

A Study on the Importance of Training Strength in Basketball

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Abstract – The strength training in basketball sports is an important and key training task and relates to many technical action levels. Therefore, the strength should be trained specially and effectively in basketball sports, so as to make basketball players have solid body posture, do the coordination of their upper and lower limbs well and make their physical conditions reach the highest level, thus promoting the effective combination and coordinated development of each links of body and greatly improving the overall level in basketball sports. This paper will discuss the strength training in basketball sports in detail, expecting to make the physical training of basketball players scientific, reasonable and high-efficient and finally improve the competition level and performance of basketball sports.

Keywords – Basketball Sports; Strength Training; Training Practice

INTRODUCTION

The Strength training is a fundamental element for the physical conditioning of basketball players. Its purpose is to improve explosive power and acceleration/speed around the court and to reduce the risk of joint and tendon injuries. During the season, resistance training and power training are performed in different periods. Moreover, individual and team development plans optimize the improvement of each player. Let's find out how athletic training aims to improve strength, speed and acceleration in the field of play, as well as reducing the risk of joint and tendon injuries. We will understand specific team roles, their characteristics and champions who have had specific success in these roles. We'll also aim to understand how much work and fatigue are hidden behind the results and notoriety of such players. And finally let's have fun in shooting basket! In the top 10 most popular sports, this sport counts between 2 and 3 billion fans in the world. More than 450 million people around the world play basketball both as professionals and for recreational activities. 300 million do in China. In Asia and Australia basketball has replaced football as the most popular sport. NBA basketball players are the most well-paid sports professionals on the planet, and names such as Jordan, Shaq, Kobe, and LeBron are almost immortal. They act as magnets for millions of hopeful young people who would like to achieve their own glory and fame[1].

Basketball is a team sport characterized by high intensity activities such as jumping, sprinting, shuffling and direction changes. Basketball players' physical conditioning is focused on enhancing aerobic capacity, speed, agility, muscular strength and power.

Aside from being just a team sport, basketball can be practiced alone, one against one or with 3 players per side. A professional game is made up of teams of 5 players each. As a team game, basketball is played on a rectangular field 94ft wide and 50ft long. The height of the basket from the ground is 3.05 meters, so there is a fair advantage in being high but not necessarily, depending on the role in which you play. The team that scores the most points by putting the ball into the opponent's basket wins. It seems easy to say, but this discipline needs a variety of sports skills and abilities unlike many others [2].

NEED TO TRAIN STRENGTH IN BASKETBALL

Many famous players today have started their love story with basketball by throwing the ball into a basket in their backyards. However, the work to reach certain levels of professionalism and notoriety links to rigid and challenging workouts and lifestyles. Let's discover together how a basketball player trains strength and more. Throughout the sports season, strength and power training is carried out at different times. In fact, an individual and team program must be developed to optimize the improvements of each player and left parts of the body, and between extensor muscles and flexors. Exercises are carried out at low intensity, with a load equal to 50-60% of a maximum repetition (1-RM), 2 or 3 times a week. In the second phase, the first pre-season period, is based on the development of ceiling strength of each player. The exercises are performed with loads of 80-90% of 1-RM, 3 times a week for about one month. In the late preseason phase, players begin to train together and muscle work consists in the development of muscle power.

Exercises are performed with free body using different methods (e. g. plyometry, circuit training), taking into account to avoid exceeding 120 contacts with the ground within the same session (e. g. jumps). During the championship, training is functional to maintaining the previously developed muscle strength. A key component in training is the recovery. This can consist of a week without strength exercises every 6-8 weeks, or 2 weeks of low intensity training in the same period of time.

Despite the importance of strength training, exercises can negatively affect the player's technical skills due to neuromuscular fatigue. In particular, the high-intensity training circuit reduces performance capabilities in jumping, agility and accuracy of basket shooting. On the other hand, a circuit training of muscle power does not result in a reduction of these skills and, therefore, can be considered the most effective method of working to train the strength behind a competition. If, on the other hand, the aim is to perfect technical gestures in situations of fatigue, high intensity circuit training can be adopted as a working method.

Basketball also involves many lateral movements and jumps, squatting and sinking, which require strong leg muscles and stability of the core. Strength training using weights to perform squat or leg curl allows you to build quadriceps and strong calves. Finally you can build the strength of the core with abdominal crunch. As we have already seen, the qualities of a basketball player are many and different. The characteristics that a basketball player must train during the season are:

- Cording
- Elevation (strengthening thigh and foot extenders)
- Resistance and stamina
- Speed
- Explosive strength
- Resistance to speed

These are some of the features that come into play during a basketball game:

- Changing Speed - Increase (or decrease) of the speed of movement, executed in the shortest possible time.
- Changing Direction - Deviation of the direction of your movement, keeping the movements and the coordination necessary for a positive response to changes in the game. The change of direction never draws a curve, but instead creates an angle formed by two straight lines.

- Contracting foot - Attack conducted at high speed in order to reach a close conclusion and with little disturbance on the part of defenders.

If we also add that the Forwards and Point Guards do about 4km per game and develop more actions at high speed while the Centers and Wings are defending constantly on the weak side (the side of the attack where the player in possession of the ball is not present), it becomes clear that a lot of stamina is required in basketball. Basketball fast pace and erratic movements mean that players have to be agile, strong and able to make sudden and explosive moves. But also can quickly change direction. Exercises that work with the cardiovascular system and include all major muscle groups are ideal for improving basketball skills.

TRAIN FOR SHOOTING

Although not everyone in the team are shooters, some of the most enjoyable activities that you can have in basketball, are basketball shots. There is a real sense of achievement in looking at the ball from the sides of the basket sliding down through the net. Shooting is a skill that can be improved with the correct technique and daily practice.

The first step to correct the shot is the "square up", which means standing by pointing all the feet straight towards the basket. Now turn the upper part of the body so that the sides align the front side parallel to the basket. This helps to make shots more precise; the hand of fire is usually the dominant hand. Then keep the elbow of your shot in tight with your hip and balanced ball on the fingertips at the base of the ball. The power comes from the hand of the shot, but you can stabilize the ball with the other hand. Bring the ball at chin level and bend your knees so that you are squatting. Extend the shooting elbow upwards and forwards by turning the wrist forward. Let the ball jump forward while the arm stretches out completely, pulling it back instead, while the ball is released. It is also important to continue to follow the movement with your hand after releasing the ball. To get more power from your shot, you have to push up with your legs from the crouching position while you shoot [3]. Whether you play basketball in a competitive way or for recreational activities, it's essential to know how to be fully aware of the surrounding environment. In other words: do it without looking down. This requires advanced hand-eye coordination, achieved through many hours of practice. Correct manipulation of the ball involves the use of fingertips and the possibility of b-balling with both hands.

As a result, basketball is ideal to ensure a balanced approach of the body to training. Unless you want to limit the game by playing only with your dominant hand, you need to train both sides of the body in the same way. In addition, the high degree of concentration and concentration required to play

basketball well means that you must also be mentally agile. The combination of the physical and mental abilities of basketball makes it the ideal candidate for a total wellness activity. To improve your endurance there are many methods of training but the most used are: slow, with its possible variables, and/or the very long or cross training. A method in which you run at a slower rate, between 40 and 55 seconds, compared to your reference speed. Its length is variable, depending on the race (marathon or half marathon) that we are going to prepare can provide from 10 to 22 km. Its use is recommended the day before or the day after the demanding workouts or races.

DIFFERENT TYPES OF BASKETBALL STRENGTH TRAINING

We can split the term 'strength' into three separate categories. Each is important in basketball. Absolute or Maximal Strength Absolute strength is the maximum force that a muscle group can exert in a single, momentary contraction. For example, a player who can bench press 200lbs has greater absolute strength than a player who can bench press 180lbs. As a basketball player it's important that you devote a portion of your strength program to developing maximal strength. Why? Because it serves as a foundation for muscular power and speed. But there is one condition. Maximal strength (usually measured by one repetition max) makes no allowances for time – a weightlifter can spend 20-30 seconds lifting a weight inch by inch. That's next to useless in basketball. The ground contacts in most explosive movements (like jumping and sprinting) occur in less than a second! So maximal strength training is simply a means to an end (still a very important one though). And the end is to increase your explosive speed and muscular power. Muscular Power is a combination of both absolute strength and speed of movement.

Increase either one (without reducing the other) and you increase explosive power. As we'll see in a moment, strength training for basketball should fall into some distinct phases over the course of a season. If you can build a high level of maximal strength first, you can then convert much of those gains into explosive power. A very effective form of power training is called plyometrics or jump training – and it's ideally suited to basketball. Plyometrics combines elements of both speed and strength in single movement patterns. But you must have a solid strength base before you move on to these types of sessions. For example plyometric exercises.

THE 4 PHASES OF STRENGTH TRAINING FOR BASKETBALL

Bodybuilders and weight lifters tend to follow a progressive weight training program. They just keep increasing the weight indefinitely always striving to lift just a little bit more. Strength training for basketball should be periodized. What exactly does that mean Over the course of a year, strength training for

basketball should follow several distinct phases or cycles. Each of these phases has a very specific objective that leads you naturally into the next phase of training. Follow a periodized strength regime and you'll maximize your results. Unless you're an elite basketball player, very few of your opponents will take this approach to their strength training routine. That gives you a real competitive advantage. Let's have a look at each phase one by one. Off-Season – Build Functional Strength Before you begin the more intensive strength training for basketball, it's crucial that you prepare your body. During the off-season, and even the early pre-season, begin by performing functional exercises that focus on stabilizing muscles and in particular, core stability. Basketball places a lot of uneven strains on your body. You throw predominantly with one arm for example. Some joints and tendons are placed under more stress than others. The same muscles are used over and over and grow strong while others are neglected. A low-intensity functional strength phase helps to restore the balance. So the goals of this phase are:

- To prepare joints, ligaments and tendons for more intense work in subsequent training phases.
- To strengthen neglected stabilizer muscles.
- To balance the right and left side of the body.
- To correct any imbalance between flexors and extensors (the pectorals and triceps may become overly strong in relation to the rhomboid and biceps for example).

LITERATURE REVIEW

Ognjen Andrejić (2012) et al. The aim of this study was to evaluate and compare the effects of two short-term off-season conditioning training programs on fitness performance in young basketball players. Twenty-one young basketball players, aged 12-13 years, volunteered to participate in this study. The participants were randomly assigned to a strength training group (ST, n = 10) or a combined plyometric and strength training group (CT, n = 11). The ST group performed free full court basketball play followed by strength training, whereas the CT group performed plyometric exercises followed by the same strength training program. Young basketball players were assessed before and after a six-week training period on the vertical jump, long jump, medicine ball toss, 20 m sprint, 4 x 15 m standing start running and stand and reach flexibility. The CT group made significantly ($p < 0.05$) greater improvements than the ST group in the vertical jump (3.2 cm vs. 0.6 cm), long jump (10.3 cm vs. 2.2 cm), 20 m sprint (-0.2 sec vs. 0.0 sec), 4 x 15 m standing start running (-0.41 sec vs. -0.05 sec) and the medicine ball toss (40.7 cm vs. 18.2 cm) following the training. The results of this study demonstrate that a short-term plyometric and strength training program significantly increases

motor performance skills in young basketball players.[4]

Dr. Kavita Sharma (2014) et al. The purpose of the present study was to find out the effect of nine weeks resistance training program on selected physical fitness variables of Basketball players. For this purpose twenty female basketball players from Delhi University were selected to act as subjects for the study, the age of the subjects ranged from 17 to 21 years. The minimum level of participation was Inter-University. The subjects were further divided into two groups i.e. Control and Experimental group, group-I underwent resistance training and group-II acted as control and continued with their regular physical activity. The training period for the study was three days in a week for nine weeks. Pre data of both the groups were taken prior to the training period; the subjects were tested for speed, back strength and abdominal strength. The dependent's test and analysis of covariance was applied as statistical tool. In all cases 0.05 level was fixed as significance. It was concluded from the results of the study that training groups had improved on back strength, and had no significant improvement on the speed and abdominal strength. [5]

Shuguang Shan (2011) et al. The traditional basketball skill teaching process has show some disadvantages in the teaching practice. In order to seek a totally new process of basketball skill teaching, in the passage, the writer take the rationalization process of basketball skill teaching as the object of study and the writer chose the team which trains by himself as the object of reach, through documentation method mathematical statistics method, experimental method and other method, getting relative achievement of the study. Meanwhile the writer gives us a way about the innovation and reform of basketball skill teaching and makes a daring attempt; these provide us an accountable assistance on reform of basketball technology teaching.[6]

Zhou Xian-jiang (2008) et al. The ultimate goal of competitive basketball is winning, and this sport develops to achieve this goal. Winning the game is the start point, and end point as well, thus winning the opponent in the game become the immediate pursuit and effort direction.[7]

Pei-Chih Wen (2009) et al. Multimedia is the core and main technical measure of the application of modern information technology into education. As a new modern teaching method, multimedia technology has been widely applied to all fields of teaching. Applying multimedia technology to the basketball practice class of college will benefit the improvement of teaching method and system and students will become more active in the learning of basketball theory and skill. This will also give them sufficient knowledge to appreciate a basketball match and contribute to China's basketball industry. This paper analyzed the use of basketball multimedia courseware by

literatures and mathematical statistics. Basic on the investigation and discussion on the effect of multimedia teaching, author of the paper thought the application of multimedia technology should be accelerated and popularized.[8]

Bai Haijun (2011) et al. At present, the university reform urgently needs to achieve educational innovation. The key of innovation is to implement comprehensive qualified education. This requires the teaching methods and means changing from simply impart knowledge to focus on training skills and developing abilities when impart knowledge. Traditional teaching thought and methods cannot solve this problem. For this contradiction, we have carried out research on the integrated teaching methods using in the basketball special elective, looking forward to overcome and find solutions for the problems existed in present basketball teaching, updating the basketball teaching philosophy, and further improving the whole process of basketball teaching. In the reform of the unit teaching process, integrated teaching methods make the past teaching "from part to decompose the teaching" to "from whole teaching to part teaching and then back to whole teaching", make students "understand" the overview and basic profiles of project (especially the collective ball games) from the start, master the tactical concepts early, form the awareness of basketball, practice in teaching and racing, enable students to improve technical and tactical level in basketball special elective, have a certain basketball tactical sense, and grasp the characteristics and rules of basketball.[9]

Todd E Layne (2015) et al. Many universities offer an abundant amount of physical activity courses designed to improve student knowledge and performance which may lead to increased fitness involvement. This study examined the effect of Sport Education model on university students' (N = 25, 22 males, 3 females) basketball game performance and content knowledge of a physical activity course. Students were taught using either the Sport Education instructional model or a traditional method of teaching basketball. Data were collected to determine game efficiency through the examination of game statistics, offensive game performance measured by the basketball offensive game performance instrument, and content knowledge through the completion of a pre-and-post examination. Results revealed that students in the Sport Education group improved significantly in their offensive game performance and content knowledge compared to a traditional teaching model. In addition, the game efficiency of the Sport Education group did slightly improve while the students in the traditional group did experience a decrease. These findings suggest that the Sport Education model is an effective pedagogical approach for improving game performance and sport content knowledge of university students. Based on the limited amount of research on the impact of the Sport Education model

with university physical activity courses, future studies should continue to examine the effectiveness of the model [10].

Mehmet Fatih YUKSEL, (2017) et al. Objective of this study is to examine some physical parameters of basketball players at elite level who are playing in different league levels. Total 24 sportsmen consisting of 12 sportsmen from Turkish Man Basketball 2nd League and 12 sportsmen from Turkey Men Basketball 3rd league whose training age is minimum 5, voluntarily participated to this study. Vertical jumping, 20 m speed running, hand grip strength (right and left), flexibility, 30 sec do sit-ups, 30 sec push-up, 20 m shuttle running tests were performed for determining physical properties of basketball players. It was determined that the 2nd league basketball players had better hand grip strength (right-left), Max VO2 and anaerobic power values than basketball players playing in the 3rd league [11].

Giocoiu Dana Lucica, (2014) et al. This article aims at analyzing the weight of basketball practice in primary, middle and secondary schools in Galati, compared to other sports disciplines practiced during the physical education and overall sport lessons. Thus, the data processing from the survey questionnaire, and the effective discussions with teachers from 59 schools and high schools (37 from the middle education and 22 from the secondary education) became aiming points and tangible solutions targeting the professional activity of the students and graduates in basketball (or other sport disciplines). Furthermore, the results led to increase the motivation of young students for learning the game and of the graduates for teaching the technical and tactical content of basketball (or other sport disciplines) during the next physical education lessons. Young graduates realize that choosing and teaching a traditional sport in schools, make most students gladly attend these classes [12].

Ghazi Rekik (2019) et al. This study tried to identify how varied level of content complexity (low vs. medium vs. high) could affect learning outcomes, cognitive load investment, and attitudes when learning basketball tactical actions from different formats of visualization (dynamic vs. static) within physical education context. One hundred and fifty secondary school students ($M_{age} = 15.31$ years, $SD = .64$) took part in the experiment. They were quasi-randomly (i.e., matched for gender) assigned to the six experimental conditions and asked to rate their perceived cognitive load (i.e., mental effort invested and estimated difficulty), indicate their attitudes (i.e., attention, enjoyment, engagement and challenge) and perform the learning tests (i.e., game comprehension test and game performance test) immediately after the learning phase. Results showed that for low-complexity content, both formats of visualization have similar effects on cognitive load investment, and learning outcomes. However, for

medium and high complexity contents, the dynamic format had a clear advantage over the static format in terms of cognitive load investment and learning outcomes. Moreover, it was found that whatever the level of content complexity, students exposed to the dynamic visualization reported more positive attitudes compared to those exposed to the static visualization. Considering the learning outcomes and the subjective experiences (i.e., cognitive load and attitudes), the results recommend the use of dynamic visualizations for learning basketball tactical actions whatever the level of content complexity [13].

CONCLUSION

The strength training in basketball sports becomes more and more important, which is one of the effective ways of making the physical training of basketball players scientific, reasonable and high-efficient. The major influence elements of basketball player's athletic ability are: reaction speed, shoot accuracy, action speed, displacement speed, understanding of techniques and tactics, burst power, height, jump height, rebound ability, will and character, mental stability, tactic provision.

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