

Guidelines to Promote and Develop the Skills of Physical Coaches for Basketball Clubs in Henan Province

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Abstract

Background and Aim: Before the introduction of coaching positions such as physical coaches into China, the head coach and assistant coach were required to be responsible for all the training of the athletes, and the coaches' energy and concentration were limited. So, the main objective of this research was to develop guidelines to promote and develop the skills of physical coaches for basketball clubs in Henan Province.

Materials and Methods: This research employed a mixed-methods design, combining quantitative and qualitative approaches. This study designed a questionnaire on the training path of professional basketball physical coaches. Distributed online to the physical coaches of 10 teams in Henan basketball clubs. The questionnaires (IOC=0.67) were analyzed and sorted to obtain the survey results. A total of 5 experts were interviewed to improve the skills of strength and conditioning coaches at a basketball club, based on the current situation database, including 2 managers and 2 basketball physical coaches. The focus group method will involve a total of 9 experts—a connoisseurship method using 5 experts, including 2 managers and 3 basketball physical coaches.

Results: The finalized management guideline was developed under the ICCE framework. The results indicated that, based on the ICCE framework and questionnaire analysis, most dimensions demonstrated moderate to high problem levels ($\bar{x} > 3.60$). Consequently, the management guideline encompassed five key dimensions: 15 guidelines of exercise programming and periodization, 15 guidelines of assessment and testing, 15 guidelines of first aid and emergency response, 15 guidelines of nutrition basics, 15 guidelines of professionalism and ethics, a total of 75 guidelines to promote and develop the skills of physical coaches for basketball clubs in Henan province.

Conclusion: The guidelines cover the design of training plans based on player characteristics and competition rules and dynamic adjustments, the establishment of a comprehensive and scientific evaluation system and the accurate use of data, the mastery of first aid skills, regular drills and emphasis on prevention, the formulation of nutrition plans according to different stages and attention to details, as well as continuous learning, enhanced collaboration, adherence to professional norms and other aspects, forming a systematic and targeted skill development direction.

Keywords: Physical Coaches; Physical Coaches' Skills; Basketball Clubs; Henan Province

Introduction

With the vigorous development of my country's sports industry, basketball, as a popular sport, has attracted wide attention for its competitive level and talent cultivation. The national level attaches great importance to the cultivation of sports talents and has issued a series of macro policies to promote the construction of a strong sports country (Akuthata, 2004). In modern basketball teams, the division of work of the coaching team is becoming more and more detailed, down to every training session of the athletes. Before the introduction of coaching positions such as physical coaches into China, the head coach and assistant coach were required to be responsible for all the training of the athletes, and the coaches' energy and concentration were limited (Brian, 2003).

The training of physical coaches in Henan basketball clubs faces some problems. First, the training system of physical coaches is not perfect, lacking systematicity and standardization, resulting in uneven professional quality of trained physical coaches. Secondly, the training content of physical coaches is out of touch with actual needs and fails to fully combine the particularity of basketball projects, making it difficult to meet the physical training needs of club athletes. Thirdly, the training resources for physical coaches are relatively scarce, lacking professional training teachers and advanced training facilities, which affects the training effect (Chang, 2004).

In summary, this research uses the questionnaire survey method to take the training path of physical coaches in Henan basketball clubs as the research object. Through the literature and expert interview methods, the training paths of excellent physical talents at home and abroad are compared, and problems in the training of physical coaches in Henan basketball clubs are found. Ways to optimize the training of physical coaches are proposed.

Objectives

The main objective of this research was to develop a guidelines-based ICCE framework to promote and develop the skills of physical coaches for basketball clubs in Henan Province.

Literature Review

1. Physical Coaches for Basketball Clubs: Concepts and Theories

The role of coaches has evolved from non-professional to professional in modern sports. Since the 1950s and 1960s, countries like the United States and Japan have successively established coaching certification systems. China saw the emergence of professional coach roles during this period, though it wasn't until 1994 that the "Sports Coach Certification Standards" clarified their hierarchical levels and responsibilities. In 1999, China's "Occupational

Classification Dictionary" categorized sports coaches as technical professionals under sports staff, defining them as specialists engaged in athlete training and guidance. Their core responsibilities include physical conditioning, technical-tactical training, psychological coaching, assisting in developing training and competition plans, and participating in event guidance. Basketball club fitness coaches, as a specialized branch, also focus on player physical conditioning work within these duties.

The work of physical trainers in basketball clubs is supported by theories such as exercise physiology and biomechanics. Exercise physiology studies the human body's response to physical activity and its adaptability, guiding coaches to scientifically design training regimens. For instance, reasonably high-altitude training can enhance players' blood oxygen-carrying capacity and aerobic performance while optimizing body composition (Fan, 2011). Biomechanics applies principles of mechanical engineering to analyze human movement patterns, providing evidence for action optimization and injury prevention. For example, the joint movement sequence principle guides players in performing jumps and sprints, helping them maximize physical efficiency. This approach also aids in athlete technique diagnosis and training method improvements (Guo, 1991).

2. Physical coaches and the policy in Henan

As an emerging profession in the process of professionalizing competitive sports and industrializing public fitness, physical conditioning coaches fall under the category of sports coaching. They require specialized education and training to acquire expertise in physical training, with their professional development aimed at meeting the needs of both competitive sports training and public fitness guidance. This discipline-based system provides systematic education and vocational training covering various stages, formats, and levels, emphasizing career growth and lifelong learning. China has established a sports coaching training framework that combines academic education with job-specific training. Building on this foundation, specialized physical conditioning coach programs address industry talent shortages by helping non-professionals become qualified instructors. Meanwhile, Henan Province's "14th Five-Year Plan" for Sports Development prioritizes basketball physical conditioning coaching, proposing measures such as improving training systems, establishing athlete performance databases, and promoting "sports-education integration." These initiatives highlight its crucial role in enhancing athletic performance, advancing basketball development, and nurturing young talent.

3. A competency-based coaching framework

Physical coaches are the architects of athletic potential, shaping not only physical prowess but also the very essence of performance through structured expertise and ethical practice. This insight underscores the pivotal role of competency-based frameworks in guiding the cultivation of physical coaches' skills (ICCE, 2013), which serves as a cornerstone for

dissecting the five dimensions crucial to physical coaches in basketball clubs in Henan Province (As shown in Figure 1).

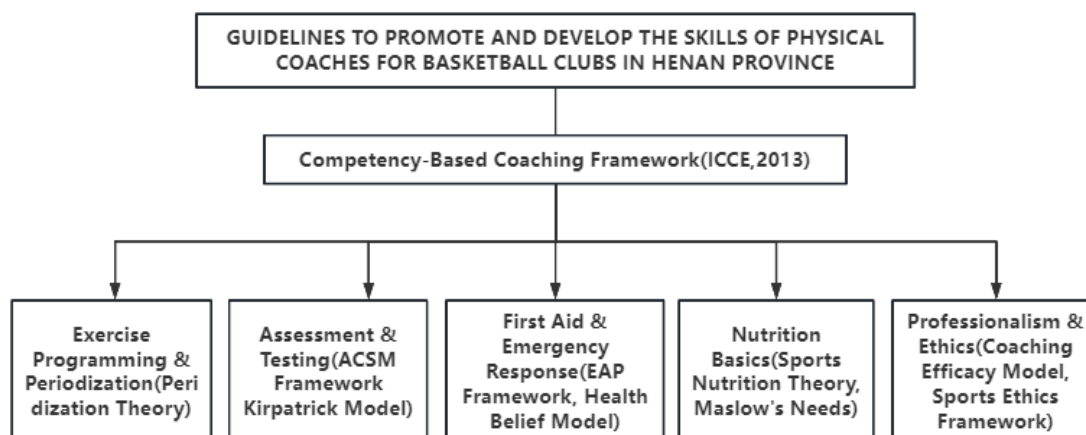


Figure 1 Competency-Based Coaching Framework (ICCE,2013)

4. Summary

In summary, there are problems in the training of physical training talents in basketball clubs. Physical training should not only include the training of strength and other qualities, but also include psychological and special physical training. A good basketball physical coach should be a person who understands basketball or has been engaged in basketball. He should have the common characteristics and responsibilities of coaches, understand the sports characteristics of athletes, and communicate with other coaches to implement the physical training of basketball players into the training practice of their various qualities and special physical fitness. Regarding the qualifications of physical coaches, the physical training coach certification organized by the National Strength and Conditioning Association of the United States is the main certification method. This certification does not mean that the certified physical coaches are qualified for this position. It is also necessary to carry out planned training for different sports, so as to strengthen the professionalism of professional basketball coaching teams and improve the scientific nature of athletes' physical training.

Conceptual Framework

The research title “Guidelines to Promote and Develop the Skills of Physical Coaches for Basketball Clubs in Henan Province” was designed as follows.

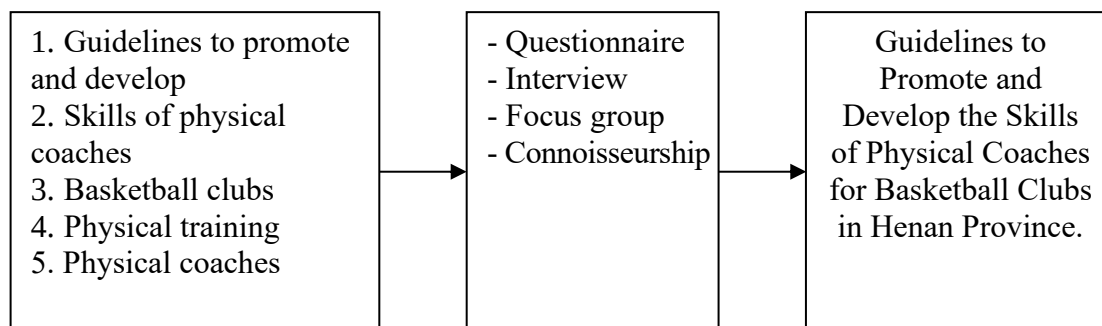


Figure 2 Conceptual framework

Methodology

Population

There were 521 basketball clubs in Henan Province. Secondly, we randomly selected 10 clubs that had been in operation for more than 10 years from the 521 basketball clubs. Furthermore, we selected 133 head fitness coaches with more than 10 years of working experience from these 10 clubs.

Sample

According to Taro Yamane's schedule (Yamane, Taro, 1967), the researcher will use a total sample size of 133 head coaches. The sample will be selected from each club as table below.

Sampling Method

The method of combining qualitative and quantitative methods is mainly adopted. Questionnaires were distributed to 133 head coaches with more than 10 years of working experience. In addition, expert consultation was conducted in multiple stages: interviews, focus group discussions, and the connoisseurship method.

Research Participants

1. 3 experts were used to determine the quality of the questionnaire (IOC); three experts were selected. 3 players from the basketball club were selected. All the experts will have more than 3 years of experience.

2. 5 experts were used to interview experts to consult about the draft of the guideline to promote and develop the skills of physical coaches for basketball clubs from the database on the current situation, including 2 managers and 3 physical coaches. All the experts will have more than 5 years of experience.

3. The focus group method will involve a total of 9 experts. All the experts will have more than 5 years of experience.

4. Connoisseurship method using 5 experts, including 3 managers and 2 physical coaches. All the experts will have more than 5 years of experience.

Research Instrument

1. Questionnaire for collecting the data

The questionnaire is mainly used to investigate the strategies for cultivating the skills of physical coaches in basketball clubs ($IOC=0.67$). The questionnaire is divided into two parts: the first part is the background information of the respondents; the second part is the current situation investigation of the problems existing in the skills of physical coaches in basketball clubs, which contains five aspects: exercise programming and periodization, assessment and testing, first aid and emergency response, nutrition basics, professionalism and ethics.

The evaluation criteria for each question are as follows:

5 points: highest

4 points: high

3 points: medium

2 points: low

1 point: lowest

2. In-depth Interviewing form to collect the data from experts

An interview form on the current status of physical training skills training for basketball clubs in Henan Province. This interview form is an open-ended question designed under the question "What are the existing problems and improvement strategies for physical training skills of basketball clubs in Henan Province?" Before formal use, three experts will test the effectiveness of the interview form.

3. Focus group outline

In the focus group method, the researcher will submit guidance countermeasures to the managers of Henan basketball clubs based on the data from the questionnaire survey and expert interviews. The experts will be asked to provide additional feedback on the guidance countermeasures developed by the researcher.

4. Evaluation form for connoisseurship

The researchers will use the strategy guide as a tool to request advice and evaluation results. The evaluation is divided into two parts: the first part is the written evaluation content, and the second part is the evaluation results in a tabular form. Each item must be agreed upon by at least 5 experts.

Data Collection

1. Literature review by consulting journal articles, newspapers, magazines, and using websites such as CNKI and Chinese academic journals to search and access relevant literature materials.

2. The questionnaire will be sent to 133 sports coaches in 10 basketball clubs in Henan Province. The questionnaire was distributed randomly, and an online survey was conducted on the

physical coaches of basketball clubs to understand the current status of physical coaches' skills in basketball clubs in Henan Province.

3. The focus group with 9 experts will provide additional comments on the researcher's developed guideline to gain more information to improve the guideline and make it more valuable.

4. Connoisseurship by 5 experts to verify the guidelines for improving the skills of strength and conditioning coaches in basketball clubs by using content analysis.

Data Analysis

1. Evaluate the content validity of the questionnaire and interview form employing the Indexes of Items of Objective Congruence ($IOC \geq 0.6$).

2. Use computer analysis software to collect and organize the data obtained from the questionnaire. (, SD., Percentage). The criteria for the 5-level evaluation scale of Part 2 are as follows:

- An average score of 4.51 to 5.00 indicates the Highest
- An average score of 3.51 to 4.50 indicates a High
- An average score of 2.51 to 3.50 indicates a Medium
- An average score of 1.51 to 2.50 indicates a Low
- An average score of 1.00 to 1.50 indicates the lowest

3. Content analysis for the interview and focus group method

4. Content analysis for the Connoisseurship method

Results

1. The questionnaires returned were 133 copies; all the respondents were head coaches in basketball clubs. There were 106 males (79.70%) and 27 females (20.30%). Most of the population was aged 31-40 years old (67.70%), 90 people, and those aged 50 and above years old had the least number, 5 people (3.80%). In terms of educational level, it was found that the largest population had a bachelor's degree, 84 people (63.20%), and those with an educational level of senior high school or below had the least number, 1 person (0.80%). About the sports Level, it was found that the least populated had a national top-notch athlete, 7 people (5.30%), and the other sports levels were the other have the most number, 83 people (62.40%). In terms of the sports experience can be seen that most of the population was others, 55 people (41.40%), and the least populated group was the national team, 10 people (7.50%).

2. This research mainly conducted a questionnaire survey on the physical coaches' skills of basketball clubs in Henan Province from five dimensions, including: exercise programming and periodization skills, assessment and testing skills, first aid and emergency response skills, nutrition basics skills, and professionalism and ethics skills.

The average score for the exercise programming and periodization skills dimension is 4.16, with a standard deviation of 0.86; the average score for the assessment and testing skills dimension is 4.20, with a standard deviation of 0.82; the average score for first aid and emergency response skills is 4.21, with a standard deviation of 0.82; the average score for nutrition basics skills dimension is 4.25, with a standard deviation of 0.82; and the average score for professionalism and ethics skills dimension is 4.23, with a standard deviation of 0.77. Overall, the average value of each dimension is greater than 3.6, and the level of nutrition basics skills is the highest, while the level of exercise programming and periodization skills is the lowest.

3. Draft of guidelines to promote and develop the skills of physical coaches for basketball clubs in Henan province.

No.	Guidelines
Exercise programming and periodization	
1	Analyze the movement characteristics of players in different positions and design targeted training.
2	Set up injury prevention modules based on injury history.
3	Allocate training and rest according to the intensity of the schedule.
4	Increase the proportion of basic ability training for young players.
5	Develop a "load peak" plan for core players.
6	Adjust the load according to feedback after the small cycle.
7	Adjust the plan based on changes in competition rules.
8	Set up a "test week" in the annual cycle to verify the effect.
9	Provide off-season family training plans.
10	Design collaborative training content based on tactical systems.
11	Learn from the European "microcycle" model to regulate competitive status.
12	Reduce the total amount for veterans and increase the proportion of high-quality training.
13	Establish a training plan database.
14	Incorporate special functional training tools.
15	Dynamically adjust the recovery period after the playoffs.
Assessment and testing	
1	Complete a comprehensive baseline assessment upon joining the team.
2	Test special physical fitness every quarter (shuttle run, etc).
3	Use FMS to screen movement patterns.
4	Real-time monitoring of training heart rate intervals.
5	EMG monitoring of core muscle activation.

No.	Guidelines
6	Build an annual physical fitness development curve.
7	Simple test 72 hours before the game.
8	Add special assessments for those with repeated injuries.
9	Standardized warm-up before the test.
10	Introduce a sports performance analysis system.
11	Measure maximum oxygen uptake every six months.
12	Add bone age and other indicators for adolescents.
13	Three-level review of test data.
14	Plantar pressure test to help with shoe selection and gait correction.
15	Develop a personalized improvement list based on the evaluation results.
First aid and emergency response	
1	Be familiar with the RICE principle and emergency first aid skills.
2	Participate in simulated first aid drills every month.
3	Carry a portable first aid kit.
4	Master the temporary fixation methods for common injuries.
5	Check AED equipment regularly.
6	Develop emergency plans based on the players' medical history.
7	Build a green channel with the hospital.
8	Identify early symptoms and treatment of emergencies.
9	Check the safety of venues and equipment before training.
10	Master the emergency fixation method of Kinesio tape.
11	Develop a list of first aid supplies for outings.
12	Record the injury treatment process and create a file.
13	Learn the differences in first aid for players of different ages.
14	Participate in first aid skills refresher training every year.
15	Clarify the division of labor mechanism for emergencies.
Nutrition basics	
1	Calculate the exact amount of carbohydrates needed daily.
2	Calculate the exact amount of carbohydrates needed daily.
3	Guide the correct consumption of sports drinks.
4	Design a meal replacement plan for the fat loss period.
5	Analyze diet logs to correct bad habits.
6	Work with nutritionists to develop snack recipes.

No.	Guidelines
7	Explain the scientific use of sports supplements.
8	Adjust calorie intake during the off-season.
9	Develop a nutrition plan in advance for away games.
10	Monitor morning weight to find problems.
11	Provide nutrition manuals for parents of teenagers.
12	Measure and supplement micronutrients before the season.
13	Guide the replenishment skills during the halftime break.
14	Analyze the optimization plan related to fatigue recovery and diet.
15	Establish a nutrition response file.
Professionalism and ethics	
1	Read academic papers and take notes every month.
2	Participate in tactical meetings to understand physical needs.
3	Develop a personal annual learning plan.
4	Respect differences and patiently answer players' questions.
5	Record training problems and adjustment measures truthfully.
6	Establish a daily communication mechanism with team doctors.
7	Comply with the principle of professional confidentiality.
8	Participate in industry seminars every year.
9	"Teach and help" young coaches.
10	Evaluate their own shortcomings, ask for advice, and learn.
11	Arrive early before training to prepare.
12	Look at winning and losing rationally and do not shirk responsibility.
13	Participate in community basketball promotion.
14	Build trust with players and pay attention to their physical and mental health.
15	Comply with ethical standards and do not accept improper gifts.

4. All experts agree that the above 75 expert suggestions revolve around the five dimensions. They cover the design of training plans based on player characteristics and competition rules and dynamic adjustments, the establishment of a comprehensive and scientific evaluation system and the accurate use of data, the mastery of first aid skills, regular drills and emphasis on prevention, the formulation of nutrition plans according to different stages and attention to details, as well as continuous learning, enhanced collaboration, adherence to professional norms and other aspects, forming a systematic and targeted skill development direction.

Discussion

About exercise programming and periodization element: This research reveals that physical coaches at Henan Basketball Club demonstrate strong competency in this domain ($\bar{x} > 3.60$), particularly among mid-career coaches aged 31-40 (67.70%). Their expertise in managing cross-cycle training loads and setting phased objectives effectively reduces overtraining risks. Notably, professional club coaches outperform youth academy coaches in multi-cycle integration design – the former excels at optimizing training rhythms for competitive demands, while the latter focuses on short-term foundational conditioning. These findings align closely with core periodization theory principles (Jiang, 2016), corroborating a study showing 8-10% injury reduction through periodized planning for mid-career coaches (Peter, 2011), overlooking injury history increases recurrence rates by 20% (Sun, 2003), and confirming professional coaches enhance players' season endurance by 15% through multi-cycle planning (Tian, 2002).

Assessment and testing element: the evaluation and testing of skills should balance basic indicators (body fat percentage, resting heart rate) with specialized metrics (30-meter sprint time), utilizing advanced technologies like FMS and sports performance analysis systems to ensure data accuracy and practicality. This study reveals that physical coaches at Henan Basketball Club have mastered such integrated assessment methods. Coaches with bachelor's degrees or higher (63.2%) demonstrate superior capabilities in indicator interpretation and data analysis, while most utilize basic equipment like body fat scales and stopwatches (professional clubs show higher adoption of high-end equipment compared to youth training clubs). It found that coaches with bachelor's degrees exhibit 25% higher accuracy in indicator interpretation (Wang, 2011).

First aid and emergency response element: The study highlights three critical areas for physical training coaches in Henan basketball clubs: First, instructors must master core first aid competencies. Clubs should enhance equipment provision, conduct regular simulation drills, and establish standardized emergency protocols to integrate prevention with intervention. The findings reveal that 91.7% of coaches possess CPR certification and 85.8% understand the RICE protocol. While most clubs strengthen emergency preparedness through monthly drills, coaches demonstrate weaker skills in managing rare emergencies like sudden exercise-related death and heatstroke, as well as operating automated external defibrillators (AEDs) (particularly among coaches aged 50). Moreover, the absence of standardized emergency procedures often leads to a chaotic response. It found that "regular drills reduce emergency response time by 20%, report on 40% lower AED competency rates among coaches over 50, and it concluded that regarding the integration of prevention and intervention strategies (Xiang, 2005).

Nutrition basics element: nutritional foundation training requires customized nutrition plans aligned with different phases (preparation and recovery periods), focusing on dietary, sleep, and hydration management while considering individual factors like players' allergy histories and dietary preferences. This study reveals that physical coaches at Henan Basketball Club implement phased nutritional adjustments (55%-65% carbohydrate intake during preparation, increased protein consumption during recovery), with female coaches demonstrating better compliance with players' dietary plans. However, coaches generally overlook personalized nutritional needs for young athletes and those with injuries, showing significantly lower attention to sleep and hydration management compared to diet (reflecting cognitive biases). These findings regarding sports nutrition research, improvement in dietary compliance among female coaches, and a 20% recovery efficiency boost through sleep management (Yang, 2001).

Professionalism and ethics element: coaches are expected to maintain continuous learning, proactively engage in cross-team collaboration (sharing player information with team doctors and technical coaches), adhere to professional standards such as accurate data recording and player privacy protection, while optimizing communication methods with athletes. This study reveals that Henan Basketball Club's physical conditioning coaches demonstrate the highest consensus in this dimension ($\bar{x} > 3.80$). Most coaches uphold professional norms and engage in regular learning (with higher frequency among club coaches), yet show insufficient initiative in cross-team collaboration. Coaches with other sports backgrounds exhibit weaker awareness of professional standards compared to those transitioning from professional athletes. It concluded that annual learning exceeds 40 hours, with 30% faster skill updates and observation that transitioned professional athletes demonstrate 25% higher collaboration efficiency (Zhu, 2011).

Recommendations

1. Skills improvement

Select different types of basketball clubs in Henan Province, including professional clubs, youth training clubs, and amateur clubs, as pilot programs.

2. System Optimization

Collaborate with the Henan Basketball Association to establish a Physical Training Physical Coaches Skills Improvement Promotion Platform, integrating outstanding examples from the pilot phase and making it available free of charge to all basketball clubs in Henan Province.

3. Implementation mechanism

Promote the Henan Basketball Association to include physical coaches' skills improvement in club rating indicators, forming a closed-loop implementation system of piloting, promotion, and optimization.

Recommendations for further research

1. The sample selected in this research only partially reflects the current status of physical coaches' skills in Henan basketball clubs. A larger sample size is needed to verify the broad representativeness of the questionnaire.

2. This questionnaire was compiled based on a literature review; while its reliability and validity meet measurement standards, its theoretical framework still contains ambiguity and incomplete consistency.

3. This research focuses on Henan basketball clubs, not other types of basketball clubs. The differences in physical coaches' skills across different types of basketball clubs require further research.

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