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The effect of exercises in the third intensity zone of the strength characteristic of the speed of the two legs on the adequacy of the circulatory and respiratory systems and the performance of some basketball skills among young players

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Abstract

The research aimed to prepare exercises area intensity third strength distinctive speed of the two men for young players basketball, and to identify its impact on the adequacy of the circulatory and respiratory systems and in the performance of some of their basketball skills, and the researcher assumed that there are statistically significant differences between the results of the pre- and post-tests of the experimental and control research groups for each of the adequacy of the circulatory and respiratory systems and the performance of some basketball skills, and there are statistically significant differences between the results of the tests of the experimental research groups and the dimensional control for each of the adequacy of The circulatory and respiratory systems and the performance of some basketball skills, and the experimental approach was adopted by designing the experimental and equal control groups, on a sample of (12) players who were deliberately selected by (75%) of the young basketball players at the Industry Sports Club for the season (2022-2023), and after determining the tests and preparing the exercises, they were applied over a period of (10) consecutive weeks at a rate of two units per week, and after the completion of the experiment, the results were processed with the (SPSS) system to be the conclusions that the application of the exercises of the third intensity zone of the strength characteristic of the speed of the two men helps in developing the adequacy of the circulatory and respiratory systems, and in improving the performance of some skills among young basketball players, and the researcher recommended that, it is necessary to adopt the application of intensity area exercises The third is for the strength characterized by the speed of the two men for the young players in basketball and the good rationing of the high-intensity training load without exaggerations, It is necessary to pay attention to developing the capabilities of basketball coaches when working on the application of exercises in the third

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intensity zone of strength characteristic of speed for the two men for young basketball players that aim to develop their physiological skill factor.

Keywords: Third intensity zone exercises, circulatory and respiratory adequacy, basketball skills.

Introduction:

Strength exercises characterized by speed are necessary and important for young basketball players because they are linked to different skill abilities, especially in playing quickly with the jump and exchanging receiving between them. Every intensity and training load has repercussions represented by internal physiological reactions to meet the requirements of that load, and this is what requires study in the field in order to achieve the required improvements in According to the steps of scientific research and avoiding speculation to express the facts, and that "I use training methods to develop and improve the player's physical fitness to achieve advanced sporting achievements. We do not believe that a coach can dispense with the use of these methods, which have become the basis for construction and development, and the important thing in this The methods are used for all different types of sports, and the coach only has to be an artist in choosing the appropriate method for the event in which a method can be used more than the rest of the other methods." (Kamal, 2004, p. 215)

"No matter how diverse the methods and methods for developing muscle strength are, the required improvements fall within the determinants of good planning for the application of these methods and methods, which often focus on plyometric and ballistic exercises in cycles of lengthening and shortening the muscle for rapid, high-production contraction in the effect of the force resulting from it." (Goldberger, 2013, p: 258)

Also, "the components of the training load are the intensity of the training stimulus, the size of the training stimulus, the duration of rest, and the player's level, which is determined by the player's biological age, training age, level of special physical abilities and skill level, social status, and psychological state of the player, whether he is married or single, and the circumstances." "Psychological." (Marwan and Muhammad, 2010, p. 106)

Thus, "third intensity zone exercises are a concept often used in physical exercise programs, and they mean exercises that target strength characterized by speed. These exercises include many fast and powerful movements that aim to develop rapid muscle strength and the ability to perform sufficiently sudden and powerful movements." (Negra & Other, 2020, p: 132)

Also, "the third intensity zone works to develop a variety of physical abilities, including rapid muscular strength, and exercises that focus on the third intensity help in developing rapid muscular strength, which is the ability to produce great force in a short time. This is useful in various sporting activities." ". (Ramirez-Campillo & Others, 2020, p: 169)

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Also, “the gradual increase in training load is the basis for any player training planning and must be followed by all players who care about their level of achievement.” (Jamal, 2018, p. 66)

“The third intensity zone exercises enhance the ability to jump and run very quickly, and are especially important in sports that require rapid acceleration, such as athletics and team sports.” (Chaabene & Other, 2021, p:301)

Also, “third intensity zone exercises help in some functional improvements by strengthening muscles and developing the ability to make fast and powerful movements. This type of exercise can improve daily performance and the ability to move efficiently.” (Haff & Triplett, 2016, p:11)

“Exercises in the third intensity zone help contribute to increasing the basal metabolic rate, which contributes to burning calories and improving general fitness.” (Chaabene & Other, 2021, p: 304)

Among the distinctive exercises in the third intensity zone include: (Bompa & Haff, 2018, p: 114)

- High jumps and horizontal jumps.
- Exercises that require explosive ability, such as push-ups from the ground and biometric jumps.
- Lift weights quickly and frequently.
- Exercises that combine strength and speed, such as throwing and tossing.

It is also “very important that these exercises are performed correctly and under the supervision of a specialized trainer to avoid injuries and ensure that you get the most benefit from them. These exercises must also be included as part of a balanced training program that targets all aspects.” (Baker, 2017, p: 3)

Also, “exercises that target the third intensity zone contribute to improving the performance of athletes in a variety of sports, such as strength sports, speed and explosive sports, and even team sports such as football and basketball.” (Lloyd & Others, 2016, p:1241)

Also, “training leads to physiological changes that include the body’s systems, and the level of athletic performance advances whenever these changes are positive, in order to achieve physiological adaptation of the body’s systems and then to the physical load and skill performance.” (Adnan, 2010, p. 182)

“Exercises that target the third intensity zone help enhance balance and coordination by strengthening muscles and developing rapid muscle strength. They help improve balance and coordination in general, which can be useful in various daily and sporting activities.” (Chaouachi & Other, 2014, p: 404)

Also, "exercises that target the third intensity zone contribute to developing muscle strength and enhancing the ability to move quickly and efficiently, which leads to improving general health and increasing body flexibility." (Lloyd & Others, 2012, p: 4)

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"Exercises that target the third intensity zone, which focuses on strength characterized by speed, contribute to strengthening muscles, tendons, and ligaments, thus reducing the risk of injuries during sports activities and daily life." (Chaouachi & Other, 2014, p: 405)

Also, "the efficiency of the circulatory and respiratory systems is an important factor in the performance of basketball players, especially for young people." (Manou & Other, 2013, p: 284)

First: The circulatory system (muscular and skeletal): The circulatory system includes muscles, bones, and joints, and it is very important in basketball because it directly affects strength, physical fitness, and the player's ability to withstand physical challenges and compete in matches. Some important points include: (Impellizzeri & Others, 2008 , P:870)

 Muscular strength: Strong muscles contribute to executing movements such as jumping, throwing, and dribbling more effectively.

 Basal strength: allows the lower extremities to support the body and bear the load of repeated jumping and landing.

 Flexibility: Flexible muscles reduce the possibility of injuries and allow various movements to be performed.

 Balance: contributes to the implementation of launching movements and rapid changes in different directions.

Second: The respiratory system: The respiratory system plays a vital role in supplying the body with the oxygen necessary for physical performance and removing excess carbon dioxide. In basketball, players are exposed to great physical stress as a result of running, jumping, and rapid movements, and some important points include: (Nikseresht & Other, 2014 , P: 308)

 Pulmonary capacity: The ability to absorb a large amount of air contributes to withstanding physical effort.

 Deep breathing: Correct breathing provides the body with a sufficient amount of oxygen and helps in eliminating metabolic waste.

 Pulmonary endurance: the ability to perform physical effort for long periods without exposure to excessive stress on the respiratory system.

"To achieve high efficiency in the circulatory and respiratory systems, basketball players are advised to pay attention to comprehensive fitness training, which may include vigorous exercises, improving flexibility, developing basal strength, and improving respiratory capacity through aerobic exercises. Training must be done regularly and balanced, taking into account Rest periods and healthy nutrition to support this lifestyle." (Özkan & Kurt, 2016, P:104)

After this digression, which clarifies the interrelationship between the research variables investigated,(Kazim et al., 2019) it is no secret that basketball players always seek to raise the adequacy of the circulatory and respiratory systems to meet the requirements of various physical, motor, and skill abilities, according to the specificity of this fast-paced game, and by virtue of the researcher's academic and training work, she noticed a lack of interest in eating Strength training characterized by speed as an independent variable to influence the raising of

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the necessary physiological indicators by producing training mixtures that deal with the time of exercises for the distinctive strength of the legs, which is one of the factors controlling transitional speed and the success of various basketball skills, in which a decrease in the level of players is usually observed, forming this noticeable weakness. The problem of the current research is explained as an attempt by the researcher to find solutions to it by targeting physiological and skill factors in the training units that they receive during the period of special preparation, which is an attempt to experiment according to the caveats of avoiding sports injuries when receiving these high-intensity exercises for the third intensity zone exercises for strength characterized by speed. For the legs, considering that these exercises are applied with high-intensity training loads,(Kadhim, 2023) and hence they must not negatively affect the techniques of skill performance and do not confuse the player in various critical situations, especially when the speed is high in the strength characteristic of speed for the legs,(Salih et al., 2024) so the research aims to prepare area exercises The third intensity zone of leg strength for young basketball players, and identifying the effect of the third intensity zone exercises for leg speed power on the adequacy of the circulatory and respiratory systems among young basketball players, and identifying the effect of the third intensity zone exercises for leg speed power on the performance of some basketball skills.(Abdulhussein et al., 2024) Among young players, the researcher assumed that there are statistically significant differences between the results of the pre- and post-tests of the experimental and control research groups for both the adequacy of the circulatory and respiratory systems and the performance of some basketball skills, and there are statistically significant differences between the results of the tests of the experimental and control groups for both the adequacy of the two systems. Periodic, respiratory, and performing some basketball skills.(Kadhim, 2024b)

Method and tools: In light of what the researcher mentioned in the problem of her current research, the experimental research approach was adopted, which is defined as "controlling a specific variable within the conditions of an experiment that enjoys safety conditions to determine its effect on another variable or variables by fixing the rest of the influencing factors." (Fawqia, 2022, p. 218). The boundaries of the research community were represented by the young basketball players in the Al-Sinaa Club, who numbered (16) players continuing their training for the sports season (2021-2022). (Kadhim, 2024a)They were chosen intentionally in a comprehensive enumeration style to represent the research sample with a percentage of (100). %), and then (12) players (75%) were selected from them to represent the main research sample, who were divided according to the requirements of the experimental design into two experimental and control groups with an equal number of (6) players for each of them. They were randomly distributed to them, and homogeneity was conducted for them in some extraneous variables. Which affects the internal integrity of the experimental design. The values of the torsion coefficients ranged between (+1), and (4) of them (25%) players were chosen for the exploratory sample.

Results:

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Table (1) shows the results of the pre-tests for the dependent variables between the two research groups

Discussion:

The results presented in Table (2) indicate that the physiological response was achieved in the post-tests by increasing the adequacy of the circulatory and respiratory systems and the performance of the skills (stomping, shooting by jumping from running, and shooting peacefully) among the players of the experimental group compared to what their results were in the pre-tests. The researcher attributes the emergence of these The result is that they applied the third intensity zone exercises for strength and speed for the legs,(Kadhim et al., 2021) and that their application required vision ventilation to meet the requirements of supplying the body with oxygen to cover the energy related to the burden of resistance and during the distances specified in this application, (Kazar & Kazim, 2020)which constitutes a reflection on the internal reactions of the body to appear in the form of a physiological response in an increase Dimensional values increase the adequacy of the circulatory and respiratory systems, as the exercises in the third intensity zone for strength and speed for the legs have proven their suitability for targeting this physiological development in the physiological and skill factors, and the suitability of good regulation of the training load to apply the exercises regularly for the two units in one training week within the determinants of the anaerobic energy system and the duration of the training for a period of (10) Consecutive training weeks. The researcher also attributes the emergence of this result to the habit of young basketball players to inhaling increased amounts of external breathing air in a way that suits the nature of applying these high-intensity exercises in this period of time, and by their nature, they require strengthening the breathing muscles according to the nature of muscle contractions and their direction in movement. (Easa et al., 2022)The arms to fill the lungs with air, which helped expand the lung tissue to respond to the requirements of these exercises, and for a specific period of time for each exercise, in addition to the period of rest after performing each exercise that young basketball players invest in for recovery, which is also in which quantities of air are inhaled to oxidize metabolic waste and restore Rest for cellular regulators and their basal balance, which requires an increase in the depth of breathing,(Farhan et al., 2016) which reflects positively on the emergence of these results, as these factors combined from external influences and internal body reactions as a physiological response helped in the emergence of results of not harming the skill performance of each skill performance (stomping, aiming, jumping from running, and peaceful shooting among young basketball players in this research.(Mahmood & Kadhim, 2023)

“Third intensity zone exercises can have a positive effect on developing muscular strength and explosive power, which enhances players’ ability to jump and move with greater speed and strength.” (Granacher, 2014, p: 430)

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Also, "the third intensity zone exercises that target strength and speed can contribute to developing muscular endurance and physical endurance, which helps players perform well during prolonged basketball matches." (Granacher & Other, 2011, p: 2241)
"Third intensity zone exercises can have a positive effect on muscle strength and movement control.(Mousa & Kadhim, 2023) It can enhance balance and coordination, which contributes to improving the performance of basketball skills such as dribbling and passing, and movement control can reduce the risk of injuries while exercising." (Muehlbauer & Others, 2012, p: 506)
Also, "athletes who undergo organized training programs with specific times, goals, methods, and training contents achieve better results than those who train in random ways during the time periods allocated for training times." (Abdel-Zaher, 2014, p. 47)

"The third intensity zone exercises that target strength characterized by speed can help develop rapid muscle strength and can increase the efficiency of the circulatory system. This means increasing the ability of the muscles to repeat fast and powerful movements with greater efficiency, and this contributes to improving the performance of basketball skills that require... Fast explosions, such as jumping, running, and dribbling, are better and stronger, and enhance the efficiency of the respiratory system, as the respiratory system needs to supply the muscles with oxygen and remove carbon dioxide effectively during high-intensity exercises." (Ozmen & Other, 2017, p:39)
Third intensity zone exercises can have a positive effect in developing strength and movement control, which contributes to enhancing balance and coordination, and this positively affects skills such as dribbling and passing. Developing rapid muscle strength can increase players' endurance during intense matches and training." (Seitz & Other 2017, P: 2578) (Young 2006, P: 76)
"The fast and changing situations that the player faces in applying third intensity exercises can achieve progress in performing exercises that depend on the third intensity, and can contribute to building self-confidence and belief in the body's abilities, and then the required improvements in the skill factor in basketball, and contribute to Improving high jumps and positioning in the air, which enhances players' ability to shoot and defend better." (Lloyd & Other, 2015, P: 4) (Sheppard & Other, 2016, P: 231)
"It is worth noting that the diversity of exercises and the inclusion of different components of fitness in a training program can have a greater positive impact on results. These exercises may include strength, flexibility, aerobic capacity and endurance, along with the third intensity zone of strength characterized by speed." (Faigenbaum & Myer, 2016, p: 15)

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Conclusions and recommendations:

1- Applying exercises in the third intensity zone for strength and speed in the legs helps in developing the adequacy of the circulatory and respiratory systems in young basketball players.

2- Applying the exercises in the third intensity zone for strength and speed in the legs helps improve the performance of the skills (stomping, shooting by jumping from running, and shooting peacefully) among young basketball players.

3- It is necessary to adopt the third intensity zone exercises for the strength and speed of the legs for young basketball players and to properly regulate the high-intensity training load without exaggerations.

4- It is necessary to pay attention to developing the capabilities of basketball coaches when working on applying the third intensity zone exercises for the strength and speed of the legs for young basketball players that aim to develop their physiological and skill factor.

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Appendix (1) shows the maximum oxygen consumption test (VO2max): (Osama, 2018).

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Necessary tools: indoor court for handball or basketball, a stopwatch, a whistle.

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Procedures: The maximum distance an athlete covers during a run (12 minutes) around the indoor handball or basketball court is recorded. In basketball, the length is 35 m and the width is 15 m, and the total lap is (100 m).

Purpose of the test: to measure the maximum oxygen consumption.

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To measure the maximum oxygen consumption, the researcher relied on the Cooper test (12-minute run), which is the best way to measure the maximum oxygen consumption. It also does not require many devices or tools and is one of the functional field tests.

Unit of measurement: mmol/kg/min.

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