



# AN ANALYTICAL STUDY INDICATOR OF SOME BIOMECHANICAL VARIABLES FOR SKILL OF SNATCH LIFT FOR SOME OF SPECIALIZED SCHOOL WEIGHTLIFTERS

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| Article history:  | Abstract:  |
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| <p><b>Received:</b> 1<sup>st</sup> March 2023<br/><b>Accepted:</b> 3<sup>rd</sup> April 2023<br/><b>Published:</b> 10<sup>th</sup> May 2023</p> | <p>Performance of movement of gravity and quickly, which depends on the preparatory period for performance of skill, requires greater great power result, in addition to fact that performance requirements require player to put greatest strength during skill performance to have to occur in movement, which affects outcome of the power used Therefore, he needs a large force on the ground that results in the land's reaction to the player. Some players of specialized school for research and experimentation using skill of kidnapping to study in order for image to be more clear to the coaches, which provides information that enables these trainers to explain performance more accurate For this skill, which raises level of our players in this center in terms of skill, so researcher considered an analytical study of the index of some biological variables of the skill of kidnapping for some players of specialized schools in weights, research sample included some specialized school players to lift weight of sports season 2022-2023 m, which numbered (6) Two players for each of them, because they are of good level, and their percentage is (37.5%) of the original community. filming was performed by Sony video camera with a frequency of 100 images /s placed on a triple holder at a distance (5 m) and a height (1.40 m) vertically on the field of movement and these distances show the full lift, and some biometric variables of the research sample represented by following variables (reaction strength index, kinetic energy, work, ability), analysis by (Kinovea) program was studied eighteenth edition .SPSS VER 21 statistical bag was also used to obtain the search results, after which results obtained and discussed by researchers, as for most important conclusions that reach researchers are:</p> <ol style="list-style-type: none"><li>1 - Biomechanical variables have an important effect on outcome of artistic performance of Snatch Lift because of their effective role.</li><li>2 - Speed has basic and large role on biomechanical variables studied in research, and therefore we note that results are within required level because player moves at a somewhat small distance.</li></ol> |

**Keywords:** Biomechanical variables; snatch lift;; weightlift.

## 1 - DEFINITION OF RESEARCH:

### 1-1 Introduction Research

field of sport is witnessing a remarkable development in all games, whether it is individual games or difference, and this development did not come from the coincidence, but rather through the interest of those in charge of this field and their attempt to find modern theories and employ them with the best correct scientific methods and methods to reach highest level of performance and achieve achievement. The weightlifting game is one of the individual and widespread games in all countries of the world where its players need to have a high level of basic skills and high physical strength that enables them to perform well in addition to that it is a pleasure skill for viewer and enhances self -confidence for players, The skill of kidnapping is one of the important skills in the weightlifting game due to its frequent use for the players, but it needs to have a high level of accuracy in implementing the elevation and the final value of these measures and targeted actions (Ali Turki & Ahmed Youssef: 2002), as the player tries to reduce time from During the increase in speed, this requires a rapid performance of movement, which depends on the preparatory period for the performance of the skill. The sooner it is, the greater the result of the strength, in addition to the fact that the performance requirements require the player to put the greatest strength during the skill performance to

have to occur in movement, which affects the result The force used, so it needs a large force on the ground that results in the ground's reaction to the player. In addition, it is the relationship of the force that the player puts during the rise, as through the power of payment he puts on the ground, it enables him to reach the highest possible point and according to Newton's third law (Hussein Mardan & Iyad Abdel Rahman: 2011 ) is one of the important things in most sports events, especially in the events that use the player to a tool as it benefits from converting the speed as a result of the flow of movement from the joints of body to the tool, which increases the speed of the tool during the elevation phase, so the weightlifting game of games is considered Which needs speed in performance by speeding the skill performance that he gets as a result of the increase in the speed of elevation by reducing time and then converted to the tool. The more large the speed, the greater the result of the strength and thus the speed of the ball is high, hence the importance of the research in Exception of some players of the specialized school to research and experimentation with the use of the skill of kidnapping to study in order for the image to be more clear to the trainers, which provides information that enables these trainers to explain the performance more accurate .best of this skill, which raises the level of our players in this center in terms of skill, so the researcher considered an analytical study of the index of some biomechanical variables of skill Snatch Lift for some players of specialized schools in weights.

**1-2 Research aim:**

1 - Identify an indicator of values of some biomechanical variables of skill Snatch Lift for some players of specialized schools.

**2- RESEARCH METHODOLOGY AND FIELD PROCEDURES:**

**2-1 Research Curriculum**

Since selecting appropriate approach to discuss any problem depends on nature of problem itself, researchers has taken descriptive approach in survey style a way to reach research aim and its hypothesis.

**2-2 Research Sample**

research sample included some players of specialized schools for weightlifting for sports season 2022-2023, and they numbered (6) players each, because they are a good level, and their percentage is (37.5%) of original community, and for purpose of ensuring homogeneity of sample in variables Which may affect course of experiment, researchers tackled statistics using Difference Factor and showed all value that was between (3 ±) (Wadih Yassin & Hassan Muhammad Abed: 1999), which indicates homogeneity of members of research sample in anthropometry variables, mathematical medium ± normative deviation (Length 1.78 ± 0.20 meters), (Age 16.165 ± 0.752 years), (mass 70.166 ± 3.544 kg). As shown in Table (1).

**Table (1)  
Show some anthropometry measurements in research sample**

| variables          | Arithmetic mean | standard deviation | Difference Factor |
|--------------------|-----------------|--------------------|-------------------|
| length of body/ cm | 167.500         | 2.271              | 1.355             |
| body mass/ kg      | 70.166          | 3.544              | 5.050             |
| Age / year         | 16.165          | 0.752              | 4.652             |

**2-3 Means, Tools and Devices used:**

- Arab and foreign sources and references
- Sony HDR-XR520 Video Frequency (100 photos / second) number (1).
- P4 electronic computer (Desktop).
- Tripod triple (1).
- Metal measuring tape.
- Medical balance.

**2-4 Photography of Experiment**

Filming was performed by a 100 -Sony -video camera that was placed on a triple holder at a distance (5 m) and a height of (1.40 m) and vertically on the field of movement and these distances show the full lift.

**2-5 Biomechanical variables:**

- 1 - Reaction force indicator = the maximum height of the body mass weights, divided into the time of payment (**Banan Raji: 2017**)
- 2 - Energy Kinetic = Half Body Balds multiplied in its speed box (**M.C. SIFF, BIOMECHANICAL**)
- 3 - Work = is the result of striking power in the displacement (**Raymond A. Serway, John W. JeWett: 2013**)
- 4 - Ability = Eugene (**Hecht: 2018**)

**2-6 Exploratory Experience:**

An exploratory experiment was conducted on 8/1/2023 on a sample approximately level for the main sample in order to confirm the distances on the basis of which the photography machine will be placed as well as identifying some obstacles that may affect the progress of the main experience.

**2-7 Main Experiment:**

Main experience of research was conducted on 3/9/2019 on closed hall of South Oil Club in Basra Governorate, where correction skill is performed from angle area.

**2-8 Computer analysis (kinetic performance):**

After transferring videos from camera to the computer and storing them, analysis was carried out by the (Kinovea) program, eighteenth version, position on calculator, and this program is dedicated to analyzing sports movements, so researcher after filming the experiment By converting it from camera to computer, the best attempts were chosen and researcher extracted biomechanical variables for performance through analysis program.

**2-9 Statistical Means:** Data was analyzed statistically by statistical bag (SPSS) version (21) to extract.

**4- View and Discuss Results**

section included a presentation of results research indicated by results of tests that researcher relied on in his research and was presented in form of tables and through which we can explain digital values to show the validity of these results or not and extent of their achievement of research assumptions and its aim, "and the analysis of information means extracting Evidence is quantitative and qualitative scientific indicators, which demonstrate the answer to questions and emphasize accepting his assumptions or not accepting them (Saleh Al -Assaf:: 1995) After data was processed statistically, result Table (2)

**Table (2)**

**Shows computational circles and deviations of Biomechanical variables appeared, which shown by**

| <b>Biomechanical Variables</b>  | <b>Unit measurement</b> | <b>Arithmetic mean</b> | <b>standard deviation</b> |
|---------------------------------|-------------------------|------------------------|---------------------------|
| <b>Reaction force indicator</b> | <b>M/sec</b>            | <b>304.166</b>         | <b>12.416</b>             |
| <b>Kinetic energy</b>           | <b>joule</b>            | <b>130.605</b>         | <b>25.033</b>             |
| <b>Workforce</b>                | <b>joule</b>            | <b>565.753</b>         | <b>49.380</b>             |
| <b>Ability</b>                  | <b>Watt</b>             | <b>1350.359</b>        | <b>392.020</b>            |

Through above table it was found that computational medium of reaction power index reached (304.166), while standard deviation reached (12.416) and sees researchers that basic principles of weightlifting are the player's ability to raise the weight at the maximum strength and less time, the highest necessary reaction strength. To get rid of the weight, which needs a high force of impulse to achieve the appropriate height and achieve a successful elevation, and this is confirmed by (Dergham Abdel Salem Naimah & others: 2020) that force depends on the player's ability first and the extent of his ability to pay near or near in addition to the near correction or after the player from the player (Al-Jadaan, D. A. N., Zaalán, M. S., & Ali, I: 2020).

Where researchers see role of muscle strength in a large way in raising the weight and good performance, and this is confirmed by the force applied to the Earth to possible upper point due to the third Newton M. UMRAN & Ayad Abdu Alrahman, 2011) This interactive payment process is very important for rapid transition From landing to payment to improve strength within a short time. Therefore, time of communication is an element of equation skill performance by taking a small distance aside that increases the time, improves the player's height and reduces power of payment. This is a negative indication of the reaction power index. On the other hand, time of communication is in one way or another that is continuing for the largest height, which increases Earth's reaction indicator.

Through above table, it was found that calculation of the motor energy index variable reached (130.605), while the standard deviation reached (25.033) and the researchers believe that tamount of kinetic energy needs a speed in paying up to the highest by raising the weight, which generates an amount in the vertical speed, which is one of the two ends .kinetic energy equation, and this is what the (Dergham Abd al-Salem mechanism indicated& others :2020) that = amount of speed is one of the basic components that depends on the amount of kinetic energy for the body. Ali: 2020). = bending angle in the knee joint is a major factor for improving the resulting strength. = knees bent causes the bounce time and then the power of payment in a short time. It also affects the muscles to produce a large strength to extend the joint to get more driving strength in a shorter time. This is what ( Raysan Khouribet & najah Mahdi :1992) mentioned that there is a direct relationship between strength and time. The power force means the power in a short time that changes body momentum from one direction to another according to (Resan K. Majed & Najah M. Shalash) (1992:

$$Impulse = Force \times Time \text{ taken}$$

Researchers believe that impulse has a direct rate with strength and a review of time. This is because the time is longer, the power force is less and this indicates a small speed. Leg muscles and arms play a good role in generating enough energy to produce height.

Through above table it was found that computing medium of employment index variable reached (565,753), while the standard deviation reached (49.380). researchers believe that work is a major role in the skill of weightlifting, because there is no job unless there is a force of change from the body's position, so weightlifting needs that It sheds a great force that enables him to overcome his self-deficiency torque, and this is what (Haider Odeh Zughair) indicated and others stipulates the first Newton's law. The inhabited body remains a dwelling unless an external force greater than his weight changes his position (Al-Jadaan, A.: 2021), so he needs The player to a great strength that overcomes his weight in addition to the weight of the weight required to raise it up, and this needs harmony and a kinetic sequence between the joints of the body and well so that the movement is performed without any intersection or slow during the path in which the weight is going to avoid injury or failed attempt.

researchers believe that ability depends on amount of mechanical work within a short period, so it needs strength to overcome amount of determination of its self -deficiency, so we notice that the speed is slow and therefore the

amount of strength is also small, and this is confirmed by the Power Law =  $W/T$  (Raymond A. Serway, & John W. Jewett, Jr, 2014)

Through above table, it was found that computational medium of the capacity index reached (1350, 359), while standard deviation (392.020) reached and researchers believe that ability has a close connection with the work. Greatest time is, greater the result of ability, as there is an inverse fit between power and time, and researchers believe that force represented by an important role in achieving high ability as the payment relationship is a direct relationship with strength and opposite with time. An indication that speed is few and less time, good impulse and great strength, speed is high, and this is what law of impulse = force x time (Hussein Mardan Omar & Iyad Abdul Rahman: 2018).

### CONCLUSIONS:

- 1 - Biomechanical variables have an important effect on outcome of artistic performance of Snatch Lift because of their effective role.
- 2 - Biomechanical variables have an important effect on the result of the strength of Snatch Lift, because skill depends on strength of strength in overcoming self -deficiency of player in addition to weight of weight.
- 3 - Speed has basic and large role on Biomechanical variables studied in research, and therefore we note that results are within required level because player moves at a somewhat small distance.
- 4 - That rapid transition during process of relying and impulse heaviness to top led transition well during joints of body and then tool and therefore it was somewhat good.

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