

**Predictive Equation for the performance level of the Straight Somersault of the rear in terms of Kinetic Energy and potential energy on the players of the National Team in Technician Gymnastics for ages (11-14) years.**

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**Abstract:** The development of a predictive equation for the subject of kinetic and potential energy is one of the foundations on which the sport of the gymnastics is based, especially in the correct and appropriate preparatory situation that the player takes, thus achieving a mechanic position for acquisition of kinetic energy and through the work of a researcher in the sport of gymnastics and through tournaments Localization of the Gymnastic was due to the lack of availability of biomechanical information, especially in kinematics, in addition to the weakness in the performance level of the players in mechanical energy because the skill of the complex skills, which researchers have to study the skill and provide the mechanical knowledge of the proportion of its contribution to Technical her performance technical and put an equation to determine the level of predictive skill performance in terms of kinetic energy and potential research sample on the table ground movements in the artistic gymnastics.

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**Keywords:** gymnastics, kinetic, energy, and potential energy. straight somersault

### 1-1 Introduction to research:

The sport of gymnastics is a sport that has developed greatly in recent years and this is through the great progress experienced by motor skills and the improvement of the level of motor difficulties. The linear and angular movements and energy exerted on the ground and devices require attention to the Biomechanics with the many complex and complex social movements. The emergence and development of scientific laboratories for the science of physiology, psychology and biomechanics, which have a great role in interpreting the skill of straight Somersault on the ground movement mat. And the process of improving them requires the fragmentation of their basic components for the purpose of monitoring the factors and some of the biomechanical variables that control their performance to identify the strengths and weaknesses. (6:117)

Therefore, the importance of research has emerged that there is an urgent need to know the kinetic energy and its role in the success of the skill of open air backbones on the surface of the movements of the ground by studying the variable kinetic energy and the potential of the positive impact on the success of the skill and thus the technical performance of the skill, The special requirements on the ground movements are classified as difficult in international (law B).

### 1-2 Research problem:

The physical and kinetic energy is one of the foundations on which gymnastics is based, especially in the correct and appropriate preparatory position of the player, which achieves a mechanistic state of acquisition of kinetic energy and through the work of a researcher in the field of gymnastics. The researchers found that there is a lack of availability of biomechanical information, especially in kinematics. In addition, there is a weakness in the performance of the players in mechanical energy because the skill is a complex skill. FH contribution ratio in technical performance.

And the development of a predictive equation to see the performance level of skill in terms of kinetic energy and latent in the research sample on the ground movements in artistic gymnastics.

### 1-3 Research Objectives

1. Identifying the statistical values of the level of performance of the straight somersault of the rear skill, the latent energy and kinetic energy in the research sample.

2. Identifying the relationship between the level of performance of the aerobic and aerodynamic capacity of the research sample.

3. Identifying the percentage of kinetic energy input and potential energy in the performance of the straight somersault of the rear skills on the ground movement.

4. To devise a predictive equation for the level of performance of straight somersault of the rear skill in

terms of kinetic energy and latent on the ground movements of the sample.

#### 1-4 Research hypotheses

1. There is a significant relationship between the level of performance of the skill of the airway and the kinetic energy and latent in the research sample.

2. There is a difference in the ratio of the contribution of kinetic energy and the level of performance of the skill of the straight somersault of the rear on the back of the ground movements.

#### 2. Research methodology and field procedures

##### 2-1 Research Methodology

The researchers used the descriptive approach in the survey method and the correlative relations that fit the nature of the research problem and its objectives.

##### 2-2 The research community and its design:

The researchers identified the research community of the gymnastic players (national team) of 7 players, and the sample was chosen by the vertical method and there were 6 players because there was an injured player was excluded. (6: 164) that the sample is the part that represents the community of origin:

##### 2-3 Means of gathering information, instruments and tools used

###### 2-3-1 Means of information collection

The information was collected by means of a technical scientific observation, where the video was taken with a ( Casio ) camera at a speed of 300 images / Second.

###### 2-3-2 Instruments and tools used

Video Camera type (CASIO 2010.1).

Video Camera Holder (1)

Calculator for laptop Type Dele (1)

Floor Mats (1)

CD (1 )

#### 2-4 Conducting the Research

##### 2-4-1 Determination of the technical: performance variables of the open airway backgammon skill

1. The kinetic energy value of the skill (half the mass  $\times$  square speed).

2. The value of the potential energy of skill from the height of the player to a fixed point in motion and mass (weight  $\times$  height) (3:146).

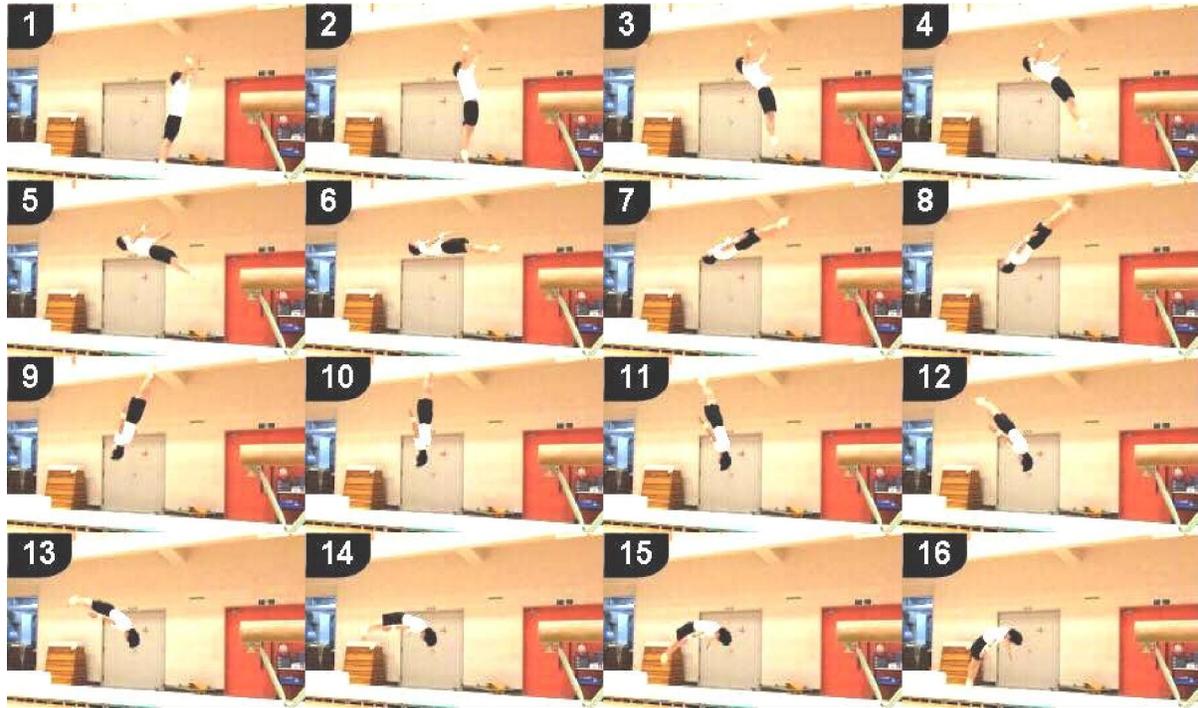
3. Full energy (kinetic energy + potential energy ).

##### 2-4-2 Experimental experiment

The reconnaissance experiment was conducted on 16/1/2017 and on Monday at 5:30 pm in the personal gymnasium hall at (Al-Shaab Stadium / Zayouna) in order to locate the camera on sample (2) of the same sample. (1.35) from the edge of the surface of the ground mat to the focus of the lens, either the horizontal dimension (9.15) from the ground movement mat.

##### 2-4-3 Main experience

The main experiment of the research sample was filmed on 17/1/2017 at the gymnasium specialized center for gymnastics at ( Al-Shaab / Zayouna ) Stadium at 5:00 pm, where a video camera was installed with the same height and dimension as was determined by the exploratory experiment.



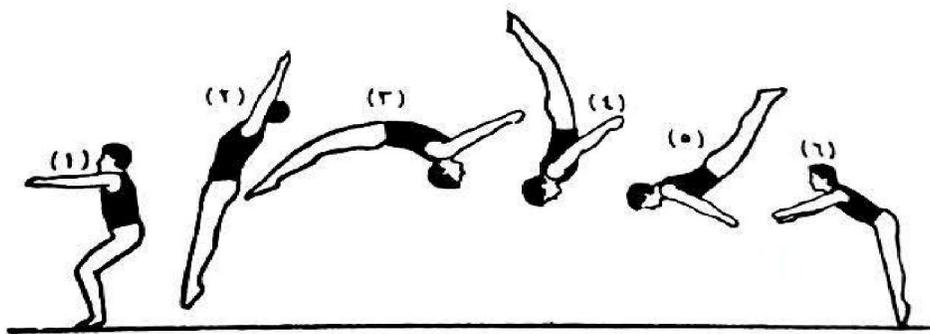


Figure (1) Shows the technical performance of the skill of the straight rear somersault

### 2-5 Program used in kinetic analysis of skill

The researchers used the program (Kenova). It is also a simple, uncomplicated and easy to use tool for analysis and can be used in qualitative, quantitative and learning analysis.

### 2-6 Statistical means

Data extracted from kinetic analysis were processed using the statistical program (Spss) (virgin 12).

### 2-7 Evaluate the level of performance

In order to evaluate the performance, an objective division of the scores of the four arbitrators and the final score for each player was eliminated. The first two grades were divided and divided into two. (7:89).

3- Presentation of results, analysis and discussion.

3-1 Presentation and analysis of statistical estimates of the variables investigated.

**Table 1:** Shows the computer classes and standard deviations of the investigated variables.

Variables	Unit measurement	Mean	±SD standard deviation
Kinetic energy	Joule	18.86	19.751
Potential energy	Joule	534.54	15.633
The straight somersault of the rear on the ground movement mat	Degree	8.27	0.729

2. Display and analyze the correlation between the open air back ache skill on the floor mat and the full energy (kinetic + potential).

Table 2 shows the correlation coefficient between the open-air backgammon skill on the terrestrial motif and the kinetic and kinetic energy results and the total energy (kinetic energy + potential energy). The appearance of the strong correlation between the search variables, The correct result of the player to acquire kinetic energy and this acquisition was the result of increasing the speed required in this skill because the increase will allow a greater opportunity to perform the skill in its full form due to the momentum on the ground movements that requires to be obtained towards the duty As a vector quantity and through which the body speed increases and increase angular momentum through the best D gives the body motor speed in increasing the kinetic energy through the payment and access to the optimal mode,

the increase in speed given the time of flight and higher altitude, allowing a player to link harder skill because of achieving Higher center height body weight in order to raise the difficulty in skills.

(Talha) pointed out that the extension of the joints of the body for the moment of upgrading and reduce the time of advancement of low bending of the knees and increase the momentum of the ground factors can increase the speed of tossing the body up and increase the kinetic energy of rotation and roll) (4: 171).

Kinetic energy is the energy the body possesses during its movement. The amount of this energy varies depending on the difference in the mass of the moving body and its speed during performance ( $1/2 \times 2 \times 2$ ). (3: 146).

The potential energy was significant and the researchers attributed that the potential energy is originally a kinetic energy gradually turned to stored

energy in the body to benefit at a moment in time by achieving a higher rise in the performance of the skill at the highest point reached the center of the weight of the body, since the weight constant will be more kinetic energy. Thus, a complete reflection of the full energy is reflected when the player leaves the movement mat with momentum and in short time as energy stored before the moment of reaching the dead point at the highest altitude to obtain a relatively small displacement force because the kinetic energy becomes zero at the dead point. The underlying is  $=(\text{mass} \times \text{acceleration of} \times \text{height})$  (2: 224).

At this stage the player tries to change the form of motor performance to avoid falling towards the gravity and restore the final position, which began to avoid the impact of collision with the surface of the earth. (4:123).

Full energy is a combination of motion and latent energy, where explicit (that the kinetic energy of the body is a numerical quantity without direction and be constant as long as its components of mass and speed).

The mechanical amount remains constant as the mechanical energy of the body is a sum of form of energy (latent and kinetic) at any given time

Constant amount = latent energy + kinetic energy (1: 190)

3-3 The ratio of the kinetic energy input, the latent energy and the full energy to the level of performance of the open air backgammon skill on the ground movement mat.

Open Backgammon Skill Backlight on the floor movement mat =  $(4.476) + 1.705 \times$  The kinetic energy value of the player +  $0.140 \times$  The potential energy value of the player (full power of the player).

**Table 2:** Shows correlation coefficient values between research skill and full energy (kinetic + potential )

Biomechanical variable	Calculated R value	Contribution ratio	Expatriate factor	The coefficient of alienation	Error rate	Statistical significance
Kinetic energy	0.664	0.440	0.748	74.8%	0.009	moral
potential	0.746	0.556	0.666	33.3%	0.003	Moral

If the error rate is less than (0.0)

**Table 3:** Shows the value of the regression coefficients of the straight somersault of the rear skill in terms of kinetic and latent energy and full energy.

variables	transactions		Correlation coefficient	Correlation link	Value of F Calculated	Contribution ratio
	Nature of coefficient	The value of coefficient				
Fixed limit	Fixed A	-4.476	0.795	Multi	7.775	0.632
Kinetic energy	B1	1.705				
Potential energy	B2	0.145				

F value calculated at line ratio (0.05)

Predictive equation

## Conclusions and recommendations

### 4-1 Conclusions

1. There is a significant relationship between the skill of the front airway hindgut and the kinetic energy and latent and full energy.

2. The ratio of the contribution of kinetic energy, latent and complete in the level of performance of the skill of the air bag, open back, which confirms the effectiveness of this energy full skill.

3. To devise a linear equation to determine the predictive value of the skill level in terms of full energy (kinetic and latent).

4. This skill needs to invest the mechanical foundations a good investment, such as kinetic energy,

angular speed and potential energy to achieve the best performance.

5. The horizontal paths of the hip and the full extension of the body after leaving the feet of the carpet movements of the ground achieved through the high level of the body at the moment left the rug.

### 4-2 Recommendations

1. Conduct similar research on other devices in artistic gymnastics.

2. The need to emphasize the values of energy rates and kinetic because of their positive role in improving the equation of energy is the horizontal and vertical speed to reach the desired level of high body weight to the highest height and this comes through

the momentum of the carpet so that the player to link another skill.

3. Emphasize that the knowledge of mechanical laws and how to achieve mechanical conditions and demonstrated in the service of the completion of motor skills.

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