

# A Comparison Of Energy Expenditure Using A (Fit Mate Pro) Device Between The University Of Diyala Basketball And Volleyball Teams

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**Abstract:** Adaptations that occur to the various functional systems in the body come from the regularity of the sports training process based on the application of modern scientific foundations, and these adaptations have a great impact on developing the individual's athletic level in addition to their work in quickly returning the individual to his natural state to pre-effort, which is an indicator of the development of the condition. Training is incomplete and developed at the present time physiological equipment and it has become to measure most of the functional indicators in a direct way and with accurate results almost free from errors in the case of correct use of it and among these devices or supplies is a fitness device (fit mate pro) which was used for the first time in Iraq in 2009 Through it the training programs or tests are evaluated and the player's training status is evaluated, and this device measures a set of functional indicators, especially the maximum oxygen consumption (VO<sub>2</sub> MAX), energy spent upon effort and metabolic rate (RMR) (energy expenditure during rest), Basketball is one of the interesting games, and the purpose of this game is to score the largest number of points in the opponent's basket and through the progressive development In various fields of life Including the sports field, especially the basketball game. The game of volleyball is closely related (with physiology), because of this science of importance in the process of development in the scientific and sports field, as well as the functional competence that the athlete possesses has a direct and major role affecting the level of his performance in the correct manner. Which results in a good technique and performance to win the match, in addition to that, the more the player's functional condition improves, the better he can achieve with energy savings. The importance of the research lies in comparing some physiological variables between the basketball and volleyball teams at the University of Diyala. The research problem included that which is a study Comparison of these two variables for these two activities (basketball and volleyball) Or in different events through differences, in addition to their impact on the practice sporting events (and thus we reach the scientific foundations for selecting players who are qualified to represent the university in Iraqi universities forums) The research objectives included: Measuring the energy spent by the players of the university teams in basketball and volleyball, which is supposed Research There are statistically significant differences in the physiological variables between the players of the two university teams (the basketball team and the volleyball team). The researchers reached the following results:

The presence of statistically significant differences for the variable energy expended during effort (EE) were significant for the two groups. The researchers recommend conducting similar studies for different age groups. Emphasize that the teachers and those in charge of the training process need to periodically monitor the functional indicators associated with the training status, the development of the physical and the functional level, the codification of the training curricula used, the continuation of training and not

*be interrupted for any reason so that the athletic level of the players is not affected or the training status is affected.*

*The use of such a study of the device itself on other activities to improve the oxygen capacity and achievement, the most important of which are (swimming, cycling) and others. Conduct the test on a controlled sample in terms of nutrition or make sure of the players' diet and adhere to training times and under stable conditions.*

*Players of the university's basketball and volleyball teams, totaling (10) players.*

*Test time: for the period from 12/18/2018 to 4/15/2019.*

*Place of experiment: Physiology Lab at the College of Physical Education - University of Diyala.*

## **1. RESEARCH METHODOLOGY**

The method is “the method used by the researcher in studying the problem to discover the truth” (Badr: 1978: 3), as the researcher used the descriptive approach to suit the nature of the problem. And its development "(Mustafa and Muhammad: 2000: 45) The research community was chosen by the deliberate method represented by the two teams of Diyala University in basketball and volleyball, whose number is (24) players for both teams, and from them the research sample was chosen in the same way, which amounted to (10) players equally between the basketball team And the volleyball team, and thus the percentage reached (41.66%). Devices and tools used and means of collecting information. Research tools mean “the means by which the researcher can collect data and solve his problems to achieve the objectives of the research, regardless of those tools in terms of data, samples and devices” (Mahjoub: 1988: 33)

Devices and tools used in the research:

- Fit mate Pro device, made in Italy, is used to find the variables occurring in the respiratory system, count (1). \*
- Treadmill device (Trad mail) made in China, count (2) used to perform physical exertion.
- Heart rate clock device (pulse) Sport Line made in China, used to measure the pulse during the performance of voltage, count (1).

Fit mate Pro:

(Fit mate pro) device is one of the products of the Italian company (Cosmed) specialized in the manufacture of laboratory sports and medical devices according to the papers or the accompanying catalog, and it is one of the trusted companies on the global level and produces many modern laboratory devices, and this product is one of the latest devices manufactured at the level International, which is one of three production lines:

- 1- Fit mate Basic: (Fit mate Basic).
- 2- Fit mate Med: (Fit mate Medical Device).
- 3- Fit mate Pro: a device used by the researcher in the research.

The device measures a set of functional indicators in the direct way during the rest and stress test, the most important of which are the metabolic rate and the maximum oxygen consumption, and it must be used under the supervision of a qualified and experienced person, and the instructions for the measurements should not be exceeded Fit mate pro consists of:

- 1- Color LCD screen, size of 8 inches.
- 2- Key Board.
- 3- Data Cable and Air Connections.
- 4- Internal laser printer.
- 5- Other attachments:

\* A USB pulse receiver and transmitter that acts as a Bluetooth identification device attached to the belt the tester wears.

\* Masks for both the metabolic rate index and the maximum oxygen consumption. (Mahdi: 2011: 55)d.

Test indicators search during effort:

The voltage indicators are measured by means of the voltage gradient test, as the researcher used the rated Bruce test according to what was stated in the instructions for the device used.

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Test name: Maximum oxygen consumption test.

The target of the test: to measure the maximum oxygen consumption and the heart rate during exertion.

Tools used: (fit mate pro) device, treadmill.

Method of performance: The measurement process is done by attaching the belt of the pulse to the runner's chest, after which the runner ascends to the treadmill and wears the mask for the stress test (the test of the maximum oxygen consumption) and the mask is tightened so that the runner breathes from it only and the rated Bruce test is applied while noting the operation of the device ( fit mate pro) a minute after the start of the runner's jog for the purpose of correcting errors and warming up, and therefore the relative maximum oxygen volume (VO<sub>2</sub>max) was calculated by means of the gradient voltage and by the direct method through the (Fit mate pro) device by analyzing the air by the mask for measuring this indicator and its accessories And it is measured in units of dead (METS) and according to the agreement of most sources, the foreign and American training chain, in particular at the present time, as well as the results table of the device used in the search (fit mate pro).

(1 met = 3.5 ml / kg / min)

The Bruce Test was applied to each individual of the sample, through continuous jogging with an increase in the intensity stages by increasing the speed and height of the treadmill until the exhaustion of effort (fatigue) and as mentioned in the measurement of heart rate in detail to obtain appropriate measurements for the physiological indicators For runners.

Recording: The device records the time the runner ran to the end, and it varies from one laboratory to another according to its ability to resist fatigue during the performance of the test and at the end the device gives all the information at the same time and appears on its screen, and this information is printed on the device's paper.

The maximum oxygen consumption index is one of the most honest and common criteria used in sports medicine and physiotherapy, especially in sports activities that require oxygen to produce energy (Aerobic Metabolism), so this indicator reflects with complete privacy cardiorespiratory fitness, which is one of the most important elements of physical fitness. Healthy nature.

Test name: spent energy test. (EE).

The aim of the test: to measure the indicator of energy discharged during voltage.

(Energy Expenditure during exercise)

Tools used: fit mate pro, treadmill.

Performance method: energy expenditure is the amount of calories spent during exertion, and it was measured by the same device in the test of the maximum indicator (VO<sub>2</sub>max) by analyzing the gases entering the device (fitmat pro) using the voltage gradient test (Bruce).

As "energy is a term that describes for us the amount of heat produced by the body that links the perceived mechanical work with the temperature of the body itself, as it can be calculated from the total amount of work produced and the predetermined efficiency of the athlete (Radwan: 1998: 61)

It is considered one of the important research indicators that is adopted in the direction of rationing energy spent during effort, assessing the training status of the players, developing training programs, as well as giving accurate information on the amount of energy spent for each runner during the performance of the same effort and at a specific time.

Recording: The data for this indicator appear in the form of the indicator of the maximum oxygen consumption and measured in the calories spent per hour (kcal / h) and the results are printed from the device used itself.

Statistical means:

The statistical system (spss) was used to extract the data.

Presentation, analysis and discussion of results:

The chapter includes presenting the results obtained by the researcher through measurements and tests of functional indicators, analyzing these results and discussing them after conducting statistical treatments for them.

The researcher arranged the results of these treatments, classifying them and classifying them in line with the study indicators sequences index as mentioned in Chapter Three, and then these results were presented in a set of tables and graphs according to what will be mentioned in Chapter Four in line with the objectives of this study, which were identified in the evaluation The performance status of the players through the performance of the graded effort, as well as the comparison of the results of the functional indicators between the two groups for the research sample and also the statistical difference between the functional measurements of the two groups.

- Presenting and analyzing the results of statistical treatments and functional indicators of the research sample and analyzing them. Presenting and analyzing the results for the rate of energy spent during voltage (EE) variable

Table. (1) shows the arithmetic means, standard deviations, the calculated (t) value, and the error percentage of the (EE) variable for the two groups.

Groups	A	STD	T	Error Percentage	Significance
Basketball	1224.4	80.56	5.07	0.001	Sign
Volleyball	984.2	68.690			

Table. (2) shows the arithmetic mean of the group of basketball players, which is equal to (1224,4), the arithmetic mean of the group of volleyball players, which equals (984,2), the standard deviation of the group of basketball players, which equals (80,56) and the standard deviation of a group of players

The volleyball, which is equal to (68.690), the calculated value of (t) reached (5.07) and the error rate was (0.001), which indicates the presence of significant differences for the tested sample for the variable energy expended during voltage (EE).

## 2. DISCUSSING RESULTS

As for the EE variable, energy expended, the results were positive, i.e. significant, and the researcher attributes this to the fact that the effort made by the athlete, who translates the spent calories, has developed in the direction of energy ration and is considered one of the most important indicators of the physiological load scale in addition to the pulse and the maximum oxygen consumption, and this indicates The training process goes in the right direction and thus improves the athlete's functional ability. The energy spent varies according to the type of activity and the intensity of the activity used and varies from person to person, and this is consistent with what was stated by (Hazaa bin Muhammad al-Hazaa) "The metabolism process continues to generate the necessary energy for the body and the levels of generation differ Energy in the body depending on the type and level of activity. It is also mentioned that there is an inverse relationship between lipid ratio and metabolic rate (Hazaa: 2005: 26).

Studies have shown that the higher the energy consumed, the better, because increasing it means reducing the fat percentage, and this is what Hazaa mentioned, "The response of the

various body systems to physical effort needs to speed up metabolism and metabolic rate, increase oxygen consumption and work to activate certain enzymes to stimulate The required metabolic pathways, as well as the need for rapid blood flow to feed tissues with energy and oxygen substances, and this activity is controlled by the thyroxine hormone, which increases with the increase in physical effort to work to implement the conditions required by the type of effort. (Born: 2013: 120)

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