Original Article

# The impact of procedures of controlling the formation of the degrees of the proposed training load on the strength development in young basketball players

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**ABSTRACT**

The significance of this study is to enhance the game of basketball for the better and boost the muscle strength level suitable for the player to conduct the game needs according to the best control of appropriate loads, hoping to attain outcomes serving the game of basketball. The study objective is to prepare and control exercises in ways of forming the degrees of the proposed training load in developing the force characterized by speed and some offensive skills in youth basketball. To fulfil those aims, the experimental approach with two experimental groups is conducted to suit the solution of the research problem and achieve its objectives. The sample was selected purposively, represented by the young basketball players of South Oil Club, which were (12) Players. Based on the results, the exercises used according to the formation of the grades of the load (maximum - medium - less than the maximum) and the formation of degrees (less than the maximum - medium - less than the maximum), helped effectively in developing the strength characterized by speed and to develop some basic offensive skills with basketball. Formation of load grades (maximum - medium - less than maximum) is more favourable in creating the force characteristic of speed than forming degrees (less than the maximum - medium - less than the maximum), and this is an indication that this ability can merely be enhanced and developed in the maximum load degrees.

**Keywords**: Performance analysis of sport , Basketball, Muscle strength, Offensive skills, Speed, Load grades.

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## INTRODUCTION

Societies are interested in various aspects that promote human beings and achieve their well-being and happy and evolving life, especially even the sporting aspect. Interest in this aspect has begun in order for these communities to achieve material and moral gains in sports tournaments, for various individual and even team sports (Wen et al., 2018; Al-Saadi, 2019).

Therefore, attention has been paid to the aspect of sports training because it is the important element that fulfils desires in achieving high sporting achievements, such as research, investigation, and experimentation for the best exercises used or the beginning of the correct training programs or the formation of loading that suits the age group and the level of athletic progress (Aoki et al., 2017; Arede et al., 2021).

The construction of the formation of the load is one of the principles of important and basic sports training science that helps to gradually advance the level and not fall into an overload or drop in the level if the load does not suit the sample level and every sports game needs training that suits it and works to achieve good results, i.e., the ability of the player He completes the match and performs the game-specific skills without dropping his level until the end of the match (Abdel Fatah Alkhfif, 2016; Arslan et al., 2022).

The basketball game is one of the team games that specializes in special physical requirements that differ from other sports, especially the strength characteristic, which is the active element in it (Vázquez-Guerrero et al., 2018). This is what we note with the movements of the player within the game depends primarily on the muscle strength to perform the required jumps and to perform skills with the ball weighing more than half a kilogram; he works to push the ball either by handling or shooting on the basket so needs the required muscle strength (Deepika and Rathod, 2022; Morrison et al., 2022).

Control of load grades is important and essential to help the player to progress at his level without landing or stopping progress either with physical abilities or skills, so basketball players need the right muscle strength to help them perform the basic skills of the game and can only develop that strength with the right training and control of the appropriate load grades for that muscle type and strength (Vanlandewijck et al., 1995; Moselhy, 2022).

Through the researcher's humble experience in sports training and basketball, he discovered that the majority of players have a flaw in conducting the needed skills until the end of the match, and this is due to weak muscle strength, as is the case for the advanced South Oil Sports Club players.

Because there are different cases in the control of training load grades, the researcher tended to experiment with two cases that he found better in progressing and improving the muscle strength and types important to basketball players.

### *Research objectives*

1. Preparing and controlling exercises in ways of forming the degrees of the proposed training load in developing the force characterized by speed and some offensive skills in youth basketball.
2. Recognizing the effect of exercises and controlling them in ways by forming the degrees of the proposed training load in developing the force characterized by speed and some offensive skills in youth basketball.
3. Identify the variations between the outcomes of the pre and post-tests of the two experimental groups in the development of strength characterized by speed and some offensive skills in youth basketball.

4. Identify the differences and variations in the outcomes of the post-tests between the two experimental groups in developing strength characterized by speed and some offensive skills in youth basketball.

***Research hypotheses***

1. The presence of a positive effect of exercises and control in ways of forming the degrees of the proposed training load in the development of strength characterized by speed and some offensive skills in youth basketball.
2. There are differences between the results of the pre and post-tests for the two experimental groups and in favour of the post-tests in developing the strength distinguished by speed and some offensive skills in youth basketball.
3. The existence of variations in the outcomes of the post-tests between the two experimental groups in the development of strength characterized by speed and some offensive skills in youth basketball.

## METHODOLOGY

***Research fields***

*The human field*

Players of The South Oil Sports Club youth basketball.

*Spatial field*

The South Oil Sports Club Stadium.

*Time field*

Length of 6/2/2019 until 19/4/2019.

***Training load grades***

The main training load grades agreed in most sources are as follows:

1. Maximum load.
2. Less than maximum load.
3. Medium load.
4. Low load (below medium).
5. Positive rest

*Maximum load*

It is the maximum degree of load that a person is able to employ or tolerate, it is featured by quite an immense burden on the human body systems and organs (muscular system, respiratory system, nervous system, circulatory system, and so forth) and necessities quite a high degree of ability to concentrate, During the performance, the person is clearly shown fatigue, and needs long rest so that healing can be restored.

That load ranges level in severity between 90 to 100 percent of the maximum that a person can bear with repetition for few times or for short periods (1-3) times.

*Less than maximum load*

It is a load whose degree is slightly lower than the maximum load. Since the less than maximum load is not much less than the maximum load, the functional apparatus of the athlete operates at a high level as well, but not at an extreme degree.

 

The intensity of the less than maximum load ranges between 90- 75% of the maximum a player can handle. The number of times the load is less than the maximum, it is between (4-10) times.

*Medium load*

It is a load that is characterized by mediation in terms of the burden on the functional apparatus of the player's body, and the feeling of fatigue is less than the two maximum and less than the maximum loads, then the player can continue his performance to a satisfactory degree without the appearance of symptoms of fatigue. The medium degree of load is estimated between 50: 75% of the maximum an athlete can handle. The number of times the medium load is 8-15 times.

*Light load (less than medium)*

It is the load that is slightly less than the medium load. This load leads to the activation of the vital organs of the body of the athlete while not placing great burdens on them, and thus he does not feel tired during it. The intensity of the light load ranges between 35: 50% of the maximum that an athlete can bear. the number of repetitions of the light load is 16:30 times.

*Positive comfort*

It is the lowest degree of load that a player can be exposed to .The researcher used the experimental approach with two experimental groups to suit the solution of the research problem and achieve its objectives.

***Research sample***

Table 1. The equivalence and homogeneity of the two experimental groups in the study variables.

| **Exams** | **First experimental group (Less than maximum - medium - less than maximum)** | | | **Second experimental group (Maximum - medium - less than maximum)** | | | **Calculated t values** |
|---|---|---|---|---|---|---|---|
| | s | P | Coefficient of variation | s | P | Coefficient of variation | |
| Age / year | 19.33 | 0.63 | 3.259 | 19.74 | 0.82 | 4.154 | 0.887 |
| Weight / kg | 82.4 | 2.64 | 3.203 | 82.36 | 2.45 | 2.974 | 0.024 |
| Height / cm | 185.7 | 2.2 | 1.184 | 185.8 | 2.4 | 1.291 | 0.068 |
| Characteristic Force of Arms Speed / number | 8.8 | 0.24 | 2.727 | 8.7 | 0.26 | 2.988 | 0.632 |
| The force of speed for two men / number | 18.67 | 0.13 | 0.696 | 18.62 | 0.41 | 2.201 | 0.26 |
| Handling with one hand / number | 16.4 | 0.22 | 1.341 | 16.71 | 0.62 | 3.71 | 1.054 |
| Follow-up offensive board / number | 17.8 | 0.34 | 1.91 | 17.71 | 0.3 | 1.693 | 0.445 |
| Correct scoring after plumping / number | 8.71 | 0.32 | 3.673 | 8.32 | 0.41 | 4.927 | 1.681 |

*Note. (T) tabulated value at a degree of freedom (10) and under a level of significance (.05) = 2.23.*

The sample was deliberately chosen, represented by the South Oil Sports Club with (12) young basketball players. The players were divided into two groups (experimental) by the random method. The first group worked with degrees (maximum - medium - less than the maximum) and the second group worked with

degrees (Less than maximum - medium - less than maximum) so that the number of each group became (6) players, and the homogeneity and parity of the two groups were found according to Table 1.

***Collecting data and research tools***

Methods of collecting data are:

1. Foreign and Arab sources.
2. Scientific consideration
3. Tests utilized

***Used devices and tools***

1. Stopwatch.
2. Tape measures.
3. Medical balance.
4. Basket balls.
5. A basketball court.

***Determining research variables***

Through the researcher's field and training experience, he realized that those variables are crucial for basketball players, and therefore they were selected and assessments were done about them:

1. The force is distinguished by the arms' speed.
2. The strength of the two legs distinguished by speed.
3. Handling with one hand.
4. Follow-up the attack on the board.
5. Correct scoring after performing plumping.

***Research variables tests***

1. Test the strength characterized by speed (extending and bending the arms from the front support situation in ten seconds).
2. Test the strength characterized by the two legs' speed (bending and extending the knees in 20 seconds.
3. One-handed handling test.
4. Test follow-up attack on the board.
5. The correct scoring test after performing the plumping.

***Scientific bases of the tests***

The standardized test, which enjoys high honesty, objectivity and consistency, has been relied upon and taken from previous sources.

***Exploratory experience***

The researcher conducted an exploratory experiment on 20/2/6 at the original sample through employing several exercises for the aim of modularization and knowledge of the suitability of the research sample and to find the training load elements.

***Field experiment***

- Pre-tests: conducted on 20/2/20.
- Main experience: form 20/2/21 until 20/4/18.
- Post-tests: conducted on 20/4/19.

 

### *Proposed exercises*

The suggested exercises on muscle reinforcement (speed strength) have been employed in the primary part of the trainer's training unit for the two trial groups and with the proposed training load grades (maximum-medium-less than maximum) and the second group operating with degrees (less than maximum- medium-less than maximum), i.e. control of daily training units and depending on the composition of the weekly load.

The particular preparation time was adopted, and the exercises' intensity ranged from (75% to 100%) while the volume of exercise sought is dependent upon the degree of load applied, while the rest between groups and repetitions, the researcher were reliant on the pulse as an indicator, ranging from (120-130 p/min) between repetitions with a rise in intervals sometimes, especially at intensity (90%-100%). It was (130-140 p/min), which was the right period for the skill to perform again at high concentration and without fatigue or a drop in the level. These exercises lasted for nearly two months, 3 training units in a weekly basis.

### *Statistical methods*

System was reliant on SPSS to find.

1. The arithmetic average.
2. Standard deviation.
3. T-test for related samples.
4. T-test for non-correlated samples.
5. Percentage.

## RESULTS AND DISCUSSION

### *(pre – post) Tests of the two experimental groups in the research variables*

Table 2. Results of the pre and post-tests for the two experimental groups in the research variables.

| **Tests** | **First experimental group (Less than maximum - medium - less than maximum)** | | | | **Second experimental group (Maximum - medium - less than maximum)** | | | |
|---|---|---|---|---|---|---|---|---|
| | S-pre | S-post | Standard error | Calculated t value | S-pre | S-post | Standard error | Calculated t value |
| Characteristic Force of Arms Speed / number | 8.8 | 9.956 | 0.431 | 2.682 | 8.7 | 10.23 | 0.447 | 3.422 |
| The two-legged force of speed / number | 18.67 | 19.89 | 0.344 | 3.546 | 18.62 | 21.58 | 0.771 | 3.839 |
| Handling with one hand / number | 16.4 | 18.23 | 0.366 | 5 | 16.71 | 19.96 | 0.995 | 3.266 |
| Follow-up attack on board / number | 17.8 | 19.74 | 0.447 | 4.34 | 17.71 | 20.71 | 0.974 | 3.08 |
| Correct scoring after performing the plumping / number | 8.71 | 9.84 | 0.411 | 2.749 | 8.32 | 11.86 | 0.887 | 3.99 |

*Note. (T) tabulated was evaluated at a degree of freedom (5) and under a level of significance (.05) = 2.57.*

Through the observation of Table 2, we show that all the research variables for the two experimental groups have developed through the significant differences between the values of (T)The calculated and tabular between the pre and post-tests, as the calculated (T) values is the largest tabular evaluator with a degree of freedom (5) and a probability of error (.05). This indicates the presence of significant differences and in favour of post-tests.

The two groups' development is because of the exercises applied, scientifically chosen and utilized by the sample of research, working to attain the objective of training the subject, since the feature of strength with speed is not created automatically and spontaneously, but by regular and organized training as this kind of training works to develop strength distinctive by speed (Arslan et al., 2022).

The researcher argues that the main cause for the development is the observance of all exercises' conditions and its legal and technical principles, this is what Arede affirmed "*that there stands a scientific reality that has to be considered, which is that the exercises utilized in the training programs result in the performance development as it is created on scientific bases in handling the training procedure and utilizing proper load and note the individual variations and in preferable training circumstances and the supervision of special trainers where the training process regulated and managed based on the scientific bases functioning to enhance the skill and physical level of the players*" (Arede et al., 2021; Ibañez et al., 2018).

The cause of the basic offensive skills' development is because of the reinforcement of the speed's strength characteristic, as athletes are unable to learn the fundamental skills characterizing each activity in the event lacking the required physical qualities of sporting activity, so we find a close connection between the skill level and the special requirements in each activity.

***Post-tests of the two experimental groups in the research variables***

Table 3. Clarifies the results of the post-tests between the two experimental groups in search variables.

| **Tests** | **First experimental group (Less than maximum - medium - less than maximum)** | | **Second experimental group (Maximum - medium - less than maximum)** | | **Calculated t values** |
|---|---|---|---|---|---|
| | S post | P | S post | P | |
| Characteristic Force of Arms Speed / number | 9.956 | 0.154 | 10.23 | 0.112 | 3.223 |
| The two-legged force of speed / number | 19.89 | 0.445 | 21.58 | 0.563 | 5.281 |
| Handling with one hand / number | 18.23 | 0.551 | 19.96 | 0.554 | 4.957 |
| Follow-up offensive board / number | 19.74 | 0.331 | 20.71 | 0.265 | 5.132 |
| Peaceful scoring after performing the puck / number | 9.84 | 0.667 | 11.86 | 0.668 | 4.786 |

*Note. (T) tabulated value at a degree of freedom (10) and under a level of significance (.05) = 2.23.*

By observing Table 3, we found that the second experimental group with degrees of load (maximum - medium - less than maximum) was better in developing strength characterized by speed and also in developing basic

 

skills in basketball through the presence of significant differences in the post-tests of a group with load grades (less than the maximum - medium - less than the maximum).

The reason for this is due to the maximum load levels that played a role in developing the strength characterized by speed, and this is evidence that this ability can only be developed under large loads.

Moreover, sporting activities depend on particular muscle groups that differ from one game to another give the specialized sport and the reality that the basketball game is one of the games that characterize its players with the strength of the muscles of the legs and arms substantially. Hence, attention must be paid to these groups through the organized repetition of exercises and the gradual increase of repetitions as the maximum load proved successful in The development of strength characterized by speed through the repetition of physical exercises throughout the training unit and numerous times to the development of this physical characteristic (Al-Saadi, 2019; Dheyab, 2019; Spiteri et al., 2019).

## CONCLUSIONS AND RECOMMENDATIONS

1. The exercises used according to the formation of the grades of the load (maximum - medium - less than the maximum) and the formation of degrees (less than the maximum - medium - less than the maximum), helped effectively in developing the strength characterized by speed and to develop some basic offensive skills with basketball.
2. Formation of load grades (maximum - medium - less than maximum) is more desirable in developing the force characteristic of speed than forming degrees (less than the maximum - medium - less than the maximum) and this is an indication that the ability could merely be developed in the maximum load degrees.

### *Recommendations*

1. Adopting the exercises utilized in accordance the formation of the grades of the load (maximum - medium - less than the maximum) and the formation of degrees (less than the maximum - medium - less than the maximum), in developing the strength distinguished by speed and to developing some basic offensive skills with basketball.
2. The adoption of the formation of the load grades (maximum - medium - less than the maximum) more in developing the strength characteristic of speed than forming degrees (less than the maximum - medium - less than the maximum) because it is an indication that this ability can only be developed in the degrees of maximum load.
3. It is necessary for training and its methods to be subject to proper codification in shaping its load and according to the goal set for it.

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## DISCLOSURE STATEMENT

No potential conflict of interest was reported by the author.

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