

Research on the physical training of college basketball referees in Shanxi Province

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Abstract: Basketball as a competition in the same field, the referee plays an important role in the game, the level of its execution is closely related to the smooth progress of the game. The physical fitness of the referee plays an important role in its execution level in the game. Only by ensuring that the physical fitness of the basketball referee meets the requirements of the game, the competition items can be carried out normally. Therefore, it is very important to strengthen the physical fitness of the basketball referee. At the present stage, there is little research on the physical training of basketball referees at home and abroad, and the research focuses on the training of rules theory, rules, sentencing gestures, etc., and the attention to physical training is not high. In view of this, this paper is based on the existing research theory and results. It takes the physical training of college basketball referees in Shanxi Province as the research object and combines it with the current basketball referee physical training practices. It identifies the problems existing in the physical training of college basketball referees in Shanxi Province and, based on the causes and strictly adhering to the principles of training, proposes feasible training countermeasures from different perspectives.

1. Introduction

In recent years, the development speed of basketball has been accelerating, and the duration of basketball games has been gradually extended. The confrontation increases significantly, and the pace of the game is faster. In this context, the referee, as the law enforcement personnel of the game, needs to have a deep understanding of the specific development trend of basketball at the present stage. In addition to mastering the theoretical knowledge and penalty skills, they should also meet the requirements of the game in physical aspect. Therefore, it is particularly important to conduct professional physical training for college basketball referees.

2. Physical training of college basketball referees in Shanxi Province

2.1 Research object

With the physical training of college basketball referees in Shanxi Province, a total of 107 basketball referees were investigated.

2.2 Physical fitness test of various levels of basketball referees promoted in colleges and universities in recent years

According to the physical fitness test of the universities in Shanxi Province, the first level 23.26%, the second level 30.84%, and the third level basketball 40.56%. According to the results of the survey, the proportion of three-level referees is the highest, which is related to the system that the school holding the examination of referees. Are shown in Figure 1.

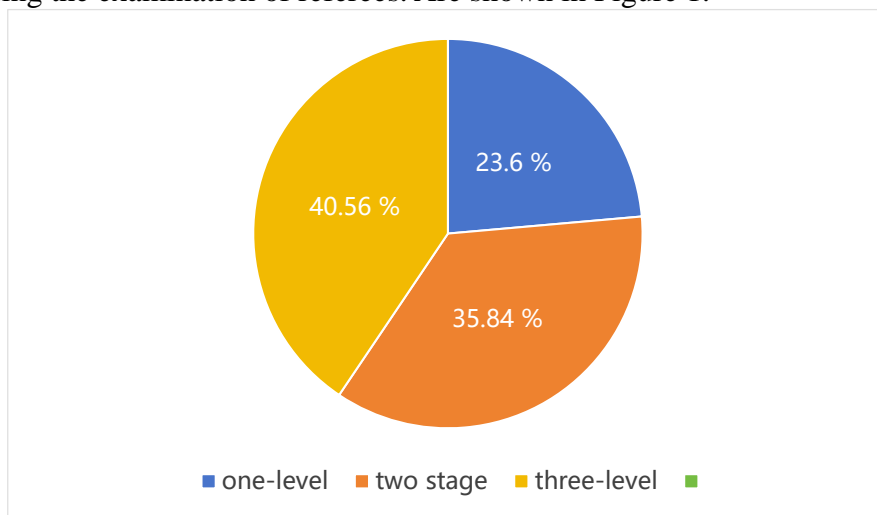


Figure 1: Promotion of basketball referees in universities in recent years

2.3 Physical fitness test of first-level basketball referees in universities in Shanxi Province

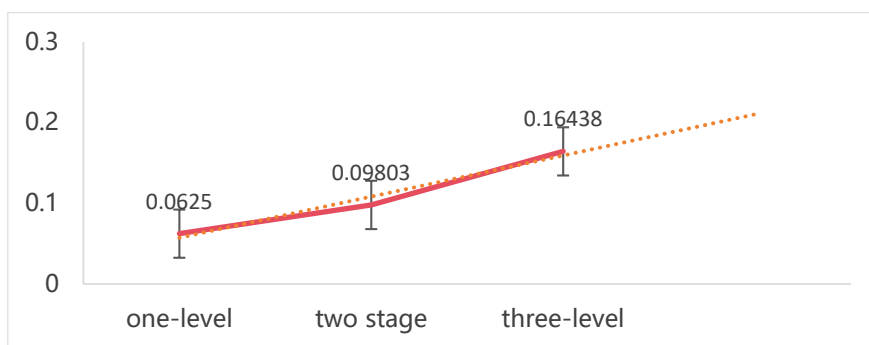


Figure 2: Physical failure rate of promoted first-level basketball referees in Shanxi Province from 2020 to 2023

Based on the analysis of the physical fitness test of basketball referees in recent three years, 32 students failed in 2021; in 2022, 51 failed the test; in 2023, 73 students failed and 12 failed the physical fitness test. The failure rate is specific as shown in Figure Figure 2. According to the data in the figure, the failure rate of the first level physical fitness test is larger than the growth rate of the number of participants, and there is no physical fitness test in the second and third level tests of college basketball referees in Shanxi Province. In view of this kind of situation, it may be related to the students have a certain level of physical quality. The failure rate of the physical fitness test of the first level test is increasing year by year, which also indicates that the physical conditions of the referees cannot be agreed with the standards and requirements of the test, which reflects the school's low attention to the physical fitness training and ignores the difficulty of the physical fitness test. In recent years, the examination time of the first-level examination notice is about 2 to 4 weeks, and

the effect of surprise training cannot be immediately effective. Therefore, so the importance of physical training should be recognized in the daily training process of college basketball referees in Shanxi Province.

2.4 Physical training of college basketball referees in Shanxi Province

Through the analysis of the physical training of college basketball referees in Shanxi Province, the school has a basketball association, which can provide auxiliary support for the competition training and basketball competition. In addition, some referees can participate in the large basketball games to complete the referee. For students, it can provide a platform for the improvement of their referee ability. As shown in Figure 3, in the process of physical training for referees, the content involved is relatively extensive, but the content of physical training accounts for a small proportion, only 10%, with the emphasis on rules theory, adjudication norms, sentencing gestures and other aspects.

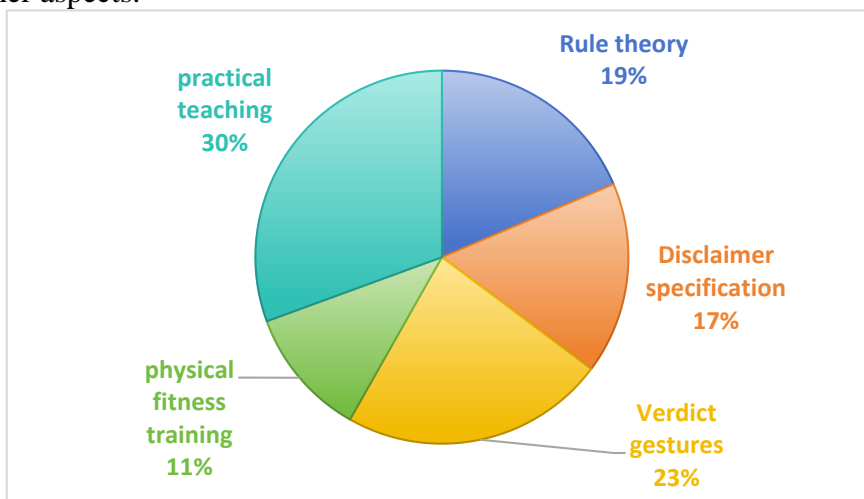


Figure 3: Physical training of college basketball referees in Shanxi Province

2.5 Training content of college basketball referees in Shanxi Province

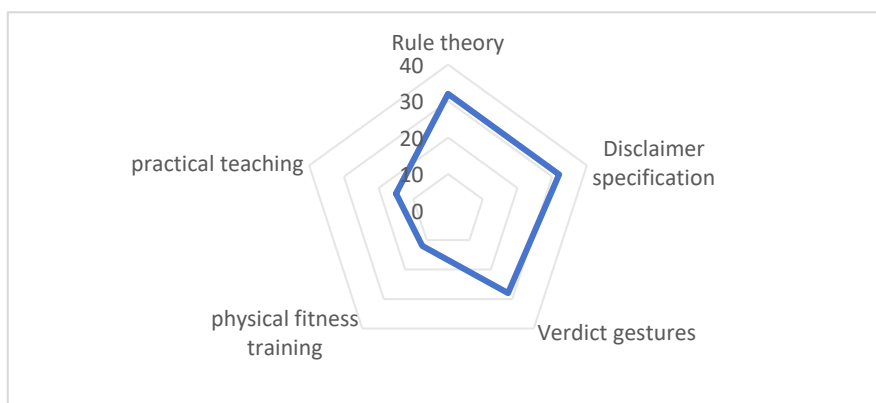


Figure 4: Training content of college basketball referees in Shanxi Province

If you want to promote the improvement of basketball referees, you need to master the relevant theoretical knowledge and have good physical quality. Combined with the data in Figure 4, college basketball referees have a solid grasp of the rules and theories, and can practice the ruling norms and sentencing gestures in their spare time. But for physical training, and did not give too much

attention, the content of skill training is less. In addition, during the training process, some respondents had full confidence in their physical strength, believing that they could always maintain sufficient physical strength in the competition and did not need to spend a lot of time on training. In view of this situation, it fully shows that the basketball referees pay low attention to physical training and ignore the importance of physical training.

2.6 Understanding of physical training by Shanxi Provincial college basketball referees

Usually, the training time of the promotion test is about a week, and the physical training schedule is not the best effect, nor does it have a direct impact on passing the physical fitness test. Physical training, as the primary factor to improve the ability of basketball referees and level promotion, requires student referees to master the training methods, clarify the training cycle, and adhere to physical training for a long time, so as to achieve the goal of comprehensive improvement of their physical fitness. However, combined with the overall training situation of college basketball referees in Shanxi Province, the theory of rules, adjudication norms and sentencing gestures are the focus of teaching, and the specific training concepts and methods are explained in detail, but for specific practice, there is not too much class hours arranged.

"What knowledge do you know about physical training for basketball referees?" The details of this question are shown in Table 1. According to the data in the table, most students do not understand the physical training of basketball referees, 49 do not understand, accounting for 43.80% of the total; 22, accounting for 22.55%; the total number is 3, accounting for 2.8% of the total. Visible most students referees about the content of physical training, or one-sided think physical training is running speed and endurance, understanding of physical training is not professional, system, the wrong cognition will not only make the referee physical improvement affected, also restrict the referee in-depth training and physical training effect.

Table 1: Understanding of physical training among college basketball referees in Shanxi Province

Ask for information	Number of people (people)	Scale (%)
Know very well	3	2.8
Compare the understanding	13	12.15
General understanding	20	18.70
Don't know much	49	43.80
Do not understand	22	22.55

3. Physical training principle of college basketball referees in Shanxi Province

3.1 Systemic principles

In the process of physical training of college basketball referees, the systematic principle should be strictly followed. Because physical training and can achieve results overnight, it takes a long time to insist, only continuous and repeated training, to improve physical fitness^[1]. Therefore, in the physical training, systematic and professional training program should be formulated according to the actual situation of the referee, and the training method should be adjusted flexibly adjusted according to the training effect, so as to not only enhance the physical fitness of the referee.

3.2 The principle of differential treatment

The physical training of basketball referees should be based on the actual age, physical condition, sports level and other characteristics, and the targeted training plans and methods should be formulated on the basis of the full understanding of the training conditions and each stage. At the same time, based on the weak events and the physical fitness problems generated in the competition, the training should be emphasized, and the content and program of the training should be adjusted appropriately^[2].

3.3 Principles of cycle arrangement

Things are cyclical, and the improvement of human competitive ability is no exception. Therefore, in the process of basketball referee physical training, should be the time and cycle as the basis, make different periods and period of training plan, to ensure that the referee during the game of physical state, sports function can keep in the best, no physical decline or excessive consumption problem, let the field cutting work orderly and efficient^[3].

4. Shanxi Province college basketball referees physical training method

In view of the various problems existing in the physical training of basketball referees in Shanxi Province colleges and universities, colleges and universities should pay great attention to the causes of the inadequate training and poor results, and make a reasonable training plan from multiple angles to improve the effect of physical training.

4.1 Strengthen the speed training of basketball referees

During the physical training of basketball referees, speed training, as an important content, is closely related to the movement speed and reaction speed of the referees. Therefore, in the process of carrying out this training activity, targeted training methods should be formulated^[4].

1) Response speed training. Usually, the referee needs to make a quick response to the fouls and violations occurring in the game, and the cultivation of the ability in this aspect needs to rely on a good response speed. Therefore, in the process of physical training of basketball referees, for the speed training, we should pay attention to the training of reaction speed, and adopt the method of selective signal reaction practice, so that the overall reaction speed of the referees is improved. At the same time, explosive force training to enhance the referee's starting and sprint ability. During the training period, the referee can be organized to run 30 meters sprint, each group 3-5 times, the interval of 1~2 minutes to rest. This high-intensity sprint training helps to improve the initial acceleration ability of the referee.

2) Strengthen lateral movement training and technical training. A series of marking points are set to allow the referee to move sideways quickly, such as the lateral fast run and the T run, to improve the speed and flexibility of lateral movement on the field. At the same time, the way of simulated competition scene is used to guide the referee to practice the movement speed, such as simulating fast follow-up, turn and change direction, so as to improve the application ability in the actual competition^[5].

3) Direction change training, and coordination training. This training method is crucial to improving the ability of the referee to change direction quickly on the court. You can set up cones or obstacles, such as running around the cone and L running, 5-10 times to enhance the agility and coordination of the referee on the court. Coordination training promotes the speed of movement, using jumping rope, obstacle jumping and various flexibility exercises, such as leg swing and arm

rotation, to improve foot speed and body coordination.

4) Interval training. To improve endurance, referees can perform interval training, such as alternating 30s full-out sprint and 30s jogging or brisk walk, with 5-10 sets. This training helps improve the referees' ability to move fast during the game.

4.2 Pay attention to the strength training of basketball referees

In the process of the referee's physical training, strength training, as an important content, should also be paid great attention to the training focus on strength endurance, fast strength and maximum strength training, in order to promote the improvement of the referee's physical fitness^[6].

1) Strengthen maximum strength training. In the training process, combined with the actual situation of the referee, the load intensity is strictly controlled. Usually, the number of training groups is about 5 groups, and the interval time varies according to the training maintenance time and load intensity, which needs to be reasonable and appropriate. If the training lasts for a long time and the load intensity is large, the arrangement of interval time should be increased appropriately. During the maximum strength training period, each group adopts the implementation of multiple strength training for the referees through the rational application of a variety of strength training instruments. During the training process of each group, the method of gradually increasing the load should be adopted, and the number of repetitions in each group should be reduced appropriately. For example, in the weight squat training, the number of contact groups set is 5 groups, the load intensity is gradually increased from 50% to 90%, the number of repetitions in each group starts from 10 times, reduced from 10 to 2 times. When setting the interval time of each group, the control was kept at about 2min.

2) Develop rapid strength training together. During the rapid strength training for basketball referees, the load intensity should be based on the referee's ability and training level, and the intensity should be controlled between 30% and 100%. According to the load control, the speed of practice will not be reduced. The interval time should be reasonably controlled, and at the same time to ensure that the referee can keep the excitement for a long time under the premise of physical recovery. During the rest process, strengthen the use of the active rest method. The overall duration of the practice was controlled at around 15 to 20 min. In order to ensure that the practice speed can reach the best, in the selection of training methods, you can use no weight bearing methods, including leapfrog, legs jumping and so on.

3) Focus on strength and endurance training. During the period of this training activity, there is no high requirement for the load intensity, usually about 25%~40%. But the number of repetitions in this training is particularly important, need to be repeated, even to the maximum. The number of training groups should be reasonable and arranged, and the number of groups should not be too many or too little, so as not to affect the effect of the training. The interval time is based on the heart rate. If the heart rate recovers to 110 times / min~120 times / min, the next group of training activities can be carried out.

4.3 Increase the endurance training of basketball referees

In the process of basketball competition, the referee's exercise is usually mainly aerobic endurance metabolism, and anaerobic endurance rarely appears in the competition. Based on this characteristic, in the process of endurance quality training of referees, we can focus on the aerobic endurance training, and the specific methods are as follows:

1) Continuous training method. In the process of carrying out endurance training activities, through the reasonable application of this method, the referee can improve the endurance quality. For the application of this method, the requirement of load intensity is small, and the training

process should be carried out according to the heart rate. The training load can be determined based on the referee's own training level. Take the time of the basketball game as the benchmark, the duration of the training is appropriately extended, usually more than 40min, it is best to control the time in about 90~120min. At the same time, in the training process, we should also use bicycle cycling, uniform running and other ways to improve the effect of training.

2) Interval training method. In the process of training basketball referees with this method, if the referee's heart rate reaches 160 times / min, and the training duration of each group is more than 5min. For the interval time control, the heart rate of the referee should be restored as the benchmark. If the referee's heart rate is restored to 120 times / min, the follow-up training activities can be organized. During the rest process of the training group, the effect of the auxiliary training was improved through the application of active activity forms. In the control of the total duration of the training, the time needs to take the basketball game as the benchmark and be scientifically arranged to obtain the best training results.

3) Cycle the practice method. This method bases the specific content, objectives, requirements and tasks of the training, and the training mode is set into several practice stations, and the tasks of each station are completed according to the established order and route. Through the rational application of this method. The endurance quality of the referee can not only enhance, the physical strength will also gradually improve. In the application process of this method, the interval time should not be arranged between the exercises of each station. The load of each station exercise is not large, so 1 / 3 of the maximum load can be used as the benchmark, and the time of a complete continuous cycle can be reasonably arranged. At the same time, according to the basketball game, each period lasts for more than 10min. In terms of setting, the number of cycling groups should be controlled in more than 4 groups. When setting, the content of each group will improve the aerobic endurance of the referee.

4.4 Strengthen the sensitive training of basketball referees

In order to improve the complex ability of basketball referees, the training of sensitive quality is also crucial. During the training, the method of changing training can be adopted to improve the effectiveness of training. During the application of this method, the practice intensity is high, so the duration of each load needs to be reasonably controlled, and the number of repeats is well controlled. The interval time should be kept sufficient to ensure that the referee will not be tired during the training period. Usually, the training and interval time is best controlled at 1:3. In the training process, the activity mode of the referee will be used as the benchmark, and the training of the referee's gestures should be emphasized when running fast, which needs to ensure speed, coordination and accuracy. At the same time to strengthen the training of referees all kinds of sudden mobility, quick emergency stop response. In order to improve the sensitivity of the referee, the rope ladder can also be adopted to carry out systematic training.

4.5 Reasonable flexibility training

In the process of flexibility training, the referee can use by stretching. During the specific training period, the number of training is determined according to the characteristics of the joint and the maximum range of movement. Through the combination of dynamic stretching and static stretching, we can promote the improvement of the flexibility training effect, so that the referee can improve his/her flexibility in the continuous training. During the dynamic stretch, the leg can be swung back and forth, gradually increasing the amplitude of the swing, repeated 10 times per leg. With the shoulder as the axis, move the arm in large circles, 10 times forward and backward. Stand up, straighten your hand up, bend your body to the other side, feel the stretch on your side, and

repeat this process 5 times on each side. During static stretching training, you can sit on the ground, keep one leg straight, with the other leg bent, your heel close to the hips, lean forward, stretch your leg muscles, hold them for 15-30 seconds, and then change your legs. Or sit on the ground, stretch your legs straight, stretch your hands forward, try to touch your toes, and hold on for 15-30 seconds. At the same time, conduct flexibility training to improve the referee's skills, such as rapid lateral movement between two parallel lines, 10 times per group, and quick 180-degree turn practice, 10 times per group.

5. Conclusion

In general, basketball as a confrontation project, the referee plays a self-evident role, and if you want to make the game smoothly, the referee should not only have a higher level of execution, but also ensure that the physical ability to meet the requirements of the competition. According to the analysis of the physical training of college basketball referees in Shanxi Province, we can see that there are many problems, and some students have insufficient understanding and understanding of the physical training, and the training effect can not reach the expectation. In this regard, in the future college basketball referee training process, we should realize the importance of physical training, reasonable speed, strength, endurance and other aspects of training, to help enhance the physical fitness of basketball referees.

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