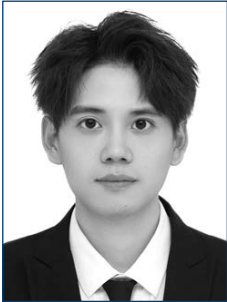


The evolution of physical attributes of the basketball players from the student team of the chinese university, through the lens of functional training

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Abstract

Objective of the study was to empirically validate the enhancement of the physical abilities of the male basketball players from the Chinese university team through the implementation of functional training.

Methods and structure of the study. In the course of the research, the physical attributes, agility, reaction time, and stamina of 15 male basketball players from the Heihe University team were assessed. A tailored training regimen was devised. The participants engaged in a 14-week program, with daily workouts lasting approximately 90 minutes. For a comparative evaluation of physical parameters, a group of 49 basketball players from the Division I of the Chinese Student Basketball Association (CUBA) in the 2022-2023 season was selected.

Results and conclusions. Following the functional training, the players of Heihe University's men's basketball team demonstrated substantial improvements in their strength capabilities ($<0,001$), speed attributes ($<0,001$), and endurance ($<0,001$), indicating the effectiveness of the training program.

Functional training is a crucial component in the development of specific physical attributes for basketball players. It has a positive impact on enhancing the flexibility and stability of the upper body, improving statokinetic functions, developing explosive power, maintaining a low center of gravity, and facilitating rapid acceleration, technical adjustments, and endurance.

Keywords: college basketball players, physical quality, information, reliability, athletic performance

Introduction. In basketball competitions, the key factor determining victory or defeat in the game is the athletes' abilities, which are associated with special physical qualities, anthropometric parameters, and functional state [2,3]. As a result of a survey of coaches and athletes from 12 teams of the Chinese student men's basketball league, it was found that university basketball teams do not pay enough attention to special training for the development of the physical qualities of basketball players, and, as a rule, equate general physical training with special [4]. The university stage of training is a key period of high growth of special physical abilities of basketball players, so their development has important theoretical significance and practical value.

Objective of the study was to empirically validate the enhancement of the physical abilities of the male basketball players from the Chinese university team through the implementation of functional training.

Methods and structure of the study. The study tested the strength, speed, reaction speed, and endurance of 15 basketball players from the Heihe University men's basketball team. It was found that the participants had high strength and low speed and endurance. In this regard, a functional training program was developed (Table 1). The subjects underwent a 14-week experiment with daily training lasting about 90 minutes. A group of 49 basketball players from the 2022-2023 Chinese Collegiate Basketball Association



(CUBA) Division I was taken for a comparative analysis of physical indicators.

It is important to note that functional training for basketball players focuses on specific muscles or muscle groups. At the same time, functional training can help athletes improve motor function and balance, prevent injuries, and improve long-term performance.

Results of the study and discussion. Table 2 presents a comparative analysis of the physical performance of the Heihe University men's basketball team and the Division I team.

Analyzing the data in Table 2, it can be noted that the athletes of the Heihe University men's basketball team are superior to the athletes of the first division in strength qualities. This indicates that they have a higher adaptability to a power confrontation. In attack, players can use their strength advantage to break through opponents and take rebounds. In defense,

players have sufficient strength abilities to withstand opponents' throws and limit their chances of winning. On the other hand, the participants of the Heihe University men's basketball team are below the average level of the first division in the speed of reaction to changes in the pace of the game and the speed of movement. This means that they do not keep up with their opponents and cannot react in a timely manner to sudden situations during the game, which affects their results. In attack, with insufficient speed reactions, players will be limited in attack, which makes it difficult to effectively break through the defense and score points.

As the results of the comparative analysis showed, the endurance parameter of the athletes of the Heihe University men's basketball team is lower than that of the players of the first division team. Thus, a low level of endurance over a long season can lead to basket-

Table 1. Functional training program of Heihe University men's basketball team

Days of the week	Focus of training	Content
Monday	Upper Body Strength	<ol style="list-style-type: none"> 1. Bench Press (70%-80% of 1RM of bodyweight to complete 5 reps/5 sets) 2. Power Press (60%-70% of 1RM of bodyweight to complete 6-8 reps/4 sets) 3. Unilateral Dumbbell Overhead Press (each side of bench press 70%-80% of 1RM25% of bodyweight to complete 5 reps/5 sets) 4. Borrowed Dumbbell Press (each side power press 60%-70% of 1RM25% of bodyweight to complete 10 reps/4 sets) 5. Triceps Extension (find a weight that allows you to push yourself to failure, complete 15 reps/4 sets)
Tuesday	Lower limb strength	<ol style="list-style-type: none"> 1. Contrast Training (86%-90% 1RM to perform 3-5 reps of fast centripetal squats) Loaded Squat Jumps (30% 1RM or less to perform 6-8 reps of squat jumps) 4-5 sets 2. Single Leg Push-Ups with Hard Rows (6 reps per side 4/sets) 3. Lateral Lunges with Sliding Plate (8 reps per side/4 sets) 4. Nordic Snatches (8 reps/4 sets)
Wednesday	Functional improvement of the upper limbs + heart training	<ol style="list-style-type: none"> 1. Unilateral Dumbbell Dead Bug Press (12 reps/4-5 sets per side) 2. Unilateral Single Leg Dumbbell Press (10-12 reps/4-5 sets per side) 3. Unilateral Dumbbell Overhead Raises (10-12 reps/4 sets per side) 4. Unilateral Standing Row (10-12 reps/4 sets per side)
Thursday	Functional improvement of the lower limbs + heart training	<ol style="list-style-type: none"> 1. Squats with foot raise and reverse rotation (10-12 reps/4-5 sets per side) 2. Single-leg weighted squats with front lunge (10-12 reps/4-5 sets per side) 3. Single-leg step-down squats (8-10 reps/4 sets per side) 4. Single-leg weighted step-down squats (8-10 reps/4 sets per side)
Friday	Explosive Power + Core Workout	<ol style="list-style-type: none"> 1. Jump Squats (12 reps/5 sets) 2. Jump Ankle Extensions (20 reps/5 sets) 3. Squat Pushdown with Resistance Band (8-10 reps/4 sets) 4. Kettlebell Lifting (12-15 reps/4 sets) 5. Oscillating Anti-Rotation Movements (10-12 reps/4 sets) 6. Supported Ab Wheel (10-12 reps/4 sets)
Saturday	Endurance training	<p>Morning: 5 x 6-minute runs (1-minute intervals between sets), requiring a lactate concentration of no more than 2.5 mmol/L.</p> <p>Evening: 10 x 3-minute runs (30-second intervals between sets), requiring a lactate concentration of no more than 3.5 mmol/L.</p>
Sunday	Rest	Rest and do some low-intensity recovery workouts such as yoga, stretching, etc. to help your body recover and prepare for next week's workouts.



Table 2. Comparative analysis of the performance of the Heihe University men's basketball team and the Division I team

Indicator	Heihe University (N=15)	Division I (N=49)
Medicine Ball Throw (m)	14,46±0,49	14,26±0,64
T-type test (c)	10,03±0,12	9,88±0,10
Cooper Test (m)	2869,80±49,56	2981,77±61,85

Table 3. Data of comparative analysis of test results before and after the experiment of the participants of the basketball team of Heihe University

Indicator	Heihe University		t	p
	before	after		
Medicine Ball Throw (m)	14,46±0,49	14,61±0,53	-5,228	<0,001
T-type test (c)	10,03±0,12	9,88±0,08	6,330	<0,001
Cooper Test (m)	2869,80±49,56	2951,47±50,27	-16,826	<0,001

ball players becoming tired at the end of a game and can affect their ability to cope with opponents and make decisions. Athletes with low levels of endurance may demonstrate less speed and explosiveness during a game, which can affect their ability to score and play defense, thereby affecting the outcome of the game for the team as a whole (Table 3).

After functional training, the basketball players of the Heihe University men's basketball team showed significant differences in strength (<0.001), speed (<0.001), and endurance (<0.001), which indicates the effectiveness of functional training.

Conclusions. Functional training plays an important role in the development of special physical qualities in basketball players, which is expressed in its positive, targeted impact on improving the flexibility and stability of the upper limbs, improving statokinetic functions, special explosive power, the ability to maintain a low center of gravity, which allows for a rapid increase in speed and change of technical actions and endurance.

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