

## ESTIMATE THE VALUE OF REDUCING STRENGTH ACCORDING TO THE IMPACT FORCE IN SHOOTING IN BASKETBALL WITH DIFFERENT AREAS IN BASKETBALL

\* Prof. Dr. Hussein Mardan Omar

\* College of physical education – Al Qadisiya University.

### ABSTRACT

The basketball is one of the most familiar and wide popularity game which require the skills of a lot of movements like running, jumping, throwing, change of pace and feint, and in general the morphology of the skill shooting from rotation indicate the presence of power and reducing the impact effect in maximum knee flexion in order to preparing to jump shoot from rotation.

Pivot is more essential players used for shooting because of the positions effective occupied inside the Zone, every player seeking to deliver ball to them in order to make points, and so we see that he is subjected to great pressure requires him great performance with minimal effort and time.

The stage maximum knee flexion (reducing strength after impact force) is a section preparatory for the next phase which is to jump and shoot, in this phase we note Newton's second law ( $F=m.a$ ) that the force is inversely proportional to the time. This research tries to reach to the amounts of forces exerted at the stage of absorption (maximum flexion possible) according to the amounts of the forces of the impact when the performance jumping to shoot the ball after rotation.

The (27) successful samples attempt to jumping to shoot the ball after rotation was collected from (9) Pivot players of Premier League clubs Iraqi basketball, from the two regions by (13) attempt from the left of the basket, and (14) attempt from the right of the basket outside from Zone.

The data provided from curve force - time through samples test on the platform to measure the force, the correlation between maximum force in impact phase and minim force in reducing effect impact force phase was ( $r=0.955$ ) tested with ( $f: p<=0.01$ ) test, this signify value make us to building a simple regression model to estimate the strength of absorption through the power of the impact and this equation is (reducing force= 0.98. impact - 64.057) newton.

The good reducing of impact effect capacity of player to change the direction of the force acting on the movement against the direction, when he tries to move his body from the movement severe to static phase or to the movement of less severity, and load the body joints responsible for absorption and appear in the form of bending restricted status anatomical muscles working on the joint. The absorption process means a decrease in the amount of acceleration.

KEYWORDS: BASKETBALL, IMPACT, FORCE, MODEL, JUMPING.

### 1. INTRODUCTION

The pivot players are more players using corrections of various kinds because of the effective positions they occupy inside the stadium (the zone) because most of the team players are seeking to deliver balls to them in order to make points, and so we see that the player is exposed to great stress required from him to performance with minimal effort and time empowered, the skills in the game of basketball, "requiring hard physically weight as well

as the group of sprinting movements, jumping, throwing, which is the form of the game of basketball (James G. Hay, 1995) and in general, the morphology of the skill of the shooting of the rotation indicates the presence of strength and absorption of this force (bending the knee) and preparing to jump (to push the ground) and throwing the ball. The good absorption of collision means susceptibility of the athlete to change the direction of the acting force on his movement against the trend, when trying to move his body from the severe movement to the calmness or to the movement of less intensity, the stage of absorption strength (bending the knee) is preparatory section of the correction phase which is the jumping that strong preparations will in the preparatory phase and during Newton's second law ( $\text{force} = \text{mass} \times \text{acceleration}$ ) note that the force is inversely proportional to the time of bending, this research tries to reach to the magnitudes of the exerted forces at the stage of absorption (maximum possible flexion) according to the amounts of the forces of the collision during the performance of the correction from the rotation, that our knowledge of these ingredients will help us to estimate the power required to push the land and to find out the exerted effort to legalize it and training on it.

The basketball shooting is divided into two types, the first from the stability and the second from the movement, the most important type of shooting of the movement is shooting by jumping and could be done from the rotation before jumping, and "This is the kind of shooting considered as a successful potent force against the defense because it is done after the striker player receipt the ball and taking the appropriate condition when the body is facing the basket" (Huda Hamid al-Attar 2002).

The process of jumping in the skill of the correction is difficult because of motor transportation through the participation of more joints of the body, which starts from ankles joints through and hip and torso, shoulders, arms, and is compatible with the qualifications of the player's technique (physical and skilled), the skill requires a proper timing between jumping up and correction. "The high altitude, which can the player reach depends on raising the center of gravity of the body mass of the player through the vertical velocity of the body in the air" (Khaled Najm 1997).

The mechanical which is made out of this movement is how to invest the player all corners and joints of the body to get movement with technical conditions at the beginning of the movement after he receives the ball and behind him is the basket to start the process of deception and rotation and then begins the process of bending the knees and hip to start the preparatory phase of bending the knees which is a very important process to get enough power for the purpose of jumping up so after the body gained amount of movement and proper acceleration from rotation and thus the performance of this skill dose not start from zero.

The right mechanical performance enable the player to invest the use of corners of the joints of the body in order to obtain the appropriate movement and in accordance with the technical and mechanical qualifications, that the preparatory situation is to give the body the amount of movement and thus to increase range of motion and assembly of power, which is one of the important factors in starting the body in the air.

"The mechanical purpose of correction skill from jumping of basketball is entrance the ball to the basket with a high level of precision by investment the mechanical principles which has an effect on the effectiveness of the performance and this principle is based on fitness and the ability to control the skill for the purpose of generating the motor movement coupled with accuracy the best economic style" (Finch, Alfred, 2001).

And the degree of control varies according to the desired goal where precision is required for correction in basketball is high and requires a high degree of compatibility (Hussein Mardan, lyad Abdel-Rahman, 2011) and that the basis of the beginning strength considered one of the important foundations of the bio-mechanics.

Any exaggeration in knees bending in the preparatory phase of the performance will impact on the process of the required motor transport which starts from the foot, because the increased time of bending means loss of the power gained.

The information available for the mechanical compatibility between the two phases of the collision (setting foot on the ground) and absorption (maximum flexion) of the important things that should not be overlooked in the exercises and specially jumping training, and that the biomechanical laws that control the interdependence between the two phases outlines the training on them and thus the development of the power of the tide or pushing the land, and the seek time (the time of absorption strength) is inversely proportional with the strength needed to jump according to the law (force = the amount of movement \ time). From here the problem of the research appeared as by finding a correlation between the two phases the mechanism of training appear on them and to develop jumping strength for shooting. The aim of the research is to know the relationship between the force of collision and the force of absorption and then estimate the power of absorption according to the force of the collision.

## 2. PROCEDURES

The research sample consisted of (9) players of the pivot players from the Iraqi League clubs of basketball and underwent (27) successful attempt of correction for analysis and were collected from two areas by (13) attempt from the left of the basket, and (14) attempt from the right of the basket.

The platform device of measuring ground reaction force (Force Platform) has been used, and two video camera with frequency of up to (fps 100).

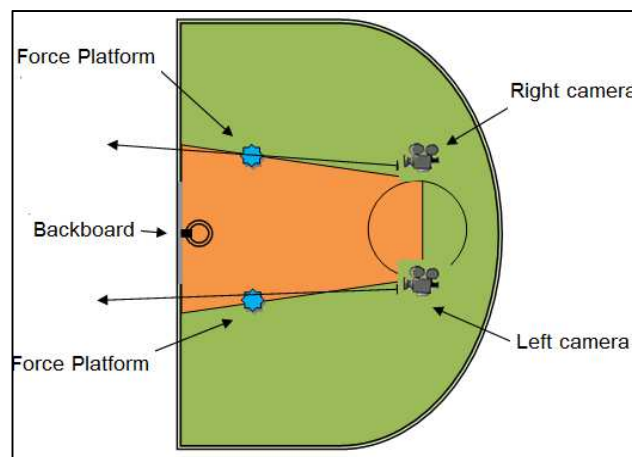


Figure 1, illustrates the locations of cameras and platform of measuring the force (site of the field experience)

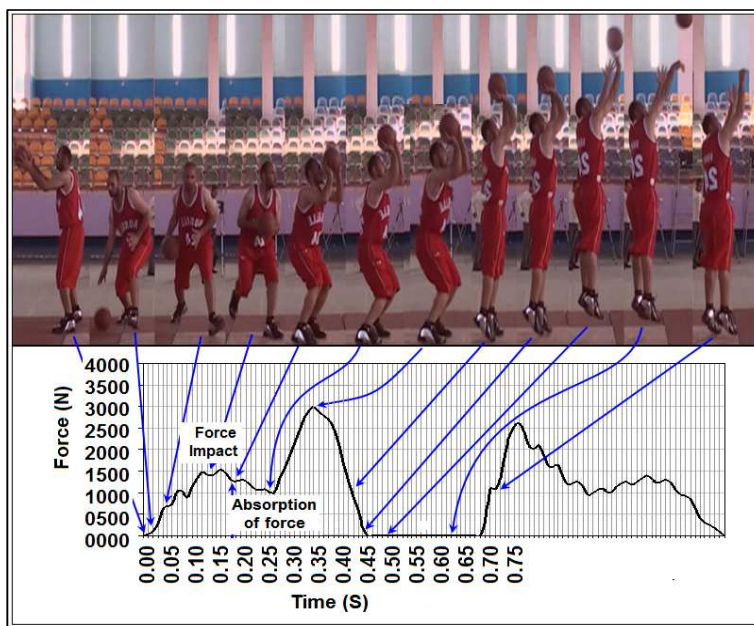


Figure (2) demonstrates the skill and the variables of strength measuring platform (the seek moment is the collision phase and less powerful is the stage of absorption)

### 3. DISPLAYING THE RESULTS

Table (1) shows less and the biggest force in the two phases of the collision and absorption with the arithmetic mean and standard deviation and sprains.

The variables	The number	Less value	Biggest value	The arithmetic mean	The standard deviation	The sprain
The collision	27	557,032	1536,640	1088,453	237,350	0,092-
The absorption	27	499,408	1498,220	1002,372	243,491	0,015

Can be seen from table (1) that less force observed in the stage of absorption and was the biggest force has been observed in the stage of the collision, and that the difference between the two phases in the amounts of the few the large power was convergent and in favor of the stage of the collision with rate (57.624) Newton at the lowest value and the difference of (38, 42) Newton at the largest.

Table (2) shows the correlation and the percentage of contribution and significance ratio

The variable	The correlation	Coefficient of determination	Percentage of contribution	The calculated value	The degrees of freedom	Level of significance
The collision	0.955	0.912	0.909	259.518	1   25	0.000

Can be seen from table (2) that the level of significance smaller than (0,001), which means that the force of the relationship between the two variables is function and not subjected to chance and it is a great value and a centrifugal so whenever the values of the force is growing at the stage of the collision, power of absorption was the growing, which means that there is a high biomechanical compatibility in exchanging the muscular work in between the two phases and the performance is harmonic and consistent with the motor performance of the preparatory department with regard to the influential force in the movement in order to reach the main section with integrated skilled performance.

Table (3) shows the parameters of the linear regression between the amounts of force in the two phases of the collision and absorption.

The collision model	The linear regression	The calculated value	Levels of significance
The constant	64,057-	0,946-	0,353
The collision	0,980	16,110	0,000

Shown in table (3) that the model that can be putted to estimate the force of the absorption has high significant and as notes that in figure (3) as the level of significance for the regression parameter of the collision force variable was less than (0,001) which means that it can estimate the force of the absorption through the collision by equation with high credibility (absorption = 0, 98 × collision - 64.057) and this achieves this hypothesis.

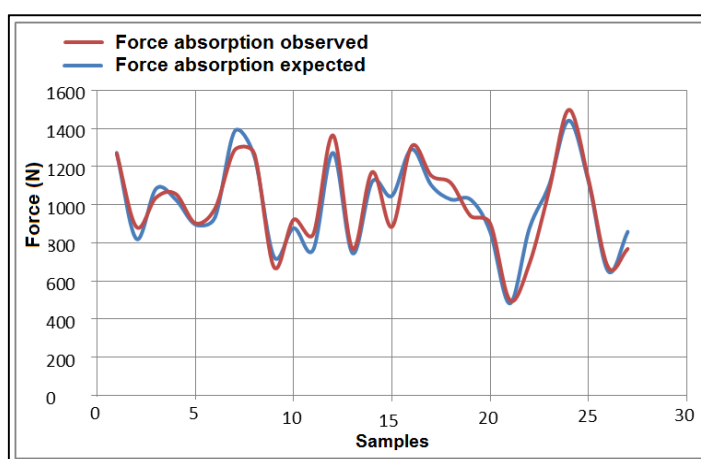


Figure (3) shows the values of the expected force for absorption through the real values which are available as tracers of the collision.

#### 4. DISCUSSION THE RESULTS

The basketball players at the preparatory section of the shooting skill from the jumping after rotation baptized to bend the knee to reduce the ring acceleration and converting speed with suitable angle for the vertical direction, and the joints of the body bear the responsibility of absorption and appear in the form of restricted bending in the anatomical status of the working muscles on the joint. The absorption process means decreasing in the amount of acceleration, and after receiving the player the land, he bends his ankles to absorb the impact of the force on the ankle joints and then reducing the transfer of this impact on the knees joints by bending the knees forward out of the line of the force impact and finally weakening the anti or adverse force and possibly terminated it at the hip joints, and in this performance, the small joints start to change the direction of the force, and we mean by the term (changing the direction of the force) that after player collides with the land, the impact of his collision will move vertically on the ankle joint so if the knee joint within the natural anatomical situation, all the coming influence from the ankle joint will arrive to the knee joint, as the process of twisting and turning that happened at the beginning and thus bending the knees will lead to the production of a large force in the main stage of the movement which will help to gather the force and increasing as well as the amount of the speed and thus starting the body in the air properly, as well as that the preparatory phase has importance in stimulating the muscles which will contribute directly to the pushing process and thus jumping to top (Mohammed Qasim, 2010).

But during bending the ankle joint, the vertical direction of the force impact decays into two things so the effect of the acting force decreases on the knee joint, hence the importance of good absorption of the collision, as this performance eases the burden on the joints and muscles and avoids injury and generates well balance on all subsequent sections of the movement.

## 5. CONCLUSIONS

1. Difference the values of force between the two phases of the collision and absorption. During the shooting from rotation and jumping in basketball does not exceed in less value than (40) In Newton and in highest value than (60) Newton.
2. There is a direct correlation between the values of the force in the two phases of the collision and absorption during shooting from rotation and jumping in the basketball.
3. 3 can strongly predict with the absorption force through the values of the force at the stages of the collision during shooting from rotation and jumping in the basketball.
4. 4 whenever the force of collision was large, the biggest is the force of the absorption.

## REFERENCES

1. Hussein Mardan Omar and Ayad Abdul Rehman: the biomechanic in the sport movements, Najaf Press, the Republic of Iraq, 2011, 46 p.
2. Khaled Najm: the relationship between some biomechanical variables and the calculated shooting by three points of jumping in the basketball, PhD thesis, Faculty of Physical Education, University of Baghdad, 1997, p 10.
3. Qassim Mohammed Abbas: relationship of curve characteristics (the force –the time) and some of biomechanical variables with accurately of shooting from the movement of the basketball pivot players, doctoral thesis, Faculty of Physical Education, University of Qadisiyah, 2010, p 25.
4. Huda Hamid al-Attar: Some biomechanical variables of the shooting by jumping from different sites and their relationship with the accuracy in basketball, PhD thesis, Faculty of Physical Education, University of Baghdad, 2002, p 7.
5. Finch, Alfred: Throwing for speed and accuracy, Indiana state university, internet 2001
6. James G.Hay.: Biomechanics of sports Techniques of jump shoot, athletic Journal, 1995, p.75.

**Prof. Dr. Hussein Mardan Omar. College of physical education – Al Qadisya University.**

**E-Mail:** hussein\_mardan@yahoo.com