

Analysis of the Problems and Countermeasures of Physical Training of Handball Players

Shengrong Pang¹, Huixin Tang², Jianchao Pang^{2,*}

¹Guangzhou Maritime University, Guangzhou, Guangdong, Chian

²Guangdong Huangcun Sport Training Centre, Guangzhou, Guangdong, Chian

*Corresponding Author.

Abstract: Handball has a very long history and was an official sport from the XI Olympic Games. In recent years, another key factor in determining performance, physical fitness, has gradually been emphasised by sports teams and the field of sports science. Although handball has become very mature in terms of technical and tactical training, the physical fitness training plan adopted by most handball teams is still not in line with the needs of modern competitive sports, and most teams do not develop physical training programmes based on the characteristics of handball. Therefore, The literature method was used to collect studies related to handball physical training in recent years and to read relevant books, explore the specialised features of handball, which find that some problems including a lack of knowledge and attention to physical training, insufficient training load intensity to meet the demands of international competition, inadequate integration of physical training and special features, a failure to consider the specific requirements of different player positions, and a lack of emphasis on prevention and protection during training. and makes some suggestions from the perspective of the specific characteristics of handball, offering novel training ideas for coaches in the area of late special physical training to enhancement of the quality of special physical training.

Keywords: Handball; Physical Training; Player; Sport Characteristics; Strategy

1. Introduction

Handball is a collective ball game that is one of the official sports of the Olympic Games and is also one of the oldest sports in the world.

Handball is also a popular sport worldwide, along with numerous other ball games. Nevertheless, handball is a relatively recent phenomenon in our country which has not yet reached the same level of popularity as other sports. This has resulted in a discrepancy between the standard of handball in our country and that of other countries [1].

Handball is a skill-driven class of same-field confrontation project, a comprehensive project that integrates collective ability, skill, intelligence and mental ability. In the modern era, handball competition is evolving in a number of ways that include a greater emphasis on speed, intensity, variety, coordination and ornamentation [2]. Good physical fitness is the foundation of technical and tactical training and the basis for enhancing sports performance, which is a prerequisite for athletes to withstand rigorous training and also a physical guarantee for athletes to maintain a stable and positive mental state during competition. It is the material guarantee for improving health, preventing injuries and prolonging the life span of the sport. Throughout the whole process of training, athletes have a close relationship with the state of physical training, which has a close relationship with the improvement of the quality of training and sports performance. Therefore, in order to achieve victory in sports games and excellent sports results, physical training is one of the indispensable contents of the training of handball players [3].

There are significant differences in the physical attributes of individuals from various countries. In comparison, the strength and endurance of individuals belonging to the yellow race are generally inferior to those of the white race and the black race. Consequently, the physical training methodologies employed in different countries

should be tailored to suit the specific needs of their athletes. Indeed, a significant number of teams have yet to establish their own training methodologies, which represents a crucial factor contributing to the technical deficiencies observed in certain countries, particularly in comparison to the highest-performing teams globally. Therefore, in addition to the sport characteristics of handball, the individual athlete's physical condition should also be taken into account when developing a physical training programme. In light of the above, our study collects relevant studies on handball physical training in recent years, discusses the characteristics of handball sport, and at the same time identifies the shortcomings of current handball physical training and makes relevant suggestions.

2. Characteristics of the Handball

In order to study the physical training of a sport, it is first necessary to gain an understanding of the characteristics of the sport in question. In particular, the metabolic characteristics of handball demonstrate that the game is a mixed-oxygen sport, with players maintaining an average intensity slightly above the anaerobic threshold intensity of athletes engaged in mainly aerobic exercise. Goalkeepers exhibit lower heart rates than players on the field, and the majority engage in low-intensity aerobic exercise [4]. The deficiency in anaerobic energy supply during play may be a significant constraint on the performance of field players. It has been posited by researchers that in order to excel at handball, one must possess both high levels of anaerobic explosive power and a robust aerobic capacity [5].

Handball is a skill-based sport with unclear periodicity. The game process may require athletes to perform explosive jumps and short sprints, as well as to engage in high-intensity, prolonged confrontations. Handball is a skill-based, same-field confrontation project, characterised by intense and intermittent physical contact, and the athletes involved are required to meet relatively high physical standards. Simultaneously, they must contend with including shooting, passing, receiving, blocking, and other forms of tactical cooperation [4]. The performance of the game to a certain extent by its repeated sprinting, the ability to move determined. In a 60-minute

intense race, athletes move a total distance of 3,500-4,000 metres, of which 2,000-2,500 metres are fast sprints. Most of the time, the pulse rate averages more than 30 beats/10s, and can be as high as 32-34 beats/10s [6]. It is therefore evident that a certain degree of physical fitness is required. Handball is a highly competitive sport, particularly towards the latter stages of the game and becomes an increasingly crucial factor. The primary objective of handball is to score, and the game is characterised by a rapid and flexible tempo of attack and defence. It demands considerable strength and resilience, as well as a certain degree of technical proficiency. In order for handball to maintain its status as a high-intensity and high-confrontation game, it is essential that players possess a high level of physical fitness. The level of physical fitness affects the technical abilities of athletes. In the absence of a sufficiently robust physical fitness level, it is challenging for handball players to adapt to the intense competitive games. Even if their technical abilities are relatively high, it is difficult for them to perform effectively in the actual process of the game. Furthermore, it may also affect the tactical coordination between themselves and their teammates [7]. In order for handball players to develop the requisite skills and gain more experience, it is necessary for them to undergo training which will enable them to make changes in speed, strength, agility and flexibility [8].

3. Problems with Physical Training in Handball

A review of the literature and video footage revealed several shortcomings in the physical training of handball. These include a lack of knowledge and attention to physical training, insufficient training load intensity to meet the demands of international competition, inadequate integration of physical training and special features, a failure to consider the specific requirements of different player positions, and a lack of emphasis on prevention and protection during training. Some authoritative experts posit that in the final stage of a handball match, physical strength is a more significant factor than technique, which a review of the international rankings for the performance of the game reveals a clear correlation between the weaker teams' lack of physical fitness and their lower

rankings. The weaker team's handball players are less capable of bearing the load than their counterparts on the stronger team and they also exhibit a lower overall level of physical fitness, particularly in terms of speed endurance [8]. It can be observed from the data that the weaker teams lack the requisite technical and tactical abilities to compete effectively. In the course of investigating the coaches of men's and women's handball teams in a number of countries, the coaches were in broad agreement that the players' basic skills were good, but they were unanimous in their view that the players' ability to use basic skills in confrontation was very poor, especially the ability to use basic skills in strong confrontation. This was identified as one of the main constraints on the development of the sport and the improvement of the performance of the handball team. The data indicate that poor physical fitness represents a significant obstacle to the advancement of the handball [9]. In the actual physical training, many coaches still choose to train handball players through barbell training or track and field training. There is no unified training principles and scientific and reasonable training content about handball physical training and The training process does not have a detailed analysis and discussion of the factors that may affect the athletes' special skills to play as well as the performance of the game. This results in confusion between handball training and physical training, despite the significant differences between the two. However, it is important to recognise that there are significant differences between the two. The objective of physical training is to enhance the athlete's performance in their chosen sport. This entails focusing on the training of the athlete's body organs and skills, with the aim of enabling them to adapt to the demands placed upon them. The ultimate goal is to improve the athlete's physical fitness and their ability to adapt to the demands placed upon them [9]. Furthermore, an analysis of the current state of physical training in handball reveals that the importance of physical training for athletes has been undervalued. The majority of coaches tend to prioritise technical and tactical training over physical conditioning, which is often inadequate. This is problematic as physical conditioning is a fundamental aspect of sports performance, and without it, athletes cannot

fully optimise their technical and tactical abilities [10]. It is only through the attainment of optimal physical fitness that an individual can truly excel in the sport of handball and narrow the gap with other formidable teams.

4. Countermeasures Related to Physical Training in Handball

Handball is an intense and confrontational sport that requires a high level of physical fitness, particularly in the trunk and limbs. The selection of physical training methods should not only meet the specific requirements of the sport in question, but also contribute to the overall enhancement of the sport. In addition to focusing on the improvement of the specific physical fitness, it is essential to enhance the basic physical fitness, which in turn will facilitate the performance of the specific physical fitness. It is imperative that those engaged in the sport of handball undertake a comprehensive programme of strength training. In particular, the muscles of the upper and lower limbs, the waist, the abdomen, the ankle joints, the knee joints, the wrists and the fingers should be the focus of specialised training [11]. It is essential to engage the muscle strength of each movement unit of the body in order to achieve comprehensive strength training, and ultimately facilitate the athletes' speed and movement effectiveness. Presently, a considerable number of coaches continue to prioritise upper limb strength, the strength of large muscle groups, and the strength of various sports links, while neglecting to consider the importance of lower limb strength, the strength of smaller muscle groups, and the necessity of training for injury prevention and health care. Conversely, strength training may not yield the desired outcomes and may even precipitate injuries and other complications during training. In the context of actual strength training, it is evident that some coaches neglect the specific muscle characteristics inherent to the specialized handball movement. The lack of precision in muscle strength composition and classification renders the strength training approach unscientific and unreasonable [6]. In the context of handball, the incorporation of speed training is of paramount importance, as it serves to enhance the power and efficacy of the player's movements. It is important to note that when undertaking speed training, the

development of speed ability should be combined with other training tools in order to achieve a higher training effect. In the context of maximal strength development, it is crucial to be able to integrate the speed and technical proficiency of specific movements. In the training method to jump and promote running, the "short jump" exercises are used to train the acceleration ability of the start, the increase in stride length is used to increase the frequency of movement, the "long jump" is used to improve the speed and endurance, and the 50m step jump training is used to ultimately improve the effect of training [8]. At this juncture, a comprehensive analysis of the height and weight of players on major teams worldwide revealed an increase in the number of tall players. These players, due to their height, weight, and other factors, exert downward pressure on the ground, back stirrups, and other actions with relatively slow reaction speed. This will inevitably affect the execution of their skills and in the actual training process, it should be focused on improving the strength of the hip, improving the strength of the muscles in the knee and ankle. It is also important to ensure that all parts of the body are trained, as the heart of tall players has to bear a great burden. Finally, it is essential to strengthen medical supervision. It is therefore recommended that speed endurance training be given greater emphasis. The most effective method for developing endurance in athletes is the 3200 m, and this should be the focus of long-term training in order to achieve the desired results [12].

The importance of stretching exercises prior to physical training and competitions cannot be overstated. However, at this stage, many coaches fail to emphasise the significance of stretching exercises within the training process itself. This results in athletes merely warming up on their own before training and competitions, leading to an increased risk of muscle strains during training or competitions. Such injuries not only impact the performance of the athletes but also have adverse effects on their physical health. In comparison, a considerable number of coaches in Europe place a significant emphasis on stretching exercises and typically conducted in a group of two individuals, with the assistance of teammates, to enhance the range of muscular activity and the perception of stretching,

during the stretching exercise, it is important to maintain a slow and rhythmic breathing pattern [13]. It is recommended that exhalation precede stretching, that slow inhalation and exhalation be performed during stretching, and that counting be done aloud during stretching. This approach can help to prevent the tendency to hold one's breath and The effective adjustment of breathing during stretching can facilitate the ease and freedom with which muscles are extended, thereby ensuring a more regular breathing pattern and guaranteeing a positive response to the body's condition. In the event of experiencing discomfort, it is imperative to cease the stretching exercise promptly [14].

Furthermore, there is a notable discrepancy in the degree of physical exertion exhibited by athletes occupying distinct positions on the field of play, it is evident that the training regimen must also be differentiated to align with the specific physical demands of each position. The winger is expected to demonstrate proficiency in rapidly initiating a fast attack, accelerating rapidly, and advancing towards the opponent's goal area in front of the goal to score which required to possess a high level of speed and agility [15]. The primary responsibility of centre forward players in an attacking formation is to move along the goal area line, utilising lateral movement to advance towards the opposition goal. Conversely, players on the opposite side of the pitch must maintain vigilance and a rapid response. Centre forward players and defenders engage in frequent physical contact, necessitating a robust physical confrontation ability. Defenders positioned on the outside attack are required to shoot from a distance outside the 9m line. Therefore, they must possess a strong arm, excellent jumping skills and the ability to bounce [16]. The role of the defender is to disrupt the opposing team's defensive formation in order to create opportunities for a counterattack and requires a combination of speed and sensitivity, as the defender must be able to identify and exploit weaknesses in the opposition's defensive structure. In a defensive-offensive strategy, the centre back frequently participates in the initial phase of a rapid counter-attack taht it is essential to possess a higher level of speed and agility. In a position attack, the centre back is required to move between the opposing team's defensive

line with great flexibility and responsiveness, breaking through their defence to initiate a coordinated attack [17]. The goalkeeper is responsible for defending the goal and is required to demonstrate proficiency in a variety of techniques, including handball shooting speed and method form. In addition to these technical abilities, the goalkeeper must possess flexibility, sound judgement, and the ability to react swiftly to situations on the field. The technical demands of goalkeeping are extensive and require a combination of speed, flexibility, agility, jumping power, and other physical attributes [18].

5. Conclusion

Handball is a fast-paced, physically demanding sport that requires excellent physical fitness to excel. The physical training of handball players should be based on an understanding of the specific physical fitness requirements of their position on the court, the technical and tactical demands of the game, and the unique physical characteristics of the athletes in different positions, that enables the formulation of a training plan that is tailored to the specific needs of the athletes. It is recommended that future training programmes adopt a dynamic approach to physical training, incorporating specific analysis of the problem and targeted training to enhance the physical fitness of athletes.

Foremost, it is imperative to enhance the significance of the sports team and the investment in physical training, and to accelerate the modernisation process in order to improve the quality of the hardware facilities. It is of paramount importance that handball players undergo physical training throughout the entire annual training cycle. Furthermore, the efficacy of the physical training regimen and the extent of its maintenance must be evaluated through a scientific index system which designed to identify deficiencies and determine the optimal strategies for enhancing the overall physical conditioning of the team and individual athletes. Last but not least, it is essential to summarise the physical training of athletes and to propose new training tasks and requirements on a regular basis, will enable the players to progress to a higher level of development.

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