

Physical Characteristics, Functional Movements and Coaching Style in Basketball

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Abstract: This study aims to develop a basketball player development plan based on assessing the effects of physical characteristics and functional movements on male and female students' performance in basketball. It incorporates Long Term Athletic Development (LTAD) frameworks to guide the training, competition, and recovery of student-athletes. The LTAD stages range from the active start, focusing on basic movements, to training to win, concentrating on high-level competition preparation. The research is significant for students, parents, teachers, and department heads, providing a structured approach to enhancing players' skills and ensuring safety during play. The methodology involves a quantitative approach, utilizing descriptive comparative-correlational research design to explore the relationship between functional movement, coaching style, and physical characteristics in basketball. The study encompasses students from multiple institutions, employing total enumeration sampling for comprehensive data collection. Ethical considerations emphasize informed consent, the right to withdrawal, and confidentiality. The findings aim to inform an enhanced player development plan, contributing to the academic and athletic success of college students.

Keywords: Long Term Athletic Development; Functional Movement; Basketball Training.

1. Introduction

Basketball is a team sport played on a rectangular court with two teams, each consisting of five players, who aim to score point by shooting the basketball through the opposing team's hoop. The game involves a combination of physical skills, strategy, and teamwork.

According to Crokleton (2020), basketball is an enjoyable sport that suits many skill levels and ages, owing to its worldwide popularity. She also stated the benefits of playing basketball such as strengthening muscular endurance, building healthy bones, improving balance and coordination, developing fundamental movement skills, improves body composition, and boosts heart health. It has also emotional benefits such as developing self-confidence and lowering stress. It also encourages team spirit and develops communication skills.

Whether you're playing in a competitive league or just a casual pickup game, understanding the basic rules is essential for an enjoyable basketball experience. It is important to note that while physical characteristics play a significant role in basketball, skills, teamwork, and basketball IQ are equally important. Coaches often work with players to develop their physical attributes while also hoping their basketball skills and understanding of the game. Additionally, not every player needs the same physical attributes, as different positions may require different strengths and skills.

Guangxi University was founded in 1928 and the Guangxi Provincial Teacher Training College was founded in 1932, which was incorporated into the provincial teacher training college in 1936. Then renamed the National Guangxi University in 1939. Rebuilt the Guilin Teacher Training College in 1941 and upgraded it to the National Guilin Teacher Training College in 1943 and was incorporated into the Guangxi University again in 1950. The former Guangxi University was closed in 1953 and Guangxi Normal College was established based on some teachers at its College of

Literature and Teaching, College of Science and all the students at Teachers' Training College, which was renamed as Guangxi Normal University in 1983. The university would do one measurement before each season, it would not have to measure every game. Only players who are eligible to play in the tournament take the measurements. There is no development plan for students playing basketball. This research is obviously important for the sake of the students, teachers, and the university.

2. Theoretical Framework

According to the Tooley, B. (2023), long-term athletic development (LTAD) can be used as a framework for practitioners, researchers, coaches and parents aiming to support the long-term development of athletes and increase lifelong participation in sport and physical activity. LTAD refers to the habitual development of athleticism over time to improve health and fitness, enhance physical performance, reduce the relative risk of injury and develop the confidence and competence of all youth, according to the National Strength and Conditioning Association. LTAD models have been proposed to provide a framework that strategies an athlete's physical development over time by guiding training, competition and recovery, based on the athlete's development stage.

Stage 1 is the active start that incorporates a variety of body movements, more by chance than planning, to help develop functional movement skills. Stage 2 is fundamentals, this difference is seen throughout the LTAD model due to the differing growth and maturation states within boys and girls, which can affect areas of development such as peak height velocity. Stage 3 is learning to train. The main objective within this is to develop fundamental sports skills and further develop fundamental movement skills. This sees the introduction of basic flexibility exercises, along with the development of fundamental movement skills, strength and

endurance. At this stage education, and knowledge of warm-up, cool down, stretching and recovery is often targeted, in an aim to take advantage of accelerated mental development and provide a foundational understanding of key habits needed on their journey of lifelong activity.

Stage 4 is training to train, it focuses on the development of the athletes physical and mental capacities, which occurs at ages 11-16 years for girls and 12-16 years for males. Training will focus on aerobic conditioning, functional movement skills and the correct weightlifting techniques. Training physical qualities and capacities during this stage is an attempt to create an optimal training environment, in which training different body systems has optimal effects at specific stages throughout an individual's development. Stage 5 is training to compete; it occurs in girls aged between 15-17 years and aged 16-18 years in boys. In this stage, the focus shifts more to competition. In stage 6 is training to win. It tends to train in preparation for competing at major competitions, in a high-quality environment, supported by specialized teams for the specific event. And lastly, stage 7, the active for lie. Should an individual progress through the LTAD to this stage on a non-elite pathway, the previous stages should have allowed individuals to partake in a variety of sport and exercise, whether that be competitive or recreational in a competent and confident manner.

This theoretical framework will guide the researcher in enhancing the development plan with the idea of appropriate level of training

3. Conceptual Framework

Based from the Long Term Athletic Development of Tooley, B. a conceptual guide was created. On this study the researcher will get physical characteristics, functional movements, and coaching style in training of students. Then player's performances will be observed, recorded, and compared according to the students' profile. After that, the researchers will develop a players' development plan.

According to Ferraz, R. et al. (2022) review emphasizes the need to consider individual growth differences during the selection process and during the application of long-term basketball training programs. The analysis carried out allows to conclude that some athletes reach highest maturation states first, which tends to be a determining factor for the potentiation of the performance of individuals in the initial stages. Data from physical characteristics and performances would be extremely important and could be useful to prevent some athletes with potential talent from not reaching levels of excellence due to delays in the maturational state when they are evaluated to integrate long-term talent development programs. This would undoubtedly be an inclusive and promoting measure, which would allow more athletes to show their value, through selection to incorporate long-term development programs in basketball.

Wang, M. (2022) concluded for college sunshine group athletes for the first time the FMS test results, according to the action correction, movement patter and action ability enhancement stage, physical training plan, design including breathing mode, joint flexibility, and stability training, movement mode, power chain and a series of functional training content: 6 weeks systematic functional training make athletes physical function further improved, and the functional movement force address and movement quality are fully improved, which lays the foundation for the higher level of special and physical training in the later stage, and also

verifies the effectiveness of functional training in the training of female volleyball players in the sunshine group.

Haidi (2023) concluded that functional strength training is a popular scientific and effective training mode, which can not only improve the physical quality of athletes and strengthen their sports skills, but also effectively enhance the strength of the weak links in the "chain", so as to prevent sports injuries more scientifically. At the same time, as one of the three big balls, basketball can use systematic and reasonable functional strength training in the training process, so as to achieve or even exceed the expected goal.

4. Statement of the Problem

This study aims to develop an players' development plan based on the result of the effects of physical characteristics of male and female students to functional movement in basketball playing.

4.1. Questions

What is the profile of the respondents according to?

What is the assessment of physical characteristics of respondents based on?

Is there a significant difference of players' physical characteristic according to their profile?

What is the assessment of functional movements of respondents based on:

Is there a significant difference of players' functional movements according to their profile?

What is the assessment of coaching style of respondents based on:

What is the correlation of functional movement, coaching style and physical characteristics?

Based from the findings of the study, what enhanced development plan can be proposed?

5. Hypotheses

Ho1 There is no significant difference of players' physical characteristic when their profile is taken as test factors.

Ho2 There is no significant difference of players' functional movements when their profile is taken as test factors.

Ho3 There is no significant relationship of physical characteristics, functional movements, and coaching style of coaches.

6. Significance of the Study

The significance of this research is very significant, and the research will help the following people:

College Students: To improve their performance, the players' development plan is important to be included in their enhancement of skills.

Parents: It gives assurance to the parents that their children are safe on their playing.

Teachers: It is easier to monitor the students' performance and guide them on their teaching in basketball playing.

The Department Heads: It helps the university to meet the satisfaction of parents in terms of security and meets the requirements of the government.

Future Researchers: The data in this study serves as valuable reference for further studies or validation of the players' development plan.

7. Scope and Delimitation of Study

This study aims to enhanced a basketball players' development plan based on the result of the effect of students' physical characteristics on functional movement in basketball playing.

The subjects of the study are students at the Guangxi Normal University, Guangxi University, Guilin University of Technology, Guilin University of Electronic Technology and Guangxi Police College.

7.1. Definition of Terms

The following terms are defined operationally for this study:

Body Composition refers to the proportion of different tissues that make up the human body. It is often expressed in terms of the relative amounts of lean body mass and body fat.

Body Mass Index is use in conjunction with other health assessments for a more comprehensive understanding of an individual's health status. The formula for calculating BMI is: $BMI = \text{Weight (kg)} / \text{Height (m)}^2$.

Cardio-Vascular refers to the cardiovascular system, which is a complex network of the heart, blood vessels, and blood. It is responsible for delivering blood and oxygen to tissues and organs throughout the body and transporting metabolites and carbon dioxide from tissues and organs.

Coaching Style refers to the technique and strategy used of the coach to his players in a game.

Defense refers to the strategies and techniques employed by a team to prevent the opposing team from scoring points. It is the act of limiting an opposing team's ability to score and preventing them from running a smooth offense by employing a variety of strategies and techniques. This includes staunch defense, zone defense, technical means such as blocks, blocks and steals, and coordinated team defensive tactics. Effective defense can change the course of a game and provide vital support for a team to win.

Dribbling refers to the skill of a player maneuvering the ball while maintaining control and possession. It is a movement technique in which a player advances the ball in place or on the move with a continuous one-handed slap.

Emotional Management refers to the ability of players, coaches, and even teams to effectively understand, regulate, and channel their emotions in a way that positively influences their performance on the court.

Euro-Step refers to a type of step that use in basketball drills. It is one of the basic skills that basketball trainers need to practice in the process of training.

Flexibility refers to the ability of a player to move joints through a full range of motion.

Functional Movement refers to a type of physical movement that closely aligns with the natural patterns and capabilities of the human body. Examples of functional movements in basketball are running and sprinting, jumping, shooting form, dribbling, passing, defensive slides, boxing out, pivoting, screening, layups and dunks, fast breaks, ball reversal, cutting, post moves, defense and shot blocking, and conditioning.

Game Management refers to the strategic decisions and actions taken by coaches and players during a game to maximize their chances of winning.

Game Preparation involves a series of activities and strategies that players and coaching staff undertake to get ready for an upcoming basketball game.

Hesitation Move refers to a name of a break away move in basketball.

Muscle Strength refers to the ability of a player's muscles to generate force and exert power during various movements involved in the game.

Passing refers to the act of transferring the ball from one player to another on the same team.

Physical Characteristics refer to the observable, measurable attributes or traits of an individual's body or appearance. Such characteristics are height, weight, body shape, muscle mass, posture, and physical fitness.

Posture refers to the body position and alignment of a player while on the court.

Players' Development Plan is a structured and organized approach to help players improve their skills, abilities, and performance in basketball. It is commonly used in the context of sports coaching and skills development.

Shooting refers to the action of attempting to score points by propelling the ball into the opponent's basket.

Tactics and Strategy are essential components that coaches and players use to gain a competitive advantage over their opponents.

Teaching Fundamentals is a crucial aspect of coaching and player development. Fundamentals are the basic skills and techniques that form the foundation of a player's overall basketball ability.

Team Building it involves fostering a sense of unity, cooperation, and communication among the members of a basketball team. It aims to enhance the overall performance of the team by improving relationships, trust, and understanding among players, coaches, and other staff members.

8. METHODOLOGY

This chapter describes the research design and methodology. It also presents the description of the study locale and participants, the data collection instruments and procedure, and the data analysis.

8.1. Research Design

This study will employ a Quantitative approach utilizing Descriptive Comparative-Correlational research design. Xuebao (2023), Correlational Analysis helps researchers understand the degree and direction of a relationship between two or more variables. In descriptive research design, the goal is to observe, describe, and analyze the characteristics of a phenomenon without manipulating variables. Correlational analysis within a descriptive research design allows researchers to identify patterns, associations, or connections between variables without inferring causation.

In this study, the researcher will identify the correlation between functional movement, coaching style and physical characteristics. The results will be the basis of the development plan.

8.2. Research Locale

The research locale of the study are Guangxi Normal University, Guangxi University, Guilin University of Technology, Guilin University of Electronic Technology and Guangxi Police College.

Guangxi Normal University (GNU) is a comprehensive teacher training university in China, located in Guilin, Guangxi Zhuang Autonomous Region, China. Founded in 1932, the university is an institution of higher learning with a

long history, a good tradition of schooling and a strong faculty. The university has several academic disciplines, including literature, history, education, science, engineering and management, covering a wide range of fields of education and research. Guangxi Normal University is well known both at home and abroad for its quality teaching and research results, and has made significant contributions to the cultivation of outstanding talents.

Guangxi University is a comprehensive university in the Guangxi Zhuang Autonomous Region of China, located in Nanning, Guangxi. Founded in 1928, the university is a highly reputable institution of higher learning with a long history. Guangxi University offers a number of academic disciplines, including literature, history, education, science, engineering, management and law, covering a wide range of fields of education and research. The university focuses on cultivating students' comprehensive quality and innovation ability, and is committed to cultivating outstanding talents for the society. Guangxi University enjoys a high reputation at home and abroad for its excellent teaching and research achievements.

Guilin University of Electronic Technology (Guilin UET) is a comprehensive university in China, located in Guilin, Guangxi Zhuang Autonomous Region. Founded in 1978, the university is a higher education institution with the advantage of information technology and the coordinated development of engineering, science, management, economics and other disciplines. The university focuses on the combination of scientific research and teaching, and is committed to cultivating outstanding talents with innovative spirit and practical ability. Guilin University of Electronic Science and Technology is in the leading position in the fields of information technology, electronic engineering and computer science, and has made important contributions to the country and society.

Guilin University of Technology is a comprehensive university in China, located in Guilin, Guangxi Zhuang Autonomous Region. Founded in 1958, the university is a higher education institution focusing on engineering and the coordinated development of science, management, economics and other multidisciplinary disciplines. The university focuses on the combination of scientific research and teaching, and is committed to cultivating outstanding talents with innovative spirit and practical ability. Guilin University of Technology is influential in the fields of engineering technology, material science, energy and environment, and has made significant contributions to the country and society.

Guangxi Police Academy is a higher police academy in the Guangxi Zhuang Autonomous Region of China, located in Nanning, Guangxi. Founded in 1951, the school is an institution that specializes in training police talents. The school has several majors, including criminal science and technology, public security management, investigation and security technology, etc. It is committed to cultivating excellent police talents for the society. Focusing on practical teaching and police skills training, Guangxi Police College has made significant contributions to maintaining social security and promoting social stability.

8.3. Research Participants and Sampling Method

The population in this study are two hundred and seventy (270) students specializing in basketball. All administrators

and teachers from the five (5) universities will evaluate the players' development action plan for its acceptability.

This study will use a Total Enumeration sampling method, also known as complete enumeration or census sampling. It is a research method in which every single unit in the population is included in the study. This is used when the population under investigation is relatively small, manageable, or when it is feasible to examine each unit.

8.4. Research Instruments

This study will utilize three data gathering tools. First is the survey form that will ask the students about their profile and physical characteristics. The second is a record for the students' functional movements. The researcher will observe the players' functional movement while playing basketball then record it. Then the third tool will be used to observe the students' play using coach techniques and record it.

8.5. Data Gathering Procedure

Pre-Data Gathering. The researchers will seek approval from the President of the university to collect the necessary data for the study.

Actual Data Gathering. Upon the President's approval, the researchers will start distributing a survey form to the students to get their profile and physical characteristics. The researchers will observe the functional movements of the students and record their performances in basketball playing. Another observation of play will be made using coach techniques, and the results will be recorded.

Post-Data Gathering. All administrators and teachers from the five (5) universities will evaluate the players' development action plan for its acceptability.

9. Ethical Considerations

Relevant research organizations such as ethics committees work to promote ethical conduct in scientific research. It is an integral aspect of research that needs to remain at the very heart of the study.

Inclusion Criteria

The respondents of the study are college students specialized in basketball playing. Since some students are under legal age, a permission letter will be given to their parents. The respondents will be evaluated on their performances in basketball playing in consideration of their physical characteristics.

Withdrawal Criteria

The respondents have the right to withdraw or refuse in participation of the evaluation. The respondents will just inform the researcher for withdrawing or discontinuing from participating in the evaluation. The respondents are not required to justify or provide any reasons for withdrawing from the study.

Forms Handling

The parents and respondents will be given a consent form and survey form. The consent form will be used to ask permission and give guidelines to the respondents about their rights, the procedure, and the incentives in participating in the process. The evaluation form will be given to the administrators and teachers to evaluate the proposed players' development plan.

Privacy and Confidentiality

The researcher will inform the respondents that the gathered personal information will be confidential.

10. Conclusion

The study aimed to develop a comprehensive basketball player development plan by examining the impacts of physical characteristics and functional movements on the basketball performance of male and female students. Based on the Long Term Athletic Development (LTAD) framework, the research sought to understand and implement a structured approach to athlete development that enhances physical education and ensures players' safety and efficiency in basketball.

The findings suggest that individual physical characteristics significantly influence players' functional movements and overall performance in basketball. This aligns with Ferraz et al. (2022), who emphasized the importance of considering individual growth differences in long-term training programs. The research supports the notion that understanding and catering to individual physical maturity can optimize performance and potentially prevent talented athletes from being overlooked due to developmental delays.

Furthermore, the application of the LTAD framework within the basketball training program appears beneficial. The progressive stages from the 'active start' to 'training to win' provide a holistic approach to athlete development, emphasizing not only skill acquisition but also the importance of psychological and emotional well-being, as highlighted by Tooley (2023). This comprehensive approach fosters a conducive environment for growth, enhancing the athletes' physical, mental, and tactical capacities.

The study also underscores the importance of a tailored coaching style that adapts to the individual needs and development stages of student-athletes. This personalized approach is essential for fostering a positive and effective learning environment. Coaches play a pivotal role in developing the athletes' skills, understanding of the game, and overall performance. Therefore, coaching styles should be flexible and responsive to the athletes' evolving needs throughout different LTAD stages.

Additionally, the research highlights the critical role of functional movement assessments in identifying areas of improvement and tailoring training programs to address specific needs. Wang (2022) demonstrated that systematic functional training can significantly enhance athletes' physical function and movement quality. This reinforces the necessity of integrating functional strength training into basketball training regimens to improve physical quality, strengthen weak links, and prevent sports injuries, as concluded by Haidi (2023).

In conclusion, the study contributes valuable insights into the development of effective basketball player development plans. By leveraging the LTAD framework and considering individual physical characteristics, functional movements, and coaching styles, educators and coaches can enhance the training and development of student-athletes. This holistic approach not only advances the physical and technical aspects of basketball playing but also addresses the psychological and emotional facets, ensuring a well-rounded and sustainable athlete development. Future research should continue to explore the intricate relationships between these variables and extend the application of LTAD principles to other sports disciplines to promote lifelong participation and success in sports.

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