015). Zhang Tingting used the "Eysenck Personality Scale" to analyze competitive Tai Chi athletes and their Pre-match psychological conditions. She believed that competitive Tai Chi athletes have typical psychological characteristics before competition, and conducted mindfulness training intervention to improve competitive Tai Chi athletes. Pre-match training system.

Previous studies in other sports have shown that mindfulness training can better help athletes improve their pre-match psychological quality than other training methods in pre-match psychological research on athletes in sports (Zhao Yuqi, 2020; Yang Shu, Zhang Zhongqiu, 2014). Competitive Tai Chi is a sport that requires a high level of physical and mental quality, and is a sport that combines physical and mental elements. Mindfulness training has a stronger practical guiding significance for society, athletes, and the competition itself. Mindfulness training can help competitive Tai Chi athletes better manage their pre-match psychological stress and anxiety, and improve their psychological quality and performance level. This is crucial for competitive Tai Chi athletes because the pre-match mental state directly affects their performance and results. Through previous studies, we also found that mindfulness training has been applied to other sports, but has not yet been applied to the pre-match psychological research of competitive Tai Chi athletes. Moreover, competitive Tai Chi athletes would participate in the "2024 National Wushu Taolu Championship" from 22 to 29 June, and this experiment would enhance the pre-match psychological quality of the competitive Tai Chi athletes.

Research questions

1. Do competitive Tai Chi athletes have pre-match psychological problems?
2. Whether mindfulness training improve pre-match psychological of competitive Tai Chi athletes after 12 weeks of intervention?
3. Can mindfulness training for 12 weeks improve pre-match psychological of competitive Tai Chi athletes differently, compare with control group?

Objectives of the research

1.To investigate and compare the pre-match psychological characteristics in both genders and three levels of competitive Tai Chi athletes.

2.To compare the effect of mindfulness training on the psychological characteristics of competitive Tai Chi athletes before and after 12 weeks

3.To compare the effects of mindfulness training and control group on the psychological characteristics of competitive Tai Chi athletes after 12 weeks.

Hypothesis of the Research

1.Competitive Tai Chi athletes in each gender and three levels will have poor pre-match psychological characteristics differently.

2. Mindfulness training for 12 weeks can improve all pre-match physiological characteristic

3.Mindfulness training for 12 weeks can improve all pre-match physiological characteristic better than control group.

Scope of the study

1. Population and sample

150 Competitive Tai Chi athletes from the School of Physical Education of Zhengzhou University, Zhengzhou City China, all aged 19-24 years old.

2. Sampling and Sample

Phase I-II: Using criteria or estimation from population numbers. The total population is in the hundreds, sample is 15%-30% of total population (Bunchom Srisa-at, 1992). 40 participants were met criterias and convenience samples, including 20 males and 20 females. There were different levels of competitive Tai Chi athletes; national, first and second levels

3. Independent variables

Phase I:

-Genders (male and female)

-Different athlete levels (national athlete, first level athlete, second level athlete).

Phase II:

Mindfulness training and Control group

4. Dependent variables

Phase I:

Cognitive state: Five-Factor Mindfulness Questionnaire

Emotional state: Mood Measurement Scale

Anxiety level: Contest Anxiety Questionnaire

Confidence level: Trait Motor Self-Confidence Scale(TSCI-PL)

Phase II:

Cognitive state: Five-Factor Mindfulness Questionnaire

Emotional state: Mood Measurement Scale

Anxiety level: Contest Anxiety Questionnaire

Confidence level: Trait Motor Self-Confidence Scale (TSCI-PL)

Four dependent variables were measured together, with a focus on comparisons between the mindfulness training group and the control group. To understand the effects of mindfulness training on psychological traits.

Significant of Study

Theoretical significance:

At present, previous research on competitive Tai Chi projects at home and abroad mainly focuses on technology, tactics, physical fitness, teaching and reserve talents. There is relatively little research on the psychological quality and existing problems of athletes before competition, especially for competitive Tai Chi athletes. Research on the characteristics and responses to psychological problems is very weak and cannot provide strong support for responses to improve psychological quality

(VittoriaPC, 2022). Based on the analysis of the current psychological characteristics of competitive Tai Chi athletes, this study applies psychological quality improvement training to the recovery after daily training, which can make up for the shortcomings and deficiencies of previous studies to a certain extent and provide a basis for improving the psychological quality of competitive Tai Chi athletes. It provides a new perspective and provides a theoretical basis for promoting the improvement of athletes' psychological quality through professional training in competitive Tai Chi training, which has certain theoretical significance.

Practical significance

Today, as competitive Tai Chi sports training continues to develop and improve, it is crucial to deal with psychological problems and improve psychological quality after sports training. However, there are still relatively few arrangements for improving psychological quality in daily training, and there is a lack of practical and effective training methods (Zhao Saijia , 2022). Based on the characteristics of competitive Tai Chi projects and related theories, this article applies psychological quality improvement training to the post-training psychological training of competitive Tai Chi athletes, which can provide coaches and athletes with a new psychological quality improvement strategy for competitive Tai Chi athletes. The future application of psychological quality improvement strategies has laid a practical reference value (J.BB, 2022). This study investigates competitive Tai Chi athletes to understand the psychological characteristics of competitive Tai Chi athletes before the competition. At the same time, it innovates ways to deal with psychological problems before the competition, introduces mindfulness training into training, and tests the innovative methods used to affect the effects of competitive Tai Chi athletes before the competition. Psychological problems are of great significance and value. First, the research can make up for the shortcomings of previous research, enrich research in this field, and provide experience and reference for subsequent pre-match psychological improvement of competitive Tai Chi athletes; second, the research can help improve the awareness of various training subjects in improving the pre-match psychological existence of competitive Tai Chi. Questions, let them realize that psychological improvement is of equal importance to sports training, and be able to integrate pre- match psychological improvement into daily training and normalize it;

In addition, a new and effective method was explored for the pre-match psychological improvement of competitive Tai Chi athletes in the future, so as to achieve the goal of pre-match psychological improvement of competitive Tai Chi athletes (C.CW, 2022).

Definitions of the term

1. Competitive Tai Chi athletes

The research subjects of this paper are competitive Tai Chi athletes who are student athletes from the School of Physical Education of Zhengzhou University .Competitive Tai Chi athletes who will participate in the "2024 National Wushu Taolu Championships" from 22 to 29 June, in the school team of the School of Physical Education of Zhengzhou University.

2. Pre-match Psychological Characteristics

The pre-match psychological characteristics in this paper refer to the experiment conducted three months before the competition (27 March to 20 June, 2024) of competitive Tai Chi athletes who will participate in the "2024 National Wushu Taolu Championships" from 22 to 29 June. This research studies about 4 pre match physiological characteristics including the five-factor mindfulness questionnaire (Si Gangyan et al., 2014), the mood measurement scale (Xing Jianhui, 1996), the contest anxiety questionnaire (Martens, 1977) and the trait motor self-confidence scale(TSCI-PL) (Yuan Lin, 2005) were used to measure the emotional experience of athletes caused by various internal and external stimuli and the athletes' cognition of various stimuli before participating in the competition (Appendix A)

3. Mindfulness training

The mindfulness training in this article is a training method that improves physical and mental balance by cultivating focus and awareness. In this study, mindfulness training was mainly combined with Tai Chi practice, with a 12-week cycle of 90 minutes per week to systematically train the competitive Tai Chi athletes of the School of Physical Education of Zhengzhou University who are about to participate in the "2024 National Wushu Taolu Championships" from 22 to 29 June .

In general, mindfulness training improves the concentration, body awareness, and combat ability of competitive Tai Chi athletes through the combination of phased Tai Chi and mindfulness training, while promoting the overall development and balance of body and mind (Appendix E).

Conceptual framework

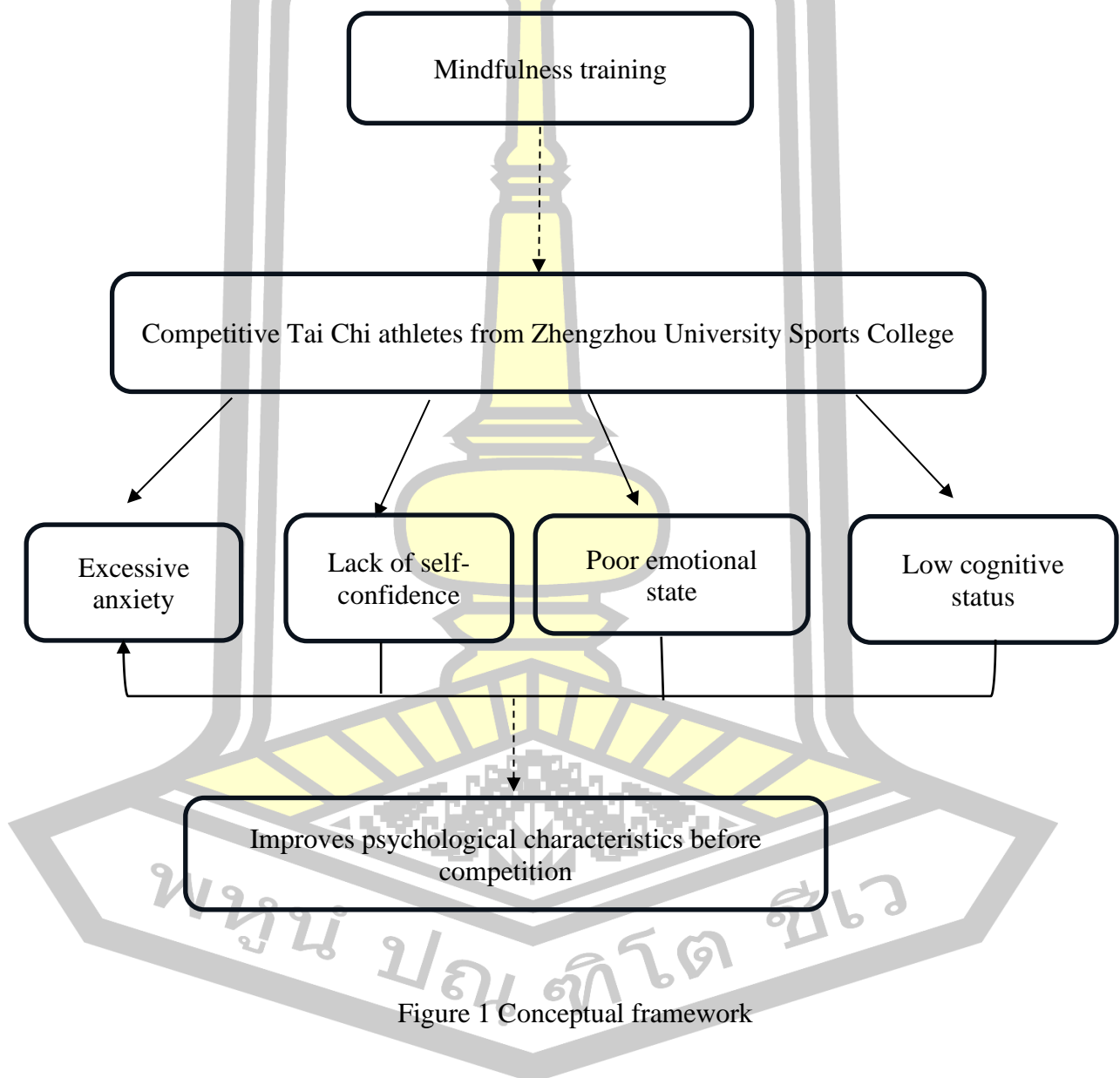


Figure 1 Conceptual framework

CHAPTER II

REVIEW OF RELATED LITERATURE

The chapter II contains the definition of competitive Tai Chi, the classification of Wu Shu sports, Pre-match psychological characteristics, Mental state or psychological characteristics before sport competition, Pre-match psychological characteristics Measurement, The researches on psychological characteristic before sport competition, psychological Training before sport competition, Mindfulness training and so on.

1. Competitive Tai Chi

The competitive Tai Chi studied in this paper is a new Tai Chi routine situation developed on the basis of traditional Tai Chi, which is born for competition, pursues "high, difficult, beautiful and new", has standardization, difficulty, performance and art, and is influenced by the rules of martial arts competition, which is the product of the combination of martial arts and modern competitive sports mode.

1.1 Wushu sports grade standard division

Wushu sports grade standard division used for: Wushu routines, Health Qigong, sanda, single: traditional and competitive (long boxing, swordsmanship, knife skills, guns, stick skills, southern boxing, southern knife, southern stick, Tai Chi, Tai Chi sword, sparring) and other items.

Table 1 Athlete Rating

Five levels of athletes				
International athlete	National Athlete	First level athlete	Second level athlete	Third level athlete

(1) International athletes

Those who meet one of the following conditions can : apply for the title of international athlete; Top 3 in the World Championship and World Cup; First place in the World Martial Arts Games.

(2) National Athlete

Those who meet one of the following conditions can apply for the title of athlete: Second to third place in the World Martial Arts Games ; The top 3 in Group A (Youth Group) of the World Junior Championships, the Asian Championships and the Asian Games ; The top 8 teams in the National Games (preliminaries and finals) , the national championships, and the national championships, the top 12 in the all-around, the top 6 in individual events, and the first place in each individual event in traditional events; The top 3 in the finals of the National Youth Games.

(3) First level athlete

Those who meet one of the following conditions can apply for the title of first level athlete: The 13th to 24th place in the all-around of the National Games (preliminaries and finals), the national championships, and the national championships, the seventh to the 24th place in individual events, and the second to eighth places in each individual event in traditional events ; Fourth to sixth place in the finals of the National Youth Games ; The top 6 in Group A (Youth Group) and the top 3 in Group B (Youth Group) of the National Youth Championship ; The top 3 all-around in the national martial arts school competition; The top 3 in the individual items of the National Sports Traditional School League.

(4) Second level athlete

Those who meet one of the following conditions can apply for the title of second level athlete: 7th to 16th place in the finals of the National Youth Games ; Fourth to sixth places in Group B (Youth Group) of the National Youth Championship ; Fourth to sixth place in the all-around of the National Martial Arts School Competition; Fourth to sixth place in the national sports traditional school league ; The top 3 individual events in the comprehensive games or championships sponsored by the provincial (autonomous region, municipal) sports bureau.

(5) Third level athlete

Those who meet one of the following conditions can apply for the title of third level athletes : Fourth to sixth place in individual events of comprehensive games or championships sponsored by provincial (autonomous regional, municipal) sports bureaus. (Measures for the management of Athletes' Technical Grades (People's Republic of China Order No. 18 of the General Administration of Sport of China,

2015)The athletic levels of the competitive Tai Chi athletes in the School of Physical Education of Zhengzhou University who participated in the experimental research and training program in this paper are: national、 first and second level athletes.

2. Pre-match psychology-related literature

2.1 Pre-match psychological characteristics

Since the concept of "state of mind" is rarely mentioned in Western sports psychology, the overall theoretical framework of pre-match mental state has not yet been established, and the discussion of this concept mainly focuses on pre-match anxiety. Competition state anxiety was the focus of previous foreign research (GongLirong, 2019). In our country, pre-match psychological state was an independent concept with specific research content and relatively clear research boundaries. However, due to the influence of the history of mental state research in the parent subject center, there has not been a unified conceptual definition of pre-match mental state (EliseRCF, 2021). Some people believe that the mental state before a game was a comprehensive reflection of the changes in "body" and "mind" that would shown in the upcoming game. Most previous people believe that it was the emotional experience of athletes caused by various internal and external stimuli and the athletes' recognition of various stimuli before the competition (WenQingyan, 2021).

Psychological characteristics refer to the stable characteristics that were often exhibited when mental activities were carried out. United States psychologist Wood worth created the concept of motivation in 1918, defining motivation as the intrinsic motivation that determines behavior (EmilyW, 2022). From a philosophical point of view, human behavior was the relationship between the individual itself and the external environment, and correspondingly from the level of psychological activity: the so-called "individual itself" refers to the psychological characteristics of human beings, because this was the most stable part of the psychological activity level and only representative of human beings and their individuals; At the level of mental activity, the "interaction between the individual and the external environment" is the psychological process of the individual's response to objective things (Baoyan F, 2022). Thus, at the level of mental activity, behavior was the process and result of the interaction between the individual's psychological characteristics and his mental processes. Since the interaction and reaction of psychological characteristics and

mental processes result in the formation of a psychological state, from the level of mental activity, behavioral motivation actually belongs to the psychological state. In the running state of the machine, it was the energy source such as electricity that really provides the energy driving force to the machine, and we should not assume that the starting and manipulation are the energy of the machine's running state just because the start and operation make the machine run (LiMin, 2022). In contrast, in the state of mind, what really provides energy to the mental state or behavior was the psychological characteristics including individual ability, intelligence, temperament, personality, etc., and we cannot think that these mental processes were the potential energy of the mental state and behavior because the cognitive process, emotional process and consciousness process inspire and induce behavior. Just like the raw energy that runs a machine such as electricity, it was either natural or the result of processing and refining (BuDanran, 2022).

The psychological characteristics of the elements that form a state of mind are almost the same, and they come from people's innate, past training, and life experiences. The innate unconditioned instinct in the psychological characteristics can provide the physiological driving force for the formation of the psychological state, the acquired reflex instinct, skills, physical fitness and other abilities can provide the potential for the psychological state to complete the task, and the personality can provide the individual's unique habitual attitude and behavioral response to the completion of the group and long-term goals (ErinA, 2022).

2.2 Significant of mental state before sport competition

Individual psychology refers to the psychology of individual subjects, i.e, specific individuals. Individual psychology was generally divided into two categories: mental processes and personality. The former Soviet psychologist Elevitov (1890-1972) believed that there was also a transitional state between mental processes and personality, that is, the psychological state (Ranjit M, 2022). Mental state was a psychological phenomenon that was both temporary and stable between psychological process and personality psychology. It was a manifestation of the unity of psychological process and personality psychology. Competition mental state was a unique mental state formed by athletes before competition, during training or during competition. A good competition mental state enables athletes to give full play to their

physical fitness, technical and tactical levels, and form the best mental state for competition, the basis for going all out to participate in training and competitions and achieving excellent results (XiaoyuJ, 2022). The "fluency state" mentioned by many foreign sports psychologists refers to the same state of competition psychology as the "finding the feeling of the game", "entering the role of the game" and "entering the state of competition" mentioned by domestic athletes and coaches (BrianE, 2019).

2.3 Mental state or psychological characteristics before sport competition

2.3.1 Cognitive state

(1) Definition

Mindfulness was a mental training method derived from Eastern philosophy and integrated with modern psychological concepts, the core of which was to cultivate the individual's attention and attitude (Hinitz D, 2016). In terms of attention, mindfulness training requires individuals to focus on current activities, emphasizing the awareness of "living in the moment" and avoiding distractions from past memories or future anxieties. In terms of attitudes, mindfulness training requires individuals to maintain an open, non-evaluative mindset about the current experience, i.e., allowing themselves to react to any emotion or experience without overreacting or judging it.

In the mental training of competitive Tai Chi athletes, the goal of mindfulness training is to help athletes maintain a calm mind during the competition, focus on the cognition of techniques, tactics, environment and other aspects, and at the same time deal with the challenges of complex factors such as opponents, referees, the competition environment and their own psychological pressure.

(2) Contents

Through meditation, deep breathing, etc., athletes can be helped to concentrate on the current activity and avoid distractions (Tsuyoshihiko, 2014). For example, in Tai Chi competitions, athletes should focus all their energy on the execution of technical movements and the adjustment of tactics, rather than being affected by external circumstances, referee decisions or other interference. Mindfulness training encourages athletes to be open to all experiences during the competition and to accept all positive and negative emotions, rather than judging or avoiding negative emotions. For example, when an athlete encounters a setback in a competition, he or she should not be overly critical of his mistakes or failures, but accept and learn from them with a calm mind. Through mindfulness training, athletes can learn to regulate their emotions

in high-pressure situations and reduce the negative effects of anxiety, stress, or mood swings. In Tai Chi competitions, athletes are able to remain calm in the face of competitive pressure and challenges from their opponents, and flexibly adjust their tactics. Mindfulness training emphasizes enhancing individual self-awareness, allowing athletes to have a clear picture of their mental, emotional, and physical states, and to make real-time adjustments based on these perceptions during the game.

The cognitive state of competitive Tai Chi athletes covers a comprehensive understanding of technology, tactics, environment, psychology, referees and opponents. During the competition, athletes need to accurately master the technical essentials of Tai Chi, use various skills flexibly, and adjust tactics according to the characteristics of the opponent and the competition environment. At the same time, they need to cope with the psychological pressure during the game, understand referee standards, and observe the characteristics and trends of their opponents. This comprehensive cognitive state not only affects an athlete's performance level, but was also the key to successfully coping with complex game scenarios.

(3) Mechanism

In an experimental study, Kee et al. found that mindfulness training can help athletes improve attention control and self-management, which is essential for rapid reaction and precise execution in competitive Tai Chi. Studies have shown that mindfulness training is effective in reducing distraction, allowing athletes to focus more on technical details and tactical adjustments during competitions, thereby improving performance. By cultivating a non-judgmental mindset, mindfulness training helps athletes reduce overreaction to negative emotions. In competitive sports, athletes often face emotional challenges such as competition pressure, failure anxiety and self-doubt, and mindfulness training can help athletes accept these emotions and face them with a healthier mindset. Mindfulness training strengthens the mental resilience of athletes by guiding them to cope with the volatility and uncertainty of competition with a positive mindset. For example, when faced with a strong opponent or a difficult match, an athlete is able to remain calm, make rational decisions, and find solutions by adjusting their mindset. Mindfulness training not only improves athletes' concentration, but also enhances their cognitive flexibility in the face of complex or changing competition situations. Athletes are able to quickly adjust their tactics, adapt to changes in their opponents, and optimize their own behavioral strategies.

(4) Benefits

Edward believes that mindfulness training enables athletes to better execute technical movements and tactical decisions during competition by helping them focus, regulate their emotions, and maintain peace of mind. Studies have shown that athletes with higher levels of mindfulness are generally able to maintain better performance, adapt to the complexities of the game, and effectively adjust their behavioral strategies. Competitive Tai Chi competitions are often accompanied by a great deal of psychological stress, with athletes often having to deal with referee decisions, strong challenges from opponents, and their own nervousness and anxiety. Mindfulness training can help athletes reduce this stress, avoid excessive anxiety or panic, and help them stay calm under pressure to perform at their best. Mindfulness training helps athletes flexibly adjust their tactics during the game, responding to the different strategies of the opponent and the changes in the competition environment. For example, an athlete can constantly observe their opponent's movements, assess their weaknesses, and adjust their strategy in real time based on these changes. Mindfulness training helps athletes better manage their mental state and enhance their resilience by cultivating their self-awareness and emotional regulation skills. This is of great significance for competitive Tai Chi athletes to stay competitive and meet the challenges of competition in the long term. Mindfulness training not only improves an athlete's performance, but also enhances their enjoyment of the game. At its core, mindfulness training focuses on the process rather than just the outcome, so athletes can enjoy every detail of the game more than just focusing on the winner.

2.3.2 Emotional state

(1) Definition

Emotional state refers to the overall manifestation of an individual's psychological response and physiological changes in a specific environment, situation, or stimulus. Emotional states are usually composed of a variety of emotional components, including emotions (such as pleasure, anger, anxiety, etc.), physiological reactions (such as rapid heartbeat, shortness of breath, etc.), behavioral responses (such as facial expressions, body movements, etc.), and psychological experiences (such as changes in thinking patterns) (Ma Qiwei, 1998). In sports, emotional state is often closely related to the performance of athletes, especially before and after the competition,

emotional fluctuations, such as nervousness, anxiety, excitement or calm, etc., will directly affect the athlete's competitive state and performance.

(2) Contents

Pre-match anxiety is a common emotional state that manifests itself as nervousness, restlessness, and excessive worry about the outcome of a match (Li Jianzhou, 1987). Athletes may experience physical and psychological stress reactions, such as rapid heartbeat, stiff limbs, etc., due to excessive concern about performance or failure. Excessively high levels of anxiety can negatively impact an athlete's performance and reduce the performance of their skills. Pre-match agitation is another common emotional state that manifests as excitement, anticipation, and a high level of alertness. Moderate agitation can boost an athlete's energy and motivation, improving their performance.

However, over-agitation can lead to inattention or out-of-control behavior, affecting the level of competition. The confident and relaxed emotional state of an athlete during the competition is a positive state of mind that helps them stay calm and make rational decisions. Confident athletes are usually able to perform consistently in competition, not be shaken by external pressures, and are able to perform at their best technical level. Emotional swings during a race, such as anger, frustration or disappointment, often affect an athlete's ability to focus and perform. Emotional instability can lead to technical errors or tactical errors that can affect the outcome of the match. Emotional states after a competition, such as joy, contentment, or frustration, loss, can also affect an athlete's assessment of performance and adjustment of mindset for future competitions. Positive regulation of emotions after a competition helps athletes recover quickly and mentally prepare for the next competition.

(3) Mechanism

Emotional states are usually accompanied by a series of physiological changes (Zhu Beili and Ji Liu, 1995). For example, when you are anxious, your body secretes more stress hormones, such as adrenaline, which leads to physiological responses such as rapid heartbeat, shortness of breath, muscle tension, and more. These physiological responses may affect the physical function and performance of athletes, and excessive physiological activation may lead to a decline in fine motor skills. Emotional states affect an athlete's cognitive processes, including attention, decision-making, and reaction speed. For example, anxiety can lead to distraction, over excitement can lead

to impulsive decision-making, and self-confidence helps athletes analyze the situation more clearly and make more rational decisions. Therefore, emotional states are closely related to cognitive performance and affect an athlete's performance in competition. Changes in emotional state can affect an athlete's behavioral responses, such as tactical execution, physical control, and performance of motor skills. When the emotion is out of control, the athlete may be unstable in technical movements, and conversely, when the emotion is stable, the athlete has better control over his movements and judgment. Emotional state also affects the resilience and adaptability of athletes through psychological regulation mechanisms. Athletes with high mood swings may lose confidence or give up on effort during competition, while athletes with emotional stability are able to maintain a positive mindset and stay the course under pressure. This mental toughness is the foundation for an athlete's continued performance in high-pressure environments.

(4) Benefits

Positive emotional states, such as self-confidence, relaxation, and moderate excitement, can significantly improve athlete performance (Zhu and Ji, 1995). Studies have shown that moderate anxiety can improve concentration and resilience in athletes, while excessive mood swings may reduce technical performance. Therefore, controlling mood swings and maintaining a good emotional state can help you develop your skills steadily and improve your competitive performance. Emotionally stable athletes are generally able to make more rational decisions and avoid emotionally wrong decisions. Pre-match self-confidence, calm thinking during the game, and positive adjustment after the game can enable athletes to make correct judgments at critical moments, which in turn can affect the outcome of the game. By regulating their emotions effectively, athletes are able to strengthen their mental resilience and maintain a calm and positive mindset in the face of adverse situations during competition. This mental toughness helps athletes overcome pressure, consistently perform at a high level, and not give up easily, even in difficult situations. Emotional regulation helps athletes improve their ability to cope with stress. In high-pressure environments, athletes are able to self-regulate their emotions to avoid emotional outbursts, maintain a cool head and make effective decisions, so that they can perform at their best in critical moments. Emotional state also plays an important role in post-

race recovery. Positive post-competition emotions help athletes recover mentally, boost their self-confidence and anticipation for future competitions, and promote their continued participation and performance. This positive mindset can reduce the negative emotions caused by defeat and adjust faster in the next game.

2.3.3 Anxiety level

(1) Definition

Pre-match anxiety refers to the negative emotional reactions of athletes before the competition due to excessive worries about the results of the competition, poor performance, fear of opponents, or other external factors (Zhao Feiyi, 2019). This emotional state is often accompanied by physical discomfort such as rapid heartbeat, shortness of breath, sweating, etc., and may affect the athlete's cognitive judgment, physical coordination, and performance ability. If anxiety is not effectively regulated, it can lead to problems such as imprecise technical movements, improper tactical decision-making, and impaired physical condition. The goal of anxiety management is to help athletes reduce excessive worries about the outcome of the game, enhance self-confidence, and improve psychological adjustment ability through a variety of mental training methods, so as to improve the performance in the game.

(2) Contents

According to Yan Haixia (2019), wrong cognition was one of the root causes of anxiety. Therefore, correcting an athlete's misconception of the outcome of a competition is an important step in reducing anxiety. For example, if an athlete may be overly concerned about the consequences of failure or overestimate the opponent's abilities, coaches and coaches should help them adjust these irrational perceptions and reduce their focus on the outcome, thereby reducing anxiety. Lv Xutao (2018) mentioned that positive self-suggestion (e.g., "I am the best", "we will definitely achieve good results") can be used to mobilize athletes' confidence before the competition. This approach can help athletes subconsciously build self-confidence and improve self-efficacy, which can effectively reduce anxiety and improve their mental readiness. Yang Dong (2009) pointed out that pre-match simulation training can help athletes adapt to the uncertainty and distractions of the competition and enhance their coping ability. By simulating key situations during a match, such as training when the crowd cheers and the opponent is strong, athletes can learn to stay calm and reduce

anxiety caused by unexpected situations. Fu Mingqiu (2000) proposed that when athletes were in an anxious mood, especially when facing the key points of the competition, they should use relaxation techniques such as deep breathing to help them relax and return to technical movements, rather than paying too much attention to the results of the competition. Through such self-regulation, athletes can effectively alleviate pre-match anxiety and return to normal competitive conditions. Fu Mingqiu (1999) emphasized that the training method of simulated competition can help athletes become familiar with key scenarios and stressful situations that may occur, which can effectively reduce the anxiety response before the competition. For example, the simulation of key scores can be added to training to help athletes maintain a stable emotional response when facing pressure on the field. Fu Mingqiu (1998) proposed that psychological monitoring and counseling from a medical perspective also play a positive role in alleviating athletes' anxiety. Through psychological testing, coaches can understand the psychological state of athletes in a timely manner, and provide personalized psychological counseling and counseling to athletes with more serious anxiety, so as to help them maintain physical and mental health and enter the competition state.

(3) Mechanism

Cognitive restructuring is one of the key mechanisms to regulate anxiety. By guiding athletes to identify and change negative, self-limiting perceptions such as "if I lose, it's over" or "I'm going to fail," coaches can help athletes build a more realistic, positive cognitive framework. By correcting these cognitive biases, athletes are able to reduce excessive worry about outcomes, which in turn reduces anxiety. Autosuggestion and positive emotional cues can help athletes elicit positive emotional responses before a competition. For example, by repeatedly repeating "I'm ready" or "I'm in control", athletes can increase their self-efficacy, boost their self-confidence, and avoid anxiety from spreading. Positive emotional cues can subconsciously eliminate the influence of negative emotions and help athletes get into a positive state of competition. Through simulation training and mental conditioning methods, athletes are able to enhance their emotional regulation and self-control. Simulate stressful situations and distractions during the game to help athletes stay calm, make rational decisions, and avoid mistakes caused by anxiety when they encounter similar

situations in actual competitions. Through relaxation techniques such as deep breathing and meditation, athletes are able to reduce the physiological stress response caused by anxiety. Fu Mingqiu (2000) emphasized that deep breathing can help athletes relax muscles, breathe smoothly, and eliminate physical discomfort by activating the parasympathetic nervous system, thereby reducing the negative effects of anxiety. Through personalized coaching and intervention in the athlete's psychological state, it helps the athlete to identify and deal with the source of his or her anxiety. Psychological counseling from a medical perspective can help athletes overcome anxiety and restore physical and mental balance through professional psychological adjustment techniques, so that they can cope with stress in the best condition during competition.

(4) Benefits

Through effective anxiety regulation, athletes are able to maintain high psychological stability and reduce mood swings and stress responses during competition. During competition, emotional stability can help athletes focus more on technical execution and tactical application, and improve performance. Through autosuggestion and cognitive restructuring, athletes are able to increase their self-confidence and reduce unnecessary anxiety. Positive autosuggestion can help athletes develop a positive game mentality, be more confident in the face of competition, and reduce the uncertainty caused by anxiety. Anxiety often affects the quality of an athlete's decision-making, and through emotional regulation, an athlete is able to maintain clear thinking and rational decision-making. For example, at critical moments of the game, athletes are able to calmly analyze the situation and execute tactics with precision, rather than being impulsive or making wrong decisions due to anxiety. Simulation training and psychological coaching help athletes improve their ability to adapt to change and cope with distractions. Through pre-match psychological presets and situational simulations, athletes can stay calm in the face of unexpected situations during the actual competition, and avoid anxiety affecting their performance. Effective anxiety regulation not only contributes to athletes' short-term performance, but also plays a positive role in athletes' long-term mental health and athletic career development. Athletes' ability to maintain good mental regulation in the face of competition stress and anxiety will help them cope with more challenges in their careers.

2.3.4 Confidence level

(1) Definition

Athlete self-confidence refers to the degree of confidence and affirmation that athletes have in their performance on the field. Self-confidence is not only an important part of an athlete's mental state, but also has a direct impact on their performance and decision-making in competition. Athletes with high self-confidence tend to be more consistent in competition and are able to respond positively to challenges, while athletes with low self-confidence may experience anxiety, hesitation, and even mistakes when faced with pressure. The cultivation and maintenance of self-confidence is essential for the mental conditioning and technical performance of athletes during competition.

(2) Contents

According to Weiss et al. (1989), athletes predict future performance through self-efficacy (belief in one's own abilities) and past good performance. Self-confidence can affect an athlete's mental state when facing challenges, making them more motivated to overcome difficulties and improve their overall performance. Therefore, building and maintaining an athlete's self-confidence is key to improving athletic performance. Alexis et al. (2019) found that athletes' self-confidence was significantly affected by match feedback. Positive feedback can boost an athlete's self-confidence, while negative feedback can weaken it. Although athletic confidence fluctuates, there is little difference in performance between athletes with higher or lower self-confidence in hockey. Therefore, the study suggests that sports self-confidence is not a determining factor in itself, but rather a variable that affects athletes' mood and performance. Yuan Lin (2005) pointed out that athletes affect the psychological state of their opponents by exerting psychological pressure, thereby affecting their performance. Appropriate psychological pressure can disrupt the opponent's rhythm, weaken his concentration, and even make the opponent psychologically "admit defeat" in advance. This strategy helps athletes gain a psychological advantage before the start of the competition. Wang Junting (1998) mentioned that through autosuggestion, athletes can effectively improve their self-confidence. Autosuggestion is a method of repeatedly emphasizing positive perspectives such as "I can do it", "I will succeed" through words and psychology. This approach helps athletes maintain a positive mindset during the game, which helps them to perform at their technical level. Wang Junting (1998) also

emphasized that coaches should identify athletes' psychological problems in a timely manner, provide encouragement and support during the competition, and help athletes relieve tension. Coaches' support and positive feedback can effectively regulate the emotional state of the athlete, allowing them to stay calm and perform at their best during the game.

(3) Mechanism

Athletes' self-confidence influences emotional responses and decision-making processes during competition by regulating their mental state. Athletes with high self-confidence are often able to stay calm in the face of pressure, reducing the distraction of anxiety and making more accurate technical judgments and tactical decisions. Athletes with low self-confidence are susceptible to stress and anxiety, resulting in unnecessary mistakes. Athletes with high self-confidence are usually more motivated to devote themselves to training and competition, and are confident in their abilities, which stimulates their motivation and initiative in competitions. Conversely, athletes who lack self-confidence may show fear in competition and struggle to make the most of their technical strengths. Athletes with high self-confidence are usually quicker to adjust their mindset and overcome setbacks when faced with challenges and adverse situations. This mental toughness allows them to perform consistently in the game, especially when it comes to critical moments, so that they are not easily distracted by external factors. According to Alexis et al. (2019), athletes' self-confidence is moderated by feedback during the competition, such as feedback on success or failure. Positive feedback boosts self-confidence and promotes positive performance in athletes. Negative feedback, on the other hand, may weaken self-confidence and lead to psychological instability. Therefore, feedback mechanisms play a key role in the relationship between self-confidence and performance. Weiss et al. (1989) argue that athletes' self-confidence is closely linked to self-efficacy. Self-efficacy is an athlete's assessment of their ability to influence their performance in competition. By building positive feedback on past successes, athletes are able to increase their self-efficacy, which in turn boosts their self-confidence.

(4) Benefits

Self-confidence is directly related to an athlete's performance in competition. Athletes with high self-confidence tend to be better able to cope with the pressure of competition and perform consistently at the level they normally train. Conversely,

athletes who lack self-confidence may make mistakes due to excessive anxiety, which can affect performance. By boosting their self-confidence, athletes are able to build up their mental resilience to stress. In competition, when faced with strong opponents or pressure at critical moments, athletes with high self-confidence are able to think calmly and adjust quickly to ensure that they perform at their best. Self-confidence not only helps athletes maintain emotional stability during competition, but also stimulates their self-motivation and makes them work harder in their training and preparation processes. High self-confidence motivates athletes to constantly push their limits and strive for higher achievements. Boosting self-confidence can also improve the overall mental health of athletes. Long-term self-confidence development can help reduce psychological problems (such as anxiety, depression, etc.) and promote the sustainable development of athletes in their careers. Self-confidence is the psychological foundation for long-term success and helps them overcome challenges in their careers. In team events, an athlete's self-confidence can have a positive impact not only on individual performance, but also on team atmosphere. Individuals with strong self-confidence can inspire team members and promote collective self-confidence, thereby enhancing the cohesion and teamwork of the whole team.

2.4 Pre-match psychological characteristics measurement

2.4.1 Cognitive state

The five-factor mindfulness questionnaire is referred to as "FFMQ", 18 is a measurement tool for self-assessment of mindfulness training for individual samples, the questionnaire has a total of 39 questions, using a five-point Richter score, (from conforming to not conforming to scoring 1-5 points in turn), some questions are positive scores, some questions are reverse scoring, the higher the score, the more obvious the effect of mindfulness training, and the lower the reverse (Hou Changjian, 2021).

The five-factor mindfulness questionnaire mainly analyzes the level of mindfulness from the five dimensions of observation, description, conscious behavior, non-judgment of internal experience and non-reaction of internal experience. Observation mainly refers to the internal and external stimuli observed during mindfulness training, such as sounds, smells, emotions, etc. Descriptive refers to a person trained in mindfulness describing and recording the observed "stimulus".

Conscious behavior refers to the action of single-mindedly focusing on the present moment, that is, the individual consciousness is completely consistent with the individual behavior, and there is no unconscious activity. Not judging the internal experience means not judging and judging one's own internal experience. Not reacting to the internal experience means accepting the unwanted part of the internal experience, acknowledging its existence, and not deliberately controlling and paying attention to it, and treating it as the desired internal experience. The five elements of the five-factor mindfulness questionnaire are consistent and logical. In the use of the five-factor mindfulness questionnaire in other fields, there is a certain correlation with experience avoidance, emotional intelligence and other aspects.

2.4.2 Emotional state

In this paper, the Chinese POMS (Mood State Scale) revised by Zhu Beili (1995) was used to evaluate the changes in the mood state of the test athletes before and after the intervention. The 40-question mood measurement scale was used in Chinese (see Annex 2). The Mean Reliability 0.71 mood measurement scale uses a 5-point Richter score, but the corresponding score is from 0 to 4, and the sum of the seven dimensions plus 100 is the sum of the individual's mood states. The higher the score on this test, the more negative the athlete is and vice versa.

Zhu Beili (1995)'s revised Chinese POMS (Profile of Mood States) was a localized modification of the original POMS scale, aiming to better adapt to the Chinese cultural and psychological context. The POMS scale was originally developed in 1971 by American psychologists McNair et al. to assess an individual's emotional state. Zhu Beili's revised Chinese POMS version has made some adjustments in the measurement method to ensure its validity and applicability among Chinese students and the general population.

The Chinese POMS scale consists of 65 items, mainly divided into 6 dimensions, namely: Tension, Depression, Anger, Fatigue, Confusion, and Vigor. The score of each item adopts the Likert five-point scale, where 1 means "completely disagree", 5 means "completely compliant", and the scores of each item are summed to obtain the score of each dimension. By adding and averaging the scores of each dimension, it is possible to obtain the performance of the subjects in each emotional dimension. A higher score for negative emotions (such as anxiety, depression, anger, fatigue, and confusion) on

the scale indicates poor mood; A high score for positive emotions (e.g., vitality) indicates that the individual has a better emotional state.

Zhu Beili's revised Chinese POMS scale has conducted a large number of tests on reliability and validity to ensure its applicability and accuracy in the context of Chinese culture. Tested with a large sample number, Zhu Beili ensured the reliability and validity of the scale in measuring mental health and emotional state (Cronbach's alpha coefficient is usually above 0.85, indicating good internal consistency).

2.4.3 Anxiety level

This article uses the “Contest Anxiety Questionnaire” to measure athletes' anxiety levels. The measurement basis of the contest anxiety questionnaire was based on psychological theory and mainly focuses on the individual's psychological and physiological state during competition. The measurement basis of the contest anxiety questionnaire was based on psychological theory, which mainly focuses on the individual's psychological and physiological state during competition. It was designed based on two main facets: competitive anxiety, which was negative concerns about competition results and one's performance, and physiological anxiety, which includes feelings of tension in the body. This scale was called the Competition State Anxiety Scale-2 (CSAL-2), which was a sport-specific state anxiety scale developed by Martens, Valley, and Burton (1990). The scale divides anxiety into three components: cognitive anxiety, somatic anxiety, and a "related component" self-confidence. Self-confidence was often the opposite of cognitive anxiety and was another important factor in managing stress. To score the CSLA-2, all scores for each item are calculated on indicated value except for item 14, which was where you "invert" the scores. For example: if you circle 3 points, it counts as 2 points (1=4; 2=3; 3=2; 4=1), and the total score was calculated as follows: Cognitive state anxiety: Sum of items 1, 4, 7, 10, 13, 16, 19, 22, and 25.

—— Somatic state anxiety: and items 2, 5, 8, 11, 14, 17, 20, 23, 26. ——
Confidence: and items 3, 6, 9, 12, 15, 18, 21, 24, and 27.

Your score on each item ranges from 9, indicating low anxiety (confidence), to 36, indicating high anxiety.

2.4.4 Confidence level

This article uses the Trait Sports Confidence Scale to measure athletes' self-confidence levels. It was based on psychological theory and focuses on the trait self-confidence that athletes develop during long-term training and competition. This tool helps researchers gain insights into an athlete's mental state in the arena by assessing their level of sustained confidence in their abilities and performance. The subjects answered the test questions on a 3-point scale: 1=strongly agree, 2=agree, 3=disagree, 4=strongly disagree. Therefore, its minimum score was 10 points, The maximum score was 40 points. Among the 10 items, the scores for the 3rd, 5th, 8th, 9th, and 10th items are calculated in reverse (i.e., 1 point is counted as 4 points, 4 points is counted as 1 point; 2 points is counted as 3 points, 3 points The score is calculated as 2 points).

10-15 points: Those with low self-esteem

You lack confidence in yourself, especially in front of strangers and superiors. You always feel that you are inferior to others in everything, and you often feel inferior. You need to drastically improve your self-confidence.

16-25 points: Those who feel normal about themselves

You feel neither too good nor too bad about yourself. You feel quite confident about yourself on some occasions, but feel quite inferior on other occasions. You need to stabilize your self-confidence.

26-35 points: Confident person

You feel very good about yourself. In most situations, you are full of confidence in yourself. You will not feel nervous in front of strangers or superiors, nor will you be afraid to try because you have no experience. You need to adjust your self-confidence in different situations.

36-40 points: Super confident person

You feel so good about yourself. In almost all situations, you are so confident in yourself that you don't even know what it means to feel inferior. You need to learn to control your self-confidence and become more humble.

2.5 The researches on psychological characteristic before sport competition

According to Professor Tian Maijiu's item group theory, the decentralized evaluation of physical fitness and skills in my country shows that each category has different psychological orientations, respectively through self-directed, social

orientation, and the other three aspects. Through analysis Positive factors that form a good mental state before the game (Xie Bin, 2010). At the same time, retrospective interviews with individual athletes were conducted to obtain the athletes' real psychological experiences during a certain game, and the obtained data were coded. The following conclusions are drawn: (1)The mood before the game was stable, the body and mind are fully prepared, and the technical movements before the game feel good, which was conducive to enhancing the athlete's self-confidence before the game. (2)Poor performance before the game, thinking too much about the results of the game and ignoring their own motivations for participating in the game. (3) A small number of people believe that being in a good mood helps awaken the ideal competitive level (Lu Chungun, 2009).Chai Ling (2008) analyzed the problems of athletes in all aspects of the competition from before, during and after the competition, and found out the causes of the problems and put forward relevant solutions. Special mention was also made of the coaches' methods when directing on the spot, and the coaches were required to communicate well with the athletes in advance of the competition. Do a good job of mobilizing athletes before the competition. Help athletes to be fully mentally prepared, minimize the adverse impact of unfavorable emotions before the competition on their psychological state, help athletes strengthen self-suggestion, stabilize and calm their excited mood, fully tap the potential of athletes, and show the best competitive state on the field.

Li Ling (2007) talked about the three bad psychological states before the game, which are the state of excessive excitement before the game, the state of indifference before the game, and the state of blind confidence before the game. The reasons for these three negative pre-match psychological states and their external performance were expounded, and the coping methods for these three negative pre-match states are mentioned. It also involves how coaches use rest time to make substitutions, pauses and other ways to guide athletes to play their level normally in the game.

Li Xishui (2004) mentioned that what can affect sports performance was divided into technical and tactical and physical fitness. Usually these two aspects of physical fitness can be reflected in competitive competition. In competitive competitions, psychological factors often occupy a pivotal position, and the impact of psychological factors on competition performance was more complex. According to the literature, more than half of the athletes have experienced the best state of preparation, and

nearly 30% of the athletes will have the best mental state as long as there was a competition. At the same time, the reasons for the existence of adverse psychological states were analyzed, and relevant research countermeasures were put forward to carry out timely psychological adjustment for athletes, which was helpful to buffer athletes' adverse psychological emotions before the competition. Li Xiangru (1996) said that with the development of society, the significance of competitive sports has long gone beyond the scope of sports itself, and has a more far-reaching significance. The psychological problems of athletes before the competition have become one of the hot issues in research. There was a serious disconnect between the practice of sports training and the training of specific psychological qualities.

3. Psychological Training before sport competition

3.1 Definition and theory

Mental state refers to the state displayed by a person's psychological activities within a certain period of time. The so-called pre-match psychological state refers to the emotional response of athletes due to their cognition of the sports competition before the start of the sports competition. This emotional reaction causes some conditioned reflex changes in body functions.

The diagnosis of athletes' sports psychological ability and personality characteristics before the competition was related to the theory and method of sports psychology to carry out scientific material selection, training and competition for athletes, and its significance is mainly reflected in the following aspects:

(1) The psychological diagnosis of the athlete was a necessary prerequisite for the psychological training of the athlete before the competition, the on-the-spot command, the formation of the athlete's best psychological state, and the best level of the athlete. Without the pre-match adjustment of the athlete's psychological state and the diagnosis of the strain psychology during the competition, it is difficult to maximize the psychological potential of the athlete in the competition.

(2) Only by making a psychological diagnosis based on the individual differences of athletes and their psychological performance can it be possible to predict the performance and effect of athletes' sports activities, and it was possible to carry out individual treatment so as to carry out scientific training, so that the training process

and training effect can achieve maximum benefits, and provide a strong guarantee for achieving excellent results in sports competitions.

3.2 Significant of psychological training before sport competition

Regarding the concept and connotation of sports psychological training, from the literature on sports psychological training officially published at home and abroad, everyone's understanding of sports psychological training was different (Chi Lizhong, 2013). Richard, a United States sports psychologist, believes that in the learning and operation of motor skills, mental training was the cognitive retelling process of the practitioner's active recall of the cognitive structure or operating procedures of motor skills in the mind, or the visual representation or kinesthetic representation of the operation of the skill or skill link. Wang Chuanping (2009) believes that the psychological training of athletes was the educational process of influencing their mental activities in a planned, targeted and purposeful manner, so that the psychological factors required to improve the level of sports can be improved and strengthened, and learn the method of adjusting the psychological state, so as to promote the normal or abnormal performance of the physical and technical and tactical level in training and competition. Zhang Tiemin (2009) emphasizes the strengthening and improvement of psychological factors and the ability of athletes to master the methods of regulating and controlling their mental state, and regards mental training as a behavioral process of human control and self-control. In addition, through practice, it was not difficult for us to find that psychological training was one of the important components of the scientific training system. Zhou Chenglin (2009) psychological training was to systematically train brain function, use professional means and methods to evaluate the psychological state of athletes, cultivate their special psychological ability and strengthen psychological skills, and help athletes strive for excellent sports performance to provide a strong guarantee.

Li Jingcheng (2017) believes that in the context of the continuous development of volleyball in my country, there was no major difference in the competitive level of domestic volleyball players, and their competitive ability depends more on their own psychological factors. Coaches should constantly hone the athletes' psychology in daily training, and provide difficulties, interference, etc. during training to create psychological burden on the athletes. In this way, during the competition, due to the role of simulated competition training, the athletes would not be able to officially

participate in the competition. Only when you can calmly display your normal technical level. Zhang Zhongqiu (2007) believes that coaches should discover the psychological interference factors and causes of problems that mainly affect athletes during training, and find corresponding psychological training measures from the athletes' reflections.

Wu Dongfang (2005) believes that each competition event has different requirements for athletes' psychology, physiological skills and tactics, and athletes can meet these requirements according to their own abilities. When these demands exceed one's abilities, this can cause psychological stress. Psychological stress occurs when the athletes themselves believe that the outcome of the competition was important but the likelihood of completion was low. Deng Shizhong (2000) believes that athletes cannot predict the results of competitions because they are affected by goals, tasks, individuals, and opponents. Athletes have greater control over their technical level and ability. Athletes' reactions to psychological stress vary. Some athletes react physiologically and behaviorally. The physiological reactions are muscle tension (mainly in the limbs and abdomen), shortness of breath, and the psychological reactions were inattention and judgmental. Inaccurate ability and worry about the result of the game would directly affect the result of the game. Behavioral reactions were more obvious. Athletes behave unnaturally, engage in many meaningless actions, were distracted by irrelevant things, were mentally overly stressed, and cannot concentrate on what they should do. It can be seen that psychology and behavior Responses were closely linked.

Han Fuqing (1999) Many athletes do not have a single attitude to psychological stress, and in order to solve the problem of psychological stress, it was necessary to determine the type and degree of psychological reaction. In 1977 Mardens proposed the Exercise Stress Test. There are also measurements in physiological responses, including (1)respiratory parameters-frequency,consumption,exhaust,etc.

(2)electrocardiogram(3)electroencephalogram(4)Electrocardiogram(5)electrocardiograph (6) body temperature, etc. It also includes a pre-match state analysis, interviews with athletes, prepared questions, and observation of athletes' performance in stressful situations, which can also provide relevant information about the athletes' psychological reactions. This helps to devise a model that suggests ways to reduce the psychological stress on athletes. Relaxation was a method of mental and

physical adaptation in many forms, characterized by calmness, the ability to concentrate and the ability to control one's mind in the psychological aspect.

American psychologist William James (1890) once said in the book "Principles of Psychology" that attention was "the occupation of thoughts. Its form was clear and vivid, and it was the attention to several things or objects that exist at the same time. A series of concentration of thoughts that means detaching from certain things in order to deal effectively with other things." Nedfer et al (1976) proposed that concentration was a decisive factor for athletes to win in sports competitions. American psychologist William James (1890) once said in the book "Principles of Psychology" that attention was "the occupation of thoughts. Its form was clear and vivid, and it was the attention to several things or objects that exist at the same time. A series of concentration of thoughts that means detaching from certain things in order to deal effectively with other things." Nedfer et al (1976) proposed that concentration was a decisive factor for athletes to win in sports competitions. Martens (1987) regards attention as a psychological skill, and requires athletes to master and improve this skill through training, which also proves the importance of attention in competition. Attention was the pointing and concentration of mental activity or consciousness on certain information. Jiang Meiling (2022) believes that attention was not an independent psychological process, but an accompanying activity of various psychological processes. Cognitive psychology believes that attention was an intrinsic mechanism of information processing. Its basic function was to settlements information and regulate behavior. It determines the input and output of information, making the supplementation of mental activities consistent with needs and current activity tasks. Various stimuli; avoid or suppress other meaningless, additional stimuli that interfere with current activities. Gong Shuang, Chen Long (2020) and others believe that there was a lot of stimulating information in people's living environment, some of which was very important to the individual, while some of the information would interfere with the individual's current activities. Therefore, if a person wants to carry out normal life, work and study, he must choose important information that is helpful to him, and eliminate the interference and influence of irrelevant stimulus information. Attention to quality was a key factor that directly affects the technical and tactical

level of the athlete and the victory of the game. Therefore, in the study of psychology, attention was always an important area for psychologists to delve into.

Athletes' attention refers to their ability to concentrate. The so-called "concentration" refers to the ability to concentrate on a certain goal without being distracted by other internal and external stimuli. Western predecessors Weinberg & Gould (1995) also believe that concentration, as the name suggests, was the ability to focus on cues related to action performance in the surrounding environment and maintain it for a period of time. The form of attention and its theoretical framework were all taken from Nideffer's (1976) attention model. He believes that "attention" has two dimensions: breadth and directional. "Broad" attention means that movements must receive many external information events at the same time. Athletes must be aware of and feel many rapid changes in the external environment and respond to many stimuli. "Narrow" attention means the athlete responds to only one or two stimuli. Xiong Zhichao (2017) believes that due to the single evaluation index, there are few attention qualities available to athletes in China. Based on the existing attention application tests at home and abroad, and combined with the current experts' common views on attention phenomenal, Yin Hengchan and others determined a set of "Athletes' Attention Quality Tests and Evaluation Indicators". On the one hand, this indicator was determined in the hope that it can measure the comprehensive level of athletes' attention. On the other hand, it was also one of the objective indicators for diagnosing the attention and status of different sports. Sun Zhe (2011) proposed that different competition events have different competitive characteristics and different attention requirements among athletes. For example: shooters have high requirements on the concentration and stability of attention, and fencers have high requirements on the ability to shift and distribute attention. However, in the process of paying attention to this unique psychological activity, these basic factors were indispensable, and they were the necessary prerequisites for completing technical actions reasonably and effectively. This researcher also agrees with the above point of view. After usually watching training with the team, going out with the team to observe games, and talking with many national coaches, this researcher also deeply realized the important position of attention in the sport of fencing. Generally speaking, attention skills in the sports field can be divided into two categories. One was the ability to concentrate,

which was emphasized by closed sports; the other was the transfer and distribution of attention, which was emphasized by open sports. Special request.

According to Bandura's social cognitive theory, self-confidence refers to whether people are confident and capable of operating behavioral expectations in a specific environment. This expectation includes inferences about the consequences of their behavior and their own abilities. This was self-efficacy theory in its usual sense. After studying self-confidence in sports (sports self-confidence) in 1984, American sports psychologist Willy proposed this definition: Sports self-confidence refers to the degree of belief and recognition of an athlete's ability to succeed in competition.

Our predecessors also made similar definitions when understanding and studying self-confidence. Jiao Zifeng (2015) believes that self-confidence was an important psychological state. The best self-confidence means that you would persist in completing your goals. Xie Huisong (2017) and others believe that self-confidence was the spiritual pillar of hard work and one of the important factors in winning victory. Huang Xiting (2014) believes that self-confidence was the result of many successful experiences in the past. Li Anmin (2018) and others believe that athletes' self-confidence refers to a subjective experience based on the comparison of athletes' evaluation of their own athletic ability and their evaluation of current tasks in a sports situation.

There were currently two explanations for the classification of self-confidence. In 1986, Willy divided sports self-confidence into idiosyncratic sports self-confidence and state sports self-confidence according to competition situations. Among them, trait sports self-confidence was an individual's subjective and stable belief that he can win, while state sports self-confidence refers to an individual's actual belief in winning under a specific environment. Linda Ann Bumpu from the United States divided self-confidence into three types according to the degree of self-confidence: moderate self-confidence, lack of self-confidence and false self-confidence. Moderate self-confidence refers to having a more objective understanding of the work one undertakes and believing that as long as one exerts one's abilities, one can achieve success. People who show moderate self-confidence can set more realistic goals based on their own abilities; lack of self-confidence refers to doubts about their own abilities. Usually, such people were constrained by fear of failure and self-doubt; hypocritical self-confidence shows In order to blindly recognize their own

abilities, they use illusions to cover up their lack of confidence. Under such circumstances, people often show "arrogance", "arrogance", "belittle oneself", etc., but when their sports performance and When there was an imbalance in actual abilities, such people would even more at a loss when it comes to confidence.

From a comprehensive perspective, most domestic predecessors agree that self-confidence was closely related to operational performance, and athletes with higher self-confidence have better operational performance. The self-confidence of elite athletes was generally higher than that of ordinary athletes. Tian Maijiu and Wu Fuquan (2017) found through personality tests and evaluations that one of the main personality characteristics of some of my country's world champions and world record creators was confidence and tenacity. Zhu Beili (2016) pointed out in the study of the relationship between self-confidence and sports behavior that athletes' characteristic sports self-confidence was the prerequisite for good state sports self-confidence and was also a good predictor of their sports behavior. Zhang Zhangwei (2019) and others studied the relationship between pre-match emotions and sports performance and concluded that elite athletes have more positive psychological characteristics than ordinary athletes, such as self-confidence, tenacity and tenacity. The author believes that psychological skills training must first grasp the characteristics of the event and the psychological states of different athletes, integrate psychological skills training into physical fitness, skills, and technical and tactical training according to the training conditions and training cycles, and at the same time adopt effective training methods, make bold attempts to make psychological skills training truly play a powerful role.

In recent years, there has not been a lot of literature on high level elite athletes. Most of the studies were conducted on moderate athletes, and the main results include: the sports self-confidence questionnaire designed by United States psychologists Linda • Ann • Bamupu, with a total of 27 items. Participants give their own answers to each item and then add up the scores and divide them by 14 to get the average. Fill in the three columns of low confidence, full of confidence and overconfidence according to the score size to obtain a self-view image of the level of self-confidence. Valley, an American psychologist in United States, (1986), used three questionnaires: TSCI (Personality Sports Self-Confidence Directory), SSCI (State Sports Self-confidence Directory) and COI (Competitive Tendency Directory) to measure and evaluate trait sports self-confidence, state self-confidence and competition

goal orientation, respectively. Qian Jianlong et al. (1996) used TSCI to study athletes, and the results showed that there was no significant difference in the level of trait sports self-confidence among participants of different genders and ages, regardless of individual or group events, but there were significant differences in the level of trait sports self-confidence among athletes with different sports skill levels. Chen Limin (2005) used the Simplified Mood State Rating Scale to assess the self-confidence of basketball players. The results showed that the positive impact of self-confidence on future behavior was strongly correlated with athletic achievement, and that higher levels of self-confidence could reduce the negative effects of negative emotions.

Although the above research results would play a certain reference role in sports training and competition, there were still some differences in the self-confidence research, evaluation and diagnosis of high level elite athletes.

Anxiety was a nervous and fearful emotional state formed when individuals worry that they cannot achieve their goals or overcome obstacles and feel that their self-esteem was constantly threatened (Mao Zhixiong, 2008). Arousal refers to different states or different degrees of the body's overall physiological activation. It was a state of readiness for physiological and psychological activities determined by the level of sensory excitability, gland and hormone levels, and muscle readiness (Zhao Liang, 2007). However, in sports performance, since only the person who has experienced the anxiety state can directly describe the intensity and characteristics of this anxiety, most researchers can only use indirect methods to assess the phenomenological and physiological characteristics of the anxiety state. In this way, the anxiety state as a scientific concept was operationally defined by the specific procedures and scales used in measurement (Xie Bin, Guo Qinling, 2006).

The reason why anxiety and arousal were important in the study of sports psychology was that they have a very important relationship with the performance and performance of athletes in competition. The in-depth and refinement of anxiety research has led to the concepts of trait anxiety and state anxiety (Chen, 2003). Trait anxiety was a relatively stable difference in anxiety tendencies among different individuals: state anxiety was a transient emotional response that changes in intensity and fluctuates over time (Ye Ping, 2002). Whether anxiety and arousal represent different states of mind or different levels of intensity of the same state of mind has not

been definitively answered in the context of sports psychology (Zhao, 1996). Until now, research has equated "arousal" with "anxiety", and the measurement of state anxiety is often used to determine the level of arousal at the time of the subject, which leads to the ambiguity of this concept. At this stage, it was inevitable that "arousal level" would be used as a synonym for "state anxiety".

For a long time, the study of anxiety and arousal in sports has been a hot topic in sports psychology research. In the early days, the inverted U-shaped theory was mainly used to explain the relationship between arousal level and athletic performance (Liu Xiufen, 1995). That is, when people were at a lower level of arousal, work efficiency was lower; Productivity was highest at a moderate arousal level; At higher arousal levels, productivity decreases. Since the 80s of the last century, theories such as multidimensional anxiety and mutation models have emerged successively (Tension Wei, 1994). R. Martens proposed in 1982 that competition anxiety can be divided into three aspects: cognitive state anxiety, somatic state anxiety and state self-confidence.

Martens et al. studied pre-match anxiety and self-confidence among college and middle school students and national team athletes, and the results showed that competition level and gender affect athletes' pre-match cognitive state anxiety, physical state anxiety and state self-confidence. Overall, female athletes have higher levels of somatic and cognitive anxiety than male athletes: the average athlete has higher cognitive and physical anxiety than national team athletes, and the level of state self-confidence was lower (Shen Bo, 1993). In addition, some studies have shown that task characteristics were also another factor that affects the relationship between anxiety and sports performance. Research by P. Furst (1986) and others found that the best results in basketball and handball were related to low anxiety levels, the best results in table tennis were related to medium anxiety levels, and the best results in swimming were associated with high anxiety levels. These studies have shown the importance of sport task characteristics in influencing the relationship between anxiety and sport performance. Domestic predecessors Zhu Beili and others used the "CSAI-2 Questionnaire" to evaluate pre-match anxiety and state self-confidence among college students. The results showed that the intensity of cognitive state anxiety was a factor that distinguishes good and poor performance of on-the-spot skills and motor skills. A good predictor. In addition, competition anxiety response and state self-confidence

were closely related to the difficulty of the competition task perceived by the subject's subjective consciousness.

3.3 Type of psychological Training before sport competition

Shen Kuiyang (2010) believes that high level athletes were a unique group with their own individual uniqueness, and special methods need to be used to test specific groups. Li Lihong (2007) believes that the special group of high level athletes has obvious characteristics that were different from other sports groups in terms of psychological performance and behavioral characteristics. At the same time, each event has different competition rules and regulations, so the research methods would be different.

Jiang Zhongsheng (2005) mentioned that it mainly focuses on the adjustment of the psychological problems of athletes during the competition, and summarizes the mobilization before the competition and the guidance during the competition. According to their own understanding of athletes, according to their different personality and temperament, psychological counseling for individual differences. Liu Zhengrong (2002) believes that athletes adjust their psychological state to the most suitable psychological stage for the competition, and then proposes how to provide a powerful way for athletes' psychological counseling, and carries out objective and scientific solutions and optimization programs.

Guo Ying (2001) systematically read and summarized the previous research results of sports psychological intervention models and its development status, thereby constructing a psychological intervention model suitable for the development of my country's high level sports teams. The models it includes include: basic psychological skills training, social support psychological intervention, and personality psychological intervention. Zhou Jie (1994) believes that high level competitions require coaches with high IQ and on-the-spot command skills. As the soul of the entire team, the coach's use of wisdom and tactical arrangements on the field were very important to every team member, and the coach's communication with the players before the game and the command ability displayed by using substitutions and timeouts between games during the game must have a calm mind and a correct psychological orientation.

Yu Changqing (2006) The pre-match state of athletes refers to the emotional state produced by athletes before competing. These emotional states cause certain conditioned reflex changes in their body functions, including central nervous system

excitement, material metabolism, respiration, blood pressure and blood sugar. Level changes. These changes are due to the emotional experience of athletes' understanding of the competition before the competition, which has a very important impact on the competition. The mental state of athletes before competition varies from person to person, and generally manifests itself in the following four types:

Competition Fever-Athletes were overly excited and emotional before a competition and often find it difficult to control their actions. In this state, it would lead to a decline in athletes' intellectual activity, unclear perception and representation, and even undue forgetfulness, chaotic movements, ineffective actions, etc. (Xie Bin, 2006).

Apathy at the beginning of the game - this psychological state was exactly the opposite of an over-excited state. Athletes were prone to showing depression, depression, malaise, lack of confidence, lack of concentration, significant decrease in physical strength, slow reaction, and even try their best to avoid the game. (Xie Bin, 2006).

Blind confidence-Athletes in this state underestimate the difficulty and complexity of the upcoming competition and believe that they can win easily. Under the control of this kind of thinking of underestimating the enemy, they are unwilling to seriously study and analyze game strategies, have a negative attitude towards the difficulties they face, and are blindly optimistic. In terms of psychological processes, it manifests itself in slow thinking, reduced attention intensity, and insufficient preparation for the competition (Xie Bin, 2006).

The emotion of fighting -the athlete's psychology was in the best competitive state, full of confidence and strength, and fully prepared mentally. They were focused, perceptive and energetic. They can make correct evaluations of problems that arise in the competition. They can act decisively at critical moment while always keeping a clear mind. They have a strong desire to go all out to participate in the competition and win the competition. (Xie Bin, 2006).

During competitions, athletes often suffer from adverse psychological symptoms such as competition fever, competition apathy, and blind self-confidence. Based on this situation, necessary pre-match adjust mallets should be made to athletes so that they can reach their optimal competitive level.

3.4 Pre-match psychological training research

Peter · Morris in the study of "Psychological Preparation of Volleyball Players" showed that through a survey of 100 volleyball players, the results showed that athletes were subjected to different adverse psychological disturbances in large competitions, and coaches could find out the causes of psychological disturbances for different athletes and make relevant suggestions for the causes. At the same time, it was also proposed that if athletes have bad psychological emotions before the competition, they can use the method of inhibiting thinking to reduce the abnormal psychological reactions caused by bad emotions.

Dong Bin (2008) In the process of training, athletes should continuously improve their psychological ability and quality, and constantly improve their ideological level and cultural accomplishment, the key was to constantly improve themselves. Yu Feng (2007) psychological training includes training objectives and methods, detection indicators, implementation time and training requirements. Wang Xiaona (2002) The success of athletes was not only a test of motor skills and mental ability, but also a breakthrough test and feedback of mental activity intensity, and then forms a self-confirmation and evaluation of mental activity intensity. Zhao Gang (2007) that building strong self-confidence was a prerequisite for athletes to succeed in competitions. However, in practice, self-confidence was often affected by a variety of uncertainties and shows instability. Therefore, it was very important to boost the self-confidence of athletes before competitions, especially before competitions. Qiao Qianzhi (2007) During the competition, according to one's own subjective feelings and in the face of the complex objective environment, it was necessary to adopt a positive thinking pattern to prevent the interference of negative thinking patterns and the destruction of emotions. Shi Hong (2007) The building and enhancement of self-confidence depends on the positive emotions generated by positive thinking. At the same time, in the rapidly changing field, we must not only be good at improvising, if we were in an unfavorable situation, we should adjust our tactics in time, and we should be good at discovering the weaknesses of the opponent and overcome the enemy's shortcomings with our own strengths. Wei Gaoxia (2007) strengthens and improves the psychological quality, so that their own technical level can be fully exerted in the competition, and athletes should strive to cultivate themselves into

people who dare to face difficulties and have tenacious character in the practice of the competition, so as to effectively improve the psychological quality level of athletes.

Liu Baoyu (2006) In psychological training, the existing psychological characteristics of individuals should be taken into account, so as to adopt corresponding training methods and methods. Some need to adopt self-mobilization training, some adopt self-control training, some use motivational training, and some organically combine the three. Yuan Shoulong (2005) The selection of psychological training content and methods should not only be based on individual psychological characteristics, but also based on the specific psychological changes of individuals in different periods of time. Generally speaking, we all know that people's inner activities and psychological states have great plasticity, which was a common problem that must be considered in psychological training. Wu Qiujuan (2004) Mental training can help athletes effectively overcome psychological barriers and improve their mental skills, so that athletes can form a super competitive state before the competition. Today, with the increasing development of science and technology, sports competitions have higher and higher requirements for the psychological quality of athletes, and the quality of the psychological quality of athletes would directly affect the performance of technical and tactical levels in the competition. Wang Xiuxiang (2004) cultivates good psychological quality of athletes, which was to adapt to the needs of high-intensity training and competition. Relaxation training, appearance training, suggestion training, attention concentration training, cognitive training, simulation training and other methods are used to continuously stimulate interest and motivation, improve the psychological quality of motor memory, appearance, perception, thinking and self-confidence, and improve the comprehensive psychological quality of athletes in the shortest possible time. Qi Changzhu (2004) The application of psychological regulation methods makes the psychological regulation before the competition have obvious individual differences, and the corresponding psychological means and methods are adopted to solve the psychological disorders shown by different athletes, which can help athletes achieve effective self-psychological control. Zhang Xiaoling (2004) The application of pre-match psychological regulation methods must be combined with the characteristics of the project, closely relying on helping athletes form the best psychological state to face the competition, and must associate special techniques with individual

characteristics, fully develop the good psychological quality that has been formed before, overcome psychological defects, fully meet and meet the needs of sports training, so that the psychological quality, technical level and ability to cope with the competition of athletes can be improved simultaneously.

Dai Yong (2003) Sports psychology training was one of the components of the entire sports training process. Its role was to be combined with physical fitness, technical and tactical training and promote each other before it can play its due role. Without physical fitness and technical and tactical training, psychological training would become an empty talk. The role of psychological training in sports practice mainly reflects their:

Mental training that cultivates athletes' ability to regulate and control their own mental states and learns self-control can help athletes achieve optimal control of their thinking, emotions, and behavior.

Help athletes eliminate fatigue and speed up the recovery process. The fatigue that athletes experience after training and competition was not only physical, but psychological fatigue was often more difficult to eliminate.

Improve the mental ability required for sports and the ability to resist various internal and external interference. Mental training reinforces specific mental skills, including perception, sensation, mental representation, distribution, and concentration of attention.

It was conducive to better tapping the athletes' own potential. Psychological training was conducive to mobilizing and exploring one's own potential. When athletes realize this problem, they would have more confidence to face various challenges and overcome various difficulties (Wang Gang, Liu Rensheng, 2003).

Xue Xiaotian (2002) Psychological skills training was a process of influencing the psychological process and personality psychological characteristics of athletes in a purposeful and planned manner, and it was also a process of using special methods and means to enable athletes to learn to regulate and control their own psychological state and then regulate and control their own sports behavior. Chen Danping (2002) psychological skills training was an indispensable part of the modern competitive sports training system, which affects and restricts the improvement and embodiment of the athlete's physical, technical and tactical level, can promote the continuous improvement of the athlete's psychological process, form the good personality and

psychological characteristics required by special sports, obtain a high level of psychological energy reserve, adapt the athlete's psychological state to the requirements of training and competition, and lay a good psychological foundation for achieving the best competitive state and creating excellent sports performance.

Wu Jiaduo (2001) Simulation training, also known as competition model training or competition adaptation training, refers to a training method that imitates competition conditions in training and was used for athletes to practice technical tactics and competition coping strategies. Practical and repeated practice for possible situations in the competition prepares the athletes for the competition. Its function was to help athletes improve their on-the-spot adaptability and anti-interference ability, and establish a reasonable qualitative structure of power in their minds, so that their technical level can be played normally in actual combat. Wu Yigang (2000) simulation training was to make the training content closer to the actual situation of the game, to create conditions to adapt to the environmental requirements of the game, mainly including language image simulation and the simulation of the real scene of the game. This kind of training was to use the training ground as a competition field, and create conditions for the athletes who were about to participate in the competition to adapt to the venue, equipment, spectator behavior and even temperature as much as possible. For example, before the competition, organize more simulated competitions or actual battles, such as equipment falling to the ground, slippery kendo, and spectator heckling, etc., the purpose of these measures was to make athletes prepare for the relevant adaptation of the competition, and to ensure that the athletes' on-the-spot performance on the field was foolproof to do the necessary guarantees.

In competitive sports, there was a process that goes through in order to win a match and ultimately achieve excellent results. Generally speaking, there would definitely be confrontation when there was a competition, and confrontation is divided into direct contact confrontation and non-direct contact confrontation. In direct contact sports, in order to win, it was necessary to understand the opponent's technical characteristics, tactical level, and personnel situation and arrange simulation training (Liu Chenghua, 1999). For example, fencing simulates the characteristics of the opponent through conditional actual combat, so that athletes can have an in-depth understanding of the characteristics of the playing style and master various effective countermeasures. If both athletes use the same tactic or use different tactics; An

athlete on one side simulates a specific opponent or tactic, and an athlete on the other side uses a specific tactic; One side uses pressing tactics, and the other side uses fencing line threats to switch tactics; In addition, the two sides adopt the tactic of switching when attacking near the end line while maintaining a certain distance (Feng Tianen, 1998). In sports that were not in direct contact, such as badminton, it was also necessary to find out the technical characteristics and psychological state of the opponent for targeted training. For example, the Chinese badminton team needs to find some players with similar skills and playing styles to sparring with Asian flexible players and European strength players (Chen Danping, 1998). In recent years, with the reform of badminton rules, China's badminton program was facing severe challenges from overseas legions. One of the main reasons was the outflow of some excellent players from their own country, who conduct simulated training for the playing style of Chinese players, so that they know themselves and their opponents, and of course they would have more chances to win. In addition, due to the particularity of simulation training, various complex factors in the training process should also be taken into account in the simulation process, and the opponent's physical fitness, technical and tactical characteristics and psychological state encountered in the competition are different, if you encounter an opponent's technical play and physical fitness are comparable to your own, then the quality of psychological quality will become the winning factor for the success of the game (Chu Xiang, Cai Meiqing, 1995). In order to adapt to the competition, athletes carry out psychological simulation training during the training process, such as athletes' self-regulation, coaches' words, etc., which can improve the psychological quality of athletes. Therefore, the types of simulation need to be diversified, and the simulation training should show high flexibility, pertinence and individuality in the implementation process, which requires us to continuously collect feedback information and effectively regulate it (Feng Xiaoyu, 1995).

In terms of the characteristics of fencing events, we should start from the technical and tactical perspectives, combined with the simulation training of fencing, which can improve the athletes' concentration, adaptability and self-confidence in the competition, and create favorable conditions for their technical and tactical performance and the improvement of the scoring rate (Fu Limin, 1994). Finally, it should be emphasized that simulation training is to make full use of modern scientific and technological means, competitive sports with the development of science and

technology at a high level, today's developed science and technology put forward higher requirements for the status quo of competitive sports, because the main body engaged in competitive sports was people, in the training process, whether it was the controller or the controlled person would face the challenge of higher requirements, so fully developed. To improve people's physical fitness, there was also the use of computer comprehensive processing, sports image analysis and competition technology video to provide more effective technical support and service guarantee for athletes to achieve excellent results in the competition (Jiang Xiaozhu, 1994).

Representation training was when people consciously use the representations that have been formed in their minds to repeat, review and enrich the development of technical actions or sports situations, so as to evoke the sense of movement, methods and processes for strengthening muscle proprioception and improving motor skills and emotional control (Li Zhaolai, 1989).

It was a method of repeatedly imagining a certain motor action or situation in the mind under the guidance of suggestive language, so as to improve motor skills and emotional control. In competitions, representation training helps to speed up the learning of motor skills, consolidate and improve the learned motor technical movements. The pre-match experience of the appearance of successful movements would play a motivating role, so that the athletes would full of confidence to win, and they would in the best possible condition. Minas (1980) experimentally found that representation training can improve the speed of motor learning, and it was more prominent in motor learning with more cognitive components. The domestic predecessor Zhang Liwei (1990) found through experiments that appearance training can improve and improve the technical movements of table tennis players. In addition, representation training also has the effect of regulating people's emotions and physiological arousal levels.

Appearance training before the competition was conducive to encouraging the fighting spirit of the athletes, prompting them to be emotionally high and better enter the state of imminent battle. Athletes can consciously evoke the appearance of their most recent success in a competition with the help of their coach (Jamesha, 1989). In addition, in order to help athletes stabilize their emotions and overcome negative thoughts, it can also allow athletes to recall the appearance of a setback after relaxing, and then compile a successful ending to the experience, with the aim of

experiencing the physical sensations and emotions of success and enhancing the athlete's self-confidence (Zhang Jiahua, 1984). There was also the ability to control emotions audibly and visually, showing that it has no relationship or influence on everything around them. In modern competitive sports, there were many examples of athletes losing games due to the lack of necessary psychological skill training methods, and as an effective psychological training method, appearance training can become an invisible assistant for athletes and coaches in the process of competition or training (Liao Xianxing, 1982).

Suggestion training refers to the process of using language, gestures, expressions, and other stimuli to exert indirect and implicit methods on the psychological, state, and behavior of the trainer. In view of the fact that athletes were prone to doubt their technical and tactical ability and on-the-spot performance level in competitions, it was necessary to strengthen athletes' self-suggestion training in training competitions, so as to enhance athletes' self-confidence (He Lingyu, 1981). In the process of competition, athletes often encounter situations where they would not treat the game correctly when they are ahead, that was, we often say, they don't know how to play the game, they don't know how to deal with the control of the field when they are ahead, and they would also have a relaxed mood. In this case, we must require athletes to keep a clear head and calm state through self-prompting, and focus on how to further expand the advantage of leading on the field: on the contrary, if they were in a backward and passive state in the game, athletes are more likely to panic and cannot calmly cope with the game, so athletes need to remind themselves in time and reflect on the details of the game, and strive to find effective ways and methods to deal with the game, so as to turn things around. In addition, in view of the situation that it was easy to relax at key moments in the game, a simple and effective suggestion should be arranged before the game, so that the athlete can focus all his attention on his technical and tactical actions at the necessary moment (Chen Gongcheng, 1981).

Studies in sports psychology have shown that autosuggestion can improve the stability of movements and increase the success rate. Some athletes want to eliminate the panic before the competition, calm the brain, and by suggesting: calm, calm, calm was victory; I believe in my own strength, and I would definitely win: to motivate myself with this (Lin Yiqi, 1980). Through speech, people are able to accept cues and carry out autosuggestion, and regulate the cognitive, emotional, and volitional

processes through speech that represents all things and phenomena in the external and internal environment. According to Pavlov's theory, autosuggestion training was to regulate the excitability level of the athlete's central nervous system through the action of words, i.e, the second signaling system, so as to regulate the internal processes of the human body, such as emotion, would and confidence (Yan Zijian, 1980). It has been proved in practice that implicit training can enhance athletes' self-confidence in competition, help athletes master technical movements and essentials, and establish and improve self-efficacy. It can help athletes regulate their emotions and create an emotional arousal that was conducive to the game: there was also the suggestion that training can help athletes focus on the task at hand. In short, in sports training and competitions, the role of implicit training has been valued and concerned by the majority of athletes and coaches.

4. Mindfulness training

4.1 Definitions and Significant

Zen Buddhism was an important branch of Buddhism in China, originating from India Buddhism, and was also known as the Buddha Heart Sect by the world. The practice of Zen Buddhism was mainly based on meditation as the core, and the purpose was to thoroughly understand the origin of the mind. It was mentioned in the "Zong Jing Record Volume III" that the Bodhidharma Patriarch said that the Ming Buddha's heart was unmistakable, and the name was called the ancestor. It was mentioned in "Zhongfeng Lu Wuxia": What is Zen? It was the name of my heart. What's in the heart? That is, my Zen body. From the views of the above two Zen patriarchs, Zen thought belongs to the study of mind, metaphysics, and emphasizes people's inner understanding of themselves (Feng Guoyan and Si Gangyan 2015).

The core idea of Zen Buddhism was "the nature of the mind was pure, the nature of the Buddha was inherent, and the nature of seeing becomes a Buddha", Zen Buddhism has experienced thousands of years of development, and the ideas advocated by it have gradually evolved into four philosophical views: the theory of loss, the theory of the original mind, the theory of realm, and the theory of enlightenment. The theory of disorientation refers to the fact that people's hearts are restless and regretful, so they have inner attachment and incomprehension, and finally form a state of obsession and unconsciousness (Xu Shousen, Liu Shuhui, 2014).

Mindfulness was a concept from the Buddhist tradition that has been widely used in modern psychology and psychotherapy. Mindfulness training was a systematic approach that helps individuals improve emotional management, enhance self-awareness, and improve mental health through continuous practice and nurturing mindfulness.

In fact, Zen Buddhism was essentially a method of cultivating the mind and cultivating the spirit, and people can rely on the theories and learning methods of Zen Buddhism to realize the truth by themselves, so as to achieve a pure mind and a clear mind (Si Gangyan, 2014). In modern times, the development of Buddhism has gradually stepped down from the altar and integrated with real life. During the period of the Republic of China, the Buddhist thought proposed by Master Taixu and gradually developed - human Buddhism. Master Taixu proposed that Buddhism was to serve people, and the teachings of Buddhism are inseparable from people's lives, and put forward the concept of learning Buddhism that Buddha hood was in the world and people become Buddhas. As Zen Buddhism gradually became secularized, people gradually began to discover and feel life through Zen thought and practice methods, so as to obtain the true meaning of life and get rid of the current pain and troubles of life (Si Ganyan, 2014).

The idea of mindfulness comes from the theory of enlightenment, in which there was the Zen theory of the "Noble Eight fold Path", which includes: guiding the public through the eight righteous paths, such as correct view, right thinking, right speech, right karma, right life, right diligence, right thought, and right concentration. Practicing according to the Noble Eight fold Path can help people change their evil thoughts, develop righteous thoughts, and thus turn foolishness into sanctification (Zhao Daliang, 2013). Among them, mindfulness mainly refers to the fact that when people practice, they would focus their thoughts on a specific object and observe the object of rest attentively, so as to maintain the stability of their thoughts and mentality, and achieve a state where their minds are not scattered and their minds are not reversed. Generally speaking, mindfulness mainly refers to the fact that people, as an individual, are consciously aware of the things around them, live in the moment, non-judgment things, focus their minds and minds on what they are doing and the object of study, stay awake at all times, and be prepared to deal with emergencies (Si Ganyan, 2015).

4.2 Type of Mindfulness training

Based on the theories of mindfulness, we discussed and designed a series of training processes, such as mindfulness meditation, body scanning, mindfulness walking, mindfulness eating, etc, which is mindfulness training (C.H. N , 2016). In fact, there were many methods of mindfulness training, as opposed to systematic mindfulness training, which was created by Professor Kabajin in 1979, and his "Mindfulness-based Stress Reduction" course helped patients with depression and clinical pain. Originally used to treat patients with mild mental illness, MBSR has been widely used in clinical psychotherapy, and mindfulness-based stress reduction therapy has a positive effect on reducing postoperative pain, distraction, and depression (Liu X, 2014). Teasdal et al. developed mindfulness-based cognitive therapy in combination with cognitive behavioral therapy. In contrast to mindfulness-based stress reduction training, the therapy was also achieved through about eight sessions of mindfulness group training, and also includes unique training methods: "three-minute breathing space technique" and "cognitive recording exercises".

As shown in the period, the Mindfulness-Acceptance-Commitment approach (MAC) was also a more mature mindfulness training method, and the core of MAC was "living in the moment", and "living in the moment" was to keep the focus of attention in the here and now. It was to direct attention to the here and now, to eliminate the intentional awareness of the influence of the past and the future on the present, and to promote the self-awareness of the present moment, and to experience each present more deeply and efficiently (Si Ganyan, 2014). MAC was to develop the individual's awareness of the present moment without judgment through mindfulness training, and to improve one's own mental processes, thoughts, emotions, various physical sensations, etc, to feel their existence without paying too much attention. As early as 1974, Simpson et al. attempted to use breath control methods to control hyperactivity symptoms caused by attention deficits. Desired results were obtained in terms of improved concentration. In terms of mindfulness regulating emotions, as early as the beginning of the 20th century, the United Kingdom included mindfulness-based cognitive therapy in the national clinical treatment practice guidelines as a method of treating recurrent episodes of depression. In addition, the effect of mindfulness training has been evaluated, and foreign researchers have developed a number of scales for measuring the level of mindfulness,

such as the five-factor mindfulness questionnaire, the Mindfulness Attention Awareness Scale, and the Freiburg Awareness Scale, etc, to provide strong data support for the training effect of mindfulness and help explore the nature of mindfulness (Deng Y, 2008). Baer believes that mindfulness can alleviate chronic pain and stress-related populations, and the program lasts for 8-10 weeks with up to 30 participants, practicing mindfulness meditation skills for 2-2.5 hours per week. The purpose of mindfulness training is not to induce relaxation, but to teach people a non-judgment observation of the current situation, which may include spontaneous arousal, accelerated thinking, muscle tension, and other phenomena that are incompatible with relaxation.

Initially, the main method of psychological intervention in athletes by Western psychologists was PST traditional mental skills training, and the main methods were goal setting, representation training, arousal control, attention training, self-talk, and a combination of the above methods (Hi Tsuyoshi, 2014). However, in terms of subsequent effect verification, PST has never been able to obtain convincing research conclusions from the data, so the West began to doubt the practical usefulness of PST, and used this as a starting point to find new training methods. As a result, mindfulness training based on the third generation of cognitive behaviorism combined with Eastern Zen Buddhism was gradually accepted (Liu Shuhui, 2013). The use and development of mindfulness training in China is mainly due to one person, Si Gangyan, who first introduced and localized the PST training method with his years of experience in sports training, put forward the theory of adversity coping, and made a new definition of ideal competitive performance (Zhao Daliang, 2013). In his theory of ideal performance, he begins by explaining three key elements: first, adversity, which mainly refers to the negative experiences that exist both internally and externally during training and competition. Second, reasonable, being able to control one's own unreasonable experience and make full use of the opponent's mistakes and unreasonable experience. Third, coping, how to overcome adversity and choose the best way to deal with it. With the emergence of the theoretical system of mindfulness training, the localization process of mindfulness training began (Joy, 2014).

In the process of localization, he first deepened the concept of mindfulness training, and deepened the localization of acceptance, mindfulness, and Go self-centered, which is mainly manifested in the following three aspects. First, accept whatever

comes your way, including adversity and good times (Si Ganyan, 2014). That was to say, for athletes, adversity was inevitable in the athlete's sports career, it was objective, and the good situation was also inevitable in the athlete's life, and it was irreversible, so the ideology of "normal when encountering adversity" becomes acceptable, when the athlete can accept adversity, then when adversity appears, the athlete was more able to accept it calmly. This coincides with the Zen theory of acceptance and the concept of acceptance in mindfulness training (Si Ganyan, 2014). Second, while embracing the good and bad times in life, live in the moment, put your beliefs on what you were doing at the moment, concentrate on it, and improve the efficiency and quality of your behavior. In other words, athletes should not dwell on the adversity or good times they encounter, but focus on the present moment, what they were doing, and concentrate more on what they were doing, which was consistent with the concept of mindfulness in mindfulness training (Si Ganyan Him, 2014). Third, the awareness of the self, that was, the cognitive focus on what was being done and all the clues related to it, and the attention to the internal state of the self was minimized. From the perspective of Zen thought, it was to let go of the attachment to external objects and improve the quality of life at the moment; From the perspective of mindfulness training, it was a copy of the concept of "Go self-centered" (Si Ganyan, 2014).

Through the study of mindfulness training, combined with the adversity coping theory and Zen Buddhism that he founded, he has compiled a set of mindfulness sports training methods suitable for Chinese athletes—the Athlete Mindfulness Training Manual (Si Ganyan, 2014).

4.3 Mechanism of mindfulness training on mental state or psychological characteristic before sport competition

Mindfulness also has different degrees of intervention effects in sports competitions. In theory, mindfulness and physical exercise are closely related, and the two are mutually related. Regular participation in physical exercise can play a positive role in improving individual mindfulness. The two complement each other, and improving the level of mindfulness can also provide strong help for physical exercise.

Pre-match mood refers to the psychological and emotional state of athletes before a match, which directly affects their performance. Mindfulness training can help athletes maintain a positive and stable emotional state by intervening in their pre-

match mood (Deng Y, 2008). Through mindfulness training, athletes can learn to be aware of their emotions and accept them without judgment, which helps reduce the impact of negative emotions on their psychology (Si Gangyan, 2014). Competition anxiety refers to the negative emotional state of tension, worry, fear, etc. caused by stress before or during a competition. Mindfulness training can break the cycle of anxiety and reduce excessive worry or fear by guiding athletes to focus on breathing, physical sensations and other current experiences (Hinitz D, 2016). Competitive Tai Chi athletes can effectively reduce anxiety before competitions through mindfulness training, focusing on action execution and inner feelings rather than external interference and psychological pressure (Michael C, 2017). Sports confidence refers to an athlete's trust in their own abilities and sense of self-efficacy when facing challenges. Mindfulness training helps athletes focus on the present and avoid excessive worry about future results, which allows them to focus more on the execution of actions during the game rather than fearing failure or the evaluation of others (Chaskalson M, 2017). At the same time, mindfulness training cultivates athletes' self-awareness, allowing them to perceive their inner state more clearly, thereby enhancing their confidence in their own abilities (Kevin P, 2018).

As an emerging psychological intervention method, mindfulness training has been widely used in the field of competitive sports. For competitive Tai Chi athletes, mindfulness training can effectively improve their psychological state and ultimately improve their performance by improving their pre-match mood, reducing competition anxiety, and enhancing sports confidence. The application of mindfulness training can not only help athletes relieve competition pressure, but also provide them with a long-term psychological adjustment tool, which helps them maintain psychological balance and self-control in a fierce competitive environment.

There were many models about the mechanism of mindfulness (Baer RA, Smith GT, Hopkins J, et al; Leary MR, Tate EB). The most influential one is (Shapiro SL, Carlson LE, Astin JA, et al, 2006). The IAA three-axis model proposed believes that mindfulness is composed of three dimensions: I intention, A attention, and A attitude. These three factors occur simultaneously and intertwine with each other, leading to the generation of mindfulness.

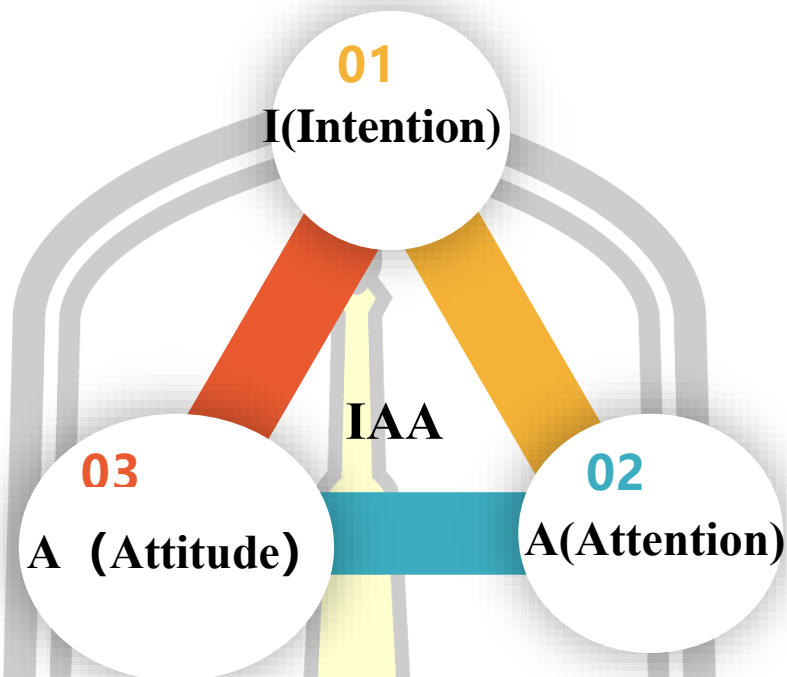


Figure 2 Mindfulness Mechanism

The mindfulness training mechanism studied in this paper includes: emotion regulation, attention regulation and cognitive reconstruction (Brown, K. W., & Ryan, R. M. 2003). (Keng, S. L, et al. 2011) reviewed the impact of mindfulness training on emotion regulation and provided a summary of relevant empirical research, (Zeidan, F, et al. 2010) discussed the impact of mindfulness on attention, (Kabat-Zinn, J. 1990) introduced the impact of mindfulness on cognitive reconstruction and its application. (Brown, K. W., & Ryan, R. M. 2003).

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The mindfulness training response mechanism of this study is shown in the figure below:

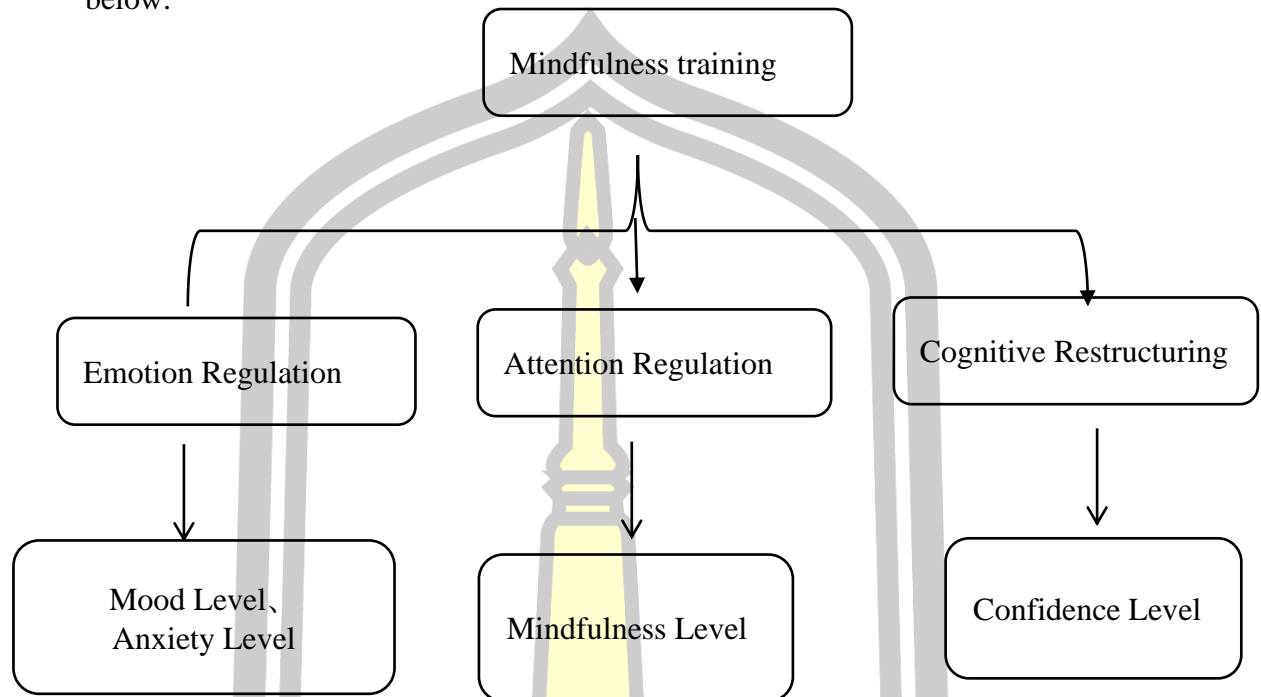


Figure 3 Mindfulness Training Mechanism

Diamond and Liu Fuqu both conducted a five- to eight-week mindfulness intervention experiment on college athletes. The results showed that the mindfulness training group had a significantly higher accuracy rate in the inhibitory function stroop task test than the control group, and the N2 amplitude was smaller, which suggests that mindfulness training can improve the mindfulness level, endurance performance and other aspects of college athletes. Secondly, by measuring the various indicators and competition performance of athletes before and after mindfulness training, the effectiveness of mindfulness training in athletes is demonstrated. And through research, it is found that mindfulness training can significantly improve athletes' trait fluency, awareness, positive emotions, acceptance, and engagement, and can also improve athletes' performance in competitions. (Wei Liu Amir Dana 1, 2022; Shan Xue, 2022) conducted a study on shooting athletes through mindfulness training. Through different degrees of mindfulness intervention, 22 athletes from the Beijing Shooting Team were treated, integrating psychology and cognition, combined with mindfulness group courses, and significantly reduced the athletes' anxiety levels; for

19-year-old male shooting athletes, six six-week 60-minute mindfulness training psychological skills control experiments were conducted. Combined with the competitive state anxiety scale, the effects of the two stages before and after the test on competitive state anxiety were monitored. Consistent with the results of the study (Shan Xue, 2013), the cognitive intervention of mindfulness can significantly reduce competitive state anxiety ($P < 0.05$), but there is no statistically significant difference in the effect of the psychological skills method.

Mindfulness training is currently widely involved. Some researchers have found that mindfulness training has a positive effect on the relief and improvement of psychological fatigue of fencing athletes. Through intervention, fencing athletes have improved their mindfulness training level and sports performance to varying degrees, indicating that the benefits of mindfulness training for athletes are also reflected in many aspects. At the same time, it was also found that fencing emphasizes self-control and has a good effect on sports performance. Cognitive fusion, cognitive separation, experience avoidance, and experience acceptance have not been found to have a good correlation with sports performance in previous studies. The main reason is that athletes are usually more intense during competitions or training, making it difficult for athletes to transform mindfulness knowledge into good mindfulness skills.

In the process of mindfulness training, practical operation ability is very important. We should focus on the athletes' self-mindfulness training so that they can develop good and stable mindfulness traits.

Many researchers at home and abroad have conducted a lot of research on basketball players through the intervention of mindfulness training. Goding et al.'s research shows that in addition to practicing free throw skills, that is, practicing free throw hit rate, as well as game experience and years of sports practice, the level of mindfulness can significantly improve the free throw hit rate in the game. Song Yaya, Wu Zhonghui and others conducted research on basketball players' anxiety and negative emotions in basketball moods of college athletes, and found that mindfulness training played a positive role in the decision-making of college basketball under negative emotional stimulation. After the intervention of mindfulness, the mindfulness training group's reaction time was shortened and the accuracy rate was significantly improved, while there was no significant difference in the control group. At the same time, after mindfulness training, the mindfulness level of the mindfulness training

group of big athletes has significantly improved, and the free throw scores of basketball have improved, which proves that mindfulness training is of great help to the sports skills of big athletes. Other researchers have conducted experimental research on the competition anxiety of high level basketball players in colleges and universities. The anxiety state of high level basketball players in competitions has different degrees of anxiety at different sports levels, different training career lengths, and time before the game. After mindfulness intervention, the overall competition trait anxiety and competition state anxiety levels of athletes have all decreased.

As we all know, martial arts is the basis of Sanda, and Sanda is an extension of martial arts. Martial arts and Sanda complement each other and are inseparable. There are also many studies on the intervention of mindfulness training on martial arts Sanda athletes in China. Liu Tao and other researchers carried out a mindfulness training intervention for about a year during the preparation of the Hong Kong Wushu Team for the 13th World Wushu Championships. The results showed that martial arts had significant improvements in both training quality and training attitude, and also in the time dimension. Zhao Daliang randomly selected three high level martial arts athletes from a team as subjects and intervened with them. A total of 6 mindfulness training sessions were conducted once a week for 1 hour each time. The final research results confirmed that mindfulness training can significantly reduce the trait anxiety level of high level athletes. Si Gangyan and Bu Danran conducted a one-week mindfulness intervention on three Sanda athletes, using a variety of methods such as self-report, questionnaire analysis, and semi-structured interviews. The results showed that after the intervention, the mindfulness and acceptance levels of the three Sanda athletes were improved.

In addition, many researchers have used mindfulness training to intervene in competitive athletes of different sports. Xu Wei believes that trait mindfulness is a multidimensional psychological factor that may play an important role before, during, and after physical exercise. Studies have shown that the five personality traits are one of the important factors affecting motivation for physical exercise, and trait mindfulness is also closely related to the five personality traits. This may be because personality variables are affected by exercise motivation. Therefore, introducing mindfulness training in physical exercise may play an important role.

In summary, in recent years, a training method with mindfulness and acceptance as the core has emerged in the field of competitive sports, aiming to improve athletes' internal state control and competitive performance. In addition to traditional psychological skills training, more and more researchers have begun to explore the effective combination of mindfulness training and competitive sports. Therefore, mindfulness training has many connections with athletes, such as shooting, taekwondo, Sanda, boxing, diving and other projects. It is also very common for athletes to lose the game due to weak mental quality. The results of the above studies also show that mindfulness training can improve athletes' learning ability, eliminate mental fatigue, and improve movement fluency and training concentration. And we can understand that athletes are constantly breaking through themselves and pursuing success, accompanied by a lot of stress, anxiety and other emotions. The main difference between traditional psychological adjustment and mindfulness training lies in individual acceptance, acceptance of positive and negative, and through mindfulness training, the main focus is on the current task, which effectively relieves the tension and anxiety of athletes. It can be seen that mindfulness training makes up for traditional psychological intervention in athletes' psychological intervention. There are more and more studies in the field of sports, and the positive impact on competitive sports is particularly significant.

4.4 The measurements of mindfulness level

At present, there were more than 20 scales to measure mindfulness, and many of them are suitable for a wide range of people and have high reliability and validity. Duan (2014) summarized and categorized a wide variety of mindfulness scales and summarized four mindfulness scales for measuring orientation: state orientation, cognitive orientation, ability orientation, and trait orientation.

(1) Measurement of state orientation

State-oriented mindfulness can be referred to as state-oriented mindfulness for short, which mainly refers to the level of mindfulness of an individual over a period of time, which can be changed through acquired training (Zheng Ming, 2020). At present, the main scales used to measure state mindfulness are the Freiburg Mindfulness Inventory (FMI) and the Toronto Mindfulness Scale (TMS).

The FMI scale is a four-dimensional scale developed by Walach et al. (2001) to measure people's attention that can be correctly identified in the moment, attitudes of non-judgment and non-evaluation of themselves and others, and openness to negative psychological states. The TMS scale was a two-dimensional scale developed by Lau et al. (2006) to measure people's curiosity and decentralization.

(2) Measurement of competency orientation

Competency-oriented mindfulness can be shortened to competency, which was mainly considered to be an individual's ability or skill, which usually needs to be learned by the individual through mindfulness training (Duan, 2014). At present, the main scales used to measure competency mindfulness were the Kentucky Inventory of Mindfulness Skills (KIMS), the Five Facet Mindfulness Questionnaire (FFMQ), and the Experiences Questionnaire (EQ).

(3) Measurement of cognitive orientation

Cognitively oriented mindfulness can be referred to simply as cognitive mindfulness, which is mainly considered to be a cognitive process of an individual (Duan, 2014). At present, the main scales used to measure cognitive mindfulness were the Southampton Mindfulness Questionnaire (SMQ) and the Mindlessness Scale (MMS).

(4) Measurement of trait orientation

Trait-oriented mindfulness can be referred to simply as trait mindfulness, and trait mindfulness (DM) refers to the level of mindfulness that people who have not received mindfulness training (Kabat-Zinn, 1990), which are both innate and acquired (Duan, 2014). At present, the main scales used to measure trait mindfulness are the Cognitive and Affective Mindfulness Scale-Revised (CAMS-R), the Mindfulness Attention Awareness Scale (MAAS), and the Philadelphia Mindfulness Scale (PHLMS). However, the most commonly used trait mindfulness scales are the MAAS scale and the PHLMS scale.

4.5 Research on Mindfulness Training of Predecessors

After the establishment of behavioral psychology in 1913, the first generation of behavioral therapy was born in the fifties and sixties of the 20th century, mainly including intensive characteristic behavior modification technology and systematic

desensitization therapy, both of which are formed on the basis of human behavior theory, and lack unified and effective corresponding experimental data and clinical verification, which are relatively crude (Page K, 2019). The second generation of behavioral therapy was mainly rational emotional behavior therapy and cognitive therapy for neurological patients. The third generation of behavioral therapy is the prime time of behavioral therapy, and during this period, behavioral therapy has received widespread attention from the society, including acceptance and commitment therapy, mindfulness-based psychological quality improvement therapy, mindfulness-based cognitive therapy, and dialectical behavior therapy (2018, Kevin P). The main purpose of these behavioral therapies was to provide correction and treatment for people with psychological and personality disorders.

Although the research on mindfulness training in China was later than that in foreign countries, a large number of studies on mindfulness training have also been applied to clinical psychology in China, specifically in the direction of depression, anxiety, obsessive-compulsive disorder and subjective well-being. In order to be closer to the reality of this study, the research population was focused on the concept of mindfulness training of athletes, and there were many related studies.

Tsuyoshi (2014) launched a more suitable mindfulness training manual for local athletes, "Mindfulness Training Manual for Athletes", which is divided into 7 chapters, including mindfulness training preparation, mindfulness, Go self-centered, acceptance of the three skills, values and awareness, engagement, comprehensive exercises, etc. The Mindfulness Training Manual for Athletes¹³ focuses more on practicality in training, i.e. training methods that can be used directly in practice. Mindfulness training arranges every content of mindfulness training and the content of daily training in detail, which was operable. And the hierarchy was clear and the arrangement was reasonable. There were three stages of mindfulness training: the first stage was basic exercises, which mainly include centering exercises, mindful breathing exercises, body scanning exercises, etc; The second stage was the practice of mindfulness in life, which mainly corresponds to various aspects of life, such as mindfulness bathing, mindfulness eating fruits, and negative internal experiences in life throughout the year. The third stage was the special mindfulness training on the basis of body adjustment, including mindfulness training movements, mindfulness corresponding to the negative internal experience in the special training, etc. The

"Mindfulness Training Manual" has no redundant content, layer by layer arrangement, step by step, the training content between the chapters was the focus, there was no redundant content, the concept and training method of mindfulness training were described in more detail, the text was shallow, easy to understand. For mindfulness training in China, Gangyan Ji's mindfulness training manual is a localized research result combined with Western research ideas, which was more suitable and effective for mindfulness training of Chinese athletes.

Bu Danran (2013) used the method of single-subject experiment, with mindfulness training as the training content, conducted mindfulness training on 3 sanda athletes in Hubei Province, and concluded that the athletes' mindfulness level improved, and their sports performance level was also improved from the feedback of coaches. Zhang Gezi (2013) also used a single-subject experimental method to verify the results of mindfulness training, and selected four wushu athletes from Guangdong Province to reach the same conclusion. Both studies have shown that the practicality of mindfulness training in China has a significant effect on athletes. Feng Guoyan and Si Gangyan (2015) conducted a four-month mindfulness psychological intervention training test and related data extraction using 6 synchronized swimmers from the Guangdong Provincial Synchronized Swimming Team as a sample. The main research method adopted was "mindfulness-acceptance-awareness-input", psychological intervention was carried out through mindfulness training, and corresponding data investigation and data analysis were carried out on 6 team members through various means such as five-dimensional mindfulness questionnaire and attention testings oft ware. One month after the end of the mindfulness training intervention, 6 synchronized swimmers and 2 coaches were invited to conduct a questionnaire survey to comprehensively evaluate the intervention effect of the athletes.

According to the data analysis of the final comprehensive display, mindfulness training has a significant effect on improving the psychological quality and sports performance level of synchronized swimmers. Bu Danran, Zhong Boguang, Liu Jingdong, Zhang Chunqing, and Si Gangyan (2018) trained badminton players at a year-round level, and the main training methods were mindfulness-acceptance-awareness-engagement and the influence of Bruna Brunel's mood level. It can improve the depression, fatigue, tension and vitality dimensions of the Brunel Mood Questionnaire; However, the anger dimension and confusion dimension of Brunel's

emotion questionnaire did not change significantly. Yin Yuanmei (2015) used the method of mindfulness training to conduct mindfulness training on 14 shooting athletes in Hubei Province, and through the data collection and testing of relevant indicators of mindfulness training, the following three conclusions were drawn: first, the seven-week mindfulness training was effective, and the effect continued but weakened in the eighth week after the end of the training; Second, the practicability of mindfulness training was verified, that was, it had an obvious effect on the improvement of athletes' psychological quality and the regulation of athletes' psychological state. Third, it provides a driving force for improving the use of mindfulness training in the field of sports.

In addition, Wang Shanshan (2015) also conducted research on the mindfulness training of shooting athletes, Li Weikang (2015) conducted a study on the mindfulness training of college table tennis, and Chen Jianzhong (2018) conducted a related study on the mindfulness training of tennis. In fields such as golf and badminton, mindfulness training has been studied.

In summary, the predecessors of mindfulness at home and abroad have carried out in-depth research for many years, and also relatively have a rich theoretical basis for mindfulness, foreign mindfulness training was initially applied to the study of long-term medical clinical pain, and then it was widely used in clinical psychology, child behavior development, corporate stress reduction and other related fields of research, and there were also successive experimental research results in the field of sports. Research on mindfulness training has also been widely carried out in China, ranging from negative emotions, stress relief and individual concentration improvement. But the same was that the research on mindfulness training at home and abroad has confirmed that mindfulness training has different degrees of help for depression, obsessive-compulsive disorder, anxiety levels, etc., whether it was from paying attention to breathing, being aware of the body, to depression, obsessive-compulsive disorder, mindfulness training not only improves personal attention and awareness, but also has a significant effect on the treatment of patients with mental diseases, but also improves the individual's subjective sense of well-being, satisfaction with life. It shows that mindfulness training can play a variety of psychological adjustment roles on people, can improve the functional structure of the brain, and also has many beneficial effects on individual psychology.

CHAPTER III

RESEARCH METHODS

1. Design and setting

This study was observational and Quasi-Experimental Designs, conducted at the School of Physical Education, Zhengzhou University, Zhengzhou City, China.

Phase I:

1. The methodology of the phase I

This study was observational and Quasi-Experimental Designs, Athletes from Zhengzhou University in Zhengzhou, China, who would participate in the "2024 National Wushu Taolu Championships" from 22 to 29 June, 40 competitive Tai Chi athletes. Participants signed an informed consent that approved by the Mahasarakham University ethics committee for research involving human subjects approval number: 116-070/2024.

1.1 Participants

Participants were selected from collegiate competitive Tai Chi athletes from the School of Physical Education of Zhengzhou University. There were screened from 150 competitive Tai Chi athletes, and selected those who were interested in this study, they were included in the scope of the study if they met the inclusion criteria of this study through the exclusion criteria and filled in the questionnaire, and signed the informed consent form for the volunteer study. A total of 40 national, first and second level athletes were selected for competitive Tai Chi events, including 20 males and 20 females.

1.2 Inclusion criteria

- (1) Male and female, aged between 19-24 years old.
- (2) College student competitive Tai Chi athletes who will participate in the "2024 National Wushu Taolu Championships" will be held
- (3) Good communication and cooperation.

(4) According to the daily training performance and the usual sports performance, the best will be selected.

(5) No physical or mental illness.

(6) There are no injuries or injuries that have fully recovered.

(7) No mindfulness training.

Phase I

The School of Physical Education of Zhengzhou University has a total of 150 competitive Tai Chi athletes, there were different levels of competitive Tai Chi athletes; national, first and second levels.

On-site registration

Exclusion(N=110)

-Not meeting inclusion criteria and declined to participate

Competitive Tai Chi athletes
(N=40)

Signed informed consent for volunteer study
(volunteers over 18 years old) (N=40)

Outcomes Measurement:
Five-factor Mindfulness Questionnaire
Mood Measurement Scale
Contest Anxiety Questionnaire
Trait Motor Confidence Scale (TSCI-PL)

Figure 4 Overview of study designs

At the began of this study, a total of 150 competitive Tai Chi athletes were selected as potential research subjects by the School of Physical Education of Zhengzhou University, there were different levels of competitive Tai Chi athletes; national, first and second levels. These competitive Tai Chi athletes come from

different training backgrounds and levels, representing a group of people with a certain level of competition in the academy. After the preliminary determination of the research subjects, a round of on-site registration screening was conducted. This stage mainly determines the qualified candidates through .The voluntary registration of competitive Tai Chi athletes and the review of preliminary conditions. Applicants were required to fill in the relevant application form and provide their personal training background and relevant information for further screening by the research team.

After the registration screened, the research team conducted a detailed screened of the applicants, and finally excluded 110 competitive Tai Chi athletes who did not meet the inclusion criteria. The main reasons were: (1) did not participate in the upcoming "2024 National Wushu Taolu Championship" from 22 to 29 June , (2) there were other competitions, and experimental conflicts, (3) the injury was not healed and other factors.

summarize 40 competitive Tai Chi athletes. who met inclusion criteria, including 20 females and 20 males. They were different levels of competitive Tai Chi athletes.

2. Instrumentals

Cognitive state : Five-Factor Mindfulness Questionnaire.

Emotional state: Mood Measurement Scale

Anxiety level: Contest Anxiety Questionnaire

Confidence level:. Trait Sports Confidence Scale (TSCI-PL)

3. Instrumentals

3.1 Confidence level (FFMQ)

This tool was designed for assessing mindfulness and encompasses five dimensions: Observe, describe, act with awareness, refrain from judging, and refrain from reacting. The five-factor mindfulness questionnaire is referred to as "FFMQ". 18 serves as a measurement tool for the self-assessment of individual samples in mindfulness training. The questionnaire consists of 39 questions and utilizes the five-point Richter scale (ranging from 1 to 5 points, from yes to no), (1 = not at all, 2 = less yes, 3 = some agreement, 4 = very agreement, 5 = complete agreement). Some problems involve positive integration, while some are scored in reverse. The higher the score, the more prominent the effect of mindfulness training; conversely.

In this study, the reliability of five-factor mindfulness questionnaire was 0.92 [Appendix A (1)]

FFMQ scores are typically evaluated by considering the entries in each dimension of the questionnaire, each comprising a set of questions to which participants respond on a Likert scale ranging from 1 to 5, where 1 represents "never" and 5 represents "always", based on their self-perception. Through calculating the scores of these questions, researchers can assess an individual's performance across five dimensions (Zhao yuqi, 2020). The following are the explanations and implications of the diverse scores:

The higher the score, the more effective mindfulness training is, and vice versa.

Observation Items: 1, 6, 11, 15, 20, 26, 31, 36

Description items: 2, 7, 12R, 16R, 22R, 27, 32, 37

Conscious Behavior Items: 5R, 8R, 13R, 18R, 23R, 28R, 34R, 38R

Do not judge items: 3R, 10R, 14R, 17R, 25R, 30R, 35R, 39R

Non-reactive items: 4, 9, 19, 21, 24, 29, 33

(R is the reverse integral item)

In the calculation of the total score, all the scores of the positive scoring items are accumulated, and the calculation rule of the reverse scoring items is 5-point value, so the maximum score of this questionnaire is 176 points.

3.2 Emotional state (POMS)

In this study, the emotional state of the experimental subjects was assessed by employing the Chinese version of the Profile of Mood States (POMS) revised by Zhu Beili (1995). The 40-item Chinese mood measurement scale (see Appendix 2) was utilized. The average reliability was 0.71. The mood measurement scale adopted a 5-point Likert rating scale, but the corresponding scores ranged from 0 to 4. The sum of the scores for the seven dimensions was 100, representing the overall mood state of the individual. The higher the test score, the more negative the athlete's mood was, and vice versa. The reliability of the mood measurement scale in this study was 0.93 [Appendix A(2)]

The scoring method for the scale was as follows: "Hardly at all" was scored as 0 points, "A little" was scored as 1 point, "Moderate" was scored as 2 points, "Quite a

bit" was scored as 3 points, and "Extremely" was scored as 4 points. The seven dimensions of the scale were as follows:

- Tension: Items 1, 8, 15, 21, 28, 35;
- Anger: Items 2, 9, 16, 22, 29, 36, 37;
- Fatigue: Items 3, 10, 17, 23, 30;
- Depression: Items 4, 11, 18, 24, 31, 38;
- Energy: Items 5, 12, 19, 25, 32, 39;
- Panic: Items 6, 13, 20, 26, 33;
- Self-related Emotions: Items 7, 14, 27, 34, 40;

The raw scores of each subscale were accumulated separately, and the T-score of each subscale was calculated by consulting the norms.

TMD (Total Score of Mood Confusion) = Sum of 5 Negative Emotions Scores minus 2 Positive Emotions (Energy, Self-Esteem) + 100. The maximum score of this questionnaire is 172 points.

3.3 Anxiety Level (CSAL-2)

The contest anxiety questionnaire is used to measure the level of anxiety in athletes, which is known as the Competitive State Anxiety Scale-2 (CSAL-2), which is a sports-specific state anxiety scale developed by Martens, Vealey, and Burton (1990). The scale divides anxiety into three components: cognitive anxiety, somatic anxiety, and a "related component" – self-confidence. Self-confidence, which is often the opposite of cognitive anxiety, is another important factor in managing stress. To score CSAL-2, all points for each item except item 14 are calculated as indicative value, as item 14 is where you "reverse" the score. For example, if you circle a 3 point, it counts as a 2 point (1=4;2=3;3=2;4=1), and the total score is calculated as follows: higher scores indicate higher cognitive and somatic anxiety and state confidence.

Cognitive State Anxiety: The sum of items 1, 4, 7, 10, 13, 16, 19, 22, and 25.

Somatic State Anxiety: The sum of items 2, 5, 8, 11, 14, 17, 20, 23, and 26.

Self-Confidence: The sum of items 3, 6, 9, 12, 15, 18, 21, 24, and 27.

Your scores range from 9 to 36, with 9 indicating low anxiety (self-confidence) and 36 indicating high anxiety. In this study, the reliability of the CSAI-2 was 0.91 [Appendix A(3)].

3.4 Confidence Level (TSCI-PL)

The respondents answer the items on a 3-point scale: 1 = Strongly Agree, 2 = Agree, 3 = Disagree, 4 = Strongly Disagree. Therefore, the minimum score is 10 and the maximum score is 40. For the 10 items, the scores for items 3, 5, 8, 9, and 10 are reversed (i.e., 1 is counted as 4, 4 is counted as 1; 2 is counted as 3, 3 is counted as 2).

10 - 15 points: Inferiority

You lack confidence in yourself, especially in front of strangers and superiors. You always feel that you are inferior to others in everything. You need to significantly improve your self-confidence.

16 - 25 points: Self-esteem Normal Person

You have a moderate perception of yourself. You are quite confident in some situations but feel quite inferior in others. You need to stabilize your self-confidence.

26 - 35 points: Confident Person

You have a very positive perception of yourself. You are generally confident in most situations and are not nervous in front of strangers or superiors. You are not afraid to try new things even if you have no experience. You need to adjust your self-confidence in different situations.

36 - 40 points: Super Confident Person

You have an overly positive perception of yourself. You are confident in almost all situations and do not even know what inferiority means. You need to learn to control your self-confidence and be more humble. The reliability of the Trait-based Sport Confidence Inventory (TSCI-PL) in this study is 0.91 [Appendix A(4)].

The full score of the questionnaire is 40 points, and the specific questionnaire score evaluation criteria are as described above.

4. Data Collection Procedure

The research of this study was to measure the psychological characteristics of competitive Tai Chi athletes through the five-factor mindfulness questionnaire, the contest anxiety questionnaire, the Mood State Measurement (POMS) and the Sports Self-confidence Questionnaire, and to evaluate the impact of mindfulness training on their psychological characteristics. The test is divided into three phases. Collecting data of phase 1. Before collecting the data, all were tested reliability by test-retest. The detailed steps were as follows:

The first test(T1) : (March 4, 2024 - March 10, 2024) Organize 40 competitive Tai Chi athletes participating in the research of this paper to go to the indoor martial arts hall for testing, describe the purpose of doing this pretest, and the college student competitive Tai Chi athletes participating in the study sign the informed consent form for volunteer research (volunteers over 18 years old), explain the content of this pretest, describe how to fill in the normative, of the questionnaire to fill in the questionnaire

The second test(T2) : (March 18, 2024 - March 24, 2024) One week after the interval between the first pretest, 40 competitive Tai Chi athletes participating in the research of this paper were reorganized to go to the indoor martial arts hall for retest, and the college student competitive Tai Chi athletes participating in the study signed the informed consent form for volunteer research (volunteers over 18 years old, re-emphasizing the normative, filling in the questionnaire.

5. Data analysis

Before the questionnaire, the main content of the survey was briefly introduced to the competitive Tai Chi athletes, and after the rules were introduced, the questionnaire was distributed. In this study, the Intraclass Correlation Coefficient (ICC) of four different scales was calculated using the Test-Retest Reliability method using SPSS software. ICC (Intraclass Correlation Coefficient) is a statistical metric that measures the consistency or reliability of measurements, and is usually used to evaluate the consistency between multiple observers or measurement tools. ICC scores range from 0 to 1, where 0 indicates no consistency or reliability at all. 1 indicates exact consistency or reliability. Depending on the application, ICC values are typically defined as: 0.00–0.49: poor consistency; 0.50–0.74: moderate agreement; 0.75–1.00: Good to excellent consistency. These ICC values reflect the consistency of measurements for the same population at different time points. Five-Factor Mindfulness Questionnaire (ICC=0.92), mood measurement scale (ICC=0.93), contest anxiety questionnaire (ICC=0.91), trait motor self-confidence scale (ICC=0.91). The ICC values of these four scales were all between 0.91 and 0.93, indicating that the measurement results of these scales at different time points were highly consistent and had extremely high test-retest reliability, which provided a solid foundation for the research in this paper.

In the phase I a one-way ANOVA was used to compare participants' height, weight, exercise class, gender, and age. Multivariate ANOVA was used to compare

athletes of different genders and levels. Evaluate the normal distribution of all variables before selecting a statistical analysis. 0.05 on the Shapiro-Wilk test.

Phase II:

1. Subjects

Forty competitive Tai Chi practitioners who are set to participate in the "2024 National Wushu Taolu Championships" from 22 to 29 June , originated from three distinct athletic levels: national, first, and second level. Forty participants were stratified random sampling into two groups. Mindfulness training group (N=20) and control group (N=20), with participants and level similarly in each group.

Clearly inform the participants of the experimental process, precautions before intervention, relevant requirements during the training process, and ensure that they attend each group training on time. A meeting was held before the experiment to explain the requirements of the experiment, ensure that all participants were able to participate on time for each training, and sign the informed consent form for volunteer research to conduct a 12-week mindfulness group intervention experiment for the mindfulness training group. Once a week, each training session was about 90 minutes (Zhao, Yuqi, 2020). After the independent mindfulness training, discuss and answer questions, record feedback, and improve the experimental content in a timely manner.

The mindfulness training group and the control group conducted a pre-experimental before the experimental, explained the experimental process, test methods and requirements to the competitive Tai Chi athletes participating in the experimental , and were familiar with the content and process of mindfulness training, and found the problems existing in the experimental plan and training process and modified and improved them to ensure the rationality of the training program.

2. Phase II

In this research was a randomized trial, with data collection from March 25, 2024 to June 16, 2024, for a total of 12 weeks and before participating in 2024 National Wushu Taolu Championships from 22 to 29 June . Participants were assigned to the

control group or a mindfulness training group. Variables were assessed before the intervention began and after 12 weeks of intervention.

2.1 Participants

A total of 40 national, first and second level competitive Tai Chi athletes were selected, consisting of 20 males and 20 females. They were randomly assigned to two groups: the mindfulness training group and the control group. The data collected included the five-factor mindfulness questionnaire, Mood Measurement Scale, contest anxiety questionnaire, Trait Motor Confidence Scale (TSCI-PL), etc. The data was then analyzed and interpreted.

2.2 Inclusion Criteria

- (1) Male and female individuals, aged between 19 and 24.
- (2) College students participating in the upcoming "2024 National Wushu Taolu Championship". Competitive Tai Chi athletes
- (3) Good at communication and cooperation.
- (4) Have no physical or mental illness.
- (5) Have either not been injured or have fully recovered from their injuries.
- (6) No experience in mindfulness training.
- (7) There are national or first or second level athlete.

2.3 Exclusion Criteria

- (1) Congenital diseases or physiological defects exist.
- (2) Mental illnesses such as depression or cognitive impairment.
- (3) College competitive Tai Chi athletes who have undergone mindfulness training.
- (4) Competitive Tai Chi college athletes who have been injured or have not fully recovered from injuries within the last three months.
- (5) Unwillingness to participate in this experimental study.
- (6) Participation in other competitions that conflict with the training time of this experiment.

2.4 Sample

In the second study, 40 college students who participated in the "2024 National Wushu Taolu Championships" from 22 to 29 June, 2024. Among them, 20 were males and 20 were females. Forty participants were stratified random sampling into mindfulness training group (N=20) and control group (N=20), with mixed gender and level similarly in each group. There were different levels of competitive Tai Chi athletes; national, first and second levels.

Phase II

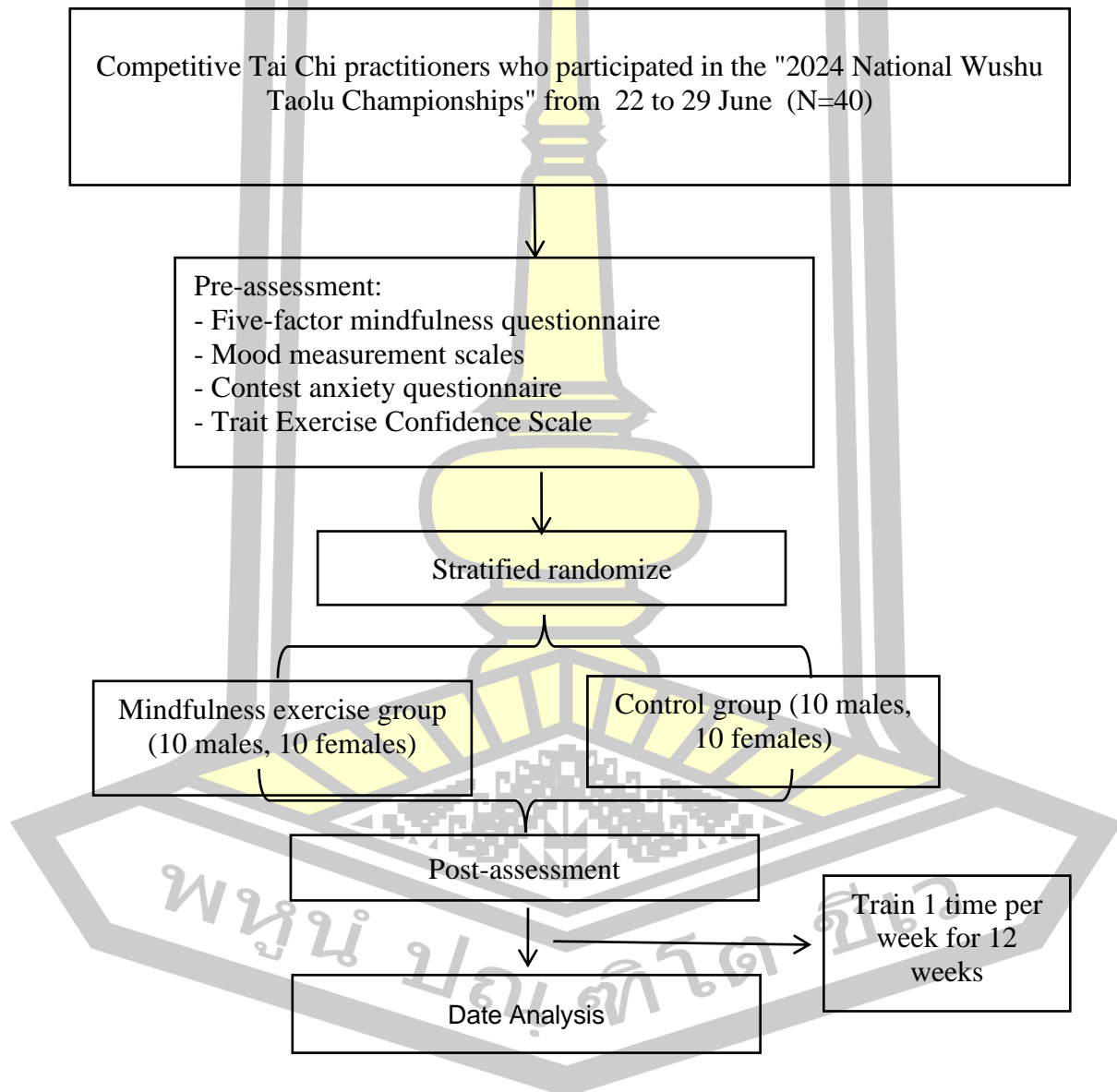


Figure 5 Overview of study designs

3. Instrumentals

Cognitive state: Five-Factor Mindfulness Questionnaire.

Emotional state: Mood Measurement Scale

Anxiety level: Contest Anxiety Questionnaire

Confidence level: Trait Motor Self-Confidence Scale (TSCI-PL)

4. Interventions

IOC testing was conducted on February 29, 2024 - -March 3, 2024. The intervention program was determined the content validity and suitability by 5 experts with index of congruence (IOC) at 0.94 level (appendix C.).

In order to ensure the authenticity of the experimental results in this paper, the experiment was conducted using a single-blind method, and the participants in the mindfulness training group and the control group did not know the training plan of the other group. In order to ensure the smooth progress of this experiment, the mindfulness training group and the control group were coordinated by the same Tai Chi instructor with rich teaching experience from beginning to end.

4.1 Mindfulness Training

Mindfulness training group scheme: To guarantee the authenticity of the experimental results, the experiment was conducted using the single-blind method. With the collaboration of the coach, the author implemented the experimental intervention. During the experiment, the coach merely assisted the author in organizing competitive Tai Chi athletes and routine Tai Chi training, without being aware of the specific details of the experiment and the test content. Besides the regular competitive Tai Chi training, the mindfulness training group was trained based on the mindfulness training scheme.

The mindfulness training group followed a 12-week training program with the addition of mindfulness training, which was conducted once a week and lasted 90 minutes. Participants must always be asked to check that they were focused on the project, and if they were not feeling comfortable while performing a mindfulness training movements or pose, they would allow to adjust or change the angle of the movements to maintain comfort, all the details of the procedure were shown in the

table below. (Mindfulness training program for 1-12 week, See the attachment for details155--184)

4.2 Control group (regular training)

The control group was given a regular training program lasting 12 weeks, and this program was trained once a week, and the duration of each training session was 90 minutes. Before the start of the training and at the end of the training, participants must fill out a questionnaire after training and stretching according to the 12-week regular training routine. All the details of the procedure were shown in the table below.

To guarantee the smooth implementation of the experiment, the Tai Chi training for both the mindfulness training group and the control group was carried out from start to finish by the same Tai Chi instructor who has extensive teaching experience.

Table 2 Training design of Mindfulness training group and control group

	Mindfulness training group		Control group	
	Time	Content	Time	Content
Start section	2	Regular training	2	Regular training
Special warm-up	5	Mindfulness jogging		
	15	Mindfulness Tai Chi+ Mindfulness training (Mindfulness Body Scan, Mindfulness Meditation, Mindful Breathing, Mindful Raisin Eating, etc.)	20	Regular warm-up activities
Teaching and training	18	Tai Chi special technique training	18	Tai Chi special technique training
	18	Tai Chi Tactical training	18	Tai Chi Tactical training
	18	Tai Chi practice	18	Tai Chi practice
End of training	14	Mindfulness relaxes Training summary	14	Regular relaxation Training summary

5. Data collecting procedure

This study provided a 12-week training intervention by dividing competitive Tai Chi athletes into a mindfulness training group and a control group. In addition to the regular Tai Chi training, the Mindfulness Training Group conducts a 90-minute mindfulness training once a week, including mindfulness jogging, mindfulness Tai Chi and other mindfulness training such as body scanning and meditation, to improve the athletes' ability to focus and regulate emotions. The control group underwent regular Tai Chi training for the same length and frequency as the mindfulness training group, but mindfulness training was not included. Both groups underwent psychometric before and after training to assess the effect of mindfulness training on mental characteristics. Throughout the experiment, the training content and methods of all participants were clearly explained before the start of the experiment to ensure the smooth progress of the experiment.

In this study, the psychological characteristics of competitive Tai Chi athletes were measured by the five-factor mindfulness questionnaire, the contest anxiety questionnaire, the Mood State Measurement Scale, and the Sports Self-confidence Questionnaire. After the experiment, the data of the mindfulness training group and the control group of competitive Tai Chi athletes were re-measured using the five-factor mindfulness questionnaire, contest anxiety questionnaire, mood state measurement and sports self-confidence questionnaire, and statistics were collected separately for different groups.

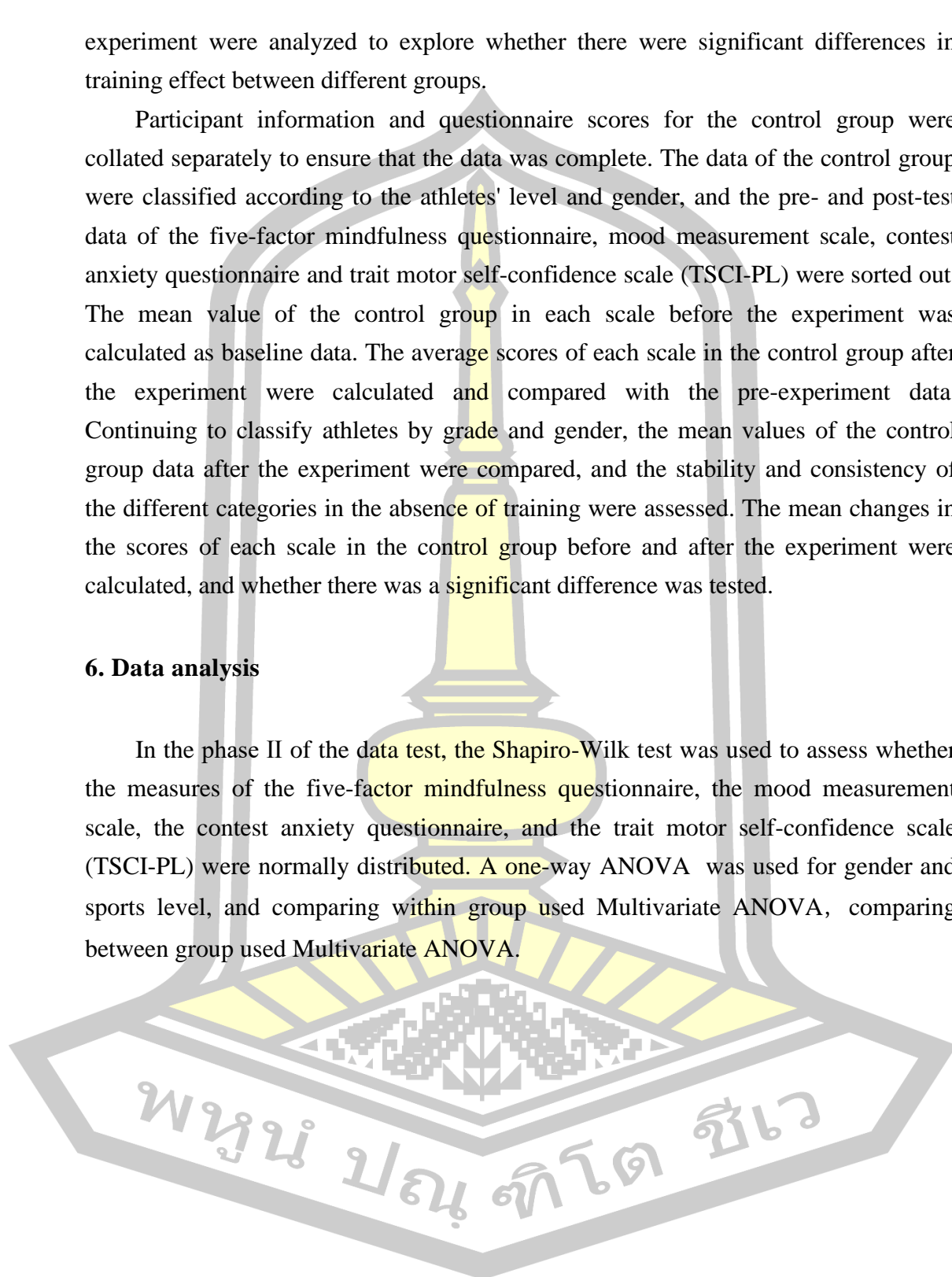
The basic information of the participants in the mindfulness training group was sorted out separately from the questionnaire scores. The data of the mindfulness training group were classified according to the athletes' level and gender, and the pre- and post-test score data of the five-factor mindfulness questionnaire, mood measurement scale, contest anxiety questionnaire and trait motor self-confidence scale (TSCI-PL) were sorted out, respectively. The mean values of the mindfulness training group in the first five factors of the experiment, competition anxiety, trait motor self-confidence scale (TSCI-PL) and mood measurement scale were calculated. The mean changes in the scores of each scale in the mindfulness training group before and after the experiment were calculated, and the significance of the differences was tested. The differences between athletes of different grades and genders before and after the

experiment were analyzed to explore whether there were significant differences in training effect between different groups.

Participant information and questionnaire scores for the control group were collated separately to ensure that the data was complete. The data of the control group were classified according to the athletes' level and gender, and the pre- and post-test data of the five-factor mindfulness questionnaire, mood measurement scale, contest anxiety questionnaire and trait motor self-confidence scale (TSCI-PL) were sorted out. The mean value of the control group in each scale before the experiment was calculated as baseline data. The average scores of each scale in the control group after the experiment were calculated and compared with the pre-experiment data. Continuing to classify athletes by grade and gender, the mean values of the control group data after the experiment were compared, and the stability and consistency of the different categories in the absence of training were assessed. The mean changes in the scores of each scale in the control group before and after the experiment were calculated, and whether there was a significant difference was tested.

6. Data analysis

In the phase II of the data test, the Shapiro-Wilk test was used to assess whether the measures of the five-factor mindfulness questionnaire, the mood measurement scale, the contest anxiety questionnaire, and the trait motor self-confidence scale (TSCI-PL) were normally distributed. A one-way ANOVA was used for gender and sports level, and comparing within group used Multivariate ANOVA, comparing between group used Multivariate ANOVA.



CHAPTER IV

RESEARCH RESULTS

This study was observational and randomized experimental studies. This study was conducted among competitive Tai Chi athletes at the University School of Physical Education of Zhengzhou University. The survey was conducted on the sample of 40 competitive Tai Chi athletes who were about to participate in the "National Wushu Taolu Championship" from 22 to 29 June. The data were collected from four questionnaires: the five-factor mindfulness questionnaire, the mood measurement scale, the contest anxiety questionnaire, and the Trait Motor Self-Confidence Scale. The results of the data analysis were divided into 2 study phases.

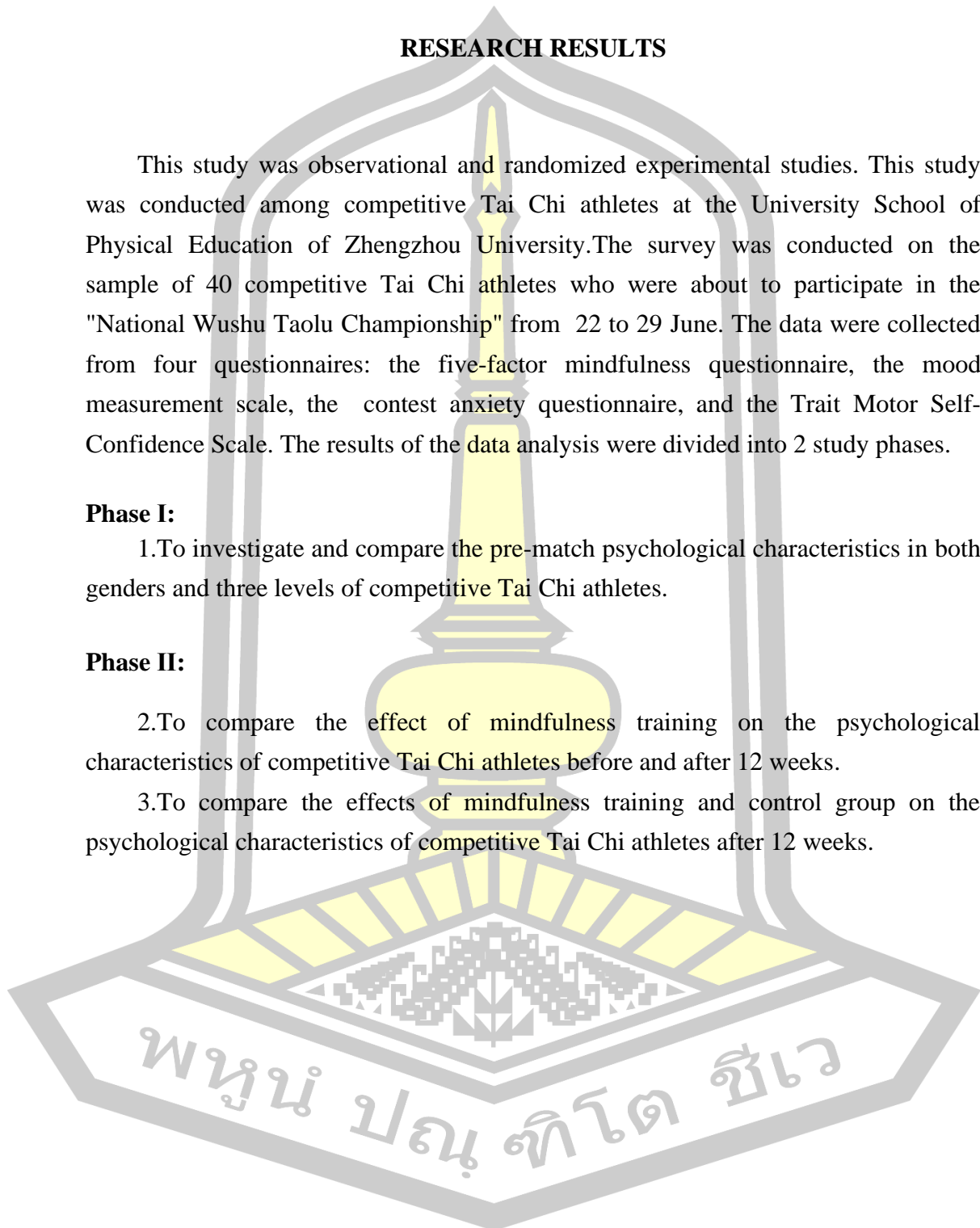
Phase I:

1. To investigate and compare the pre-match psychological characteristics in both genders and three levels of competitive Tai Chi athletes.

Phase II:

2. To compare the effect of mindfulness training on the psychological characteristics of competitive Tai Chi athletes before and after 12 weeks.

3. To compare the effects of mindfulness training and control group on the psychological characteristics of competitive Tai Chi athletes after 12 weeks.



Phase I:

1. To investigate and compare the pre-match psychological characteristics in both genders and three levels of competitive Tai Chi athletes.

Table 3 Characteristics of competitive Tai Chi athletes

Characteristics	Male Number	Female Number	Total
National athlete	4	4	8
First level athlete	6	6	12
Second level athlete	10	10	20
	Male Mean (SD) (n=20)	Female Mean (SD) (n=20)	P- value
Age (year)	20.55 (0.92)	20.32 (0.99)	0.22
Weight (Kg)	71.22 (5.24)	55.21 (2.33)	0.002**
Height (cm)	171.22 (2.44)	160.55 (2.32)	0.002**
Training duration (years)	4.55 (0.98)	4.63 (0.77)	0.12
Sports training duration (hours/day)	6.21 (1.11)	6.11 (1.22)	0.72
Frequency of Sport training (days/week)	5.11 (1.75)	5.27 (1.55)	0.77

* $P < 0.05$, significant at 0.05

Firstly, in terms of age and gender information, the Shapiro-Wilk Test was used to test the data, and the two groups of athletes in age and gender were in a normal distribution, and there was no significant difference between male and female athletes in terms of age (P value =0.22). Secondly, in terms of height and weight information, the weight and height of male athletes were significantly higher than those of female athletes, and the difference was statistically significant ($P=0.002$ and $P=0.002$), which was related to the physiological differences between males and females, and males generally showed greater muscle mass and height in physique. Thirdly, there was no significant difference in the number of years of training and the frequency of exercise training between male and female athletes in terms of training duration and frequency of exercise training.

Table 4 Comparison of the outcome measurements of competitive Tai Chi athlete between gender

Outcome measurements	Mean (SD)		P- value	Total (n=40)
	Male (n=20)	Female (n=20)		
Five-Factor Mindfulness Questionnaire				
Observe	23.67(4.33)	23.83(4.32)	0.471	23.72(4.10)
Description	21.58(4.03)	21.57(4.36)	0.486	21.57(4.11)
Act consciously	22.42(3.75)	22.17(3.54)	0.504	22.24(3.63)
non-judgment	21.42(5.09)	21.33(4.16)	0.571	21.37(4.77)
Not reacting	21.83(3.19)	21.91(3.06)	0.719	21.87(3.10)
Total	110.92(4.23)	110.81(4.26)	0.882	110.85(4.24)
Mood Measurement Scale				
Positive mood	21.50(8.02)	21.47(8.83)	0.607	21.48(8.07)
Negative mood	29.96(8.82)	29.53(8.61)	0.283	29.72(8.77)
TMD total score	108.46(20.43)	108.06(22.63)	0.564	108.33(21.57)
Contest Anxiety Questionnaire				
Cognitive status anxiety	22.83(1.15)	22.83(1.12)	0.627	22.83(1.14)
Somatic state anxiety	22.41(1.77)	22.48(1.34)	0.695	22.45(1.55)
State self-confidence	23.83(1.62)	23.87(1.55)	0.566	23.85(1.57)
Total	23.02 (1.24)	23.06 (1.22)	0.605	23.04 (1.22)
Trait Motor Self-Confidence Scale (TSCI-PL)				
Trait motor task confidence	17.68(5.83)	17.83(5.18)	0.921	17.75(5.46)
Trait sports coping with self-confidence	21.13(8.80)	21.63(8.57)	0.655	21.44(8.66)
Total sports self-confidence score	29.81(13.40)	28.93(12.33)	0.847	29.85(12.99)

*P<0.05, significant at 0.05

As can be seen from the above table, the higher the score of the five-factor mindfulness questionnaire, the more obvious the effect of mindfulness training, and the lower the negative it was. A higher score on the mood measurement scale indicates a negative state of mind for the athlete and vice versa. Higher scores on the contest anxiety questionnaire indicate higher cognitive and somatic anxiety and state self-confidence. The higher the exercise self-confidence score, the more confident the subject was. The maximum value of the five-factor mindfulness questionnaire in this test was 115 points, the maximum value of the mood measurement scale was 131, the maximum value of the contest anxiety questionnaire was 25, and the maximum value of the sports self-confidence questionnaire was 37.

Table 5 Comparison of the outcome measurements of competitive Tai Chi athlete between gender in each level

Athletic ratings	Variable	Segment items	Male Mean (SD) (n=4)	Female Mean(SD) (n=4)	P- value
National athlete	Five-Factor Mindfulness Questionnaire	Observe	23.53(0.32)	23.23(1.12)	0.712
		Description	22.57(0.36)	22.32(1.33)	0.532
		Act consciously	23.37(0.54)	23.28(1.33)	0.529
		non-judgment	22.63(0.16)	22.42(1.22)	0.424
		Not reacting	22.71(0.06)	22.42(0.06)	0.450
		Total	114.81(0.33)	113.67(1.02)	0.277
First level athlete	Five-Factor Mindfulness Questionnaire	Segment items	Male Mean (SD) (n=6)	Female Mean (SD) (n=6)	P- value
		Observe	23.03(1.12)	22.93(1.12)	0.612
		Description	22.12(1.33)	21.92(1.33)	0.514
		Act consciously	23.08(1.33)	22.88(1.33)	0.536
		non-judgment	22.02(1.22)	21.82(1.22)	0.416
		Not reacting	22.32(0.06)	22.12(0.06)	0.422
		Total	112.57(0.32)	111.67(0.88)	0.371
Second level athlete	Five-Factor Mindfulness Questionnaire	Segment items	Male Mean (SD) (n=10)	Female Mean (SD) (n=10)	P- value

	Observe	22.02(3.32)	21.73(3.32)	0.633
	Description	21.27(3.36)	21.07(3.36)	0.627
	Act consciously	21.77(2.54)	21.77(3.54)	0.622
	non-judgment	21.23(3.16)	21.03(3.16)	0.548
	Not reacting	21.01(2.06)	20.81(3.06)	0.427
	Total	107.3 (2.02)	106.41 (2.02)	0.408

As can be seen from the above table, The table presents the scores of competitive Tai Chi athletes of different genders on five-factor mindfulness questionnaire. The higher the score of the five-factor mindfulness questionnaire, the more obvious the effect of mindfulness training, and the lower the negative it was. In this test, the maximum value for national athletes was 115, the maximum value for first level athletes was 113, and the maximum value for second level athletes was 110.

In the five dimensions of the mindfulness questionnaire, male athletes generally scored higher than female, and there was no significant difference in the data. The total score of mindfulness gradually decreases with the decline of sports level, and the score of national athletes was higher than that of first and second level athletes, reflecting the superiority of high level athletes in mindfulness. Compared with the full score of the five-factor mindfulness questionnaire, although the national athletes' performance did not reach the full score level, it was closer to the full score than the first level athletes and second level athletes.

Table 6 Comparison of the outcome measurements of competitive Tai Chi athlete between gender in each level

Athletic ratings	Variable	Segment items	Male Mean(SD) (n=4)	Female Mean(SD) (n=4)	P- value
National athlete	Mood	Positive mood	22.42(5.33)	22.41(5.83)	0.764
		Negative mood	23.22(15.0)	22.53(15.04)	0.780
		TMD total score	109.86(12.63)	109.33(11.63)	0.889
First level athlete	Measurement Scale	Segment items	Male Mean (SD) (n=6)	Female Mean (SD) (n=6)	P- value
		Positive mood	21.31(7.83)	21.21(8.83)	0.550

Second level athlete	Negative mood	29.47(19.04)	29.07(15.04)	0.609
	TMD total score	108.16(21.63)	108.06(20.63)	0.429
	Segment items	Male Mean (SD) (n=10)	Female Mean (SD) (n=10)	P- value
	Positive mood	21.01(8.83)	21.01(4.43)	0.337
	Negative mood	28.77(20.04)	28.77(21.04)	0.350
	TMD total score	105.26(22.63)	105.26(27.63)	0.429

As can be seen from the above table, The table shows the proportion of score measures for competitive Tai Chi athletes of different genders on mood measurement scale. A higher score on the mood measurement scale indicates a negative state of mind for the athlete and vice versa. In this measurement, the maximum value of national athletes was 123, a difference of 49 points compared with the maximum value of the questionnaire, the maximum value of first level athletes was 130, a gap of 42 points compared with the maximum value of the questionnaire, and the maximum value of second level athletes was 135, a difference of 37 points compared with the maximum value of the questionnaire.

Table 7 Comparison of the outcome measurements of competitive Tai Chi athlete between gender in each level

Athletic ratings	Variable	Segment items	Male Mean(SD) (n=4)	Female Mean(SD) (n=4)	P- value
National Athlete	Contest Anxiety Questionnaire	Cognitive status anxiety	19.83(1.12)	19.73(1.12)	0.345
		Anxiety about physical status	19.45(1.34)	19.55(1.34)	0.237
		State self-confidence	24.84(1.55)	24.54(1.55)	0.267
		Total	21.37(1.02)	21.27(1.55)	0.117
First level athlete		Segment items	Male Mean (SD) (n=6)	Female Mean (SD) (n=6)	P- value
		Cognitive status anxiety	22.15(1.12)	22.35(1.12)	0.345
		Somatic state anxiety	22.23(1.34)	22.35(1.34)	0.237

		State self-confidence	21.24(1.55)	21.44(1.55)	0.267
		Total	21.87(1.42)	22.04(1.33)	0.128
Second level athlete		Segment items	Male Mean (SD) (n=10)	Female Mean (SD) (n=10)	P- value
		Cognitive status anxiety	24.33(1.12)	24.53(1.12)	0.325
		Anxiety about physical status	24.25(1.34)	24.45(1.34)	0.227
		State self-confidence	19.22(1.55)	19.27(1.55)	0.227
		Total	22.6(1.33)	22.75(1.43)	0.177

As can be seen from the above table, Higher scores on the contest anxiety questionnaire indicate higher cognitive and somatic anxiety and state self-confidence. The maximum measured value of national athletes was 23, which was 13 points different from the maximum value of the questionnaire data, the maximum value of the first level athletes was 24, which was 12 points different from the maximum value of the questionnaire data, and the maximum value of the second level athletes was 25, which was 11 points different from the maximum value of the questionnaire data.

The table presents the scores of competitive Tai Chi athletes of different genders on contest anxiety questionnaire. There were no statistically significant differences in the scores of cognitive state anxiety, physical state anxiety and state self-confidence among competitive Tai Chi athletes of different genders and sports levels. There was no significant difference in scores on cognitive state anxiety between males and females in each level.



Table 8 Comparison of the outcome measurements of competitive Tai Chi athlete between gender in each level

Athletic ratings	Variable	Segment items	Male Mean(SD) (n=4)	Female Mean(SD) (n=4)	P -value
National Athlete	Trait Motor Self-Confidence Scale (TSCI-PL)	Trait motor task confidence	21.63(4.18)	21.73(3.19)	0.361
		Trait sports coping with self-confidence	33.73(5.52)	33.73(3.52)	0.515
		Total sports self-confidence score	31.73(11.32)	31.73(12.32)	0.401
First level athlete		Segment items	Male Mean (SD) (n=6)	Female Mean (SD) (n=6)	P -value
		Trait motor task confidence	17.33(2.19)	17.23(2.39)	0.361
		Trait sports coping with self-confidence	31.23(2.52)	31.33(2.32)	0.615
		Total sports self-confidence score	29.23(2.32)	29.43(2.42)	0.601
Second level athlete		Segment items	Male Mean (SD) (n=10)	Female Mean (SD) (n=10)	P -value
		Trait motor task confidence	15.73(5.19)	14.73(5.19)	0.515
		Trait sports coping with self-confidence	28.43(8.52)	28.43(8.52)	0.401
		Total sports self-confidence score	22.53(12.32)	23.53(12.32)	0.361

*P<0.05, significant at 0.05

As can be seen from the above table, The higher the score in the trait motor self-confidence scale (TSCI-PL), the more confident the athlete was, and the maximum value of the national athlete was 37, the maximum value of the first level athlete was 32, and the maximum value of the second level athlete was 31. The table shows the scores of competitive Tai Chi athletes of different genders on four scales: the five-factor mindfulness questionnaire, the mood measurement scale, the contest anxiety questionnaire, and trait motor self-confidence scale (TSCI-PL). There were no significant differences in each level.

The difference between males and females on the five-factor mindfulness questionnaire was smaller, and in terms of total scores, males were slightly higher than females. There was little difference between males and females on mood measurement scale, with males slightly higher than females in the total score, but no significant difference. There was no significant gender difference in the contest anxiety questionnaire, and the total score of males was slightly higher than that of females. The difference between male and female on the trait motor self-confidence scale (TSCI-PL) remained small, with females slightly higher than men in the total score. According to the tabular data, there was a small difference between male and female scores in each questionnaire, and males were slightly higher than females in most dimensions, and females were slightly higher than males in terms of trait motor confidence. This phenomenon was related to differences in emotional regulation and psychological response between the sexes.

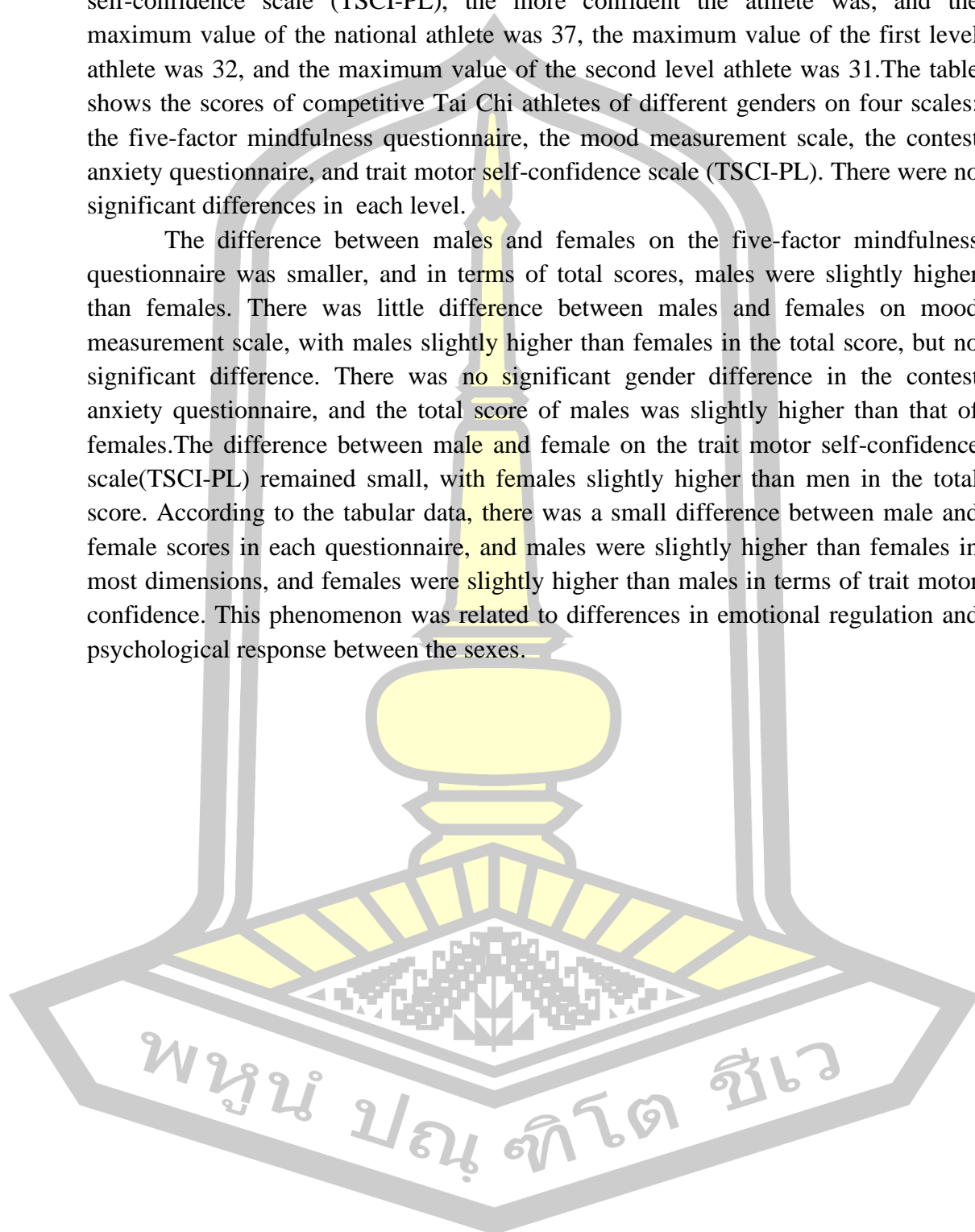


Table 9 Comparison of the outcome measurements of competitive Tai Chi athlete between levels

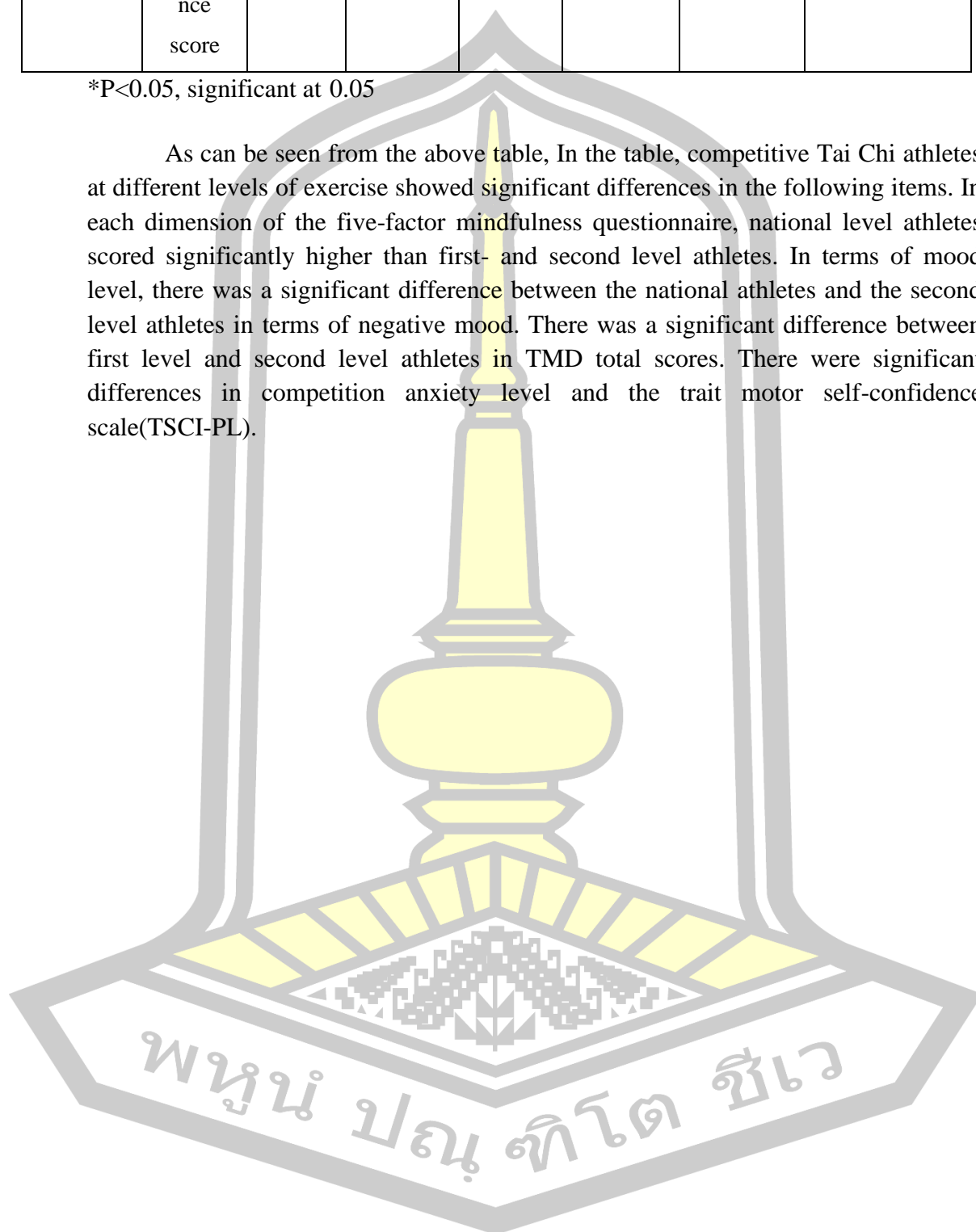
Variable	Dimension	Mean (SD)			P- value		
		National Athlete (n=8)	First level athlete (n=12)	Second level athlete (n=20)	Comparison between national athletes and first level athletes	Comparison between national athletes and second level athletes	Comparison between first level athletes and second level athletes
Five-Factor Mindfulness Questionnaire	Observe	23.38 (0.72)	22.98 (0.62)	21.88 (3.32)	0.002**	0.002**	0.002**
	Description	22.45 (0.87)	22.02 (0.93)	21.17 (3.36)	0.007**	0.002**	0.007**
	Act consciously	23.33 (0.94)	22.98 (0.93)	21.77 (2.54)	0.008**	0.002**	0.002**
	non-judgment	22.53 (0.77)	21.92 (0.87)	21.13 (3.16)	0.002**	0.002**	0.080
	Not reacting	22.57 (0.06)	22.22 (0.06)	20.91 (2.56)	0.002**	0.002**	0.002**
	Total	114.26(0.08)	112.12(0.05)	106.86(2.33)	0.002**	0.002**	0.002**
Mood Measure	Positive mood	22.42 (5.58)	21.26 (8.33)	21.01 (6.63)	0.596	0.153	0.358
	Negative mood	22.88 (15.04)	24.27 (17.04)	28.77 (20.54)	0.304	0.002**	0.454

ment Scale	TMD total score	109.60 (12.13)	108.11 (21.13)	105.26 (25.13)	0.384	0.051	0.046*
Contest Anxiety Questionnaire	Cognitive status anxiety	19.78 (1.12)	22.25 (1.12)	24.43 (1.12)	0.002**	0.002**	0.002**
	Somatic state anxiety	19.50 (1.34)	22.29 (1.34)	24.35 (1.34)	0.002**	0.002**	0.002**
	State self-confidence	24.69 (1.55)	21.35 (1.55)	19.23 (1.55)	0.002**	0.002**	0.002**
	Total	21.32(1.05)	21.96(0.88)	22.67(0.72)	0.002**	0.002**	0.002**
Trait Motor Self-Confidence Scale (TSCI-PL)	Trait motor task confidence	21.68 (3.69)	17.28 (2.13)	15.23 (5.18)	0.002**	0.002**	0.002**
	Trait sports coping with self-confidence	33.73 (4.57)	31.28 (2.52)	28.43 (8.57)	0.002**	0.002**	0.019*
	Total sports self-	21.73 (11.33)	29.33 (2.33)	22.53 (12.33)	0.020*	0.002**	0.002**

	confidence score						
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*P<0.05, significant at 0.05

As can be seen from the above table, In the table, competitive Tai Chi athletes at different levels of exercise showed significant differences in the following items. In each dimension of the five-factor mindfulness questionnaire, national level athletes scored significantly higher than first- and second level athletes. In terms of mood level, there was a significant difference between the national athletes and the second level athletes in terms of negative mood. There was a significant difference between first level and second level athletes in TMD total scores. There were significant differences in competition anxiety level and the trait motor self-confidence scale(TSCI-PL).



Phase II:

2.To compare the effect of mindfulness training on the psychological characteristics of competitive Tai Chi athletes before and after 12 weeks.

3.To compare the effects of mindfulness training and control group on the psychological characteristics of competitive Tai Chi athletes after 12 weeks.

Table 10 Characteristics of two groups competitive Tai Chi athletes

Characteristics	Mindfulness training group (number)	Control group (number)	Total
National athlete	4	4	8
First level athlete	6	6	12
Second level athlete	10	10	20
Male	10	10	20
Female	10	10	20
	Mindfulness training group Mean (SD) (N=20)	Control group Mean (SD) (N=20)	P- value
Age (year)	20.55 (0.92)	20.32 (0.99)	0.22
Weight (Kg)	71.22 (5.24)	55.21 (2.33)	0.002**
Height (cm)	171.22 (2.44)	160.55 (2.32)	0.002**
Training duration (years)	4.55 (0.98)	4.63 (0.77)	0.12
Sports training duration (hours/day)	6.21 (1.11)	6.11 (1.22)	0.72
Frequency of Sport training (days/week)	5.11 (1.75)	5.27 (1.55)	0.77

*p <0.05, significant at 0.05

The baseline comparability pre-assessment showed that there were no significant differences in age, weight, height, training experience, training period, training frequency, etc. between the participants in The mindfulness training group and the control group.

Table 11 Pre-assessments scores of all measurements between groups

pre-assessments	Groups		P- value
	Mindfulness training group Mean (SD) (N=20)	Control group Mean (SD) (N=20)	
Five-Factor Mindfulness Questionnaire			
Observe	22.67(4.33)	21.83(4.32)	0.471
Description	21.67(4.03)	22.50(4.36)	0.486
Act consciously	23.42(3.75)	24.17(3.54)	0.504
non-judgment	22.42(5.09)	21.33(4.16)	0.571
Not reacting	20.83(3.19)	19.91(3.06)	0.719
Total	111.01(3.22)	109.74(3.42)	0.322
Mood Measurement Scale			
Positive mood	20.50(8.02)	20.47(8.83)	0.107
Negative mood	28.96(18.82)	29.53(20.04)	0.283
TMD total score	108.46(20.43)	108.06(22.63)	0.644
Contest Anxiety Questionnaire			
Cognitive status anxiety	22.33(1.15)	23.33(1.12)	0.227
Somatic state anxiety	22.41(1.77)	23.08(1.34)	0.195
State self-confidence	24.83(1.62)	23.50(1.55)	0.566
Total	23.19 (1.55)	23.30 (1.33)	0.522
Trait Motor Self-Confidence Scale (TSCI-PL)			
Trait motor task confidence	18.68(5.89)	17.33(5.19)	0.921
Trait sports coping with self-confidence	32.13(8.84)	32.63(8.52)	0.655
Total sports self-confidence score	20.81(13.45)	20.93(12.33)	0.847

*P<0.05, significant at 0.05

In this analysis, we focused on comparing the performance of the mindfulness practice group with the control group on the pretest, covering multiple variables of the five-factor mindfulness questionnaire, the mood measurement scale, the contest anxiety questionnaire, and the trait motor self-confidence scale(TSCI-PL). Through the analysis of tabular data, it can be seen that the pre-test data of the two groups of competitive Tai Chi athletes were consistent, and there was no significant difference.

Table 12 Comparison of all variables within both groups

Variables	Mindfulness training group(n=20)		P-value	Control group (n=20)		p-value
	Pre-test Mean (SD)	Post-test Mean (SD)		Pre-test Mean (SD)	Post-test Mean (SD)	
Five-Factor Mindfulness Questionnaire						
Observe	22.6(4.33)	27.08(6.05)	0.0014**	21.83(4.32)	21.63(4.32)	0.862
Description	21.67(4.03)	25.08(4.21)	0.0015**	22.50(4.36)	22.43(4.36)	0.544
Act consciously	23.42(3.75)	23.67(4.01)	0.7765	24.17(3.54)	24.21(3.54)	0.622
non-judgment	22.42(5.09)	27.17(5.96)	0.002**	21.33(4.16)	21.07(4.16)	0.850
Not reacting	20.83(3.19)	25.08(4.12)	0.0002**	19.91(3.06)	20.22(3.06)	0.851
Total	111.01(2.72)	128.08(3.22)	0.002**	109.74(2.07)	109.56(2.45)	0.877
Mood Measurement Scale						
Positive mood	20.50(8.02)	24.77(7.21)	0.0216*	20.47(8.83)	23.20(8.79)	0.0421*
Negative mood	28.96(18.82)	17.17(8.34)	0.0018**	29.53(20.04)	28.83(5.67)	0.0042**
TMD total score	108.46(20.43)	92.40(12.86)	0.005**	108.06(22.63)	97.63(9.17)	0.0027**

Table 12 Comparison of all variables within both groups(Cont.)

Variables	Mindfulness training group(n=20)		P- value	Control group (n=20)		P-value
	Pre-test Mean (SD)	Post-test Mean (SD)		Pre-test Mean (SD)	Post-test Mean (SD)	
Contest Anxiety Questionnaire						
Cognitive status anxiety	22.33 (1.15)	13.58 (0.60)	0.002**	23.33 (1.12)	23.08 (1.11)	0.557
Somatic state anxiety	22.41 (1.77)	17.16 (1.31)	0.002**	23.08 (1.34)	22.75 (1.25)	0.366
State self-confidence	24.83 (1.62)	28.41 (1.25)	0.002**	23.50 (1.55)	22.41 (1.57)	0.253
Total	23.19 (1.77)	19.17 (1.32)	0.002**	23.30 (1.33)	23.29 (1.27)	0.154
Trait Motor Self-Confidence Scale (TSCI-PL)						
Trait motor task confidence	18.68 (5.89)	24.03 (5.02)	0.002**	17.33 (5.19)	17.89 (4.85)	0.881
Trait sports coping with self-confidence	32.13 (8.84)	32.53 (8.04)	0.01**	32.63 (8.52)	27.67 (8.89)	0.883
Total sports self-confidence score	20.81 (13.45)	36.56 (10.72)	0.002**	20.93 (12.33)	25.19 (12.98)	0.977

*P<0.05, significant at 0.05

In the comparison of the pre-test and post-test data of the mindfulness training group, there were significant differences in the data of each questionnaire except for the conscious action dimension in the five-factor mindfulness questionnaire, and the

post-test data were better than the pre-test data. There was no significant difference in the pre-test and post-test of the conscious action dimension. There was no significant difference in the pre-test and post-test data of the control group, except for the mood measurement scale, and there was a significant difference between the pre-test and post-test data of the control group, but the improvement was not as large as that in the mindfulness training group. In terms of mood measurement scale, although the post-test data of the control group and the mindfulness training group were significantly improved compared with the pre-test data, the improvement was greater in the mindfulness training group overall.

Table 13 Comparison of all variables between groups

Variables	Post test		Mean (SD)	P-value
	Mindfulness training group Mean (SD) (N=20)	Control group Mean (SD) (N=20)	Total N=40	
Five-Factor Mindfulness Questionnaire				
Observe	27.08 (6.05)	21.63 (4.32)	24.79 (5.09)	0.027*
Description	25.08 (4.21)	22.43 (4.36)	23.66 (4.21)	0.002**
Act consciously	23.67 (4.01)	24.21 (3.54)	23.84 (3.85)	0.002**
non-judgment	27.17 (5.96)	21.07 (4.16)	24.51 (4.94)	0.002**
Not reacting	25.08 (4.12)	20.22 (3.06)	23.44 (3.74)	0.002**
Total	128.08 (3.22)	109.56 (2.16)	116.72 (2.88)	0.002**
Mood Measurement Scale				
Positive mood	24.77 (7.21)	26.20 (8.79)	25.44 (8.44)	0.002**
Negative mood	17.17 (8.34)	23.83 (5.67)	20.41 (7.21)	0.002**
TMD total score	92.40 (12.86)	97.63 (9.17)	94.63 (10.17)	0.002**
Contest Anxiety Questionnaire				
Cognitive status anxiety	13.58 (0.60)	23.08 (1.11)	18.41 (0.95)	0.002**
Somatic state anxiety	17.16 (1.31)	22.75 (1.25)	19.22 (1.19)	0.002**
State self-confidence	28.41 (1.25)	22.41 (1.57)	25.73 (1.98)	0.009**

Total	19.71 (1.22)	22.74 (1.72)	20.59 (1.07)	0.002**
Trait Motor Self-Confidence Scale (TSCI-PL)				
Trait motor task confidence	24.03 (5.32)	17.89 (4.85)	20.45 (3.22)	0.002**
Trait sports coping with self-confidence	32.53 (8.04)	27.67 (8.89)	30.27 (8.21)	0.031*
Total sports self-confidence score	36.56 (10.72)	25.19 (12.98)	30.44 (8.14)	0.002**

* $P < 0.05$, significant at 0.05

In the comparison of post-test data between the mindfulness training group and the control group, there were significant differences in the data of each dimension of each questionnaire. Moreover, the mindfulness training group was better than the control group in terms of the overall data of each questionnaire. In terms of data of each dimension, the data of the control group were better than those of the mindfulness training group in the two dimensions of conscious action and positive mood, with significant differences, and the data of the mindfulness training group in other dimensions were better than those of the control group, with significant differences.



CHAPTER V

DISCUSSION AND CONCLUSION

The aim of this study was to investigate pre-match psychological characteristics of competitive Tai Chi athletes and compare the effect of mindfulness training on the psychological characteristics of competitive Tai Chi athletes before and after 12 week and compare with control group after 12 week. Through the analysis of these three research objectives, it was concluded that mindfulness training can significantly enhance the pre-match psychological traits of competitive Tai Chi athletes, particularly anxiety, self-confidence, emotional state, and mental adjustment ability. Mindfulness training not only reduces athletes' pre-match anxiety and boosts self-confidence but also improves their emotional stability and mental toughness, thereby contributing to the enhancement of their competitive performance.

This study centered on four psychological variables: anxiety, emotional state, self-confidence, and mental regulation. Concerning anxiety, mindfulness training notably decreased the pre-match anxiety levels of athletes. Through mindfulness training, athletes acquire the ability to focus on the present moment and diminish excessive concern about the game, thereby alleviating pre-match nervousness. Regarding emotional state, mindfulness training assists athletes in better managing their emotions, enabling them to maintain a stable and composed state of mind prior to the competition. The results indicated that the emotional volatility of the athletes in the mindfulness training group was significantly mitigated, the overall emotional state tended to be placid, and they were better equipped to handle the pre-match tension. With respect to self-confidence, mindfulness training significantly strengthened the athletes' sense of self-trust. The practice of mindfulness facilitated athletes in enhancing their confidence in their capabilities and reducing self-doubt during the competition, which in turn enhanced their performance in the competition. In terms of mental adjustment ability, mindfulness training significantly enhanced the athletes' capacity to cope with pressure and challenges. The athletes in the mindfulness training group demonstrated a stronger ability for emotional regulation and were capable of dealing with various psychological pressures before the competition more serenely, which provided support for them to maintain the optimal performance in the competition.

Overall, the findings of this study demonstrate that mindfulness training exerts a substantial positive influence on the psychological traits of competitive Tai Chi athletes prior to the competition, particularly in terms of reducing anxiety, enhancing self-confidence, improving emotional status and strengthening psychological adjustment ability. By contrasting the performance of the mindfulness training group and the control group, the study further verified the efficacy of mindfulness training.

The training group surpassed the control group in all aspects, especially in pre-match anxiety and emotion management, and the athletes in the mindfulness training group were capable of maintaining a more stable mental state, thereby enhancing their competitive performance.

Research has demonstrated that mindfulness training not only enables athletes to maintain mental serenity and concentration but also significantly enhances their emotional stability and self-confidence, thereby promoting their performance in competitions. This discovery offers novel perspectives in the domain of sports psychology and provides theoretical backing for enhancing athletes' performance through mental training in competitive sports.

Discussion

The current situation of the pre-match psychological characteristics of competitive Tai Chi athletes

Through the analysis of the basic information of competitive Tai Chi athletes, male athletes were significantly higher than female athletes in weight and height, with significant differences, and there was no significant difference in other basic information (see Table 2 for details). The results of the study of the pre-match psychological characteristics of competitive Tai Chi athletes of different genders and competitive Tai Chi athletes of different levels were consistent with hypothesis of the research 1.

(1)The current situation of the pre-match psychological characteristics of competitive Tai Chi athletes of different genders was shown in Table 3 and Table 4 for details.

The study found that gender had little effect on the psychological state of athletes, and there were no significant differences in the performance of male and female athletes in terms of mindfulness level, emotional state, competition anxiety and self-confidence. The results of the contest anxiety questionnaire showed that there was no significant difference in the scores of cognitive state anxiety, somatic state anxiety and state self-confidence between male and female athletes. Analysis of the trait motor

self-confidence scale(TSCI-PL), also showed that gender had no significant effect on athletes' self-confidence levels, with male and female scoring similarly on task confidence and coping confidence. Overall, there was no significant gender difference in pre-match psychological characteristics, suggesting that the psychological state of competitive Tai Chi athletes was more influenced by individual training experience, psychological quality and coping ability, rather than gender factors. This provides a basis for the development of individualized psychological intervention programs and emphasizes the importance of individualized training.

Table 3 analyzes the pre-test data of competitive Tai Chi athletes, focusing on the performance of male and female athletes on the five-factor mindfulness questionnaire, the mood measurement scale, the contest anxiety questionnaire, and the trait motor self-confidence scale (TSCI-PL).The results of the analysis showed no significant differences in these psychological variables between male and female athletes, suggesting that participants' psychological state and self-confidence levels were largely consistent before the intervention began. (Zhao Susu et al., 2024) to explore the value of psychological positive suggestion combined with mindfulness training in patients with anxiety and depression after total knee arthroplasty (TKA), the control group and the mindfulness training group were mixed, and the data showed that gender factors had no significant effect on the level of mindfulness and anxiety in patients, which was consistent with the conclusions of this study. The results of each questionnaire were described in detail below.

The five-factor mindfulness questionnaire (FFMQ) includes five dimensions: observation, description, conscious action, non-judgment, and non-reaction. In the observation dimension, although males scored slightly higher, there was no significant difference between the sexes, which measures the ability of individuals to remain stable without immediate response to emotions or thoughts, and the results showed no significant difference in the level of mindfulness between the two groups. (Cai Yaoyao, 2023) found that there was no significant difference in the data level of the

five-factor mindfulness questionnaire between male and female college students, which was consistent with the conclusions of this paper. The analysis results of the five-factor mindfulness questionnaire showed that gender had little effect on the level of mindfulness of competitive Tai Chi athletes. Mindfulness prior to intervention was similar in both male and female athletes (EmilyK, 2023).

The mood measurement scale was used to assess the emotional state of competitive Tai Chi athletes, and contains three dimensions: positive mood, negative mood and total mood distress (TMD) total score. It was shown that there was no significant difference between the sexes, which means that the levels of positive mood were similar in both groups of athletes before the intervention, suggesting that the negative mood state of the athletes in both groups before the intervention was basically the same (J.TN, 2023). These data illustrate that the emotional state of the athletes in both groups was relatively consistent before the intervention began (Katherine A, 2022).

The contest anxiety questionnaire evaluates the anxiety state of competitive Tai Chi athletes in competition situations, including cognitive state anxiety, somatic state anxiety and state self-confidence. There was no significant difference between the sexes in cognitive state anxiety. (Li Jie, 2024) was investigating and analyzing the competition state anxiety of athletes participating in the 8th World Youth Wushu Championships in 2022 and its impact on psychological fatigue. The study found that there was no significant difference in physical state anxiety and state self-confidence among athletes of different genders, which was consistent with the conclusions of this study. The results showed that there was no significant difference in the self-confidence levels of the two groups of athletes in the competition situation, indicating that their psychological states were similar in the competition situation (MattM, 2022).

The trait motor self-confidence scale (TSCI-PL) was used to measure athletes' performance in three areas: task confidence, coping confidence, and overall self-confidence. There was no significant difference between sexes in trait motor task

confidence. The analysis results of the trait motor self-confidence scale (TSCI-PL) showed that gender had little effect on the self-confidence of competitive Tai Chi athletes, and the self-confidence level of athletes before the intervention was relatively consistent (LukeB, 2022), (Chen Jizhe, 2016) used the psychologist "Wiley" trait sports confidence scale and the trait motor self-confidence scale (TSCI-PL) to explore the impact of five factors on self-confidence level, namely gender, age, cognitive level, training years and sports performance, respectively. The results showed that there were no significant differences in the sports self-confidence of college students majoring in physical education by gender and age, which was consistent with the conclusions of this paper.

Table 4 adds sports level information, and it can be seen from the table that athletes with different sports levels show certain differences in the five dimensions of the five-factor mindfulness questionnaire (observation, description, conscious action, non-judgment, and non-reaction). However, these differences were not statistically significant, and the p-values were all much greater than 0.05. This suggests that there was no significant hierarchical effect between national level athletes, first level athletes, and second level athletes in terms of mindfulness level. Specifically, the average value of the "observation" dimension was the highest among national level male, indicating that they were more aware of subtle changes in their daily lives and had stronger observation skills. In contrast, first level Competitive Tai Chi athletes scored slightly lower, followed by second level athletes in this dimension, which may reflect their lower level of attention to the external environment in their daily training and life. However, as the differences were not statistically significant, they may be due only to individual differences rather than systematic training or empirical effects. In the gender dimension, there was also no significant difference in scores between male and female competitive Tai Chi athletes across the five mindfulness dimensions. Male competitive Tai Chi athletes performed slightly higher in the "Observation" dimension, while female competitive Tai Chi athletes performed relatively well in the "Conscious Action" dimension. This suggests that female competitive Tai Chi

practitioners were more aware of what they were doing when they act, while male were more inclined to observe their surroundings in their daily lives. However, these differences also failed to reach statistical significance, suggesting that gender has a limited effect on the level of mindfulness (M.SC, ShonaC, 2022).

The analysis results of the mood measurement scale showed that there was no significant difference in the scores of male and female competitive Tai Chi athletes in positive and negative mood among national athletes (LiangyuZ, 2022), and the p-values of TMD total score and global score were higher than 0.05. The results of the analysis of the first level athletes also showed that there was no significant difference between the sexes, and none of the scores reached the level of statistical significance. For second level athletes, there was little difference between males and females in scores on mood indicators, especially in the total and overall scores of TMD, showing no significant differences between the sexes. Therefore, in terms of mood measurement, gender has less effect on the mood state of athletes. This may suggest that high level competitive Tai Chi athletes do not necessarily perform better than low level athletes when it comes to emotional regulation, and that they may even face more challenges in managing their emotions due to increased stress during training and competitions. The influence of gender in emotional states was also more limited. Male and female competitive Tai Chi athletes scored very close in positive and negative mood settings, and there was almost no difference in the total TMD score. This suggests that although there were some differences in physical and psychological traits between males and females, athletes of both sexes show similar patterns of emotional responses in the field of competitive Tai Chi in the management and performance of emotional states (RyanJK, E, 2022).

The results of the analysis of the contest anxiety questionnaire showed that there was no significant difference in the scores of cognitive state anxiety, somatic state anxiety and state self-confidence between males and females among the national athletes (KearnanM, 2022). The difference in total scores was also not statistically

significant. For first level athletes, the gender difference was also not significant, and the p-values of all anxiety indicators and total scores were greater than 0.05, indicating that there was no significant difference in the performance of athletes of both sexes in terms of competition anxiety. The situation was similar for second level athletes, with no significant difference in scores across dimensions, and the difference in total scores showed that gender had no significant effect on competition anxiety (Li Jie, 2024). Overall, gender did not show significant differences in the indicators of competition anxiety. This also suggests that anxiety management was of great significance in competitive sports, especially when cultivating high level athletes, and how to effectively reduce their anxiety levels was a matter of concern. From a gender perspective, female competitive Tai Chi athletes generally scored slightly higher than male on cognitive state anxiety and somatic state anxiety, but the difference was also not statistically significant (Michaela P, 2022). This may mean that female were more psychologically stressed when facing competitions, but this phenomenon may also be related to individual differences as the differences were not significant.

The results of the analysis of the trait motor self-confidence scale (TSCI-PL) showed that there was no significant difference between male and female in the scores of trait motor self-confidence scale (TSCI-PL), trait motor coping confidence, and total score among national athletes (AndersH, 2022). The data of first level athletes also showed that there was no significant difference between the sexes, and the p-values of each score and the total score were both greater than 0.05, indicating that the effect of gender on self-confidence in trait sports was not significant. There were also no significant gender differences in the self-confidence of trait sports tasks, coping confidence in trait sports and total scores of second level athletes. The effect of gender on trait sports self-confidence did not show a statistically significant difference in athletes at all levels (Shu Lei, 2022). Male and female competitive Tai Chi athletes scored similarly in trait motor task confidence and trait motor coping confidence, suggesting that gender was not a decisive factor in the development and development of self-confidence. This further illustrates that the self-confidence of competitive Tai

Chi practitioners depends more on their training experience, mental quality, and ability to cope with stress than on gender differences (VincentG, 2022).

Based on the data analysis of the above scales, it can be seen that although there were some grade and gender differences in the pre-test data of competitive Tai Chi athletes, these differences were not statistically significant. This suggests that while competitive level and gender may affect the mental state, mindfulness level, and self-confidence of competitive Tai Chi athletes, these effects were not sufficient to significantly distinguish between different groups (KarleeB, 2022). However, this does not mean that these factors were not important. In fact, these non-significant differences may reflect the diversity of individual differences, suggesting the need for more individualized interventions in research and training. Especially in high level competition, how to further improve athletes' mindfulness, emotional management ability, and self-confidence was the key to improving overall competitive performance (C.CW, 2022). In addition, it was worth noting that in all the analyses, the national level athletes, although they showed some superiority in most indicators, were not statistically significantly superior to other levels of competitive Tai Chi athletes. This may be due to the small sample size that does not adequately reflect true differences. Therefore, in future studies, increasing the sample size and further refining the research methods may help us more accurately reveal the mechanisms by which different sports levels and genders affect competitive performance (VittoriaPC, 2022).

(2) the current situation of pre-match psychological characteristics of competitive Tai Chi athletes at different sports levels.

According to the data in Table 5, the pre-match psychological characteristics of competitive Tai Chi athletes at different sports levels were compared and analyzed, and there were significant differences in the pre-match psychological characteristics of competitive Tai Chi athletes at different sports levels in terms of mindfulness, mood, anxiety and self-confidence. At the level of mindfulness, the national athletes were significantly better than the first- and second level athletes in the five dimensions of observation, description, conscious action, non-judgment and non-

reaction, and the total score, showing stronger awareness, emotional expression and psychological acceptance, and being able to maintain concentration and calm during the competition. In terms of mood, the negative mood of the national athletes was significantly lower than that of other sports levels, reflecting better emotional control. The negative emotions of second level athletes were significantly higher than those of other levels. In terms of competition anxiety, the cognitive state anxiety and physical state anxiety of national athletes were significantly lower than those of first-level and second level athletes, and their state self-confidence scores were the highest. In the minds of special sports self-confidence, the self-confidence level of national level athletes was significantly higher than that of other levels, especially in task confidence and coping confidence.

The five-factor mindfulness questionnaire covers five dimensions: observation, description, conscious action, non-judgment, and non-reaction. The results showed that the national athletes performed significantly better than the first level and second level athletes in multiple dimensions and overall scores. In the observation dimension, the scores of national athletes were significantly higher than those of first-level and second level athletes, indicating that national level athletes have stronger awareness ability. This may be due to the fact that they have developed a keen sense of observation during long periods of high-intensity training and competition, and were able to quickly pick up on subtle changes in the environment and opponents. Whereas, first level and second level athletes have relatively weak observation skills due to training intensity and lack of experience (Zhao Saijia, 2022). national level athletes also scored higher in the descriptive dimension, and they were able to express their feelings and thoughts more accurately. This advantage may be due to their frequent self-reflection and summation after training and competitions, which not only helps to improve self-awareness, but also enhances mental regulation (J.BB, 2022). In contrast, first level and second level athletes have a weaker ability to describe, which may be related to their lack of understanding of their own emotions. The results of the Conscious Action dimension also showed that the national athletes scored significantly higher than the athletes in the other two levels, reflecting their ability to maintain a high level of concentration during competition and avoid external distractions. Tai Chi was a sport that requires precise movement control, and a high degree of concentration was essential for it (RyanJK, 2022). first level and second level athletes may struggle to maintain the same level of focus throughout the competition due to their lack of experience in the competition. Without judging the dimensions, the performance of the national athletes was once again ahead, and they were more accepting of their performance in the competition and will not easily evaluate themselves negatively. This attitude of acceptance helps to maintain mental stability and avoid emotional swings that can affect performance. In the non-response dimension, the national athletes scored the highest, indicating that they were better able to stay calm in the face of pressure and would not react immediately, so as to

maintain a stable performance in the competition, and there were also significant differences between the national athletes and the first level and second level athletes in the total score dimension (Qu Ping, Wen Jingsi, Kang Zhengyu et al., 2023).

The mood measurement scale analyses positive mood, negative mood, and TMD total scores. The study found that although there were no significant differences between athletes in different levels in terms of positive mood, there were significant differences between national athletes and athletes in other levels in terms of negative mood and total TMD scores. Especially in the negative mood dimension, the negative emotions of national athletes were significantly lower than those of second level athletes, indicating that they were better able to control negative emotions in competitions. This ability to control emotions may come from their rich experience and mental training in high-intensity competitions, while second level athletes were more likely to develop negative emotions under competition pressure due to their lack of experience (Zhang Junjie, 2022). In terms of TMD total scores, although the scores of national athletes were slightly higher than those of first level and second level athletes, the difference was not significant. There was no significant difference between the national athletes and the first-level athletes in the total score, but there were significant differences between the national athletes and the second level athletes, and between the first-level athletes and the second level athletes, indicating that the mood measurement level of high level athletes was higher than that of low level athletes in terms of overall mood. This may be related to the focus on mental regulation and emotion management in Tai Chi training, which allows athletes to maintain a relatively stable state of mind during competitions (EmilyW, 2022).

The results of the contest anxiety questionnaire revealed significant differences in cognitive state anxiety, somatic state anxiety and state self-confidence among athletes at different sports levels. The cognitive state anxiety scores of national athletes were significantly lower than those of first level and second level athletes, indicating that they were less worried and nervous about the competition before the competition. High level athletes were able to face the competition more calmly due to their experience and higher mental quality, while first level and second level athletes may have more anxiety before the competition due to their lack of experience, which affects their performance (Baoyan F., 2022). The results of somatic state anxiety were consistent with cognitive state anxiety, with national athletes scoring significantly lower than athletes in the other two categories, suggesting that they were better able to control pre-match physical stress reactions, such as sweating and rapid heartbeat. This body control was important for maintaining a state of coolness, especially in high-pressure matches. First level and second level athletes may be prone to significant physical tension reactions before competition due to greater psychological stress, which in turn can affect performance during competition. In terms of form confidence, national level athletes scored significantly higher than Tier 1 and Tier 2

athletes, indicating that they were more confident in their performance before the competition. A high level of self-confidence helps athletes perform at their best in competitions, while first level and second level athletes may have relatively weak self-confidence due to their lack of mental preparation, which may affect their performance, and there were also significant differences in the total score dimension between national athletes and first level and second level athletes (LiMin, WuHanyi, 2022).

In the analysis of the trait motor self-confidence scale (TSCI-PL), we found that the national athletes were significantly higher than the first level and second level athletes in the trait sports task confidence, trait sports coping confidence, and sports self-confidence. Trait Athletic Task Confidence and Coping Confidence reflect an athlete's confidence in the face of athletic tasks and challenges. The high scores of national level athletes may be related to their rich game experience and strong mental quality, which allows them to maintain confidence and calm in the face of complex competition situations (BuDanran, 2022). In contrast, first level and second level athletes have relatively low self-confidence, possibly due to a lack of sufficient challenging tasks in training, or more setbacks experienced during competitions, resulting in a lack of self-confidence, and there were also significant differences in the total score dimension between national athletes and first level and second level athletes (ErinA, 2022).

In summary, this study revealed significant differences in psychological variables such as mindfulness, mood, anxiety, and self-confidence among competitive Tai Chi athletes at different sports levels. National athletes excel in these dimensions thanks to their extensive experience and intense mental training, while first level and second level athletes were weaker in some dimensions. These findings provide an important reference for the study of sports psychology and provide a basis for interventions to improve the psychological quality of athletes.

The effect of 12-week mindfulness training on the psychological characteristics of competitive Tai Chi athletes was detailed in Table 6, Table 7 and Table 8.

After 12 weeks of intervention, mindfulness training significantly improved the pre-match psychological state of competitive Tai Chi athletes, which was consistent with hypothesis of the research 2. The maximum value of the five-factor mindfulness questionnaire was increased from 115 in the pretest to 131 in the post test. The mood measurement scale data decreased from the pretest maximum value of 135 to the post

test maximum value of 80. The maximum value of the contest anxiety questionnaire decreased from 25 in the pre-test to 17 in the post-test. The maximum value of the Motor Confidence Scale increased from 37 in the pretest to 39 in the post-test.

According to the results of the five-factor mindfulness questionnaire, the scores of the mindfulness training group in the dimensions of observation, description, non-judgment and non-reaction were significantly improved, indicating that the athletes' awareness ability, emotional description ability, emotional acceptance and self-regulation ability were enhanced. However, there was no significant change in each dimension in the control group. The mood measurement scale showed that the positive mood was significantly enhanced in the mindfulness training group, and the negative mood and TMD total score were significantly reduced. The results of the contest anxiety questionnaire showed that mindfulness training significantly reduced cognitive state anxiety and somatic state anxiety, and significantly improved state self-confidence, helping athletes better cope with pre-match stress and enhance self-confidence. There was no significant change in these dimensions in the control group. The positive effects of mindfulness training were further validated by the analysis of the trait motor self-confidence scale (TSCI-PL), with significant improvement in the athletes' scores in task confidence and coping confidence, as well as an improvement in the overall score, while there was little change in the control group.

Table 6 shows the basic information statistics of the two groups of competitive Tai Chi athletes, and Table 8 shows the pre-test data analysis of the mindfulness training group and the control group, through the data analysis in Table 7, we can see that the data of the mindfulness training group and the control group were at the same level before the 12-week training, and there was no significant difference. Table 8 shows the comparison of the pre-test and post-test data of each index in the two groups of competitive Tai Chi athletes. The data analysis covered multiple variables of the five-factor mindfulness questionnaire, the mood measurement scale, the contest anxiety questionnaire, and the trait motor self-confidence scale (TSCI-PL). The study

aimed to explore the potential effects of mindfulness practice on the mental state and self-confidence of athletes in competitive sports, and to identify differences in these psychological indicators between different sports levels and genders.

In this study, competitive Tai Chi athletes were divided into mindfulness training group and control group, and the effect of mindfulness training on their mental state was analyzed by comparing pre-test and post-test data.

The five-factor mindfulness questionnaire includes five dimensions: observation, description, conscious action, non-judgment, and non-reaction. In the analysis, we found that the mindfulness training group showed significant changes across multiple dimensions, while the control group showed little change. The observational dimension score of the mindfulness training group proves that mindfulness training effectively improves the athletes' keen observation of themselves and the environment during the competition. This improvement may be related to the development of a sense of "now" during mindfulness training, where athletes were better able to perceive and pay attention to subtle changes in the outside and within. The observation dimension scores in the control group remained virtually unchanged, further supporting the effect of mindfulness training. In the descriptive dimension, the scores in the mindfulness training group demonstrate that mindfulness training helps athletes more accurately express and describe how they feel in competition. This increased ability may stem from non-judgmental awareness of emotions and feelings in mindfulness training, allowing athletes to more clearly identify and articulate their emotional states (EliseRCF, 2021). In contrast, the control group's scores in the descriptive dimension remained virtually unchanged, further validating the effectiveness of mindfulness training. Although the mindfulness training group showed some improvement in the conscious action dimension, this change was not significant, indicating that the training effect in this dimension may not be obvious in the short term. Acting Consciously emphasizes staying focused and aware in everyday actions, and the enhancement of this ability may require a longer period of

training. The control group also did not change significantly in this dimension. In the dimension of non-judgment, mindfulness training significantly enhanced the non-judgmental acceptance of one's own emotions and feelings in the mindfulness training group. This change may be related to the emphasis on acceptance and inclusion attitudes in mindfulness training, allowing athletes to be less distracted by negative emotions and thus maintain a better mental state during competition (Wen Qingyan, 2021). The control group's scores on this dimension did not change much. The scores of the mindfulness training group in the non-response dimension showed that mindfulness training significantly enhanced the emotional self-regulation ability of athletes in the face of negative events. This result may be attributed to the observation and control of emotional responses in mindfulness training, which allows athletes to remain calm and reduce impulsive reactions in stressful environments. The control group also had no significant change in the non-response dimension.

The mood measurement scale includes two dimensions, positive mood and negative mood, as well as the total TMD (total emotional disturbance) score. By comparing the results of the before and after tests, it can be seen that mindfulness training has a positive impact on the emotional state of athletes. The positive mood score of the mindfulness training group proves that mindfulness training can effectively improve the positive emotional state of athletes. At the same time, mindfulness training helps to reduce the negative emotions of athletes. The significant decrease in the total TMD score further supports the conclusion of mood improvement. The results showed that mindfulness training had a significant effect on the overall mood of athletes. In the control group, there were also significant changes in the pre- and post-test data of mood measurement, but the changes in the mindfulness training group were more prominent than those in the control group. This change suggests that the positive mood of the control group was enhanced to some extent without mindfulness training, and reached a statistically significant level. Although the control group did not receive mindfulness training, they may have experienced more training or competitions during this time, and these experiences

themselves may have brought about a positive emotional boost (Jiang Meiling, Lei Ting, Yan Min, 2022). For example, factors such as successful game performance, increased teamwork, and encouragement from coaches can all have positive psychological effects. These external factors may have contributed to the improvement of positive mood in the control group. Since there was no specific psychological intervention in the control group, their mood swings may be more susceptible to individual differences (Gong Shuang, Chen Long, 2022). Some athletes may show higher scores when measuring positive mood for other reasons, such as positive events in their personal lives, different individual responses to training and competitions. Although the control group did not receive mindfulness training, some athletes may have spontaneously developed certain psychological adjustment strategies, such as coping with training stress through self-motivation and positive thinking, thereby improving their positive mood. This spontaneous process of psychological adaptation may also be a factor in the improvement of positive mood scores. In the study design, the temporal effect may have an impact on the psychological state of the control group. Over time, athletes may have gradually adapted to the test environment and reduced test anxiety, resulting in higher positive mood scores (Xiong, 2017). In addition, the reuse of measurement tools may also lead to an increase in the familiarity of some athletes with the questionnaire, affecting the way they respond. Although the control group did not receive mindfulness training, the improvement in their positive mood scores suggests that the mental state of athletes was not only influenced by specific psychological interventions, but may also be moderated by other environmental and individual factors (Sun Zhe, 2011). Therefore, in competitive sports, in addition to systematic psychological interventions, attention should also be paid to the psychological dynamics of athletes in their daily training and life. Understanding these factors can help coaches and psychologists develop more personalized and diverse psychological support programs for athletes, thereby improving their performance and mental health across the board. In the negative mood dimension, mindfulness training significantly reduced the

negative emotions of athletes. Mindfulness training may enable athletes to better manage their emotions and reduce negative feelings by enhancing their awareness and regulation of negative emotions under stress. Although the score of the control group in this dimension decreased, the magnitude was smaller, which was not as significant as that of the mindfulness training group. Mindfulness training had a significant effect on the reduction of overall emotional perturbation. The reduction in the total TMD score reflects an improvement in the athlete's overall emotional state and may be related to the role of mindfulness training in reducing negative emotions and enhancing emotional regulation. The total TMD score in the control group was also reduced, but to a lesser extent, showing that the effect of mindfulness training was more obvious.

The contest anxiety questionnaire includes three dimensions: cognitive state anxiety, somatic state anxiety and state self-confidence. By analyzing these dimensions, the impact of mindfulness training on athletes' anxiety and self-confidence can be seen. The data proves that mindfulness training significantly reduces the level of cognitive anxiety in athletes before competition. This change may be related to the fact that mindfulness training helps athletes focus on the present moment and worry less about future outcomes, allowing them to face the pressure of competition more calmly. There was little change in the cognitive state anxiety score in the control group. In the dimension of somatic state anxiety, mindfulness training effectively alleviated the physical anxiety response of athletes in competition. This may be related to the role of mindfulness training in relaxing body tension through breathing and body scanning exercises. In contrast, the control group did not change significantly in this dimension. In terms of state self-confidence, mindfulness training effectively enhances athletes' self-confidence in competitions. Mindfulness training may help athletes perform more confidently and calmly during competition by improving their self-efficacy and emotional control. There was no significant change in this dimension in the control group.

The trait motor self-confidence scale (TSCI-PL) includes three dimensions: trait motor task confidence, trait motor coping confidence, and the trait motor self-confidence scale(TSCI-PL). Mindfulness training significantly boosts an athlete's confidence in completing a sporting task. This boost may be due to mindfulness training's improved focus and task execution in athletes. There was no significant change in this dimension in the control group. Mindfulness training helps athletes better cope with the challenges and pressures of competition.

Through mindfulness training, athletes may have learned to be more calm and effective in dealing with unexpected situations during competition. There was no significant change in this dimension in the control group. It has been proved that mindfulness training has a significant effect on the overall self-confidence of athletes. There was little change in the total sports self-confidence score in the control group, which further demonstrated the positive effect of mindfulness training on enhancing the mental quality of athletes.

Through the comparative analysis of the pre- and post-test data of competitive Tai Chi athletes in the mindfulness training group and the control group, it can be seen that mindfulness training has a significant positive impact on multiple psychological dimensions. These results suggest that mindfulness training can not only enhance athletes' observation, descriptive and emotional regulation skills, but also significantly reduce anxiety levels and improve self-confidence (Zhang Tingting, 2013). As a psychological intervention, mindfulness training was of great significance for improving the psychological quality of competitive athletes (Zhao ,Yuqi, 2020).

Comparative analysis of the effect of mindfulness training group and control group on the psychological characteristics of competitive Tai Chi athletes after 12 weeks of mindfulness training

Through 12 weeks of mindfulness training, competitive Tai Chi athletes significantly improved their pre-match psychology in several ways compared to the control group, which was consistent with hypothesis of the research 3. According to the five-factor mindfulness questionnaire, the scores of the mindfulness training group in the dimensions of "observation", "description", "non-judgment" and "non-response" were significantly higher than those of the control group. In the mood measurement scale, the mindfulness training group was significantly better than the control group in the total score of "negative mood" and TMD, indicating that mindfulness training significantly reduced the accumulation of negative emotions and improved overall emotional stability. The results of the contest anxiety questionnaire and the Trait Sports Self-Confidence Scale showed that mindfulness training significantly reduced cognitive and physical anxiety and enhanced athletes' self-

confidence. The mindfulness training group was significantly higher than the control group in terms of task confidence, coping confidence and total self-confidence, indicating that mindfulness training helped athletes show a more stable, confident and positive mental state before the competition.

Table 9 shows a comparison of post-test data between the mindfulness training group and the control group of competitive Tai Chi athletes. Through the analysis of multiple psychological variables such as the five-factor mindfulness questionnaire, the mood measurement scale, the contest anxiety questionnaire, and the trait sports self-confidence scale, we can gain an in-depth understanding of the impact of mindfulness training on the mental state of athletes.

The five-factor mindfulness questionnaire analysis showed significant differences in the "observation" dimension. The mindfulness training group was significantly higher than the control group, indicating that mindfulness training helped improve the athletes' ability to observe the internal and external environment. This result may stem from the "non-judgmental focus on the present moment" philosophy emphasized in mindfulness training, which allows athletes to pay more attention to their sensory experiences and physical reactions, thereby improving their ability to observe. In the "description" dimension, the scores of the mindfulness training group also showed significant differences. Mindfulness training significantly improves an athlete's ability to describe their own emotions and experiences. This may be because mindfulness training encourages athletes to express their emotions and feelings through words, enhancing their self-awareness. There were still significant differences in the scores of the "act consciously" dimension. Although mindfulness training aims to increase an individual's awareness of daily activities, this result may reflect a high level of awareness of action in certain situations among the control group athletes, especially in the absence of mindfulness training, where athletes may be more reliant on their inherent training patterns and concentration on movements. In the dimension of "non-judgment", the score of the mindfulness training group was significantly higher than that of the control group. Mindfulness training helps athletes reduce their tendency to judge internal and external experiences, which may enable them to respond more openly and receptively when faced with challenges in competition and training, thereby reducing negative self-evaluation and excessive self-criticism. In the "non-reaction" dimension, the scores of the mindfulness training group proved that mindfulness training significantly improved the non-reactivity of athletes in the face of emotions and thoughts, meaning that they were better able to stay calm and control their emotions during stress and emotional conflicts. This may be attributed to meditative meditation and breathing exercises in mindfulness training, which teach athletes how to remain calm in the face of stress without overreacting (Xie Bin & Guo Qinling, 2006).

In the analysis of the mood measurement scale, the positive mood of the mindfulness training group did not significantly exceed that of the control group, which may be because the control group adjusted its own psychological state without specific intervention, such as through social support, positive competition experience or other personal coping strategies, which may also play a role in improving positive mood. In the dimension of "negative mood", the mindfulness training group scored significantly lower than the control group. This significant difference suggests that mindfulness training was effective in reducing negative emotional experiences in athletes. One of the core aspects of mindfulness training was emotional awareness and acceptance, which allows athletes to face the stress of training and competition with a more peaceful attitude, thus reducing the accumulation of negative emotions. The TMD total score proves that mindfulness training has a positive effect on the improvement of athletes' overall emotional state, which may help them better manage stress during training and competition, and maintain a more stable mental state (Chen Yuxia, 2003).

In the analysis of contest anxiety questionnaire, the score of the mindfulness training group was significantly lower than that of the control group in the dimension of "cognitive state anxiety". Mindfulness training significantly reduced cognitive anxiety among athletes, suggesting that they were better able to control their anxiety when facing a game, focusing on the game itself rather than their anxious thoughts. This change may stem from focus shift exercises in mindfulness training, which help athletes focus less on anxious thinking. There was a significant difference in the dimension of "somatic state anxiety". Mindfulness training effectively reduces athletes' physical anxiety responses during competition, such as rapid heartbeat, sweating, etc., which may be because body scanning and breathing exercises in mindfulness training help athletes better manage physical anxiety responses. In the dimension of "state confidence", the score of the mindfulness training group was significantly higher than that of the control group. Mindfulness training helps athletes build stronger self-confidence during competition, which may be because mindfulness training improves athletes' self-efficacy and inner stability, allowing them to tackle competition challenges with greater confidence.

In the trait motor self-confidence scale (TSCI-PL) analysis, the scores of the mindfulness training group were significantly higher than those of the control group in the dimension of "trait motor task confidence". Mindfulness training significantly boosts athletes' self-confidence in athletic tasks, probably because self-awareness and positive thinking in training help athletes build stronger beliefs that they were capable of completing tasks and succeeding (Ye Ping, 2002). The dimension of "trait exercise coping with confidence" showed that the scores of the mindfulness training group were significantly higher than those of the control group. This suggests that mindfulness training helps to improve athletes' self-confidence when dealing with

challenges and stress, allowing them to maintain more positive and effective coping strategies when facing difficult situations. In the dimension of "total sports self-confidence score", the score of the mindfulness training group was significantly higher than that of the control group. This significant difference suggests that mindfulness training significantly improves athletes' self-confidence levels overall, enabling them to show greater confidence in a variety of sports situations.

Data analysis in Table 9 shows that mindfulness training has a significant positive impact on competitive Tai Chi athletes across multiple psychological dimensions, especially in terms of reducing anxiety, improving self-confidence, and improving overall emotional state. Compared with the control group, the mindfulness training group showed higher scores in the mindfulness dimensions of "observation", "description", "non-judgment", and "non-reaction", indicating that mindfulness training effectively improved the athletes' psychological awareness and emotion regulation ability (Zhang Gezi and Bu Danran, 2012). In addition, although the control group also improved in terms of "positive mood", mindfulness training was more effective in improving the mental health of the athletes overall. These results suggest that mindfulness training, as a psychological intervention, plays an important role in improving athletes' mental toughness, emotional stability, and self-confidence (Bu Danran & Zhong Boguang, 2020). Future research could further explore the long-term effects of mindfulness training and how it can be more effectively integrated into athletes' daily training and competition preparation to help them maintain their optimal mental state in high-pressure environments.

Conclusion

(1) Through the analysis of the data of the five-factor mindfulness questionnaire, the mood measurement scale, the contest anxiety questionnaire and the trait motor self-confidence scale (TSCI-PL), it was found that the mindfulness level, psychological quality and sports self-confidence of the national athletes at different sports levels were significantly higher than those of the first and second level athletes. Mindfulness training had a significant effect on the improvement of positive mood and the reduction of negative mood in the competitive Tai Chi athletes in the mindfulness training group, and the mindfulness training group was significantly higher than the control group in the five dimensions of the five-factor mindfulness questionnaire, and the anxiety level was significantly lower than that of the control group, especially in the cognitive state anxiety and somatic state anxiety, and was higher than the control group in the three dimensions of the trait motor self-confidence scale (TSCI-PL).

(2) This study investigated the effect of 12-week mindfulness training on the pre-match psychological characteristics of competitive Tai Chi athletes, especially in the four aspects of the five-factor mindfulness questionnaire, the mood measurement scale, the contest anxiety questionnaire and the trait sports confidence scale (TSCI-PL). By comparing the data of the mindfulness training group (mindfulness training group) and the control group (conventional training group), the results showed that mindfulness training had a significant positive effect on the athletes' mental state and competition performance, and verified the three hypotheses of this study.

First of all, gender factors had little effect on the psychological characteristics of competitive Tai Chi athletes, and the differences in the four scales were not significant. However, the influence of sports grade on these psychological characteristics was more significant, and the mindfulness level, psychological quality and sports self-confidence of national athletes were significantly higher than those of first and second level athletes.

Secondly, the effect of mindfulness training on competitive Tai Chi athletes was significant, and the five-factor mindfulness questionnaire, mood measurement scale, contest anxiety questionnaire and trait motor self-confidence scale (TSCI-PL) showed significant changes before and after mindfulness training in the mindfulness training group (mindfulness training group), that was, the performance of the mindfulness training group after training was significantly better than that before mindfulness training. Among the specific data, the data of contest anxiety questionnaire and the trait motor self-confidence scale (TSCI-PL) were the most significant, followed by the data of the five-factor mindfulness questionnaire, and then the mood measurement scale. This was also in line with the theory that mood was a dynamic emotional experience, which was greatly affected by short-term factors such as environmental changes, daily life, training intensity, and even personal life events, and the goal of mindfulness training was to enhance the athlete's ability to regulate emotions through long-term practice.

Finally, the improvement of mental health training on various psychological characteristics before the competition was better than that of the control group. After 12 weeks of mindfulness training, the mindfulness training group (mindfulness training group) had better data on the five-factor mindfulness questionnaire, mood measurement scale, contest anxiety questionnaire and the trait motor self-confidence scale (TSCI-PL) than the control group, among which the five-factor mindfulness questionnaire data performance improved the most, followed by the contest anxiety questionnaire, the trait motor self-confidence scale (TSCI-PL), and finally the mood measurement scale. In addition, the anxiety level of the mindfulness training group (mindfulness training group) was significantly lower than that of the control group, especially in cognitive state anxiety and somatic state anxiety, which further verified

that mindfulness training can effectively alleviate excessive worry and nervousness of competitive Tai Chi athletes. This result was consistent with the hypothesis of this study.

In summary, the results of this study clearly show that mindfulness training can significantly improve the mindfulness level, mood, anxiety control and self-confidence of competitive Tai Chi athletes, which in turn can improve their psychological state and competition performance. Although some results, such as gender differences, were not significant, the overall results support the positive effects of mindfulness training on competitive Tai Chi athletes. Future research can further explore the effects of different levels of mindfulness training on the mental performance of various athletes, so as to verify the feasibility of its widespread application.

Limitations of the study

There were some limitations in this study, which were mainly reflected in the limited ability to control some external factors in the study design. First of all, since competitive Tai Chi athletes may still participate in other activities that have an impact on their mental state during the experiment, such as massage, watching movies, listening to music, etc., these activities may affect their mental state and thus interfere with the results of the study. We do not have complete control over the recreational and relaxation activities of competitive Tai Chi athletes outside of training, which can lead to fluctuations in their mental state, which in turn affects our findings. For example, although the mindfulness training group (mindfulness training group) participated in mindfulness training, the competitive Tai Chi athletes in the control group may also participate in other activities that affect their mental state, such as yoga or meditation, and these factors may have led to an improvement in their mental health, which in turn can have an unforeseen impact on the results of the study. Therefore, such uncontrollable activities became a major limitation of this study, affecting the accuracy of experimental design and the analysis of causality.

Secondly, the sample size was relatively small, which limits the universality of the results. Although this study has achieved some meaningful results among competitive Tai Chi athletes, the sample size was not sufficiently representative of the entire athlete population, especially the differences that exist in gender, age, and athletic level. Future studies should consider expanding the sample size to include different groups of athletes to increase the universality of the findings.

In addition, the measurement tools in this study mainly focused on four psychological characteristics (Five-Factor Mindfulness Questionnaire, Mood Measurement Scale, Competition Anxiety Questionnaire, and Trait Sports Self-

Confidence Scale (TSCI-PL)), although these tools have some effectiveness in capturing the pre-match psychological state of competitive Tai Chi athletes, they may still not fully reflect the overall psychological characteristics of competitive Tai Chi athletes. Future research should consider the use of more comprehensive measurement tools, or a combination of physiological indicators, long-term psychological assessments, etc., to obtain more comprehensive and in-depth conclusions.

Suggestion

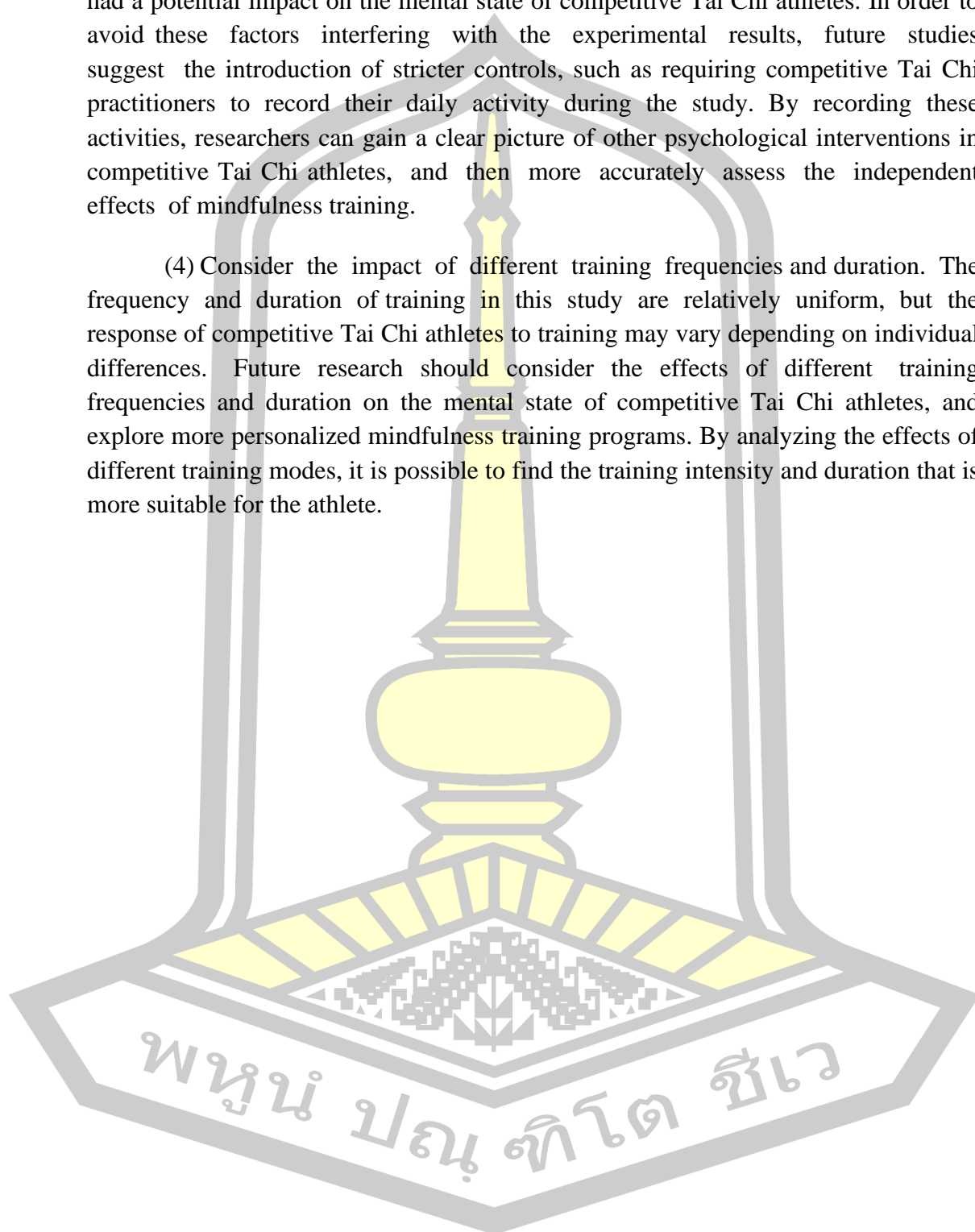
(1) The sample size of this study is small, and future studies can expand the sample size to increase the number of athletes in different sports, so as to improve the universality and credibility of the research results. The effects of mindfulness training take time to become apparent, so long-term follow-up studies can be conducted in the future to observe the long-term effects of mindfulness training on the psychological characteristics and performance of competitive Tai Chi athletes. Through the accumulation of long-term data, the long-lasting effect of mindfulness training is further verified. In-depth exploration of the mechanism of mindfulness training to improve the psychological characteristics of competitive Tai Chi athletes is also the direction of future research. Through physiological and neuroscience research methods, revealing how mindfulness training affects psychological characteristics such as emotion regulation and self-confidence by changing brain structure and function will help to understand the internal mechanism of mindfulness training.

(2) Considering that the psychological characteristics and needs of each competitive Tai Chi athlete are different, it is suggested that future researchers can develop individualized mindfulness training plans in the same or similar studies. Mindfulness training and coaching tailored to the athlete's confidence, anxiety level, and emotional management needs. This personalized program is able to more effectively target individual psychological challenges and improve the relevance and effectiveness of mindfulness training. In addition to mindfulness training, it is recommended to teach competitive Tai Chi practitioners a variety of emotion regulation techniques, such as deep breathing exercises, meditation, relaxation training, etc. These techniques can help competitive Tai Chi athletes quickly adjust their emotions and maintain a stable mental state before the competition. By integrating multiple techniques, athletes were able to use them flexibly in different situations to improve the effectiveness of emotional regulation.

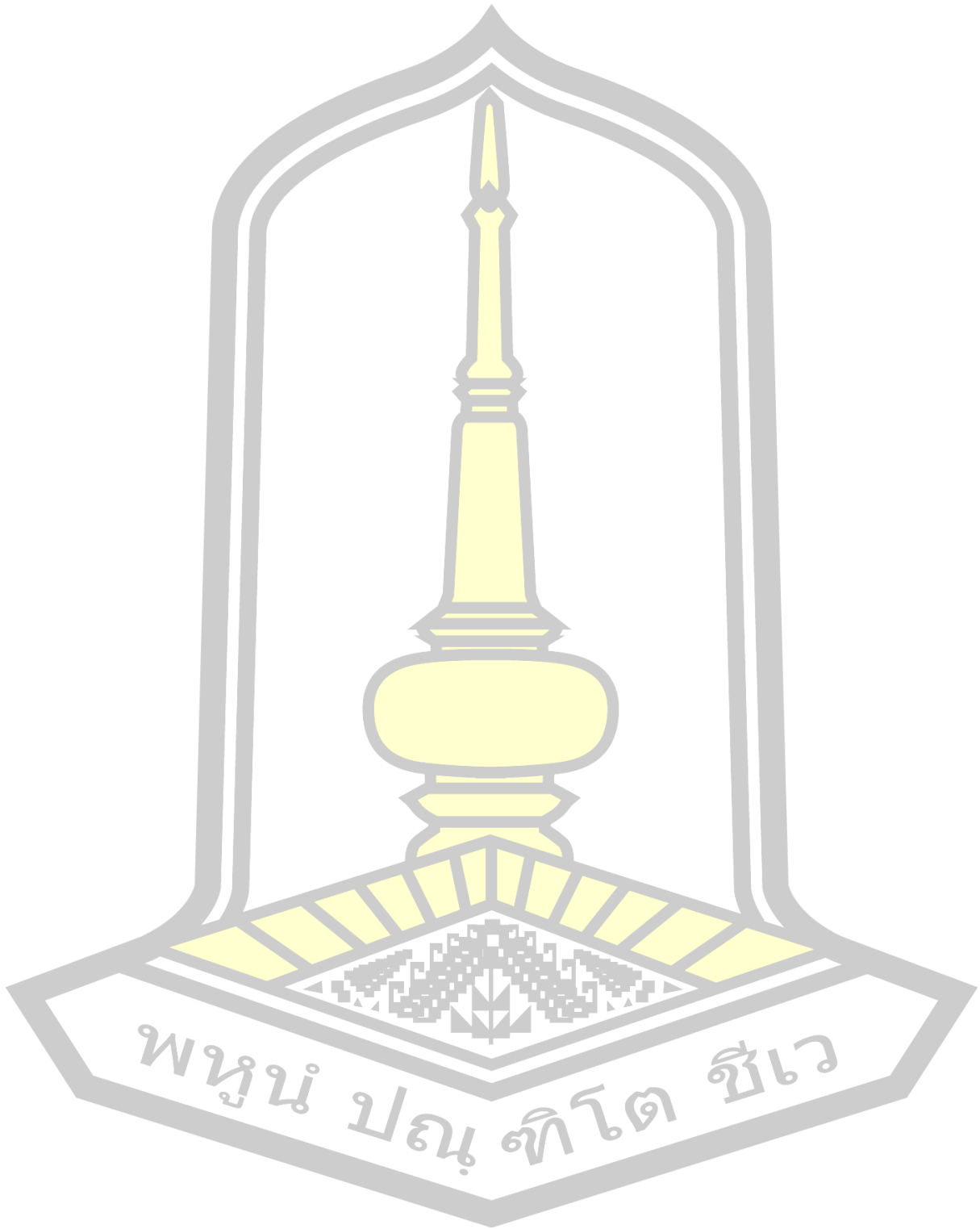
(3) Strengthen the control of external factors. In this study, competitive Tai Chi athletes may have been involved in other mental health-related recreational

activities (e.g., yoga, massage, listening to music, etc.) during the experiment, which had a potential impact on the mental state of competitive Tai Chi athletes. In order to avoid these factors interfering with the experimental results, future studies suggest the introduction of stricter controls, such as requiring competitive Tai Chi practitioners to record their daily activity during the study. By recording these activities, researchers can gain a clear picture of other psychological interventions in competitive Tai Chi athletes, and then more accurately assess the independent effects of mindfulness training.

(4) Consider the impact of different training frequencies and duration. The frequency and duration of training in this study are relatively uniform, but the response of competitive Tai Chi athletes to training may vary depending on individual differences. Future research should consider the effects of different training frequencies and duration on the mental state of competitive Tai Chi athletes, and explore more personalized mindfulness training programs. By analyzing the effects of different training modes, it is possible to find the training intensity and duration that is more suitable for the athlete.



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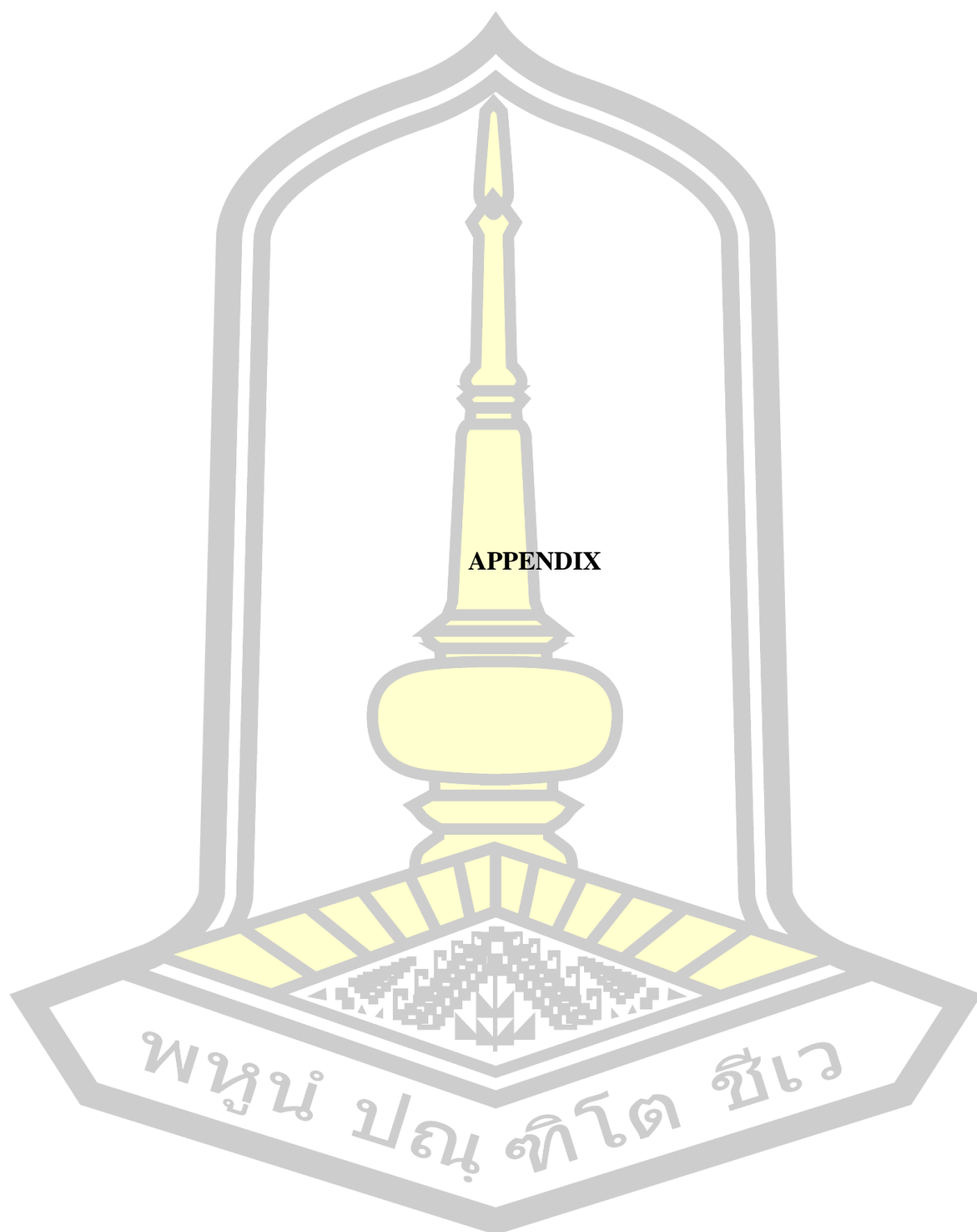
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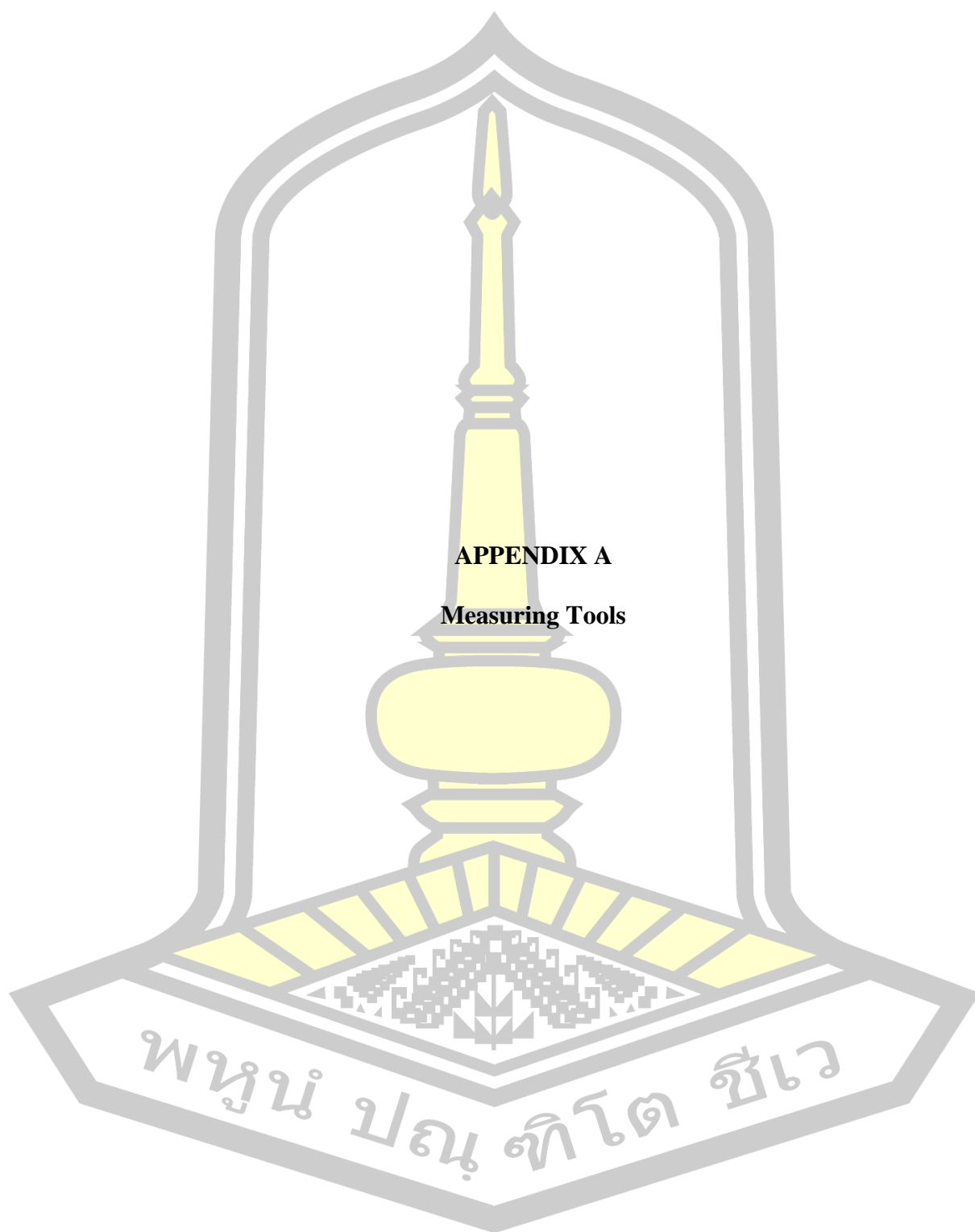
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APPENDIX

พญูน์ ปณุ ทิโต ชีเว



APPENDIX A
Measuring Tools

APPENDIX A (1)

Five-Factor Mindfulness Scale

Instructions: Please rate each sentence according to the following grades, and fill in the blank space before the sentence with the grade number that best suits your real situation.

1 = Not at all 2 = Not at all 3 = Somewhat 4 = Very much 5 = Completely

1. When walking, I intentionally pay attention to how the body parts feel as they move..... ()
2. I am good at describing my emotions in words..... ()
3. I blame myself for having irrational emotions or inappropriate emotions..... ()
4. I feel my emotions and emotions, but I don't have to react to them..... ()
5. While doing things, my mind often wanders and I'm easily distracted..... ()
6. When I take a shower, I notice the sensation of water running over my body..... ()
7. I can clearly express my beliefs, opinions, and expectations..... ()
8. I don't notice what I'm doing because I'm daydreaming, worrying or being distracted from the outside world..... ()
9. I observe my emotions without getting lost i..... ()
10. I told myself that I shouldn't be feeling emotions the way I am now.... ()
11. I notice how food and drink affect my thoughts, bodily sensations and emotions..... ()
12. I have trouble finding words to express what I'm thinking..... ()

13.I am easily distracted..... ()
)

1 = Not at all 2 = Not at all 3 = Somewhat 4 = Very much 5 = Completely

14.I think some of my thoughts are abnormal, bad; I shouldn't think that way.....
()

15.I pay attention to how I feel, like the breeze in my hair, the sun on my
face..... ()

16.I have a hard time expressing how I feel about things with the right
words..... ()

17.I judge my thoughts as good or bad..... ()

18.I have trouble concentrating on what's going on..... ()

19.When I have a sad thought or vision, I "step back" and become aware of the
the existence of these thoughts or visions without being controlled by
them..... ()

20.I pay attention to sounds like: the ticking of a clock, the chirping of a bird
Chirping, or the sound of cars passing by..... ()
)

21.In difficult situations, I pause and don't react right away..... ()

22.When I feel something in my body, I have a hard time finding the right words to
describe it..... ()

23.I seem to be doing something automatically and not fully aware of it.....
()

24.Usually, when I have a sad thought or image, I recover quickly.... ()

25.I tell myself that I shouldn't be thinking about what I'm thinking about right
now..... ()

26.I smell the smell or aroma of something around me.....
()

27.Even when I'm deeply disturbed, I can find the words to express it..... ()
)

28. I scribble through things without really paying attention to them..... ()
29. When caught up in disturbing emotions or situations, I can just pay attention to them without reacting accordingly..... ()
30. I think some emotions are wrong or inappropriate and I shouldn't be experiencing them.... ()
31. I noticed some visual elements in art and things in nature, such as: color, shape, texture and light and shadow..... ()
32. I always tend to use words to describe my experiences..... ()
33. When I have distressing thoughts or visions, I usually just pay attention to them and let it be..... ()
34. I was always working or completing a task automatically without realizing what I was doing..... ()
35. Usually when I have a disturbing thought or vision, I judge whether I am right or wrong based on what I was thinking or seeing in my mind..... ()
36. I pay attention to how my emotions affect my thoughts and actions..... ()
37. I can usually describe how I feel at the moment in great detail..... ()
38. I find myself not concentrating on what I am doing..... ()
39. When irrational thoughts arise, I self-veto..... ()

FFMQ (b1-b39) scoring method:

The scores of the following items are added together, and R stands for reverse scoring, that is, 1 is 5 points, 2 is 4 points, 3 points are unchanged, 4 is 2 points, and 5 is 1 point.

observe

1, 6, 11, 15, 20, 26, 31, 36 8 questions in total

describe

2, 7, 12R, 16R, 22R, 27, 32, 37 8 questions in total

act consciously

5R, 8R, 13R, 18R, 23R, 28R, 34R, 38R 8 questions in total

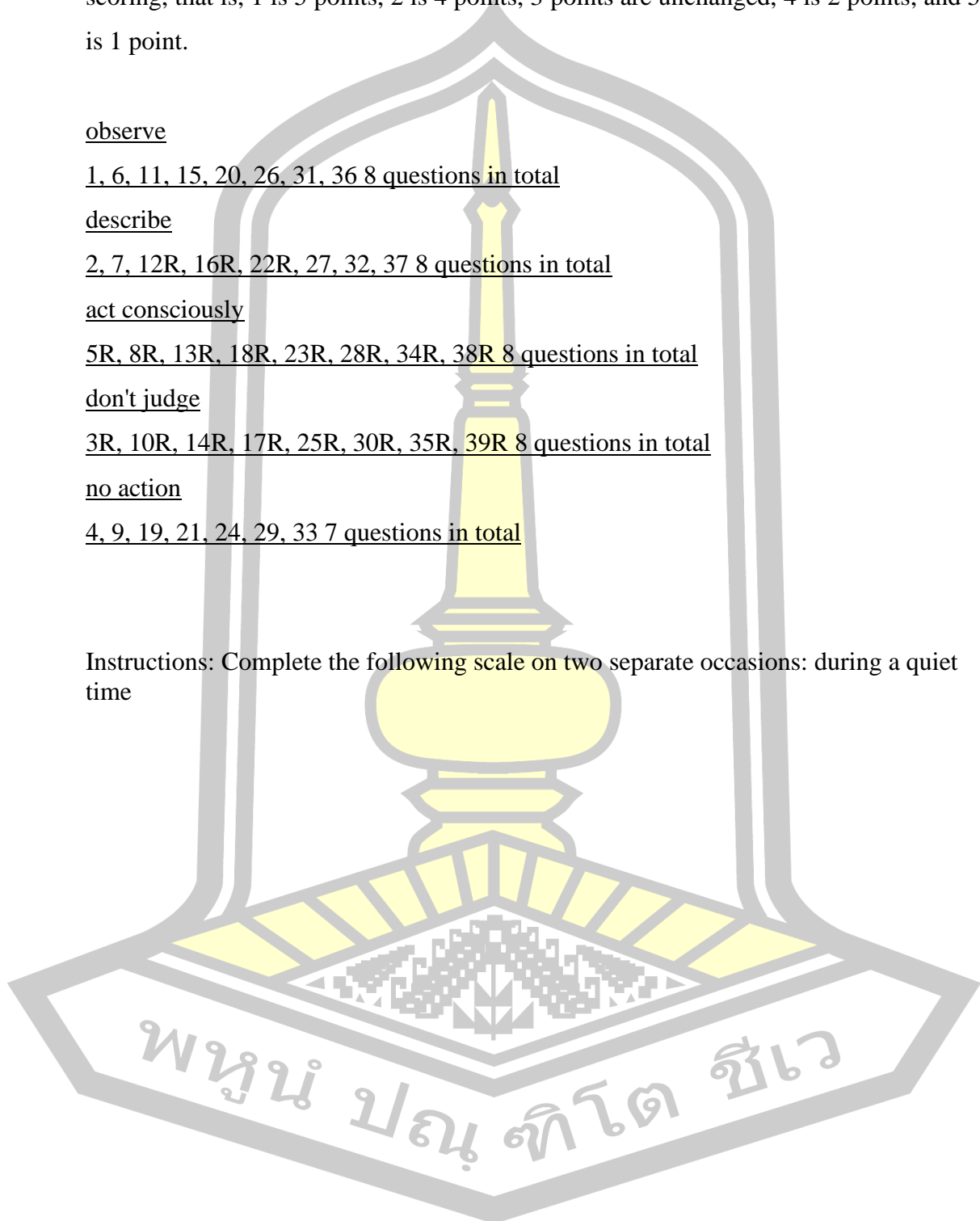
don't judge

3R, 10R, 14R, 17R, 25R, 30R, 35R, 39R 8 questions in total

no action

4, 9, 19, 21, 24, 29, 33 7 questions in total

Instructions: Complete the following scale on two separate occasions: during a quiet time



APPENDIX A (2)

Mood measurement Scale

Please use the following words to express how you felt in the past week (including today). For each adjective, you can only choose one of the five options that best suits your actual situation and feelings, and tick "✓" in the corresponding small box.

	almost none	A little	Moderate	very much	Very
1 nervous	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 angry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 listless	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 unhappy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 happy and relaxing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 flustered	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7 embarrassingly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8 Upset	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9 angry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10 tired	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11 sorrowful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12 Energetic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13 can't concentrate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14 confident	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15 disturbed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16 annoyed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17exhausted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18 depressed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19 proactive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20 panic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21 restless	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22 annoying	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23 Burnout	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24depressed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25 Enthusiastic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26 Forgetful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27 Competent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28 excitable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29 angry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30exhausted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

31 worthless	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32 active	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33 feeling uncertain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34 satisfied	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35 worried	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36 furious	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37 complaining	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38 helpless	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39 energetic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40 proudly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Scoring method:

The scoring method of the scale is: "hardly" is 0 points, "a little" is 1 point, "moderate" is 2 points, "quite a lot" is 3 points, and "extremely" is 4 points. The items of the 7 components are:

Tension: Questions 1, 8, 15, 21, 28, and 35;

Anger: Questions 2, 9, 16, 22, 29, 36, 37;

Fatigue: questions 3, 10, 17, 23, 30;

Depression: Questions 4, 11, 18, 24, 31, 38;

Energy: Questions 5, 12, 19, 25, 32, 39;

Panic: Questions 6, 13, 20, 26, 33;

Emotions related to self: Questions 7, 14, 27, 34, 40;

The original scores of each subscale were accumulated separately, and the T score of each subscale was calculated by consulting the norm.

TMD (Total Mood Disorder) = sum of 5 negative mood scores minus sum of 2 positive mood (energy, self-esteem) scores + 100.

APPENDIX A (3)

Competition Anxiety Questionnaire

		Not at all	Somewhat	Moderately so	Very much so
1	I'm worried about this game.	①	②	③	④
2	I feel nervous.	①	②	③	④
3	I am mentally stable.	①	②	③	④
4	I doubt myself.	①	②	③	④
5	I feel uneasy.	①	②	③	④
6	I feel physically comfortable.	①	②	③	④
7	I'm worried that this competition won't be as good as usual.	①	②	③	④
8	My body feels tense.	①	②	③	④
9	I feel confident in this match	①	②	③	④
10	I worry about losing the game.	①	②	③	④
11	My stomach felt tight.	①	②	③	④
12	I'm sure about this game.	①	②	③	④
13	I worry about not being able to succeed under this kind of pressure.	①	②	③	④
14	I feel my body is relaxed.	①	②	③	④
15	I am confident to face this challenge.	①	②	③	④
16	I'm worried that I won't perform well in Bizan.	①	②	③	④
17	My heart is beating hard.	①	②	③	④
18	I believe I will do well.	①	②	③	④
19	I worry about whether I can reach	①	②	③	④

	my goal.				
20	I felt my stomach sink.	①	②	③	④
21	I feel mentally relaxed.	①	②	③	④
22	I worry that others will be disappointed with my performance.	①	②	③	④
23	My hands are wet and cold.	①	②	③	④
24	I am confident in my heart that I have achieved my goals.	①	②	③	④
25	I worry about not being able to concentrate.	①	②	③	④
26	My body felt stiff.	①	②	③	④
27	I am confident that I can complete the game under this pressure.	①	②	③	④

Scoring: The scale divides anxiety into three components: cognitive anxiety, somatic anxiety, and a "related component" - self-confidence. Confidence, which is often the opposite of cognitive anxiety, is another important factor in managing stress. To score the CSLA-2, all points are calculated on an indicated value for each item except item 14, which is what you "reversed" the score for. Example: If you circled 3 points, it counts as 2 points (1=4; 2=3; 3=2; 4=1) and the total score is calculated as follows:

Cognitive state anxiety: sum items 1, 4, 7, 10, 13, 16, 19, 22, 25.

- Somatic state anxiety: and items 2, 5, 8, 11, 14, 17, 20, 23, 26.

— Self-confidence: and items 3, 6, 9, 12, 15, 18, 21, 24, and 27.

Your score on each item ranges from 9 to 36, with 9 indicating low anxiety (confidence) and 36 indicating high anxiety.

APPENDIX A (4)

Trait Sports Self-Confidence Scale (TSCI-PL)

一、. Basic information of athletes

School: _____

Gender: A male B female

age: _____**Training years:** A 1-3 years B 4-6 years C More than 7 years**Educational level:** A graduate degree and above B undergraduate degree**Sports level:** A, master level, B, national first level, C, national second level, D other**Number of times** you competed in college: _____

二、 Sports Trait Confidence Scale

Please answer the following questions based on how confident you usually feel when competing in sports. Compare your confidence to the most confident athlete you know.

Please answer the following questions based on how you really feel, not what you expect of yourself. Your answers are confidential.

When you compete in a sport, how confident are you compared to the most confident athlete you know? (please circle the number)

1. How confident are you that you can perform the skills that will make you successful (Low Medium High)

1 2 3 4 5 6 7 8 9

2. How confident are you that you can make important decisions in games (low, medium, high)

1 2 3 4 5 6 7 8 9

3. How confident are you in performing under pressure (low, medium, high)?

1 2 3 4 5 6 7 8 9

4. How confident are you that you can use successful tactics (low, medium, high)

1 2 3 4 5 6 7 8 9

5. How confident are you that you can focus and achieve success (Low Medium High)

1 2 3 4 5 6 7 8 9

6. How confident are you that you can adapt to different competition environments. (low, medium, high)

1 2 3 4 5 6 7 8 9

7. How confident are you that you can achieve your competition goals (low, medium, high)

1 2 3 4 5 6 7 8 9

8. How confident are you that you can succeed (low, medium, high)

1 2 3 4 5 6 7 8 9

9. How confident are you that you can achieve success stably (low, medium, high)

1 2 3 4 5 6 7 8 9

10. How confident are you that you can think and react successfully during a game (Low Medium High)

1 2 3 4 5 6 7 8 9

11. How confident are you that you can accept the challenge of the competition (low, medium, high)

1 2 3 4 5 6 7 8 9

12. How confident are you that you can succeed despite disadvantages (low, medium, high)

1 2 3 4 5 6 7 8 9

13. How confident are you that you can turn a weak point into a strong point and succeed in a competition (low medium high)

1 2 3 4 5 6 7 8 9

三、 Exercise State Confidence Scale

Please answer the following questions based on how confident you currently feel about the upcoming competition. Compare your self-confidence to the most confident athlete you know.

Please answer the following questions based on how you really feel, not what you expect of yourself. Your answers are confidential.

Compared to the most confident athlete you know, how confident are you about the upcoming competition: (please circle the number)

1. How would you compare yourself to the most confident athlete you know?
(Low Medium High)

Your confidence that you can successfully complete the action is 1 2 3 4 5 6 7 8 9

2. How would you compare yourself to the most confident athlete you know?
(Low Medium High)

Your confidence in making important decisions in games is 1 2 3 4 5 6 7 8 9

3. How would you compare yourself to the most confident athlete you know?
(Low Medium High)

Confidence under pressure is 1 2 3 4 5 6 7 8 9

4. How would you compare yourself to the most confident athlete you know?
(Low Medium High)

Confidence in successfully using tactics is 1 2 3 4 5 6 7 8 9

5. How would you compare yourself to the most confident athlete you know?
(Low Medium High)

The confidence that you can focus and achieve success is 1 2 3 4 5 6 7 8 9

6. How would you compare yourself to the most confident athlete you know?
(Low Medium High)

Confidence in being able to successfully adapt to different competition environments. is 1 2 3 4 5 6 7 8 9

7. How would you compare yourself to the most confident athlete you know?
(Low Medium High)

Confidence in achieving the competition goal is 1 2 3 4 5 6 7 8 9

8. How would you compare yourself to the most confident athlete you know?
(Low Medium High)

The confidence to succeed is 1 2 3 4 5 6 7 8 9

9. How would you compare yourself to the most confident athlete you know?
(Low Medium High)

The confidence that faith can achieve stably is 1 2 3 4 5 6 7 8 9

10. How would you compare yourself to the most confident athlete you know?
(Low Medium High)

Confidence in being able to think and react successfully in a game is 1 2 3 4 5 6 7
8 9

11. How would you compare yourself to the most confident athlete you know?
(Low Medium High)

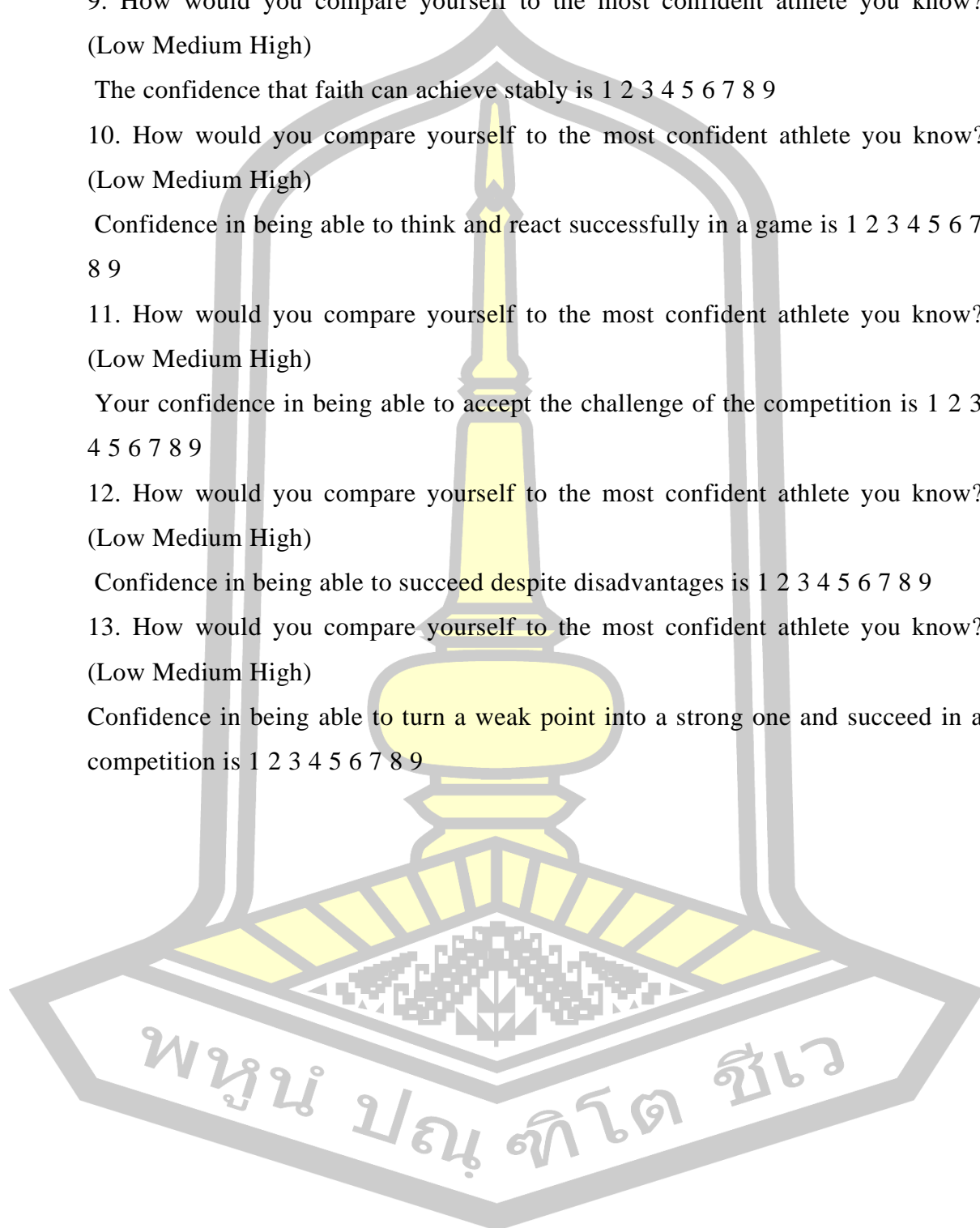
Your confidence in being able to accept the challenge of the competition is 1 2 3
4 5 6 7 8 9

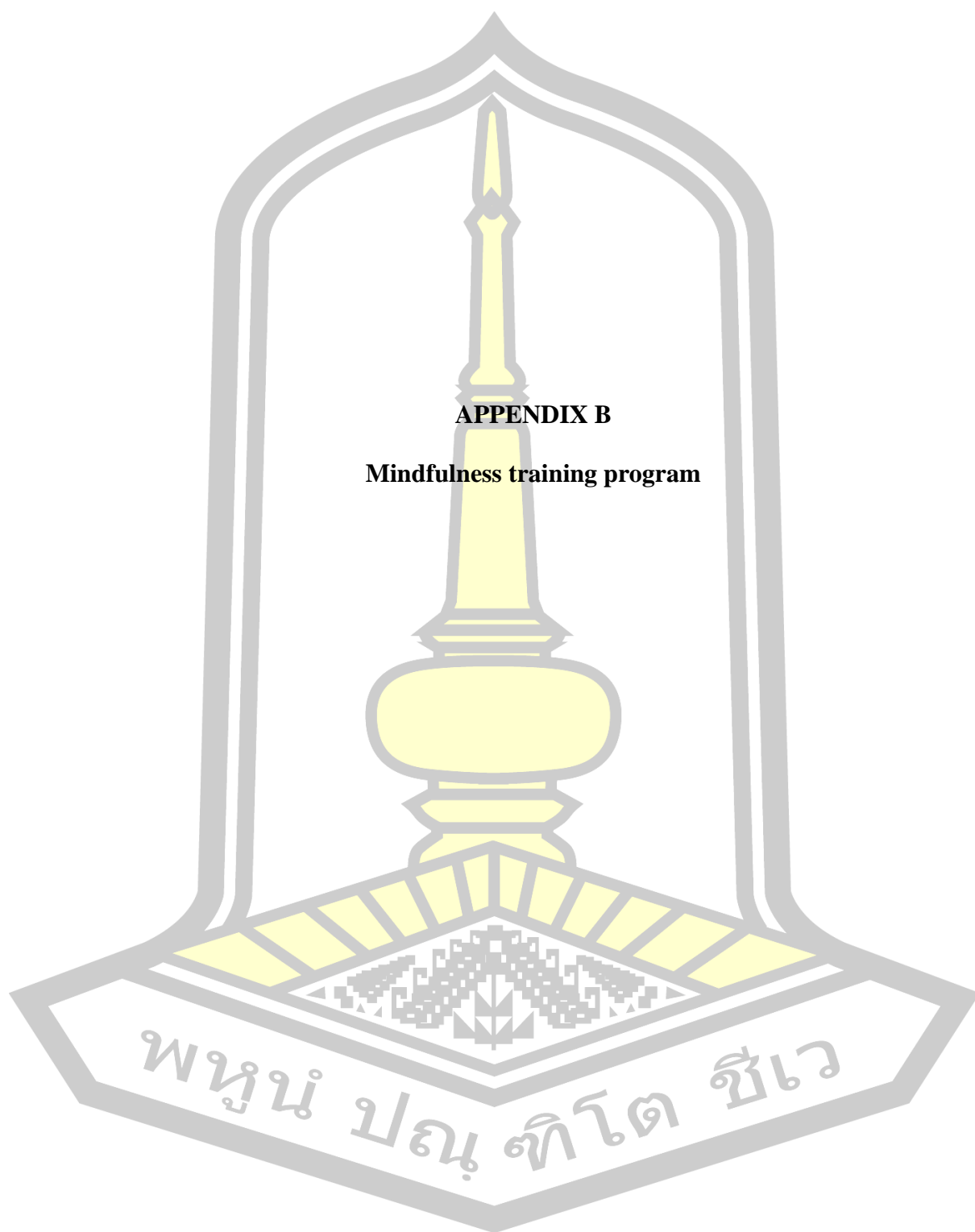
12. How would you compare yourself to the most confident athlete you know?
(Low Medium High)

Confidence in being able to succeed despite disadvantages is 1 2 3 4 5 6 7 8 9



13. How would you compare yourself to the most confident athlete you know?
(Low Medium High)

Confidence in being able to turn a weak point into a strong one and succeed in a
competition is 1 2 3 4 5 6 7 8 9







Mindfulness training program for 1-12 week

Train Process	Specific Actions	Times	Purpose	Specific Steps (Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.)	Picture
Warm-up (preparation phase)	Mindful meditation	2min	Get into mindfulness training quickly.	<ol style="list-style-type: none"> 1. Sit comfortably and adjust your breathing: 2. At the beginning, pay attention to your breathing. Take a few deep breaths and let your breathing flow naturally. Focusing on the sensations of exhaling and inhaling can also focus on the ups and downs of the abdomen. 3. Observational Thinking: Allow the mind to flow freely, but don't get caught up in it. When you notice thoughts coming up, don't force yourself to stop, but watch them produce and flow, and then turn your attention back to your breath or bodily sensations. 4. End slowly: After meditating for a while, slowly end the practice. Gently shake your body first, then slowly open your eyes. Take note to feel what you will be like after you finish meditating. 	
Mindfulness training phase I	Mindful jogging	5min	Focus on your breathing and feel the process of inhaling and exhaling.	<ol style="list-style-type: none"> 1. To begin, stand still and take a few deep breaths to develop mindfulness and focus on the sensation of breathing. 2. Then start running slowly, keeping a soothing pace and not rushing. Pay attention to the feeling of landing with each step, the ups and downs of your steps, and the posture of your body, 	


Mindfulness training program for 1-12 week (Cont.)

Train Process	Specific Actions	Times	Purpose	Specific Steps (Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.) and always be aware of your breathing. 3. Experience the impact of your surroundings on you. When thoughts come to mind, don't force them to stop, but gently bring your attention back to the feeling of breathing and running.	Picture
Mindfulness training phase I	Mindfulness Tai Chi	10min	Pay attention to the depth and rhythm of your breathing, and the feel of the air flowing through your nose or mouth.	<p>1. When entering the momentum of Tai Chi, the movements should be slow and steady, paying attention to every subtle change in the body.</p> <p>2. In the process of practicing, pay attention to the coordination of breathing and movement, pay attention to the coordinated movement of arms, body and legs, and the balance of the body. Stay focused and adjust the depth of your breath as each movement changes.</p> <p>3. During Tai Chi, pay attention to the comfort of the body and feel the stretching and relaxation of the muscles. When attention is distracted by the outside world, use mindfulness to bring it back into the practice of Tai Chi.</p>	



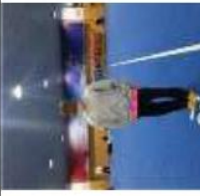
Mindfulness training program for 1-12 week (Cont.)

Train Process	Specific Actions	Times	Purpose	Specific Steps (Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.) 4.(Note: Since the subjects of this study are all competitive Tai Chi athletes, athletes can be allowed to choose their favorite moves for training)	Picture
Mindfulness training phase I	Mindfulness Tai Chi	10min	Pay attention to the depth and rhythm of your breathing, and the feel of the air flowing through your nose or mouth.		


Mindfulness training program for 1-12 week (Cont.)

Train Process	Specific Actions	Times	Purpose	Specific Steps (Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.)	Picture
Mindfulness training phase I					
	<p>Small mindfulness exercises (1. Mindful meditation, 2. Awareness of breathing, 3. Mindful body scan)</p>	5min	<p>Gradually shift your attention to the sensations in your body, starting at your head and working your way up to your feet. Pay attention to each part of your body and feel any possible tension, relaxation, or other sensations.</p>	<p>1. Sit comfortably and adjust your breathing. At first, pay attention to your breathing. Take a few deep breaths and let your breathing flow naturally. Focusing on the sensations of exhaling and inhaling can also focus on the ups and downs of the abdomen. 2. Observational Thinking: Allow the mind to flow freely, but don't get caught up in it. When you notice thoughts coming up, don't force yourself to stop, but watch them produce and flow, and then turn your attention back to your breath or bodily sensations.</p>	<p>Mindful meditation</p>



Mindfulness training program for 1-12 week (Cont.)

Train Process	Specific Actions	Times	Purpose	Specific Steps (Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.)	Picture
Mindfulness training phase I				<p>Be aware of the breath</p> <p>Start with a comfortable sitting position. Close your eyes, breathe slowly, and focus on your belly breathing.</p>	
				<p>Be aware of breathing</p> <p>Gradually shift your attention to sensations in different parts of your body, starting at the top of your head and gradually sweeping over your face, neck, shoulders, back, arms, fingers, chest, abdomen, buttocks, thighs, calves, ankles, and toes.</p>	
				<p>Mindful body scan</p> <p>1. The athlete stands in the starting position of Tai Chi with the legs slightly bent and the body relaxed. 2. Start breathing deeply and slowly, focusing on the process of breathing.</p>	


Mindfulness training program for 1-12 week (Cont.)

Train Process	Specific Actions	Purpose	Specific Steps	Picture
Mindfulness training phase II	Tai Chi special technical exercises	<p>Observe your current emotional state and accept your feelings without judgment.</p> <p>Pay attention to the physical manifestations of emotions, such as a racing heartbeat, muscle tension, etc.</p>	<p>(Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.)</p> <p>3. Next, gradually enter the basic movements of Tai Chi, such as rising, single whip, etc. In each movement, emphasis is placed on the softness and fluidity of the body, focusing on the coordination and coherence of the movements.</p> <p>4. Sense every subtle movement of your body through mindfulness, pay attention to the movement of your arms, legs, and torso to stay focused.</p> <p>5. In the practice of Tai Chi, pay attention to the movement of the mind to guide the internal qi. Channeling the breath through mindfulness allows the breath to form a flowing circulation in the body, strengthening the body's energy sensation.</p> <p>6. During each movement, maintain a movement that focuses on Qi to promote the inner balance of the body. During the practice, pay attention to the feedback from your body at all times. If you feel tight or uncomfortable, adjust your posture or movements to keep your body relaxed.</p>	


Mindfulness training program for 1-12 week (Cont.)

Train Process	Specific Actions	Times	Purpose	Specific Steps (Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.)	Picture
Mindfulness training phase II	Tai Chi special technical exercises	18min	Observe your current emotional state and accept your feelings without judgment. Pay attention to the physical manifestations of emotions, such as a racing heartbeat, muscle tension, etc.	<p>7. Mindfulness Tai Chi emphasizes the unity of consciousness and body, and through the practice of mindfulness, a state of inner peace, relaxation and concentration was cultivated. At the end, meditate and relax to feel the energy and comfort that comes out of the practice.</p> <p>8. Mindfulness Tai Chi not only helps to improve the flexibility and fitness of the body, but also cultivates the ability of mindfulness and concentration, and promotes the balance of body and mind.</p> <p>9. (Note: Since the subjects of this study are all competitive Tai Chi athletes, athletes can be allowed to choose their favorite moves for training)</p>	
				<p>1. Get started</p> <p>(1) First of all, stand in a stretched, natural standing posture with your legs slightly apart and your toes slightly turned outward to form a comfortable position. Relax your whole body and take care to maintain good body symmetry.</p>	

Mindfulness training program for 1-12 week (Cont.)

Train Process	Specific Actions	Times	Purpose	Specific Steps	Picture
Mindfulness training phase II	Tai Chi special technical exercises	18min	<p>Observe your current emotional state and accept your feelings without judgment.</p> <p>Pay attention to the physical manifestations of emotions, such as a racing heartbeat, muscle tension, etc.</p>	<p>(Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.)</p> <p>(2) Slowly sink the weight of your body between your legs to form an even standing state. In this process, the body's center of gravity changes through mindfulness, focusing on every subtle movement. With a deep breath, place your hands naturally at your sides, palms slightly inward. The fingers are gently and naturally slightly opened, and the arms and shoulders are relaxed.</p> <p>(3) At the same time, the head was slightly tilted and the eyes are fixed ahead. Through mindfulness guidance, focus on the process of breathing, feel the flow of air and the sense of tranquility that comes with breathing.</p> <p>. Next, focus mindfulness on the spine and perceive the vertical extension of the spine so that the body appears straight and not stiff. Notice that the waist sinks slightly, creating a feeling of falling hips.</p>	


Mindfulness training program for 1-12 week (Cont.)

Train Process	Specific Actions	Times	Purpose	Specific Steps (Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.) 2. In-situ cloud hand	Picture
Mindfulness training phase II				<p>(1) At the beginning, the body stands in the basic position of Tai Chi, the waist is slightly lowered, and the legs and knees are slightly bent to maintain the stretch and balance of the body.</p> <p>(2) First of all, the right hand hangs down naturally, the palm was inward, and the fingers are slightly opened. The left hand is naturally raised from the side of the body, forming a horizontal curve. In this process, the movements of the arms need to be natural and smooth, and the movement trajectory of the hands is perceived through mindfulness. With deep breathing, through mindfulness guidance, feel your body's center of gravity shift. Bend your right leg slightly, and turn your waist and hip slightly to the right to create a natural spiral of your body.</p> <p>(3) Then, the left hand was naturally lowered from above, and the right hand is naturally raised from below. In this process, hand movements need to be comfortable and natural, while focusing on arm and body coordination. In the process of movement,</p>	


Mindfulness training program for 1-12 week (Cont.)

Train Process	Specific Actions	Times	Purpose	Specific Steps	Picture
Mindfulness training phase II				<p>(Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.)</p> <p>(3) With deep breathing, feel the shift in the body's center of gravity through mindfulness guidance. The left leg was slightly bent and the waist and hip are slightly turned to the left to form a slight spiral motion. In this process, the guidance of mindfulness makes every subtle movement of the body more natural and fluid.</p> <p>(4) Next, the right hand rotates naturally, with the palm facing outward, forming a movement of holding the bird's tail. In this process, the movement of the arm needs to be perceived in every detail through mindfulness, focusing on the softness and coordination of the hand.</p> <p>(5) In the progress of the movement, through the guidance of mindfulness, pay attention to the driving of the waist and the rotation of the hips. The whole process of holding the bird's tail on the left side was guided by mindfulness, emphasizing the coordination, fluidity and softness of the body.</p>	

Mindfulness training program for 1-12 week (Cont.)

Train Process	Specific Actions	Times	Purpose	Specific Steps (Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.) pay attention to the driving of the waist and the rotation of the hips, and through the guidance of mindfulness, the whole movement presents a soft and coherent state. (4) The movements of the cloud hand emphasize the use of intention to guide qi and qi to guide movement, and guide attention to focus on each link of the action through mindfulness.	Picture
Mindfulness training phase II				<p>3. Hold the bird's tail on the left</p> <p>(1) At the beginning, the body is in the basic position of Tai Chi, the legs and knees are slightly bent, the center of gravity was sinking, and the balance and stretch of the body are maintained through mindfulness guidance.</p> <p>(2) When starting the movement, guide with mindfulness, the right hand naturally droops, and the palm is inward, forming a state of natural fall. The left hand is raised from the side of the body, and the palm of the hand presents a horizontal curve. The movement of the arm requires natural and fluid movement through mindfulness perception.</p>	

Mindfulness training program for 1-12 week (Cont.)

Train Process	Specific Actions	Times	Purpose	Specific Steps (Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.) Tai Chi emphasizes the use of mind to guide qi and qi to guide movement, and the guidance of mindfulness makes the whole movement more focused and internalized.	Picture
Mindfulness training phase II	Tai Chi Tactical Practice	18min	<p>Observe your thoughts without getting caught up in them, just watch them flow.</p> <p>Keep your attention in the present moment rather than thoughts of the past or future.</p>	<p>4. Open and close hands</p> <p>(1) Starting position: The starting position of opening and closing hands is usually the basic position of Tai Chi. The body is naturally upright, the feet and knees are slightly bent, the feet are slightly apart, and the legs form a stretched and stable foundation. Through mindfulness guidance, feel where your body stands and where you are focused.</p> <p>(2) Opening action: At the beginning, guided by mindfulness, the right hand naturally droops, and the palm presents a natural falling state. At the same time, the left hand should be raised from the side of the body, and the movement of the arm should be natural and gentle, focusing on the guidance of mindfulness, so that every movement appears calm and smooth.</p>	

Mindfulness training program for 1-12 week (Cont.)

Train Process	Specific Actions	Times	Purpose	Specific Steps (Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.)	Picture
Mindfulness training phase II	Tai Chi Tactical Practice	18min	<p>Observe your thoughts without getting caught up in them, just watch them flow.</p> <p>Keep your attention in the present moment rather than thoughts of the past or future.</p>	<p>(3) Body rotation action: With deep breathing, you can sense the shift of the body's center of gravity through mindfulness. The body was slightly turned to the right and the right leg was slightly bent to form a slight spiral motion. In this process, the guidance of mindfulness makes every subtle movement of the body more natural and fluid.</p> <p>(4) Hand closing: In the process of opening the hand, through the guidance of mindfulness, the left hand naturally rotates, and the palm of the hand is in an outward state, forming the action of closing the hand. Arm movements should be natural and coordinated, focusing on the guidance of mindfulness and keeping movements gentle.</p> <p>(5) Overall coordination: In the whole process of opening and closing hands, the guidance of mindfulness makes every part of the body participate in the movements in a coordinated and orderly manner. Special attention is paid to the driving of the waist and the rotation of the hips, and through the guidance of mindfulness, the movements are more internalized and focused.</p>	


Mindfulness training program for 1-12 week (Cont.)

Train Process	Specific Actions	Times	Purpose	Specific Steps (Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.)	Picture
Mindfulness training phase II	Tai Chi Tactical Practice	18min	<p>Observe your thoughts without getting caught up in them, just watch them flow.</p> <p>Keep your attention in the present moment rather than thoughts of the past or future.</p>	<p>(6) Ideological penetration: In the process of practicing opening and closing hands, it was emphasized that through the guidance of mindfulness, the inner mind runs through the whole movement. Tai Chi emphasizes the use of intention to guide qi and qi to guide movement, and the guidance of mindfulness makes the whole movement more focused, internalized and smooth.</p> <p>(1) Mindfulness Tai Chi tactical practice focuses on the application skills of Tai Chi in actual combat, which is different from special technical practice.</p> <p>(2) First, stand in the starting posture of Tai Chi and enter a meditative state by taking deep breaths to adjust your mindset and cultivate mindfulness. Next, focus on the basic movements of the stance and body, such as rising, stepping, single whip, etc., but emphasize the actual tactical meaning behind each movement.</p> <p>(3) Perceive every subtle change in the body through mindfulness, pay attention to gestures, leg movements, and torso coordination to ensure the practicality of movements.</p>	


Mindfulness training program for 1-12 week (Cont.)

Train Process	Specific Actions	Times	Purpose	Specific Steps	Picture
Mindfulness training phase II	Tai Chi Tactical Practice	18min	<p>Observe your thoughts without getting caught up in them, just watch them flow.</p> <p>Keep your attention in the present moment rather than thoughts of the past or future.</p>	<p>(Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.)</p> <p>(4) In the tactical exercises, various offensive and defensive scenarios are simulated, emphasizing the practical application skills of Tai Chi. Trainers need to pay attention to the choice of position, learn practical tactical actions such as dodging, shifting the center of gravity, and responding to attacks, and guide the flow of internal qi through mindfulness to improve the body's strain and reaction speed.</p> <p>(5) Practitioners should stay focused at all times and perceive changes in their surroundings through mindfulness, as well as potential threats. The training emphasizes dealing with multiple opponents and cultivating multi-faceted tactical adaptability.</p> <p>(6) At the end, perform meditation and relaxation exercises to calm the mind and body and feel the inner energy generated throughout the practice.</p> <p>Mindfulness Tai Chi tactical practice aims to cultivate reactions and skills in actual combat, focusing on the practical application of mindfulness to make Tai Chi more practical.</p>	


Mindfulness training program for 1-12 week (Cont.)

Train Process	Specific Actions	Times	Purpose	Specific Steps (Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.)	Picture
Mindfulness training phase II	Tai Chi Tactical Practice	18min	<p>Observe your thoughts without getting caught up in them, just watch them flow.</p> <p>Keep your attention in the present moment rather than thoughts of the past or future.</p>	<p>1. Hold the sparrow's tail on your right hand</p> <p>(1) Starting position: At the beginning, stand in the basic position of Tai Chi, stand naturally upright, slightly bend your knees, and spread your feet slightly apart, so as to maintain a stretched and stable foundation. Through mindfulness guidance, feel where your body stands and where you are focused.</p> <p>(2) Starting action: In the starting action of the right bird's tail, the right hand was naturally raised from the bottom, and the palm presents a natural rising state. At the same time, the left hand was moved down from the side of the body, and the movement of the arm should be natural and gentle, focusing on the guidance of mindfulness, so that every movement appears calm and smooth.</p> <p>(3) Body Rotation: With deep breathing, feel the shift of the body's center of gravity through mindfulness guidance. The body naturally turns to the right, and the right leg was slightly bent to form a natural and comfortable turning motion. The guidance of mindfulness makes every subtle movement of the body more natural and fluid.</p>	


Mindfulness training program for 1-12 week (Cont.)

Train Process	Specific Actions	Times	Purpose	Specific Steps (Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.)	Picture
Mindfulness training phase II	Tai Chi Tactical Practice	18min	<p>Observe your thoughts without getting caught up in them, just watch them flow.</p> <p>Keep your attention in the present moment rather than thoughts of the past or future.</p>	<p>2. Single whip</p> <p>(1) Starting position: At the beginning, standing in the basic position of Tai Chi, the body is naturally upright, the feet and knees are slightly bent, and the feet are slightly apart, so as to maintain a stretched and stable foundation. Through mindfulness guidance, feel where your body stands and where you are focused.</p> <p>(2) Starting action: The starting action of a single whip can be converted from other actions, such as grabbing the tail of a bird. In the starting movement, one hand moves naturally down along one side of the body, forming a downward motion, while the other hand is naturally raised upward, forming a stretched and smooth state.</p> <p>(3) Body Rotation: With deep breathing, feel the shift of the body's center of gravity through mindfulness guidance. The body naturally rotates to one side, forming a half-body rotation.</p>	


Mindfulness training program for 1-12 week (Cont.)

Train Process	Specific Actions	Times	Purpose	Specific Steps (Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.)	Picture
Mindfulness training phase II	Tai Chi Tactical Practice	18min	<p>Observe your thoughts without getting caught up in them, just watch them flow.</p> <p>Keep your attention in the present moment rather than thoughts of the past or future.</p>	<p>(4) Tail grabbing action: In the process of body rotation, the right hand continues to be raised to form a kind of action of grabbing the tail of the bird. The right arm is naturally extended, focusing on mindfulness guidance, making the movements appear soft and natural.</p> <p>(5) Left hand movement: At the same time, the left hand is raised from the side of the body to form a natural upward movement. The movement of the left arm should be coordinated and smooth, focusing on the guidance of mindfulness and keeping the movements gentle.</p> <p>(6) Body coordination: In the whole process of holding the bird's tail on the right, the guidance of mindfulness makes every part of the body participate in the movement in a coordinated and orderly manner. Special attention is paid to the driving of the waist and the rotation of the hips, and through the guidance of mindfulness, the movements are more internalized and focused.</p>	


Mindfulness training program for 1-12 week (Cont.)

Train Process	Specific Actions	Time s	Purpose	Specific Steps (Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.)	Picture
Mindfulness training phase II	Tai Chi Tactical Practice	18min	Observe your thoughts without getting caught up in them, just watch them flow. Keep your attention in the present moment rather than thoughts of the past or future.	<p>The coordinated rotation of the waist and hips is an important part of the single whip movement.</p> <p>(4) Hand movement: In the process of body rotation, the hand presents a state of natural downward pressure, forming the characteristic action of a single whip. The movement of the arms should be natural and gentle, focusing on the guidance of mindfulness, so that every movement seems calm and smooth.</p> <p>(5) Eye gaze: In the action of single whip, the eye can focus on the movements of the hands, and maintain the coordination between the direction of gaze and the movements of the hands. The gaze of the eye can help keep the movements balanced and fluid.</p> <p>(6) Overall coordination: In the whole process of single whipping, the guidance of mindfulness makes every part of the body participate in the action in a coordinated and orderly manner. Special attention is paid to the driving of the waist and</p>	


Mindfulness training program for 1-12 week (Cont.)

Train Process	Specific Actions	Times	Purpose	Specific Steps (Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.)	Picture
Mindfulness training phase II	Tai Chi Tactical Practice	18min	<p>Observe your thoughts without getting caught up in them, just watch them flow.</p> <p>Keep your attention in the present moment rather than thoughts of the past or future.</p>	<p>the rotation of the hips, and through the guidance of mindfulness, the movements are more internalized and focused.</p> <p>3. Cross hand</p> <p>(1) Starting position: Before starting the cross-hand movement, stand in the basic position of Tai Chi, stand upright, feet and knees slightly bent, and keep your feet slightly apart, maintaining a stretched and stable foundation. Through mindfulness guidance, feel where your body stands and where you are focused.</p> <p>(2) Hand movements: The hand movements of the cross hand are its unique feature. Both hands are spread out to the sides at the same time, forming a crossed gesture, as if opening a virtual door. The movements of the arms should be kept soft and stretched, and the guidance of mindfulness should be emphasized, so that every movement appears calm and smooth.</p>	

Mindfulness training program for 1-12 week (Cont.)

Train Process	Specific Actions	Times	Purpose	Specific Steps	Picture
Mindfulness training phase II	Tai Chi Tactical Practice	18min	<p>Observe your thoughts without getting caught up in them, just watch them flow.</p> <p>Keep your attention in the present moment rather than thoughts of the past or future.</p>	<p>(Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.)</p> <p>(3)Body rotation: With deep breathing, use mindfulness to guide the body's center of gravity. The body naturally rotates to one side, allowing the cross hand movement to unfold. The coordinated rotation of the waist and hips was an important part of the cross hand movement.</p> <p>(4) Eye gaze: In the action of the cross hand, the eye can watch the movement of the two hands, and maintain the coordination between the direction of gaze and the hand movements. The gaze of the eye can help keep the movements balanced and fluid.</p> <p>(5) Overall coordination: In the whole process of the cross hand, the guidance of mindfulness makes every part of the body participate in the movement in a coordinated and orderly manner. Special attention is paid to the driving of the waist and the rotation of the hips, and through the guidance of mindfulness, the movements are more internalized and focused.</p>	


Mindfulness training program for 1-12 week (Cont.)

Train Process	Specific Actions	Times	Purpose	Specific Steps (Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.)	Picture
Mindfulness training phase II	Tai Chi Tactical Practice	18min	<p>Observe your thoughts without getting caught up in them, just watch them flow.</p> <p>Keep your attention in the present moment rather than thoughts of the past or future.</p>	<p>(6) Mind penetration: In the process of practicing the cross hand, it is emphasized that through the guidance of mindfulness, the inner mind runs through the whole action. Tai Chi emphasizes the use of intention to guide qi and qi to guide movement, and the guidance of mindfulness makes the whole movement more focused, internalized and smooth.</p> <p>4. Closing trend</p> <p>(1) Starting position: Closing posture is usually the ending movement of the whole Tai Chi routine, so the starting position is completed after the previous movement. The body maintains the basic Tai Chi stance, with the feet slightly apart, the knees slightly bent, and the body naturally upright.</p> <p>(2) Hand movement: The hand movement of closing posture is an integration and cohesion movement. Usually, the hands will slowly be brought to the chest or abdomen, showing a state of gathering. The arm movement should be kept soft and smooth. Through the guidance of mindfulness, feel the process of the hands gathering.</p>	


Mindfulness training program for 1-12 week (Cont.)

Train Process	Specific Actions	Times	Purpose	Specific Steps	Picture
Mindfulness training phase II	Tai Chi Tactical Practice	18min	<p>Observe your thoughts without getting caught up in them, just watch them flow.</p> <p>Keep your attention in the present moment rather than thoughts of the past or future.</p>	<p>(Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.)</p> <p>movement, making it more profound and meaningful.</p> <p>(6) Overall balance: The closing posture was the end of the Tai Chi routine, so the whole movement must be balanced. Through mindfulness guidance, keep the body vertical and stable, so that the closing posture is not only complete in external form, but also harmonious in internal feelings.</p> <p>(7) Ending movement: The closing posture is usually the last movement of the Tai Chi routine, marking the end of the entire routine.</p> <p>Therefore, it was necessary to maintain stability at the end, and through mindfulness guidance, the movement gradually pauses in a natural and unintentional state, completing the entire routine without leaving any trace.</p>	


Mindfulness training program for 1-12 week (Cont.)

Train Process	Specific Actions	Times	Purpose	Specific Steps (Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.)	Picture
Mindfulness training phase II	Tai Chi Tactical Practice	18min	<p>Observe your thoughts without getting caught up in them, just watch them flow.</p> <p>Keep your attention in the present moment rather than thoughts of the past or future.</p>	<p>(3) Coordinated movement of the body: Closing the posture is not just a simple hand movement, but requires coordinated movement of the whole body. Through mindfulness guidance, the body naturally cooperates with the closing movement of the hands, and the waist, hips, knees, etc. are all involved, forming a coordinated movement of the whole body.</p> <p>(4) Breathing guidance: In the process of closing the posture, breathing plays an important guiding role. Through mindfulness guidance, breathing should be kept steady and deep, coordinated with the movement of the hands. Deep breathing helps to focus attention and make the entire closing movement more internalized.</p> <p>(5) Guidance of mind: During the process of closing the posture, pay attention to guiding the inner mind through the process. The guidance of mind makes the closing posture not only a movement, but also an inner experience and concentration. Mindfulness guidance helps to improve the inner quality of the</p>	


Mindfulness training program for 1-12 week (Cont.)

Train Process	Specific Actions	Times	Purpose	Specific Steps (Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.)	Picture
Mindfulness training phase II	Practical practice of Tai Chi	18min	Develop an attitude of acceptance and non-judgment of any feeling, thought or emotion. If negative emotions or thoughts arise, try to approach them with tolerance and kindness.	<p>(1) When athletes conduct actual combat training, the preparation was the same as the first two items, but they should focus on positioning and basic body movements in actual combat exercises, simulate various offensive and defensive scenarios, and emphasize the practical application of Tai Chi skills.</p> <p>(1) Practitioners need to pay attention to the choice of stance, learn practical tactical movements such as dodging, shifting the center of gravity, and responding to attacks, and guide the flow of internal energy through mindfulness to improve the body's adaptability and reaction speed. During the practice, the trainee should always stay focused and perceive the changes in the surrounding environment and potential threats through mindfulness. Emphasize the situation of dealing with multiple opponents and cultivate multi-faceted tactical adaptability.</p> <p>(3) At the end, meditation and relaxation exercises are performed to calm the body and mind and feel the inner energy generated</p>	


Mindfulness training program for 1-12 week (Cont.)

Train Process	Specific Actions	Times	Purpose	Specific Steps	Picture
Mindfulness training phase II	Practical practice of Tai Chi	18min	Develop an attitude of acceptance and non-judgment of any feeling, thought or emotion. If negative emotions or thoughts arise, try to approach them with tolerance and kindness.	(Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.) throughout the practice. Mindful Tai Chi practical exercises are designed to combine Tai Chi theory with actual tactics and make Tai Chi more practical through the guidance of mindfulness.	


Mindfulness training program for 1-12 week (Cont.)

Train Process	Specific Actions	Times	Purpose	Specific Steps (Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.)	Picture
Mindfulness training phase II	Practical practice of Tai Chi	18min	Develop an attitude of acceptance and non-judgment of any feeling, thought or emotion. If negative emotions or thoughts arise, try to approach them with tolerance and kindness.		


Mindfulness training program for 1-12 week (Cont.)

Train Process	Specific Actions	Times	Purpose	Specific Steps (Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.)	Picture
Mindfulness training phase II	Practical practice of Tai Chi	18min	Develop an attitude of acceptance and non-judgment of any feeling, thought or emotion. If negative emotions or thoughts arise, try to approach them with tolerance and kindness.		

Mindfulness training program for 1-12 week (Cont.)

Train Process	Specific Actions	Times	Purpose	Specific Steps	Picture
Ending stage of mindfulness training	Mindfulness relaxation	14min	<p>The ultimate goal of strengthening mindfulness training was to decentralize. Do not evaluate the current experience, accept everything, including emotions and feelings. Cultivate a tolerant, accepting and non-attached mentality, and reduce excessive judgment of yourself.</p>	<p>(Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.)</p> <p>(1) After training, the athlete gradually focuses on various parts of the body, starting from the head and gradually scanning to the feet.</p> <p>(2) During the scanning process, use mindfulness to perceive the tension and relaxation of each part, without judging, just observing. If you find a tense part, try to relax it through deep breathing and mindfulness guidance.</p> <p>(3) As the body gradually relaxes, practitioners can try to let go of excessive distractions to their thinking and focus on the current feelings and experiences.</p> <p>(4) Through mindfulness guidance, observe the subtle changes in the body and gradually calm the mind. Progressive muscle relaxation can be used to accelerate the relaxation process of the whole body by consciously contracting and relaxing different muscle groups.</p>	

Mindfulness training program for 1-12 week (Cont.)

Train Process	Specific Actions	Times	Purpose	Specific Steps (Athletes are in a quiet and comfortable place. This study chose an enclosed sports venue to avoid being disturbed.)	Picture
Ending stage of mindfulness training	Mindfulness relaxation	14min	<p>The ultimate goal of strengthening mindfulness training was to decentralize.</p> <p>Do not evaluate the current experience, accept everything, including emotions and feelings.</p> <p>Cultivate a tolerant, accepting and non-attached mentality, and reduce excessive judgment of yourself.</p>	<p>At the same time, through mindfulness guidance, be aware of the pleasure and comfort brought by the relaxed state.</p> <p>(5)Finally, gradually end the practice in a relaxed state, slowly open your eyes, and return to the present moment. Mindfulness relaxation practice helps reduce physical tension, calm the mind, and improve physical and mental health.</p>	



APPENDIX C

IOC Expert Scoring And Evaluation Form



FACULTY OF EDUCATION
MAHASARAKHAM UNIVERSITY

79/2 Muang, Maha Sarakham,
44000, THAILAND
Tel/fax +66 43 713 174
Email: da.edu@msu.ac.th

Center for International Affairs

MHERSI No. 0605.5 (2) / CL757

Date: March 26, 2024

To: Whom it May Concern

Physical Education College of Zhengzhou University

Subject: Data Collection Permission Request

Our student, **Ms. Ruiting Su**, student number **64010564020**, majoring in the Ph.D. Exercise and Sports Science program is currently undertaking a research project under the guidance of **Dr. Wannaporn Sumranpat Brady**.

To ensure the success and quality of this project, we are seeking your permission to allow our student to process data collection within your institution.

The details of the data collection are as follows:

Thesis title: " **Mindfulness training on Psychological Characteristics of Pre-Match Competitive Tai Chi Athletes** "

The period of data collection: **01/04/2024 to 23/06/2024**

We believe that your institution provides a valuable environment and resources that are essential for the successful execution of this research. The data collection process will be carried out diligently and with the utmost respect for your institution's policies and procedures. We acknowledge that the student has made the necessary preparations, including obtaining the Thesis title approval from our institution.

Should you require any further information or clarification regarding this permission, please feel free to contact us by email.

Yours sincerely,

Assoc. Prof. Chowwalit Chookhampaeng

Dean, Faculty of Education,
Maharakham University



FACULTY OF EDUCATION
MAHASARAKHAM UNIVERSITY

79/2 Muang, Maha Sarakham,
44000, THAILAND
Tel/fax +66 43 713 174
Email: cia.edu@msu.ac.th

Center for International Affairs

MHERSI No. 0605.5 (1) /CL758

Date: March 26, 2024

To: **Dr. Bin Geng**
Professor,
Physical Education College of Zhengzhou University,

Subject: **Thesis Reviewer Invitation**

Our student, **Ms. Ruiting Su**, student ID **64010564020**, majoring in the Ph. D. Exercise and Sports Science program is currently undertaking a research project titled "**Mindfulness training on Psychological Characteristics of Pre-Match Competitive Tai Chi Athletes**" under the guidance of **Dr. Wannaporn Sumranpat Brady**.

To ensure the successful execution and the highest quality of this research project, we are seeking your valuable expertise and experience. Therefore, I am delighted to extend a formal invitation to you to serve as a reviewer for the research instrument designed for this thesis project.

Your participation in this academic endeavor is highly valued and appreciated. Should you require any further information or have questions regarding this invitation, please do not hesitate to contact us by email.

Yours sincerely,

Assoc. Prof. Chowwalit Chookhampaeng
Dean, Faculty of Education,
Maharakham University



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79/2 Muang, Maha Sarakham,
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Tel/fax +66 43 713 174
Email: cia.edu@msu.ac.th

Center for International Affairs

MHERSI No. 0605.5 (1) /CL758

Date: March 26, 2024

To: **Dr.Chunyang Guo**
Professor, Dean
Henan University

Subject: **Thesis Reviewer Invitation**

Our student, **Ms.Ruiting Su, student ID 64010564020**, majoring in the Ph. D. Exercise and Sports Science program is currently undertaking a research project titled "**Mindfulness training on Psychological Characteristics of Pre-Match Competitive Tai Chi Athletes**" under the guidance of **Dr. Wannaporn Sumranpat Brady**.

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Yours sincerely,

Assoc. Prof. Chowwalit Chookhampaeng
Dean, Faculty of Education,
Maharakham University



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MAHASARAKHAM UNIVERSITY

79/2 Muang, Maha Sarakham,
44000, THAILAND
Tel/fax +66 43 713 174
Email: cia.edu@msu.ac.th

Center for International Affairs

MHERSI No. 0605.5 (1) /CL758

Date: March 26, 2024

To: **Dr.Yuxi Hu**
Professor/Dean,
Physical Education College of Zhengzhou University

Subject: **Thesis Reviewer Invitation**

Our student, **Ms.Ruiting Su**, student ID **64010564020**, majoring in the Ph. D. Exercise and Sports Science program is currently undertaking a research project titled "**Mindfulness training on Psychological Characteristics of Pre-Match Competitive Tai Chi Athletes**" under the guidance of **Dr. Wannaporn Sumranpat Brady**.

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Yours sincerely,

Assoc. Prof. Chowwalit Chookhampaeng
Dean, Faculty of Education,
Maharakham University



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Tel/fax +66 43 713 174
Email: cia.edu@msu.ac.th

Center for International Affairs

MHERSI No. 0605.5 (1) /CL758

Date: March 26, 2024

To: **Dr. Hao Hong**
Professor, Dean
Henan University

Subject: **Thesis Reviewer Invitation**

Our student, **Ms.Ruiting Su**, student ID **64010564020**, majoring in the Ph. D. Exercise and Sports Science program is currently undertaking a research project titled "**Mindfulness training on Psychological Characteristics of Pre-Match Competitive Tai Chi Athletes**" under the guidance of **Dr. Wannaporn Sumranpat Brady**.

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Your participation in this academic endeavor is highly valued and appreciated. Should you require any further information or have questions regarding this invitation, please do not hesitate to contact us by email.

Yours sincerely,

Assoc. Prof. Chowwalit Chookhampaeng
Dean, Faculty of Education,
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MAHASARAKHAM UNIVERSITY

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Email: cia.edu@msu.ac.th

Center for International Affairs

MHERSI No. 0605.5 (1) /CL758

Date: March 26, 2024

To: **Professor Nana Chai**
Professor/ Department Director,
Zhengzhou College of Finance and Economics

Subject: **Thesis Reviewer Invitation**

Our student, **Ms.Ruiting Su**, student ID **64010564020**, majoring in the Ph. D. Exercise and Sports Science program is currently undertaking a research project titled "**Mindfulness training on Psychological Characteristics of Pre-Match Competitive Tai Chi Athletes**" under the guidance of **Dr. Wannaporn Sumranpat Brady**.

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Your participation in this academic endeavor is highly valued and appreciated. Should you require any further information or have questions regarding this invitation, please do not hesitate to contact us by email.

Yours sincerely,

Assoc. Prof. Chowwalit Chookhampaeng
Dean, Faculty of Education,
Maharakham University

The result of the analysis is to find the expert consistency index

In this study, the purpose is to study the effect of mindfulness training program on the pre-match psychological characteristics of competitive Tai Chi athletes using mindfulness training. After 12 weeks of training, the experts considered consistency. The connection score of each question is as follows:

If it is considered appropriate and consistent, the score is +1

When it is uncertain whether it is appropriate or consistent, the score is: 0

When it is considered inappropriate and inconsistent, the score is -1.

The tools are appropriate and consistent, and there is confidence that they can be used according to the standards.

Questions with IOC values of 0.50-1.00 have usable accuracy values.

Questions with IOC values below 0.50 must be improved and are not valid.

Then the obtained scores were used to find the IOC compliance index, and the program has a value of 0.05 or higher, so it can be used for testing.

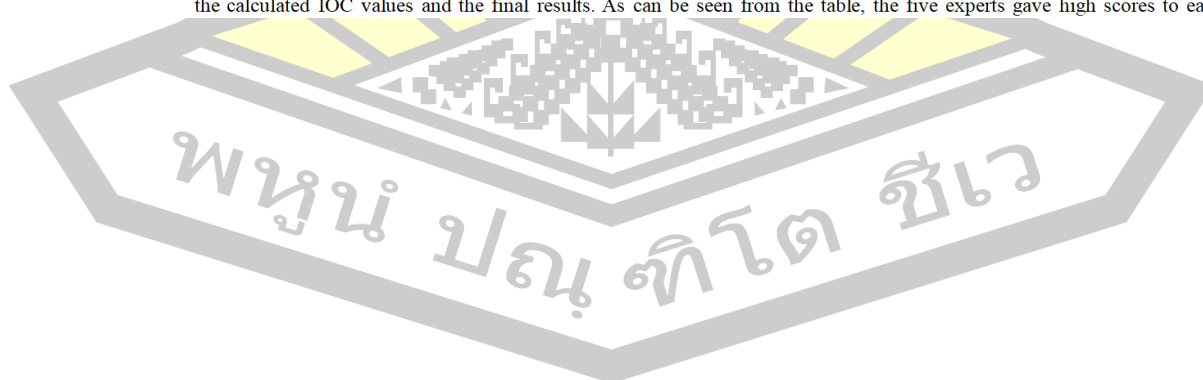
The table shows the content validity values of the experts considering consistency, evaluating mindfulness training venues and training programs.

Order	Evaluation Project	Project Description	Expert Rating					$\sum R$	$IOC = \sum \frac{R}{N}$	result
			Expert 1	Expert 2	Expert 3	Expert 4	Expert 5			
1	Training Environment	In the indoor martial arts hall of the School of Physical Education of Zhengzhou University, soothing light music is played during training and the temperature is maintained at 25°C.	1	1	1	1	1	5	1	Available
2	Training	12 weeks	1	1	1	1	1	5	1	Available

	duration									
3	Training frequency	once a week	1	0.9	0.8	0.7	1	4.4	0.88	Available
4	Training duration	90 minutes/each time	0.8	1	0.9	1	0.8	4.5	0.9	Available
5	Warm up (preparation phase)	Mindfulness Meditation	0.9	0.9	0.9	0.9	0.9	4.5	0.9	Available
	Mindfulness training phase 1	1. Mindful jogging 2. Mindful Tai Chi 3. Mindful exercises 3.1. Mindful meditation 3.2. Breathing awareness	1	1	1	1	1	5	1	Available

		3.3 Mindful body scan								
	Mindfulness training phase 2	1. Tai Chi special techniques 2. Tai Chi tactical practice 3. Tai Chi combat practice	0.9	0.9	1	1	0.9	4.7	0.94	Available
	End of mindfulness training	1. Mindful meditation 2. Breathing awareness 3. Mindful body scan	0.9	0.9	0.9	0.9	0.9	4.5	0.9	Available
All data analysis results									0.94	Available

The evaluation table shows the scores of the five experts on each stage of the mindfulness training program, as well as the calculated IOC values and the final results. As can be seen from the table, the five experts gave high scores to each



evaluation item, ranging from 0.8 to 1, indicating that the evaluation of the project was high. The final calculated IOC values were all greater than or equal to 0.9, indicating that all items were "usable".

The five experts scored the training environment as 1, 1, 1, 1 and 1, with a total of 5, an IOC value of 1, and the final result was "available". This shows that the five experts unanimously believe that the training environment meets the requirements and can provide good training conditions for competitive Tai Chi athletes. The five experts scored the training duration and frequency as 1, 1, 1, 1 and 1, with a total of 5, an IOC value of 1, and the final result was "available". This shows that the five experts unanimously believe that the training duration and frequency are reasonable, which can enable competitive Tai Chi athletes to gradually master mindfulness skills and form good training habits. The five experts scored the warm-up stage as 1, 0.9, 0.8, 1 and 0.7, with a total of 4.4, an IOC value of 0.88, and the final result was "available". This shows that the five experts have a relatively consistent evaluation of the warm-up stage and believe that the warm-up stage can effectively help competitive Tai Chi athletes relax their bodies and minds and prepare for subsequent training.

The five experts scored the first phase of mindfulness training as 0.9, 0.8, 0.9, 0.8 and 0.9, respectively, with a total of 4.3, an IOC value of 0.86, and a final result of "usable". This shows that the five experts' evaluation of the first phase of mindfulness training is relatively consistent, and they believe that the training content of this phase can effectively cultivate the body awareness of competitive Tai Chi athletes. The five experts scored the second phase of mindfulness training as 0.9, 0.9, 0.9, 0.9 and 0.9, respectively, with a total of 4.5, an IOC value of 0.9, and a final result of "usable". This shows that the five experts' evaluation of the second phase of mindfulness training is consistent, and they believe that the training of this phase can effectively integrate mindfulness skills into the actual application of Tai Chi. The five experts scored the final phase of mindfulness training as 1, 1, 1, 1 and 1, respectively, with a total of 5, an IOC value of 1, and a final result of "usable". This indicates that the five experts unanimously believe that the final stage of mindfulness training can effectively help competitive Tai Chi athletes consolidate the mindfulness skills they have learned before. The five experts scored the first stage of mindfulness training as 1, 1, 1, 1 and 1, with a total of 5, an IOC value of 1, and the final result is "usable". This indicates that the five experts unanimously believe that the first stage of mindfulness training can effectively cultivate competitive Tai Chi athletes' awareness of the body. The five experts scored the second stage of mindfulness training as 1, 1, 1, 1 and 1, with a total of 5, an IOC value of 1, and the final result is "usable". This indicates that the five experts unanimously believe that the second stage of mindfulness training can effectively integrate mindfulness skills into the actual

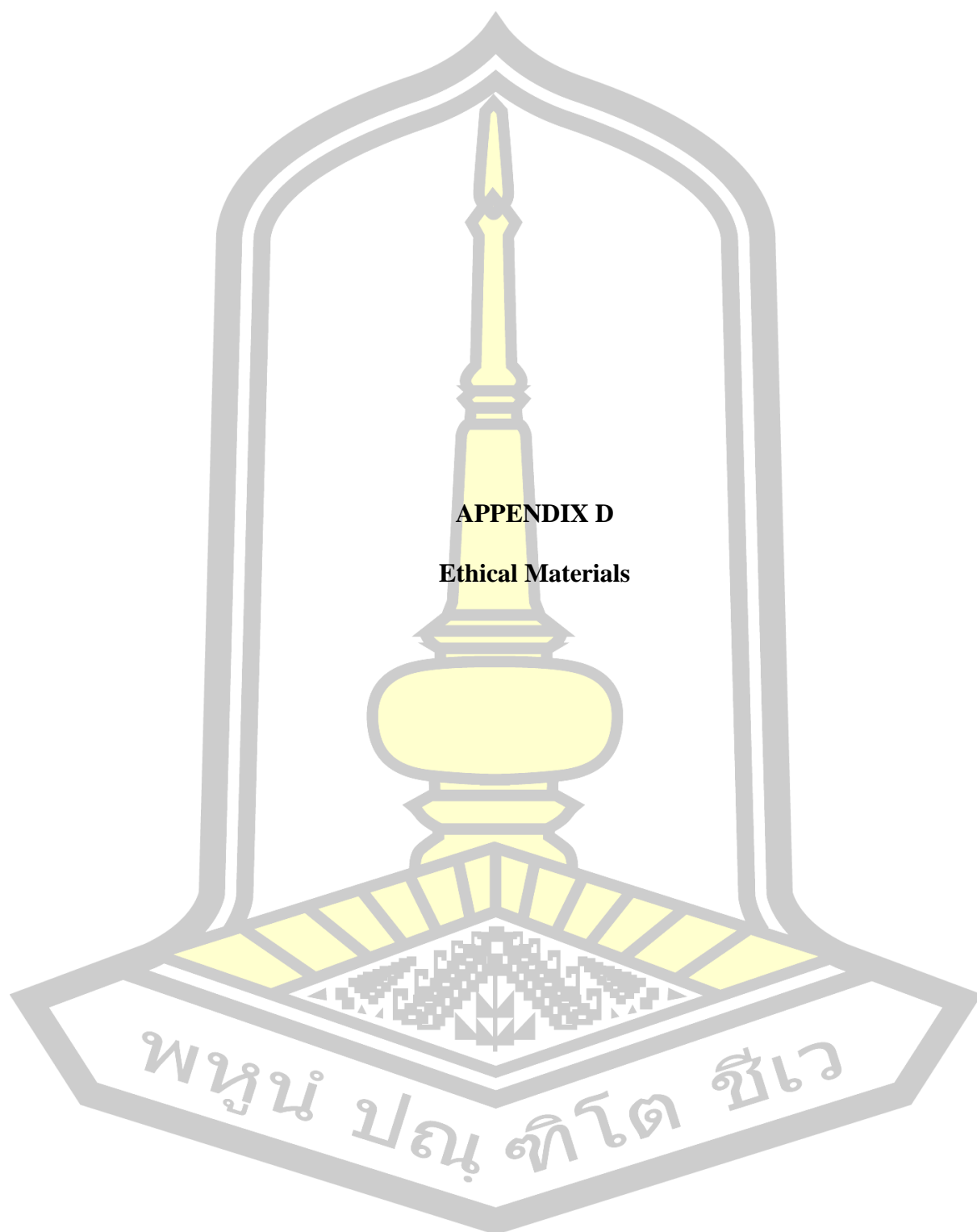


application of Tai Chi. The five experts scored the final stage of mindfulness training as 1, 1, 1, 1 and 1, with a total of 5, an IOC value of 1, and the final result is "usable". This indicates that the five experts unanimously believe that the final stage of mindfulness training can effectively help competitive Tai Chi athletes consolidate the mindfulness skills they have learned before. The five experts scored the final stage of mindfulness training as 0.94, 0.94, 1, 0.94 and 0.94, respectively, with a total of 4.76, an IOC value of 0.95, and the final result was "usable". This shows that the five experts have a consistent evaluation of the final stage of mindfulness training and believe that the training at this stage can effectively help competitive Tai Chi athletes apply mindfulness skills to daily life. The five experts scored the final stage of mindfulness training as 0.9, 0.9, 0.9, 0.9 and 0.9, respectively, with a total of 4.5, an IOC value of 0.9, and the final result was "usable". This shows that the five experts have a consistent evaluation of the final stage of mindfulness training and believe that the training at this stage can effectively help competitive Tai Chi athletes consolidate the mindfulness skills they have learned before.

Overall, the five experts' evaluations of the mindfulness training program were relatively consistent, and they believed that the course was rich in content, had clear training objectives, and could effectively help competitive Tai Chi athletes

improve their mindfulness abilities. The evaluation results showed that the mindfulness training program was of high quality and worthy of promotion and application.





APPENDIX D

Ethical Materials



MAHASARAKHAM UNIVERSITY ETHICS COMMITTEE FOR
RESEARCH INVOLVING HUMAN SUBJECTS

Certificate of Approval

Approval number: 116-070/2024

Title : Mindfulness training on Psychological Characteristics of Pre-Match Competitive Tai Chi Athletes

Principal Investigator : Miss. Ruiting Su

Responsible Department : Faculty of Education

Research site : Zhengzhou City, Henan Province, China

Review Method : Expedited Review

Date of Manufacture : 28 February 2024

expire : 27 February 2025

This research application has been reviewed and approved by the Ethics Committee for Research Involving Human Subjects, Maharakham University, Thailand. Approval is dependent on local ethical approval having been received. Any subsequent changes to the consent form must be re-submitted to the Committee.

Ratree S.

(Asst. Prof. Ratree Sawangjit)

Chairman

Approval is granted subject to the following conditions: (see back of this Certificate)

671070

Clarification documents for the volunteers who Experiment

Dear all Subject

Because I (Su Ruiting, a doctoral student in health and sports science at the School of Education, Mahasarakham University) is conducting research on "The impact of mindfulness training on the pre-competition psychological characteristics of competitive Tai Chi athletes." You may not benefit directly from participating in this research project. However, the research results of this project may support the training decisions of your coaching team, help improve the training efficiency of you and your teammates in similar pre-game psychological training, and improve the effectiveness of psychological training.

After being recommended by your coach and interviewed by a researcher, you are eligible to volunteer for this study. If you decide to participate in this study, you will be asked to provide basic personal information. If you feel uncomfortable or uncomfortable with certain questions, you have the right not to answer them.

You and 40 other athletes will participate in a pre-match psychological training test project. The test content includes: Competition Anxiety Questionnaire, Trait Sports Confidence Scale (TSCI-PL), Mood Measurement Scale, and Five-Factor Mindfulness Questionnaire. (Please note that if you are assigned to the experimental group, you will conduct mindfulness training according to the following course schedule. If you are assigned to the control group, you will just follow your previous training plan)

Table 1 Curriculum design of the experimental group

Week	Theme	Details
First week	Preparation Phase	Introduce the origin and development of mindfulness, inform the subjects of the tasks for the next 11 weeks, and mobilize the enthusiasm of the subjects to participate
second week	Operation Orientation, Imitation	Explain the first 1-4 postures of mindful Tai Chi : starting posture, cloud hand on the spot, holding the bird's tail to the left, opening and closing hands, establishing movement representations, participants imitating exercises, adding mindful breathing, discussing and exchanging experiences
third week	Operational integration and proficiency	Athletes consolidate and practice Tai Chi 1-4 styles, body coordination, movement proficiency, add mindfulness body scan, discuss and exchange experiences
fourth week	Operation Orientation, Imitation	Explain the post 5-8 postures of Tai Chi with mindfulness: holding the bird's tail right, single whip, cross hands, closing posture, establishing movement representation, participants imitating exercises, joining mindfulness meditation, discussing and exchanging experiences
fifth week	Operational integration and proficiency	Athletes consolidate and practice Tai Chi 5-8 styles, body coordination, movement proficiency, add mindfulness to eat raisins, discuss and exchange experiences
sixth week	Integrate mindfulness	Integrate the meaning of mindfulness with practice, help subjects better understand the content of mindfulness, add mindfulness breathing, discuss and exchange experiences

ECMSU01-09.03 Update 2021

seventh week	forget me	Propose ecstasy, guide the subjects to shift from focusing on themselves to focusing on the task itself, face the current task, join mindfulness body scan, discuss and exchange experience
eighth week	accept	Accept, do not judge or evaluate problems, face the present moment with an accepting attitude, join mindfulness meditation, discuss and exchange experiences
ninth week	pay attention to the body	Further focus on oneself, experience the changes that are taking place at this moment, emphasize attention to the body, add mindfulness to eating raisins, discuss and exchange experiences
tenth week	Peace of mind	Develop the subject's concentration, feel at ease in the present, do not regret the past and worry about the future, join mindfulness meditation, discuss and exchange experiences
eleventh week	develop consciousness	To develop the awareness of the subjects, based on the previous learning, self-awareness through the changes of experience, adding mindful breathing, discussing and exchanging experiences
twelfth week	discuss	Comprehensive mindfulness content, exchange and discussion experience

You also have the right to withdraw from the program at any time without notice. And there will be no consequences for you by not participating in or withdrawing from the research project. Your basic personal information will be retained and will not be disclosed to the public. Your basic personal information will only be used for this research, and the relevant data will be destroyed after the research is completed. All participant data will be encrypted and stored on the researcher's computer. Set a password for the folder where data is saved, and set a computer startup password. After the experiment is completed, all experimental data on the experimental instrument will be deleted to ensure that the experimental data will not be leaked during the collection process. The analysis and digitization of experimental data are performed on the researchers' computers, ensuring that there is no risk of data leakage. We will only use aggregate information and data for reporting purposes and will not disclose volunteers' personal information. You will not be paid or charged for your research.

If you have questions about the research Please feel free to contact us at (Ruiting Su- Health and Sport Science. Educational Faculty, Mahasarakham University, Phone: +8615038050396). If you were not treated as described or want to know your rights while participating in this study, You can contact at *Human Research Ethics Committee Mahasarakham University Division of Research and Academic Service Promotion Mahasarakham University *Tel. 043-754416 Internal number 1755

Sincerely
Ruiting Su
Researcher



ECMSU01-07.10 English 2023

Informed consent form for research from volunteers
(For volunteers over 18 years old)

I (Mr./Ms.) Surname Age.....Year.
House number Village No.
Sub-district District Province.....
Convenient phone

Read the explanation / listen to the explanation from Ms.Ruiting Su about volunteering in the research project on " Mindfulness training on Psychological Characteristics of Pre-Match Competitive Tai Chi Athletes ", the explanatory text consists of Full details about the purpose of the research, details of the research. That I have to do and be treated, the benefits that I may gain from the research and the risks that may arise from participating in the study. Including guidelines for questions that may arise throughout. It has also received an explanation and an answer to any questions from the research project leader.

As well as the testimony from the researcher that will keep my information confidential. In addition, not anonymously or private information individually to the public. The results of the research will be presented in the form of an overview that is a summary of the research results for academic purposes only.

"In participating as a volunteer of this research project I join voluntarily." And I can withdraw from this study at any time. If I wish which will not have any effect and will not lose any rights in study or work that I will receive in the future.

sign..... Volunteers
(.....)
Date.....


sign..... witness
(.....Mr.Xiao Xu.....)
Date.....

sign..... researcher
(Ms.Ruiting Su)
Date.....



Scales to measure individual variables:

(Appendix A) Competition Anxiety Questionnaire



		Not at all	Somewhat	Moderately so	Very much so
1	I'm worried about this game.	①	②	③	
2	I feel nervous.	①	②	③	④
3	I am mentally stable.	①	②	③	④
4	I doubt myself.	①	②	③	④
5	I feel uneasy.	①	②	③	④
6	I feel physically comfortable.	①	②	③	④
7	I'm worried that this competition won't be as good as usual.	①	②	③	④
8	My body feels tense.	①	②	③	④
9	I feel confident in this match	①	②	③	④
10	I worry about losing the game.	①	②	③	④
11	My stomach felt tight.	①	②	③	④
12	I'm sure about this game.	①	②	③	④
13	I worry about not being able to succeed under this kind of pressure.	①	②	③	④
14	I feel my body is relaxed.	①	②	③	④
15	I am confident to face this challenge.	①	②	③	④
16	I'm worried that I won't perform well in Bizan.	①	②	③	④
17	My heart is beating hard.	①	②	③	④
18	I believe I will do well.	①	②	③	④
19	I worry about whether I can reach my goal.	①	②	③	④
20	I felt my stomach sink.	①	②	③	④
21	I feel mentally relaxed.	①	②	③	④

- | | | | | | |
|----|--|---|---|---|---|
| 22 | I worry that others will be disappointed with my performance. | ① | ② | ③ | ④ |
| 23 | My hands are wet and cold. | ① | ② | ③ | ④ |
| 24 | I am confident in my heart that I have achieved my goals. | ① | ② | ③ | ④ |
| 25 | I worry about not being able to concentrate. | ① | ② | ③ | ④ |
| 26 | My body felt stiff. | ① | ② | ③ | ④ |
| 27 | I am confident that I can complete the game under this pressure. | ① | ② | ③ | ④ |

Scoring: The scale divides anxiety into three components: cognitive anxiety, somatic anxiety, and a "related component" - self-confidence. Confidence, which is often the opposite of cognitive anxiety, is another important factor in managing stress. To score the CSLA-2, all points are calculated on an indicated value for each item except item 14, which is what you "reversed" the score for. Example: If you circled 3 points, it counts as 2 points (1=4; 2=3; 3=2; 4=1) and the total score is calculated as follows:

Cognitive state anxiety: sum items 1, 4, 7, 10, 13, 16, 19, 22, 25.

- Somatic state anxiety: and items 2, 5, 8, 11, 14, 17, 20, 23, 26.

—Self-confidence: and items 3, 6, 9, 12, 15, 18, 21, 24, and 27.

Your score on each item ranges from 9 to 36, with 9 indicating low anxiety (confidence) and 36 indicating high anxiety.



**Scales to measure individual variables:
(Appendix B) Trait Sports Self-Confidence Scale (TSCI-PL)**



一、 Basic information of athletes

School: _____

Gender: A male B female

age: _____

Training years: A 1-3 years B 4-6 years C More than 7 years

Educational level: A graduate degree and above B undergraduate degree

Sports level: A, master level, B, national first level, C, national second level, D other

Number of times you competed in college: _____

二、 Sports Trait Confidence Scale

Please answer the following questions based on how confident you usually feel when competing in sports. Compare your confidence to the most confident athlete you know.

Please answer the following questions based on how you really feel, not what you expect of yourself. Your answers are confidential.

When you compete in a sport, how confident are you compared to the most confident athlete you know? (please circle the number)

1. How confident are you that you can perform the skills that will make you successful (Low Medium High)

1 2 3 4 5 6 7 8 9

2. How confident are you that you can make important decisions in games (low, medium, high)

1 2 3 4 5 6 7 8 9

3. How confident are you in performing under pressure (low, medium, high)?

1 2 3 4 5 6 7 8 9

4. How confident are you that you can use successful tactics (low, medium, high)

1 2 3 4 5 6 7 8 9

5. How confident are you that you can focus and achieve success (Low, Medium, High)

1 2 3 4 5 6 7 8 9

6. How confident are you that you can adapt to different competition environments (low, medium, high)

1 2 3 4 5 6 7 8 9

7. How confident are you that you can achieve your competition goals (low, medium, high)

1 2 3 4 5 6 7 8 9

8. How confident are you that you can succeed (low, medium, high)

1 2 3 4 5 6 7 8 9

9. How confident are you that you can achieve success stably (low, medium, high)

1 2 3 4 5 6 7 8 9

10. How confident are you that you can think and react successfully during a game (Low Medium High)

1 2 3 4 5 6 7 8 9

11. How confident are you that you can accept the challenge of the competition (low, medium, high)

1 2 3 4 5 6 7 8 9

12. How confident are you that you can succeed despite disadvantages (low, medium, high)

1 2 3 4 5 6 7 8 9

13. How confident are you that you can turn a weak point into a strong point and succeed in a competition (low medium high)

1 2 3 4 5 6 7 8 9

三、 Exercise State Confidence Scale

Please answer the following questions based on how confident you currently feel about the upcoming competition. Compare your self-confidence to the most



confident athlete you know.

Please answer the following questions based on how you really feel, not what you expect of yourself. Your answers are confidential.

Compared to the most confident athlete you know, how confident are you about the upcoming competition: (please circle the number)

1. How would you compare yourself to the most confident athlete you know? (Low Medium High)

Your confidence that you can successfully complete the action is 1 2 3 4 5 6 7 8 9

2. How would you compare yourself to the most confident athlete you know? (Low Medium High)

Your confidence in making important decisions in games is 1 2 3 4 5 6 7 8 9

3. How would you compare yourself to the most confident athlete you know? (Low Medium High)

Confidence under pressure is 1 2 3 4 5 6 7 8 9

4. How would you compare yourself to the most confident athlete you know? (Low Medium High)

Confidence in successfully using tactics is 1 2 3 4 5 6 7 8 9

5. How would you compare yourself to the most confident athlete you know? (Low Medium High)

The confidence that you can focus and achieve success is 1 2 3 4 5 6 7 8 9

6. How would you compare yourself to the most confident athlete you know? (Low Medium High)

Confidence in being able to successfully adapt to different competition environments is 1 2 3 4 5 6 7 8 9

7. How would you compare yourself to the most confident athlete you know? (Low Medium High)

Confidence in achieving the competition goal is 1 2 3 4 5 6 7 8 9

8. How would you compare yourself to the most confident athlete you know? (Low Medium High)

The confidence to succeed is 1 2 3 4 5 6 7 8 9



9. How would you compare yourself to the most confident athlete you know? (Low Medium High)

The confidence that faith can achieve stably is 1 2 3 4 5 6 7 8 9

10. How would you compare yourself to the most confident athlete you know? (Low Medium High)

Confidence in being able to think and react successfully in a game is 1 2 3 4 5 6 7 8 9

11. How would you compare yourself to the most confident athlete you know? (Low Medium High)

Your confidence in being able to accept the challenge of the competition is 1 2 3 4 5 6 7 8 9

12. How would you compare yourself to the most confident athlete you know? (Low Medium High)

Confidence in being able to succeed despite disadvantages is 1 2 3 4 5 6 7 8 9

13. How would you compare yourself to the most confident athlete you know? (Low Medium High)

Confidence in being able to turn a weak point into a strong one and succeed in competition is 1 2 3 4 5 6 7 8 9



Scales to measure individual variables:(Appendix C) Mood Measurement Scale

Please use the following words to express how you felt in the past week (including today). For each adjective, you can only choose one of the five options that best suits your actual situation and feelings, and tick "✓" in the corresponding small box.

	almost none	A little	Moderate	very much	Very
1 nervous	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 angry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 listless	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 unhappy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 happy and relaxing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 flustered	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7 embarrassingly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8 Upset	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9 angry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10 tired	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11 sorrowful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12 Energetic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13 can't concentrate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14 confident	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15 disturbed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16 annoyed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17exhausted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18 depressed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19 proactive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20 panic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21 restless	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22 annoying	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23 Burnout	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24depressed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25 Enthusiastic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26 Forgetful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27 Competent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28 excitable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29 angry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30exhausted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



31 worthless	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32 active	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33 feeling uncertain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34 satisfied	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35 worried	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36 furious	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37 complaining	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38 helpless	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39 energetic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40 proudly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

scoring method

The scoring method of the scale is: "hardly" is 0 points, "a little" is 1 point, "moderate" is 2 points, "quite a lot" is 3 points, and "extremely" is 4 points. The items of the 7 components are:

Tension: Questions 1, 8, 15, 21, 28, and 35;

Anger: Questions 2, 9, 16, 22, 29, 36, 37;

Fatigue: questions 3, 10, 17, 23, 30;

Depression: Questions 4, 11, 18, 24, 31, 38;

Energy: Questions 5, 12, 19, 25, 32, 39;

Panic: Questions 6, 13, 20, 26, 33;

Emotions related to self: Questions 7, 14, 27, 34, 40;

The original scores of each subscale were accumulated separately, and the T score of each subscale was calculated by consulting the norm.

TMD (Total Mood Disorder) = sum of 5 negative mood scores minus sum of 2 positive mood (energy, self-esteem) scores + 100.



Scales to measure individual variables(attached):

(Appendix D)Five-Factor Mindfulness Scale

Instructions: Please rate each sentence according to the following grades, and fill in the blank space before the sentence with the grade number that best suits your real situation.

1 = Not at all 2 = Not at all 3 = Somewhat 4 = Very much 5 = Completely

1. When walking, I intentionally pay attention to how the body parts feel as they move..... ()
2. I am good at describing my emotions in words..... ()
3. I blame myself for having irrational emotions or inappropriate emotions..... ()
4. I feel my emotions and emotions, but I don't have to react to them..... ()
5. While doing things, my mind often wanders and I'm easily distracted..... ()
6. When I take a shower, I notice the sensation of water running over my body..... ()
7. I can clearly express my beliefs, opinions and expectations..... ()
8. I don't notice what I'm doing because I'm daydreaming, worrying or being distracted from the outside world..... ()
9. I observe my emotions without getting lost i..... ()
10. I told myself that I shouldn't be feeling emotions the way I am now.... ()
11. I notice how food and drink affect my thoughts, bodily sensations and emotions..... ()
12. I have trouble finding words to express what I'm thinking..... ()
13. I am easily distracted..... ()



()

1 = Not at all 2 = Not at all 3 = Somewhat 4 = Very much 5 = Completely

14. I think some of my thoughts are abnormal, bad; I shouldn't think that way.....

()

15. I pay attention to how I feel, like the breeze in my hair, the sun on my face..... ()

16. I have a hard time expressing how I feel about things with the right words..... ()

17. I judge my thoughts as good or bad..... ()

18. I have trouble concentrating on what's going on..... ()

19. When I have a sad thought or vision, I "step back" and become aware of the existence of these thoughts or visions without being controlled by them..... ()

20. I pay attention to sounds like: the ticking of a clock, the chirping of a bird Chirping, or the sound of cars passing by.....

()

21. In difficult situations, I pause and don't react right away..... ()

22. When I feel something in my body, I have a hard time finding the right words to describe it..... ()

23. I seem to be doing something automatically and not fully aware of it.....

()

24. Usually, when I have a sad thought or image, I recover quickly....

25. I tell myself that I shouldn't be thinking about what I'm thinking about right now..... ()

26. I smell the smell or aroma of something around me.....

()

27. Even when I'm deeply disturbed, I can find the words to express it.....

()

28. I scribble through things without really paying attention to them..... ()

29. When caught up in disturbing emotions or situations, I can just pay attention to



them without reacting accordingly.....
()

30.I think some emotions are wrong or inappropriate and I shouldn't be experiencing them.... ()

31.I noticed some visual elements in art and things in nature, such as: color, shape, texture and light and shadow..... ()

32.I always tend to use words to describe my experiences..... ()

33.When I have distressing thoughts or visions, I usually just pay attention to them and let it be..... ()

34.I was always working or completing a task automatically without realizing what I was doing..... ()

35.Usually when I have a disturbing thought or vision, I judge whether I am right or wrong based on what I was thinking or seeing in my mind..... ()

36.I pay attention to how my emotions affect my thoughts and actions.....
()

37.I can usually describe how I feel at the moment in great detail..... ()

38.I find myself not concentrating on what I am doing..... ()

39.When irrational thoughts arise, I self-veto..... ()

FFMQ (b1-b39) scoring method:

The scores of the following items are added together, and R stands for reverse scoring, that is, 1 is 5 points, 2 is 4 points, 3 points are unchanged, 4 is 2 points, and 5 is 1 point.

observe

1, 6, 11, 15, 20, 26, 31, 36 8 questions in total

describe

2, 7, 12R, 16R, 22R, 27, 32, 37 8 questions in total



act consciously

5R, 8R, 13R, 18R, 23R, 28R, 34R, 38R 8 questions in total

don't judge

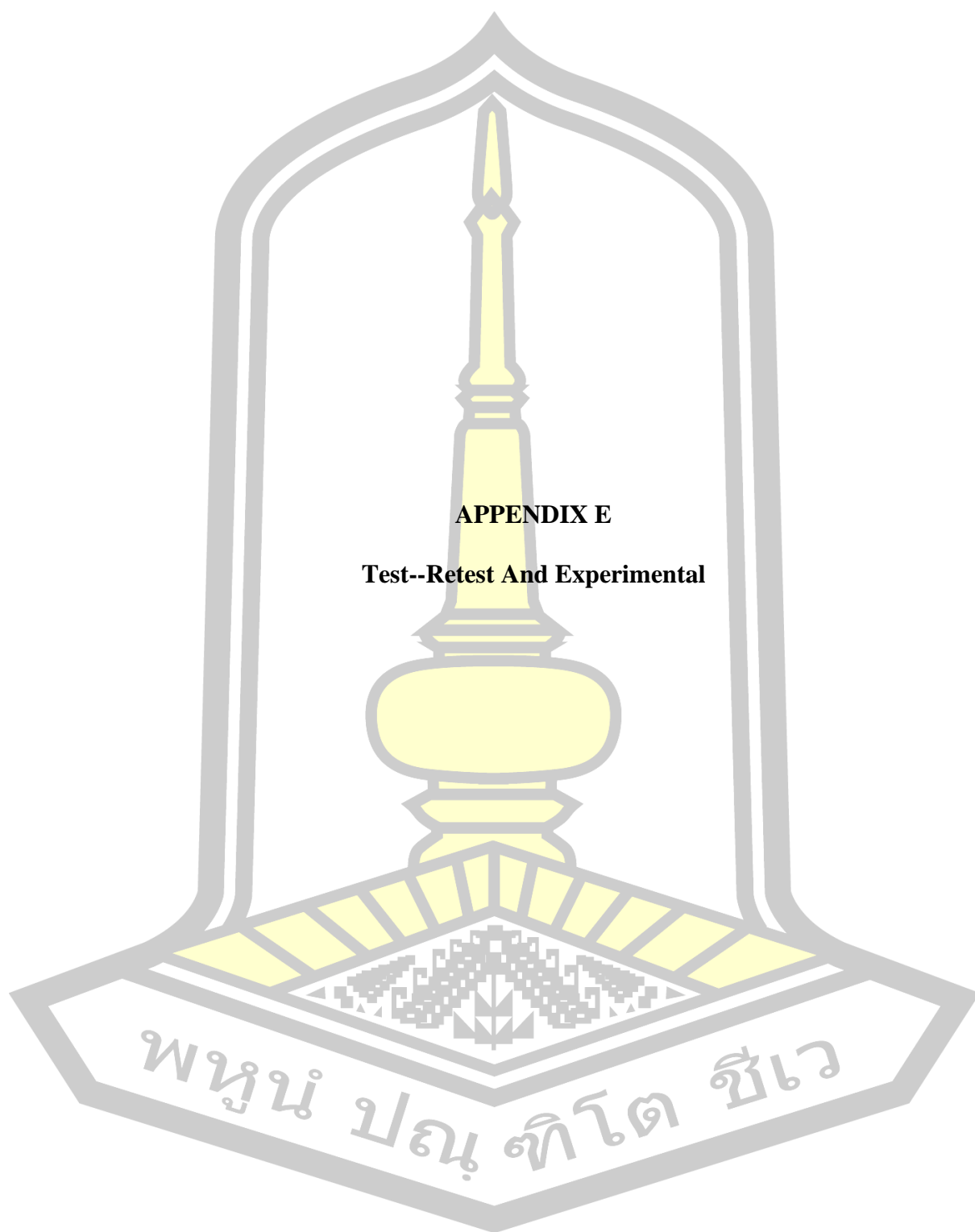
3R, 10R, 14R, 17R, 25R, 30R, 35R, 39R 8 questions in total

no action

4, 9, 19, 21, 24, 29, 33 7 questions in total

Instructions: Complete the following scale on two separate occasions: during a quiet time





APPENDIX E

Test--Retest And Experimental

Test—Retest

Time: March 4, 2024 - March 24, 2024

Venue: Indoor Martial Arts Hall, School of Physical Education, Zhengzhou University

Participating Grades: Freshman, sophomore, junior, senior

Participants: University students competitive Tai Chi athletes

Pre-test steps:

The first pretest: (March 4, 2024 - March 10, 2024) Organize 40 competitive Tai Chi athletes participating in the research of this paper to go to the indoor martial arts hall for testing→ describe the purpose of doing this pretest→ and the college student competitive Tai Chi athletes participating in the study sign the informed consent form for volunteer research (volunteers over 18 years old) → explain the content of this pretest→ describe how to fill in the normative → of the questionnaire to fill in the questionnaire

Retest: (March 18, 2024 - March 24, 2024) One week after the interval between the first pretest, 40 competitive Tai Chi athletes participating in the research of this paper were reorganized to go to the indoor martial arts hall for retest→ and the college student competitive Tai Chi athletes participating in the study signed the informed consent form for volunteer research (volunteers over 18 years old→ re-emphasizing the normative → filling in the questionnaire





Analysis Of Test-Retest Data

1. Retest the design

At the beginning of the study, the first measurement was performed on competitive tai chi athletes, with a five-factor mindfulness questionnaire to measure mindfulness levels, mood levels with a mood measurement scale, competition anxiety levels with the Competition Anxiety Questionnaire, and self-confidence levels with the Trait Sports Confidence Scale. Document the results.

Second measurement: After 1 week, the same group of competitive Tai Chi athletes were given a second measure of mindfulness level, mood measurement, competition anxiety, and self-confidence, and the results were recorded.

Ensure that the two tests are carried out under similar environmental conditions, and avoid the influence of external factors on the measurement results, such as test location, time period, ambient noise, etc.

2. Analysis of retest results

Table1 Demographics of competitive Tai Chi athletes

Demographics	Mean (SD)		<i>p</i> value	Mean (SD)
	Mean (SD)	Mean (SD)		Total
	Male	Female		(N=40)
Age (year)	20.55 (0.92)	20.32 (0.99)	0.22	20.37 (0.89)
Weight (kg)	71.22 (5.24)	55.21 (2.33)	0.001*	62.32 (3.77)
Height (cm)	171.22 (2.44)	160.55 (2.32)	0.001*	170.24 (2.11)
Training duration (years)	4.55 (0.98)	4.63 (0.77)	0.12	4.59 (0.85)
Sports training duration (hours/day)	6.21 (1.11)	6.11 (1.22)	0.72	6.17 (0.87)
Frequency of Sport training (days/week)	5.11 (1.75)	5.27 (1.55)	0.77	5.21 (1.24)

a

; using an analysis of independent t-tests

*P<0.05, significant at 0.05

Table 2 Analysis of test-retest data

Variable	Mean(SD)		R
	Time 1	Time2	
Five-Factor Mindfulness Questionnaire			
Observe	22.33±3.23	22.47±4.33	0.92
Description	21.45±4.13	21.68±4.03	0.93
Act consciously	23.22±3.75	23.32±3.75	0.91
Do not judge	22.37±5.09	22.42±5.09	0.91
Not reacting	20.77±3.19	20.83±3.19	0.92
Total score	110.14±2.24	110.72±3.22	0.92
Mood Measurement Scale			
Positive mood	20.55±8.02	20.43±8.02	0.91
Negative mood	28.67±18.82	28.56±18.82	0.91
TMD total score	108.88±20.43	108.66±20.43	0.92
Total score	158.1±10.22	157.65±11.22	0.93
Contest Anxiety Questionnaire			
Cognitive status anxiety	22.44±1.15	22.43±1.15	0.93
Anxiety about physical status	22.43±1.77	22.41±1.77	0.93
State self-confidence	24.63±1.62	24.73±1.62	0.93
Total score	69.5±0.88	69.57±1.05	0.91
Trait Motor Confidence Scale (TSCI-PL)			
Trait motor task confidence	18.48±5.83	18.68±5.84	0.92
Trait sports coping with self-confidence	32.23±8.81	32.13±8.82	0.95
Total sports self-confidence score	50.71±13.45	50.81±13.46	0.98
Total score	101.42±4.27	101.62±4.27	0.91

* $p < 0.05$, significant at 0.05

The data presented in the table covers the performance of the participants at two time points (time 1 and time 2), which represent the two measurement times. All data are presented as "mean ± standard deviation", representing the central trend and distribution of the population. The core of the study lies in the correlation coefficient R of each scale, which reflects the strength of the linear relationship between the two data. In general, the closer the R-score is to 1, the stronger the correlation between the two measurements, which means that the scale has a higher agreement in performance before and after the test.

APPENDIX E Experimental

Time: 25 March, 2024 - 16 June, 2024

Venue: Indoor Martial Arts Hall, School of Physical Education, Zhengzhou University

Participating Grades: Freshman, sophomore, junior, senior

Participants: University students competitive Tai Chi athletes

Steps: (1) Explain the purpose of the experiment → (2) College students participating in the study signed informed consent for voluntary research (volunteers aged 18 and above); → (3) Randomly divided into two groups: a mindfulness exercise group and a control group → (4) The researcher explained and demonstrated, and informed the participants of the precautions during training → (5) The mindfulness exercise group and the control group conducted training separately.

Control group:

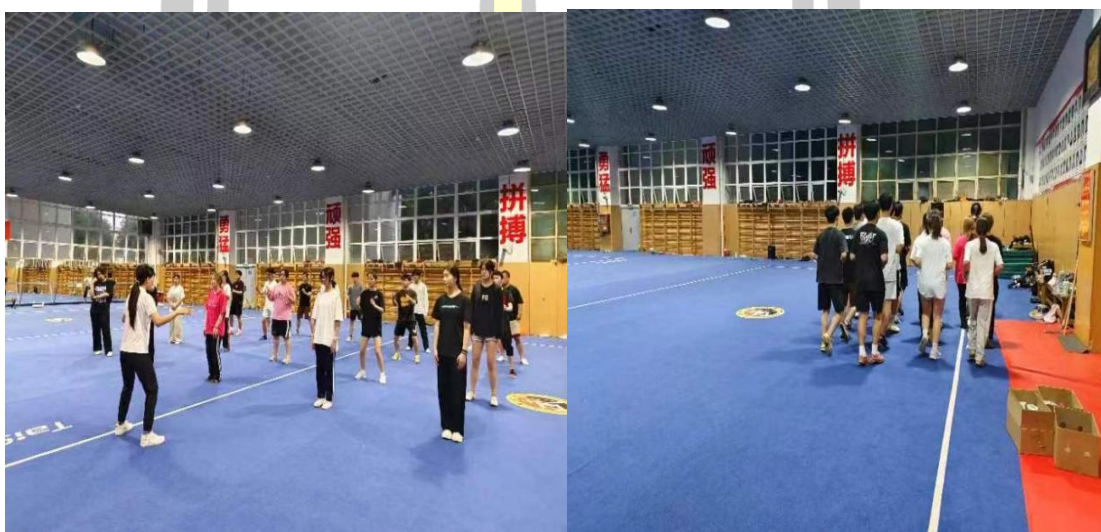
According to the traditional training model, competitive Tai Chi athletes are gathered at the training ground and trained in competitive Tai Chi: Conventional training → Conventional warm-up activities → Tai Chi special technical exercises → Tai Chi tactical exercises → Tai Chi combat exercises → Conventional relaxation → Training summary





Mindfulness exercise group

Gathered in the same training venue as the control group (the second floor of the indoor martial arts hall) to carry out the mindfulness training program → mindfulness warm-up → mindfulness Tai Chi + small mindfulness exercises (mindfulness body scan, mindfulness meditation, awareness of breathing, etc.) → mindfulness + Tai Chi special technical exercises → mindfulness + Tai Chi tactical exercises → mindfulness relaxation





BIOGRAPHY

NAME	Ms. Ruiting Su
DATE OF BIRTH	June 29,1990
PLACE OF BIRTH	Puyang County, Henan Province, China
ADDRESS	Zhengzhou City, Henan Province, China
POSITION	Lecturer
PLACE OF WORK	Zhengzhou College of Finance and Economics
EDUCATION	2010 to 2014 Bachelor's Degree, Field of physical education and training, Zhoukou Normal University 2014 to 2017 Master's Degree, Field of traditional ethnic sports, Guangxi Normal University 2021 2024 Doctor of Philosophy Program in Exercise and Sport Science, Mahasarakham University

