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Developing of Evaluation Index System for MuayThai Skills in Sport University, People's Republic of China

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Abstract

Background and Aim: Muaythai, as a popular sport among the Chinese people and an emerging sport favored by sports universities, does not have a systematic and scientific evaluation index system for Muaythai skills. A practical and systematic evaluation index system of Muaythai skills in sports universities can promote the improvement of Muaythai skill teaching effect, standardize the assessment of university students' skill mastery, and promote the enthusiasm of Muaythai enthusiasts for self-control learning. Therefore, based on the characteristics and requirements of Muaythai skill, this study combines the skill evaluation model of Chinese combat programs to formulate the Muaythai skill evaluation index system of Chinese sports universities, which will provide a theoretical basis for improving the status quo of the Muaythai skill evaluation system of Chinese sports universities, standardizing the Muaythai skill assessment and contributing to the practical value for the promotion and development of Muaythai programs.

Materials and Methods: The research mainly adopts a questionnaire survey method. Among them, a small number of 38 Chinese professors, Thai university teachers, and Muaythai experts with deputy senior professional titles or more than 5 years of Muaythai experience. Through interviews with 7 experts, the skill characteristics and movements of Muaythai were confirmed by 5 International Olympic Committee experts. Consistency verification of Delphi tables. Through the MDN and IQR obtained from the scores of 19 Delphi experts, the skill evaluation indicators of China Sports University were screened and a Muaythai skill evaluation table was constructed. Through appreciation analysis, the scientificity and applicability of the research process and results were verified. Descriptive statistics provide an overall description.

Results: Through research, the Muaythai skill evaluation index system of China Sports University was constructed, which includes 4 first-level indicators, 35 second-level indicators, and 175 third-level indicators. It can accurately evaluate the Muaythai skills of China Sports University.

Conclusion: The results of this research not only have important theoretical value for the standardization of Chinese Muay Thai skills but are also highly practical. In subsequent research, we plan to conduct field testing and verification at Xi'an Physical University, Chengdu Sport University, Wuhan Sports University, and other sports universities, and further improve and enrich the evaluation index system based on the test results.

Keywords: Evaluation Index; China Sport University; Muaythai Skill

Introduction

Muaythai, as an outstanding representative of Asian fighting skills, has crossed national boundaries and developed into a globally popular combat sport because of its unique charms of ferocity and boldness, speed of punches and kicks, elbows and knees, and proactive striking (Liu, 2018). The number of participants in the World Muaythai Championships in 2008 reached thousands of participants, and the influence and scale of the tournament even tended to surpass that of Chinese Shotokan (Chen, 2009). In 2009, the "First Chinese Muaythai Competition" had 148 participants and

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more than 20 teams. Muaythai in China has realized a leaping development, and China has a unique advantage in carrying out the Muaythai program (Chen, 2009). Under the development trend of Muaythai, the State General Administration of Sport listed Muaythai as a trial program and formed a national Muaythai training team in 2011, aiming to prepare for international events such as the Asian Indoor Games to improve the competitive level of Muaythai (Li, 2016).

As an institution in the higher education system focusing on physical education disciplines, sports universities carry the great responsibility of cultivating physical education teachers, social sports service talents, sports program researchers, and sports organization managers. (Liu, 2006). To promote the in-depth development of the Muaythai program, improve the overall quality of the sports industry, and meet the people's growing demand for diversified sports and culture, sports universities such as Xi'an Physical University, Chengdu Sport University, and Wuhan Sports University have added Muaythai courses. Xi'an Physical University, Chengdu Sport University, Wuhan Sports University, and other sports universities have set up Muaythai courses, and other universities have also set up Muaythai clubs, Muaythai is a lively sport in Chinese universities.

The research on Muaythai in China is not comprehensive enough, mainly focusing on the development status of Muaythai, Muaythai culture, and the comparison between Muaythai skills and Chinese sparring skills. There is almost no research on university Muaythai programs, and even more minimal research on the evaluation of Muaythai skills in sports universities, without a set of systematic evaluation indexes. The researchers hope that by studying the characteristics and requirements of Muaythai skill and combining it with the skill evaluation model of Chinese combat programs, they will formulate a Muaythai skill evaluation index system for Chinese sports universities, which will provide a theoretical basis for improving the status quo of the Muaythai skill evaluation system in Chinese sports universities, standardizing the Muaythai skill assessment, and contributing to the practical value of the Muaythai program's promotion and development.

Literature Review

Muaythai skill

The skill system of Muaythai mainly consists of boxing, elbow, knee, and leg kicks, etc. The skill characteristics are simple and practical, characterized by knee and elbow attacks, abdominal breathing, and a strong attacking style, etc. Boxing is often used for probing, covering, or counterattacking, and elbow skills emphasize the explosion of power (Chen & Ma, 2004). Kicking Skills in Muaythai" discusses the skill points of kicking skills in Muaythai, emphasizing that kicking skills should not only have good power and flexibility but also have good timing and attention to defense (Zhan, 2005). A Comparative Study of the Skill Characteristics of Sanshou and Muaythai" compares and analyzes the skill characteristics of the two major confrontational sports of China, Sanshou, and Muaythai, and concludes that Muaythai should have good power, accurate striking, flexible footwork, and coordination of multiple movements (Fan 2005). Muaythai should be divided into four parts, namely initial stance, attacking skills, defense skills, and footwork, with special emphasis on the ability to strike and resist strikes, and the perfect presentation of strength, flexibility, coordination, and accuracy to ensure the accuracy of skill movements (DiamondMuaythai. 2024).

Evaluation of motor skills

The training prescription function performed by the skill evaluation of sports in athletic training has also been described as "strength diagnosis". The basic principle of the strength diagnostic function

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is that different scores are obtained in different ways in a particular muscle function test - to identify specific weaknesses in a particular competitive ability. To provide a basis for finding the chain of resistance in the chain of skill development. (Meng, 2006). “Training - An Introduction to the Theory and Methodology of Athletic Training” states that, “Athletic performance is mainly determined by athletic ability and athletic preparation, which depends on the athlete's physical ability, skill and tactical proficiency, intellect, awareness, and experience. “(Werner, 2005) A large number of examples show that athletes' skill assessment scores accurately reflect their specialized competitive level. The principles followed in the process of constructing test indicators are of vital importance. (Liu, 2012) (Xiong. 2014) summarized the principles for the development of athletes' skill test indicators, covering several aspects of goal-directedness, reliability, validity, objectivity, and scientificity. Indicators, as a tool or unit of measurement of objectives, represent indices, specifications, and standards expected to be achieved, and are usually presented in the form of data. Evaluation indicators are the result of the designer's subdivision according to the evaluation objectives, aiming at reflecting the basic characteristics of the evaluation object's behavior and its specific behavioral factors, and are judgments based on the value of the evaluation object (Jiang, 1990).

Sports University Muaythai evaluation

The skill system of Muaythai mainly consists of boxing, elbow, knee, and leg kicks, etc. The skill characteristics are simple and practical, characterized by knee and elbow attacks, abdominal breathing, and a strong attacking style, etc. Boxing is often used for probing, covering, or counterattacking, and elbow skills emphasize the explosion of power (Chen & Ma, 2004). Kicking Skills in Muaythai” discusses the skill points of kicking skills in Muaythai, emphasizing that kicking skills should not only have good power and flexibility but also have good timing and attention to defense (Zhan, 2005). A Comparative Study of the Skill Characteristics of Sanshou and Muaythai” compares and analyzes the skill characteristics of the two major confrontational sports of China, Sanshou, and Muaythai, and concludes that Muaythai should have good power, accurate striking, flexible footwork, and coordination of multiple movements (Fan, 2005). Muaythai should be divided into four parts, namely the initial posture, offensive skills, defensive skills, and footwork, with special emphasis on the ability to strike and resist strikes, and the perfect presentation of strength, flexibility, coordination, and accuracy to guarantee the standardization of skill movements The theory of standardization points out that simplification refers to the standardization of the number of types of objects (things) to reduce the number of objects (things) within a certain range so that they can meet the general needs of the given time (Li, 2010) The main function of sports universities is to cultivate sports talents and teach sports skills, analyzing and evaluating sports skill indicators from the perspective of teaching effect measurement, to respond to students' skill mastery (Yang, 2018), and standardization theory is especially needed as a basis for the evaluation of sports skills. Chinese university high-level sports team wushu Sanshou examination standards of Wushu Sanshou skill is divided into four grades are required as boxing, leg skill movement method is correct, the force is smooth, speed, movement coherent, coordinated, attack and defense consciousness is obvious; boxing, leg, drop skill movement method is more correct, the force is more reasonable, speed is faster, movement is more coherent, coordinated; boxing, leg skill movement method is correct, speed is slower; boxing, leg skill movement method is correct, speed is slower; boxing, leg skill is correct, speed is slower; boxing, leg skill is correct, speed is slower; boxing, leg skill is correct. In slower; boxing, leg skill movements are not correct, slow, stiff force generation, and uncoordinated movements (Physical Education Union 2024).

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Summary

This study takes the standardization theory as a model, refers to the evaluation system of Wushu Sanda, and based on the skill characteristics and requirements of Muaythai, the evaluation index system is constructed from the accuracy, strength, reaction, fluency, stability, precision, movement amplitude, movement awareness, movement mastery, and degree of presentation of Muaythai movements, which is used to assess whether the students can accurately complete the basic skill movements of Muaythai, whether the power generation is smooth, whether the movements can be coordinated, and whether the students can accurately complete the basic skill movements of Muaythai. Whether the power generation is smooth, and whether the movement can skillfully and coherently complete the skill movements.

Conceptual Framework

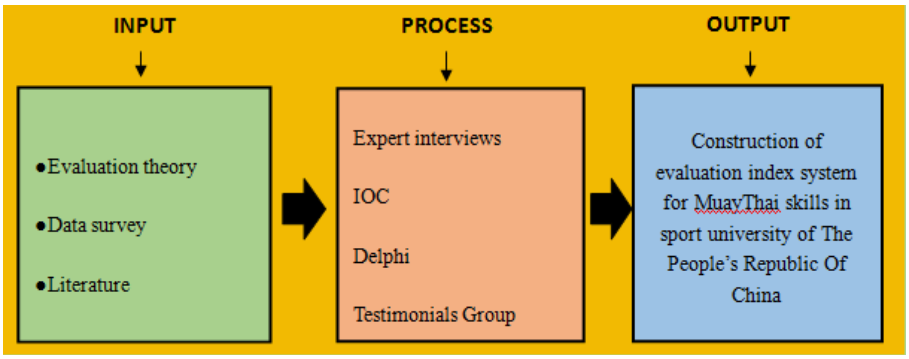

Figure 1 Conceptual Framework of Muaythai Skills Evaluation Index System of China Sport University

Methodology

Population sum sample: The focus of this study was to develop an index for evaluating Muay Thai skills in Chinese sports universities. The scope of the study was sports universities in China that offer Muaythai programs including Xi'an Physical University, Wuhan Sports University, and Chengdu Sport University. 38 university leaders (leaders of the faculty responsible for managing the university's Muaythai program), Muaythai experts (Chinese team coaches, Chinese national-level Muaythai training instructors, and Chinese national-level Muaythai training instructors), were selected for the survey. Leaders (leaders of the faculties responsible for managing the Muaythai program of the university, leaders responsible for teaching and training), Muaythai experts (coaches of the Chinese team, national Muaythai training instructors in China, experts of group associations who have long been engaged in Muaythai training and teaching with a certain degree of influence, and experts of Thailand who have long been engaged in Muaythai training and teaching with a certain degree of influence), physical education instructors (leaders of the discipline of Muaythai), of which there are 2 females, 36 males, and 2 females. There are 2 women and 36 men.

Data collection: Through the literature organization, the content related to the Muaythai skill evaluation index system of Chinese sports universities was summarized.

Through on-site observation of Onemai PhD's skill movement demonstration at Thonburi University in Bangkok and analysis of skill photographs, determine the requirements and characteristics of Muaythai skill movements and survey Onemai PhD in Thailand to solicit their suggestions for this study.

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Through e-mail, IOC experts were invited to check the consistency of the expert interview outlines, and the interview outlines were revised after collecting relevant information.

Using telephone interviews and e-mail interviews, 7 experts were consulted, an in-depth analysis of the current situation of Muaythai skill and skill evaluation indexes in Chinese sports universities was conducted, and the Delphi questionnaire was developed after collecting and summarizing the experts' opinions.

Using e-mail, IOC experts were invited to conduct consistency tests on the Delphi questionnaire, and the Delphi questionnaire was modified after collecting relevant information.

Distribute Delphi questionnaires to 19 Delphi experts in the form of emails, distribute the questionnaires for two rounds, and get the Delphi consensus.

Distribute the appreciation evaluation form in the form of an email to 7 experts for appreciation of the constructed Muaythai skill evaluation index system of Chinese Sports University.

Data analysis: The thematic analysis was used to elaborate on the literature related to the Muaythai skill evaluation index system of Chinese sports universities, which was used as the theoretical basis of the study.

The Delphi questionnaire was developed by interviewing experts' opinions and suggestions on the research related to the Muaythai skill evaluation index system of Chinese sports universities, and the IOC test was passed to ensure the rationality of the Delphi questionnaire.

Descriptive statistical methods were used to analyze the Delphi consensus data. In the first round of Delphi consensus, experts will use a 5-point Likert scale to rate the importance of each indicator from “very important” to “not important” with scores of 5, 4, 3, 2, and 1. Experts will also provide suggestions. The questionnaire includes the importance scores for each indicator at the three levels of the preliminary selection, a quantitative table of the experts' judging criteria, and a table of the experts' familiarity with the issue. After collecting the first round of expert questionnaires, the MDN and IQR of the importance of each indicator were calculated. Based on the experts' suggestions, the indicators were screened and optimized, and the second round of expert questionnaires was prepared. In the second round of Delphi Consensus, the same method of quantifying the importance of indicators as in the first round was used, and expert opinions continued to be sought again on indicators whose scoring values were not excellent enough in the first round. The MDN and IQR of the indicators were calculated in the same way as in the first round. The indicators were then screened according to the evaluation criteria. Through multiple rounds of Delphi surveys and feedback, consensus was gradually reached among experts.

The exchange of opinions among experts was fully facilitated through appreciation by the Appreciation Panel, which greatly contributed to the scientific nature of the research process and results.

Research process

Step 1: Reviewing Literature. Through reviewing various literature such as relevant books, policies, journals, and papers, the Muaythai skill evaluation indexes of Chinese sports universities were studied and the outline of expert interviews was developed based on the study.

Step 2: Observe the skills. Invite Onemai PhD from Thailand to demonstrate Muaythai skill movements and observe and analyze the characteristics of skill movements.

Step 3: Conduct an IOC test on the expert interview outline. Invite IOC experts to test the expert interview outline by email.

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Step 4: Conduct expert interviews. Consult seven experts through telephone interviews, e-mail interviews, etc., to gain an in-depth understanding of the current situation of Muaythai skills and skill evaluation indicators of the Chinese University of Physical Education and Sports. And summarize the relevant information.

Step 5: Conduct the IOC test and create a Delphi questionnaire (first round of the Delphi questionnaire). Synthesize the key insights obtained from the expert interviews and guide the questionnaire design. Validate the validity and consistency of the questionnaire content using IOC analysis and evaluation via email.

Step 6: Adoption of the Delphi Method (second and third rounds of Delphi).1. 19 experts in the Delphi method were invited to form a panel of experts to rate the content of the Muaythai skill evaluation indexes of the Chinese Sports University.2. distribute Delphi expert questionnaires by mail and collect questionnaires through two rounds of survey.3. synthesize and analyze the information collected from the questionnaires.4. formulate the model of the Muaythai skill evaluation index system of China Sport University.

Step 7: Conduct Appreciation Group Appreciation. By email, invite 7 appreciation experts to discuss and evaluate the constructed Muaythai Skill Evaluation Indicator System of Chinese Sports Universities.

Step 8: Conclusion and final report. Analyze, summarize the relevant analysis, and write the report.

Result

This study adopts a variety of methods to establish a set of practical Muaythai skill evaluation index systems of Chinese sports universities. The study determines that the Muaythai skill evaluation index system of Chinese sports universities includes a total of 4 first-level indexes, 35 second-level indexes, and 175 third-level indexes through the collation of literature, skill analysis, expert interviews, IOC expert tests, Delphi surveys, and appreciation by the appreciation team, and the results of the appreciation confirm the reasonableness and practicality of the index system. The appreciation results also confirmed the rationality and practicality of the index system. Based on the components of Muaythai skills, the system sets the evaluation standards of Muaythai skills of Chinese universities of physical education and sports in terms of accuracy, strength, reaction, smoothness, stability, precision, movement amplitude, movement awareness, mastery of movement and presentation, etc. This study lays a solid foundation for the research and practical application of Muay Thai skills in China.

Table 1 China Sport University Muaythai Skills Evaluation Index system

China Sport University Muaythai Skills Index system			
Standing posture	footwork	Offensive skill	Defense skill
1. Standing left 2. Reverse position	1. Walk straight 2. Slide	1. Straight Punching, 2. Hook Punching, 3Uppercut Punching, 4. Roundhouse Elbow, 5. Uppercut Elbow, 6. Diagonal Elbow, 7. Straight Knee Striking, 8. Diagonal Knee Striking, 9. Curved Knee Striking, 10. Roundhouse Kicking (high,	1. obstruct (anti-punch), 2. Block (anti-punch), 3. Side flash (anti-punch), 4. Retreat (anti-elbow), 5. Back flash (anti-elbow), 6. Block (anti-elbow), 7. Block (anti-knee), 8. Knee lift pat press (anti-knee), 9. Knee lift block (anti-knee), 10. Back flash (anti-low sweep leg), 11. Back flash (anti-high sweep leg), 12. Knee lift defense (against low sweep

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China Sport University Muaythai Skills Index system		
	middle, and low), 11. Diagonal Kicking, 12. Straight Kicking, 13. Kicking, 12. Straight kicking, 13. Forward kick, 14. Side push kick	leg), 13. Knee lift defense (against high sweep leg), 14. Block (against kick), 15. Receiving leg (kick defense), 16. Knee lift defense (kick defense), 17. Back flash (kick defense)
Inspection aspects strength, response, fluency, stability, coherence, accuracy, movement range, movement awareness, movement mastery, presentation degree		

China Sport University Muaythai Skills rating scale

Table 2 Standing posture

Rating scale	Marking scheme
Very Good	feet perfectly parallel and shoulder width apart, even and stable weight distribution, ready to move, maintain a relaxed and defensive posture, excellent defense effect
Good	feet parallel and shoulder-width apart, weight distribution is even and stable, maintain a relaxed and defensive posture, good defense effect.
Moderate	feet are shoulder-width apart but not parallel, weight distribution is even but not stable, posture is correct but not relaxed, and defense effect is average.
Improved	feet slightly misaligned, weight slightly off-center, tilted forward or backward, defensive movement not relaxed, poor defensive effect
Failed	feet too wide or too narrow, weight concentrated on heels or toes, shoulders slumped or back rounded, very unrelaxed defensive movement, not effective in defense

Table 3 Footwork

Rating scale	Marking scheme
Very Good	Step length is optimal, can be adapted to the situation and executed with power and precision, footwork is perfectly coordinated with punches or kicks, agility, ability to change direction quickly and easily, excellent coordination, and smooth and precise movements.
Good	Excellent stride length, ability to adjust to the situation, the stride is smooth and efficiently adjusted by punches or kicks, excellent balance, excellent agility, and excellent coordination.
Moderate	Consistent stride length, feet pointing to the target, smooth movement but slightly hesitant to pick up follow-through, good balance, slightly unsteady, good agility but not fast, good coordination.
Improved	Slightly uneven step length, direction slightly off-target, footwork slightly out of step with punches or kicks, lack of stability, slightly uncoordinated movement。
Failed	Strides are too short or too long, feet are not pointed at the target, footwork is not synchronized with punches or kicks, balance is poor, frequent stumbling or tripping, movements are slow and awkward, coordination is poor, and movements are not fluid.

Table 4 Offensive skill

Rating scale	Marking scheme
Very Good	Strong striking power, the ability to hit the intended area with precision, even aiming accurately on the move, the ability to maintain balance and be able to make the next move immediately after the strike, with great speed, while maintaining defensive maneuvers with perfect form.
Good	Stronger striking power to hit the expected area, always balanced after striking, no wobbling, faster, able to maintain defensive movements, standardized form.
Moderate	Strong strike, able to hit the expected area, occasional deflections, largely able to maintain balance after the strike, average speed, while being able to maintain a defensive action with care, more disciplined form, occasional flaws in execution.
Improved	Average strength, erratic in hitting the expected area, often off-target, occasionally off-balance after hitting, slower, and executed with multiple irregularities.
Failed	Strikes are weak, fail to hit the expected area, are off-target, are off-balance after striking, are slow, have no sense of defense, present poor form, and have not mastered skill movements.

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Table 5 Defense skill

Rating scale	Marking scheme
Very Good	Blocking power is very high, able to block attacks with precision, extremely fast blocking reactions, very consistent movement, good awareness of movement anticipation, good takedowns after completing the defense, and perfect form.
Good	Stronger blocking power, ability to effectively block the offense, faster blocking reaction time, stable movement, awareness of movement anticipation, and standardized form.
Moderate	Powerful blocking, effective in blocking offenses for the most part, average blocking reaction time, largely consistent movement, more disciplined form, occasional flaws in execution.
Improved	Blocking with some power, is occasionally effective in stopping the offense, slow blocking reactions, less consistent movement, and multiple irregularities in execution.
Failed	Inability to effectively block offenses, slow blocking reactions, poor consistency, lack of mastery of skill movement, and poor presentation of form.

Appreciation group results analysis

Seven experts in the relevant fields were invited to appreciate this study, and the results are as follows : This study rigorously processed the data through literature review, comparative analysis, direct observation, expert interviews, Delphi surveys, and dual analysis (thematic and descriptive) to ensure the reliability and accuracy of the Muaythai skill assessment. It focuses on the Muaythai skill system and combines the combat skill assessment methodology to develop an assessment framework tailored to the unique attributes of Muaythai and the practice of Chinese sports universities. The resulting evaluation index system is desirable, appropriate, feasible, and practical. The marking scheme developed is clear and practical. The study is novel and of practical significance for promoting Chinese Muaythai skills and their assessment, motivating Muaythai enthusiasts, and enhancing the teaching and assessment of Muaythai skills in universities.

Discussion

1. Through literature analysis, expert interviews, IOC tests, and Delphi surveys, this study constructed a comprehensive and practical evaluation index system to measure and evaluate Muaythai skills in Chinese sports universities. In the study, we constructed an evaluation index system, including three levels, specifically including 4 level 1 indicators (standing posture, footwork, attacking skills, and defensive skills), 35 level 2 indicators (specific skill movements included in the level 1 indicator), and 175 level 3 indicators (in terms of strength, reaction speed, smoothness, stability, precision, movement amplitude, movement awareness, mastery of movement, and degree of presentation). (5 levels of evaluation criteria for skill movements in terms of strength, fluidity, stability, precision, movement range, movement awareness, movement mastery, and presentation). The evaluation index system is both comprehensive and detailed. It can accurately reflect the comprehensive performance of Muay Thai skills in Chinese sports universities.

2. This study adopts the appreciative interview method to explore the rationality and feasibility of the constructed evaluation index system of Muay Thai skills in Chinese sports universities. From the appreciation results, the evaluation indexes constructed in this study have good rationality and feasibility, with theoretical value and practical significance.

However, our study is not without limitations. First, this study took 38 university leaders, Muaythai experts, and university teachers as research subjects and designed the evaluation index system through the experts' opinions and suggestions. Although it is highly generalizable in theory, it may need to be modified and adjusted appropriately when applied to students from different universities and

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majors. Second, although we have tried our best to make this evaluation index system as comprehensive and detailed as possible, there may still be some important evaluation indexes that have not been considered.

Overall, this study provides a tool for sports universities, students, and teachers to evaluate the skill level, helps them to better understand Muaythai skills, and achieves the function of standardizing the evaluation of skill level, improving the teaching effect, guiding the teaching of skills, and self-skill improvement. The results of this research have theoretical value and practical significance.

In the subsequent research, we plan to field verify this evaluation index system and further optimize and improve it according to the test results. In addition, we also plan to analyze the Muaythai skill in depth by combining dynamics and electromyography. Thus, making the Muaythai skill get more refined index data. Make it more universal and widely applicable.

Recommendation

Although this study has constructed an index system for evaluating Muaythai skills in Chinese sports universities, providing a reasonable and practical tool. However, we recognize the need to further refine and extend this work. The following are some of our suggestions.

1. Refine the evaluation index system: Firstly, our study is only based on Chinese sports universities that offer Muaythai courses and does not cover other universities that set up clubs but do not offer courses, secondly, we have not yet refined the differentiation evaluation criteria for students of different majors, and cannot fully evaluate all groups. Therefore, expanding the scope of the study and refining the graded evaluation index system will help to further improve this evaluation system.

2. Include more evaluation contents: Although our evaluation system has included many skill aspects of Muaythai such as strength, reaction speed, fluency, stability, precision, movement range, movement awareness, movement mastery, and presentation, there may be other relevant factors that are not included. For example, psychological state, physical state, and other aspects that may affect the skill evaluation.

3. Multidisciplinary Research Methods: Further research can consider using multidisciplinary research methods, such as dynamics, and electromyography to analyze Muaythai skills in depth. Thus, the Muaythai skill can get more detailed index data.

4. Utilization of new technologies: Utilize new technologies to evaluate the level of Muaythai skills, such as virtual reality skills, wearable devices, etc. These technologies can provide more detailed and accurate data. These technologies can provide more detailed and accurate data to further improve the accuracy and validity of the evaluation system.

These are some suggestions for future research. We look forward to seeing more researchers and practitioners get involved and work together to advance this important work.

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