Programs Training Football Teams and Their Relationship to Body Mass Index and Fatty Using the INBODY Device

البرامج التدريبية لفرق كرة قدم وعلاقتها بمؤشر الكتلة الجسمية والدهنية باستعمال جهاز الأنبودي

" INBODY 230 "

FEDLAOUI HASNI*[1]

1. Laboratory Research Contemporary in the Sports Training System and Human Movements. University Centre Nour El Bachir –El-Bayadh h.fadlaoui@cu-elbayadh.dz

Abstract:

This study aims to highlight the role and effectiveness of the training programs applied by some football coaches and determine their effects on some body components and physical indicators of the MCEB players for a sports season. By applying the experimental approach to its relevance to the nature of the study as well as the corresponding tool for coaches and players to explain the test of the method of bioelectric impedance analysis (InBODY230),we evaluated the following measurement: body weight, body mass index, body fat mass, total skeletal muscle mass, body fat percentage In order to assess the importance that trainers attach to the program planning process, the study was conducted on 27 major players with an average of 24.00 years and an average BMI of 20.72 kg / m2. And body fat showed significant decrease in inputs 9.52 kg.

Keywords: Training programs; body mass index Key; fat mass; INBODY device;

ملخص:

تهدف هاته الدراسة لإبراز دور وفعالية البرامج التدريبية المطبقة من طرف بعض مدربي كرة القدم وتحديد آثارها على بعض مكونات الجسم والمؤشرات الجسدية لدى لاعبي فريق مولودية البيض لمدة موسم رياضي. وبتطبيق المنهج التجريبي لملائمته طبيعة الدراسة وكذا أداة المقابلة بالنسبة للمدربين واللاعبين لشرح اختبار طريقة تحليل المعاوقة الكهربائية الحيوية (جهازInBODY230)، حيث قمنا بتقييم القياسات التالية: وزن الجسم، مؤشر كتلة الجسم، كتلة الدهون في الجسم، إجمالي كتلة العضلات الهيكلية، نسبة الدهون في الجسم، لتقييم الأهمية التي يوليها المدربون لعملية تخطيط البرامج، أجريت الدراسة على 27 لاعب من الأكابر بمتوسط 24.00 سنة ومتوسط مؤشر كتلة الجسم20.72 كغ/م2. والدهون في الجسم أظهرت انخفاضًا كبيرًا في المدخلات 9.52 كغ.

الكلمات الدالة: البرامج التدريبية؛ مؤشر الكتلة الجسمية؛ الكتلة الدهنية؛. جهاز الأنبودي"INBODY.

FEDLAOUI HASNI *[1]

I - Introduction:

Since the beginning of the Millennium Development Goals in 2000, sport has played a vital role in the various resolutions of the **United Nations General Assembly**. And in Resolution 01/70, entitled "Transforming our world with the 2030 Agenda for Sustainable Development", adopted in 2015, to continue to acknowledge the role of sport in promoting social progress and achieving the desired goals in the areas of health, education, and social inclusion, as well as the significant change in the third millennium In the form of sporting competitions and the form of competition, the third millennium was a witness to the entry of football into the real investment field, and its transformation from a hobby into an industry that generates huge funds, and supported this **«Mark Perlman»**,

The university professor in Paris and the author of many books on sport in general and football and its world in particular, in his latest book for the "stadium-smart stadium", on digital progress, as well as the **German Football Federation** in creating a digital academy specializing in the round world. It uses data technology to play it. They called it "Project of the Century", as **Oliver Bierhoff**, the German national team manager, described the "new academy", or "competency center" that you started in Frankfurt in 2018. In light of the development of physiological measurements, as **(Dr. Ihab Mohamed Imad Al-Din Ibrahim, first edition 2016, page 187)** said, "Because an individual has an optimal level of physiological fitness, this reflects the individual's enjoyment of a distinctive health condition. In order to identify this level, it is necessary to use devices Modern laboratory physiology, "supported by the study of Thomas Vespalk **(TOMÁŠ VESPALEC) in 2015** entitled **"Change in body composition for junior volleyball players" Department of Sports, Masaryk University, Czech Republic**. Where the study dealt with observing and analyzing the body mass composition of volley ball players. The data was obtained from 18 players, ages 14 to 19, for the Královo Pole Volleyball Club.

Johnson and Fisher (1979) believe that when developing the training program, the trainer should consider defining the goal and the content of the training program and the codified training for the age group and defining the methods and means for this process, by relying on the measuring devices that have developed tremendously in the framework of technological development Industrial mega.

And in accordance with Law No. 13-05 of 14 Ramadan1434 corresponding to July23, 2013 related to the regulation and development of physical and sports activities, especially Articles 70- 128 The significance of my choice of this research and its laboratory subject. Through which we try to study the effectiveness of the training programs approved by some coaches for soccer teams who are active in the department between the associations of the southwestern side in light of the sports system's interest in its national federations, clubs, and bodies working in the sports field, setting up treatment plans parallel to its predecessor, as it may constitute at the same time The ability to avoid errors before they happen. And evaluation of training programs leads to progress in the level of players and teams in all sports, especially football, which is still in Algeria facing many obstacles.

The progress of measuring devices allows us to develop new ways and means to carry out accurate measurements and improve modern physical measurements, pointing to the components of physical performance that allows us to measure the physical composition, such as the body mass index, which forms the cornerstone for determining the physical condition

Corresponding author: FADLAOUI HASNI*[1],   E-mail: h.fadlaoui@cu-elbayadh.dz

of the individual, on which the measurement is based and helps us in statistical treatment and evaluation Training programs approved by the trainers are evaluated in whole or in part using modern technology characterized by a high degree of honesty, consistency and objectivity in order to evaluate them.

The research problem has evolved in our minds through coexistence and follow-up of the various training stages and the way in which training programs are built, and not taking into account the nature of the game and its characteristics and features of the trained age stages, hence to this, in spite of the achievements of global football, but the contemplative to the level Algerian football notes from the first sight the weak results at all levels, and on this basis, according to **Georges Kazolla (2013)**, "It is not the duration and intensity of the exercise itself, but the overall workload that should be controlled to facilitate weight loss" page 231. In his book The book of physical preparation. This is what motivated us and raised our desire to know the extent of the impact of these training programs on both muscle and fat mass by calculating the muscle mass and fat mass index and how they are distributed in the body by using the **Inbody 230** and out of the classic methods of measurements and mathematics previously approved and clarifying the effectiveness of modern technology in order to gain time To raise the level of the athlete to the maximum degree and highlight the effective role that modern devices play. Which prompted us to ask the following general question: *** What Is The Effect Of The Approved Training Programs For Some Football Teams On The BMI and MF Using The Modern Technology Of The Sample Under Study?**

Through which we aim to use modern methods to measure the components of the body and highlight the effectiveness of training programs based on the variables body mass index and fat mass. And help through the results to build a training curriculum that is in line with the game's specificities and try to reach results and open new horizons to understand the reasons for success or low level in light of achieving the results, and know the individual differences of the players under the reference standards.

II- Method and Tools of Study:

2-1 Research Methodology:

The study that we have in our hands aims to reveal the effectiveness and impact of the approved training programs for some football teams and their relationship to the body mass and fat mass index using a device from modern devices **(INBODY 230)** through which we try to clarify the effectiveness of these programs, and we also relied on the experimental approach given Its suitability for the nature and aims of this study **(Dr. Marwan AbdelMajid Ibrahim, first edition 2000, page 136).** Wilson also adds that experience is the foundation of this approach In its broad and comprehensive concept, it is directed to a hypothesis test that seeks to correlate two factors in a causal relationship. It is also "the study of the prevailing reality associated with a particular phenomenon or situation or group of individuals drawn from an objective observation of a phenomenon **(Mahmoud Jassem, 1985, p. 85).**

2-2 Study Community and Sample:

Considering the sample as the cornerstone of any field study based on testing as a basic basis, it is part of the whole in the sense that a group of community members is taken to be representative of the research community **(Dr. Mohamed Hassan Allawi, Dr. Osama Kamel Ratib, 1999, page 143)**. In this study, the field of research, and in order to reach accurate and

Corresponding author: FEDLAOUI HASNI*[1],   **E-mail: h.fadlaoui@cu-elbayadh.dz**

objective results, we selected a intended sample that shares the same geographical affiliation, the cliff clubs and after we contacted the management of the clubs represented by the person of its president, who in turn referred us to the main coach who explained to him the topic of the research, he informed us with the list of players with all the information.

2-3 Study Limits:

2-3-1. Time Limits: The beginning was with the researcher contacting the amateur club coach for Mouloudia El Bayadh, as we said previously, to find out and inquire about the training program for the sports season 9201/2020. When is the beginning of the general and private physical preparation (training) for exams for this study, and we also had a meeting with the players to clarify the major axes of research and the definition of research and address the measurement and testing periods and were as follows:

- The period 11/05/08/2019 we conducted the exploratory tests for the sample.
- The period extending 19-20/08/2019 tribal tests (stage of PPG, PPS).
- The period extending 18-19/09/2019 the first dimensional tests (the beginning of the competition stage).
- The period extending 25-26/12/2019 the second dimension tests (the end of the first stage).

The third test was canceled due to the **Corona Virus** because it was programmed at the end of the 2019/2020 season

2-3-2. Spatial limits: The field research procedures were carried out at the level of the contemporary research laboratory of the sports training and human movements system of the Department of Science and Technology of Physical Activities and Sports for the white university center, and at the level of the multi-sports stadium of the office of the multi-sports pioneer Zakaria Majdoub Al-Bayadh where the team is active.

2-3-3 Human Boundaries: This study was conducted on the individuals of the sample represented by 27 senior players for the amateur club team of Mouloudia El Bayadh Football Club, who were active in the associations between the southwestern side.

2-4 Determining the study variables:

2-4-1 The independent variable: or as some researchers call it the experimental variable, it is the variable that the researcher assumes is one of the reasons for another specific result (**Nasr Tabet, first edition 1984**).

- Determine the independent variable in our study: training programs.

2-4-2 Dependent Variable:

It is the variable that the independent variable affects (**Dr. Mohamed Hassan Allawi, Dr. Osama Kamel Ratib, 1999, page 220**).

- Determining the dependent variable in our study: There are two variables, the BMI and the fat mass.

2-4-3 Experimental Control (Adjusting Variables):

Precisely the empirical is intended to attempt to remove and isolate any effect of a variable (other than the independent variable). (**Dr. Mohamed Hassan Allawi, Dr. Osama Kamel Ratib, 1999, page 221**), in order not to affect the results of experimentation, such as exotic variables that are not included in the research design and cannot be controlled by the researcher such as age, years of experience, and some morphology and nutrition characteristics or The percentage of water distribution in the body or play stations. On the

Corresponding author: FADLAOUI HASNI*[1],   E-mail: h.fadlaoui@cu-elbayadh.dz

basis of these considerations, he undertook a set of procedures for controlling the variables, such as: personal supervision of the measurement procedures for the same physical specifications, the use of the same measuring device and the same laboratory conditions, and the number of training sessions themselves according to From keenness on the integrity of the results, and to avoid the effects of exotic factors that must be controlled and to reduce their effects, the researcher also adopted the experimental group method for two tests before application and after application, and depends on the parity and consistency of the two groups by relying on intentional selection of the sample individuals, and comparing arithmetic averages in some variables or Factors, the torsional coefficients were calculated for all variables to find homogeneity among the sample members in all variables, and variables (weight, age, and height) were adjusted to ensure the equivalence of those variables before starting the experiment and table (01) illustrates this.

Table No. 01: Statistical significance and torsional coefficient of the basic variables of the study sample (homogeneity)

Basic variables	measuring unit	Mean	Mediator	standard deviation	Coefficient of torsion	Coefficient variation%
Weight	Kg	69.17	68.80	4.68	-0.41	5.90
Age	Year	24	23.00	3.12	0.52	9.76
Length	Cm	177.26	178.00	5.59	-0.43	7.38
Training Age	Year	11.33	11.00	2.67	0.52	7.15

It is clear from Table (1) that the torsional coefficients of the total study sample in the basic variables ranged between (5.90%, 9.76%), meaning that they were confined between (-0.43,+0.52), which indicates the homogeneity of the total sample in these variables.

Exploratory experience:
The researcher conducted the exploratory experiment in the period 11/05/08/2019 in the honorary hall of the stadium of the multi-sports compound Zakaria attracted by eggs for a sample of (16).

2-5-1 Study Tools:
In many studies such as this, the experiment is in all its stages, organizational steps and tools used in terms of accuracy in measurement and efficiency in their exploitation, and those tools used in collecting the appropriate amount of data and the most important of these steps and devices used:

Truthfulness: Through what was proven by the results of the study conducted by the fact-finding team of the convergent validity of the tube Inbody analyzer 230 **"Anthony Karelis and Mylene Obertin Luder" 2013** on 145 men and women (age 44.6 ± 20 years), with a

Corresponding author: FEDLAOUI HASNI*[1],   E-mail: h.fadlaoui@cu-elbayadh.dz

BMI of 24.5 ± 3.8 kg / M 2. They measured the body composition (fat mass, percentage of total fat and fat-free mass), and found the viability of this device is between (pp=0.94-0.99) and thanks to these advanced technologies, Inbody devices showed a high level of accuracy showing 98% correlation with **DEXA** devices that are "Gold standard" in tests. The two figures below show the validity of the testing instrument (Inbody 230).
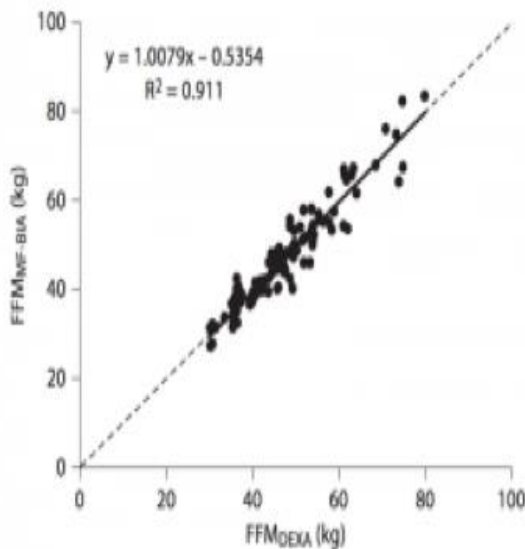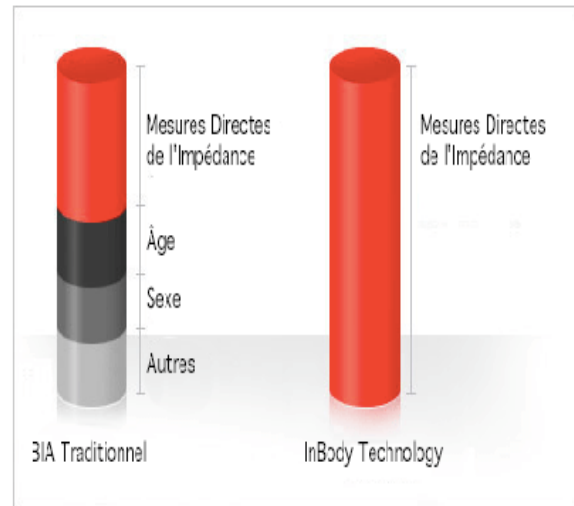

Figure N° (2) correlation coefficient
for the Inbody

Figure N° (1)
Statistical corrections for Inbody

Reliability: The common procedure for determining (degree of persistence) a complete retest using the same individuals, and under the same conditions and finding the correlation coefficient for the results obtained both times, and this is what was done to achieve consistency.

Table N° (02): shows the stability of the tests at the significance level 0.01 and the degree of freedom (N -1)

Test	Sample Volume	Degree freedom	Coefficient Stability	Sig	Significance level
Mass Body Index			**0.972	0.000	0.01	
Fatty Mass			**0.994	0.000	0.01	
Body Fat %	16	15	**0.998	0.000	0.01	0.05
Skeletal Muscle Mass			**0.992	0.000	0.01	

Through Table N° (02), it becomes clear to us that all Pearson correlation coefficients are positive and high as they are between (0.97-0.99), and this indicates the stability of the tests used where the sig value appeared smaller than the significance level 0.01 and the degree of freedom (n -1 = 15). The test was found to be highly stable as shown in the table.

Corresponding author: FADLAOUI HASNI*[1],   E-mail: h.fadlaoui@cu-elbayadh.dz

Steps and stages of organizing and administering the test: We conducted a pre-test and several dimensional tests in stages, as shown in the time limits for data collection and verification of hypotheses. Our selection of this modern tool that we see is more appropriate compared to the old methods and methods of measurement, and this is to be provided at the level of a contemporary research laboratory in the sports training system and human movements of the university center, Nour Al-Bachir Al-Bayadh, especially for its high cost and the absence of such tests except for some medical or nutrition specialists That is why the purpose of using the Inbody 230 device,

Figure 3: Steps Test INBODY230

Corresponding author: FEDLAOUI HASNI*[1],   E-mail: h.fadlaoui@cu-elbayadh.dz

which measures the body mass index and fat mass and their distribution in the body, was in addition to some other measurements that do not interest us in our study, but we give an idea about it through the photo and the technical card attached in Figure (04).

Figure 4: Technical card INBODY23

A- How to take the test:

The Inbody assay uses safe and multi-frequency bioelectric currents (1, 5, 50, 250, 500, 1000 kHz) with 8

Corresponding author: FADLAOUI HASNI*1,   E-mail: h.f

electrodes. The test takes only a few minutes, in addition to a time ranging between 15-120 seconds, depending on the athlete's body structure. Before performing the examination, the athlete must stand for 5 minutes At least, then he climbs onto the device and puts his legs in the place designated for them and when he gives the signal the poles hold hands and wait for the registration of personal data on the computer connected to the device, Then the technical card is printed.

B - Conditions for taking the test: Including not eating for 3 to 4 hours before the examination, avoiding drinking caffeine and stimulants on the day of the test, avoiding bathing before the examination and avoiding applying ointments to hands and feet, and not using the sauna and exercise for a period ranging from 6 to 12 hrs. Also, avoid wearing heavy clothing, shoes, socks, belts, and metal accessories such as jewelry that may hinder direct contact with the electrodes or may cause errors.

 In measurement. And drink plenty of water the day before the test to make your internal organs moist. Maintain the same conditions when performing the tubular test of wearing the same clothes, the same timing, the same day, and the same apparatus for ensuring the accuracy of the test results.

Note: If you are in cold weather like El-Bayadh City, warm the hall and body for 20 minutes before the examination (20° -25°), because the weather is very hot or very cold affects the components of the body.

2-4 - Statistical Tools: Statistical methods and methods are the means by which the research is provided with objectivity and scrutiny in the tool by which hypotheses are tested through data and reliable in order to give the research the scientific character and accordingly we have used the SPSS program to facilitate the calculations and it contains the following statistical methods:

- **Arithmetic Mean**： $\dfrac{\varepsilon X}{N}$ **(Gllbert .N, 1978, p. 32)**

- **Standard Deviation**： $\sqrt{\dfrac{\epsilon(x-\ddot{x})^2}{N}}$ **(Sander.D et d'auttre， 1984， p. 48).**

- **Coefficient of variation:** $100 \times \dfrac{Normative\ Deviation}{Arithmetic\ Mean}$ **(Al-Janabi Salman Akab and Al-Shawi Haider Naji, 2015, page 148).**

- **Torsional coefficient:** $\dfrac{(Median - Mean\ Arithmetic)3}{Standard\ Deviation}$ **(Zarak Ghazi Attieha, 2015, page 57).**

- **Simple Correlation Coefficient of Stability Carl Pearson's:**

$$r = \dfrac{x \times y - \dfrac{x \times y}{n}}{\sqrt{\left[x^2 - \dfrac{x^2}{n}\right]\left[y^2 - \dfrac{y^2}{n}\right]}}$$ **(Hilmi Abdelkader, 1993, page 48).**

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- **Variation Analysis Test (F):** $\dfrac{\text{Groups between average squares}}{\text{Groups within average squares}}$ (**Al-Janabi Salman Akab and Al-Shawi Haider Naji, 2015, page 204**).

- **Least significant mean difference of equal groups (L.S.D)** =

$\sqrt{\dfrac{\text{groups within mean squares} \times 2}{N}} \times T$ (**Al-Janabi Salman Akab and Al-Shawi Haider Naji, 2015, page 204**).

−**Law Tukey HDS :** $\sqrt{\dfrac{\text{groups within mean squares}}{N}} \times \text{Tukey Table}$ (**www.cedu.niu.edu, 2019**).

III - Search Results and Discussion:

Test / Variable	Pre-Test Mean	Pre-Test Std Deviation	Post-Test1 Mean	Post-Test1 Std Deviation	Post-Test2 Mean	Post-Test2 Std Deviation	Val F	Value F Tabular	Correlation	Sig
Body mass index	22.48	1.86	20.30	1.41	19.38	1.32	28.53	1.35	0.972	.000
Mean						20.72				
Standard deviation between averages						2.01				
Statistic Levene						2.15				0.12
Difference Significative Tukey						*3.10Benefit of Post-test (2)				0.00
Statistical significance						0.05				

Table N° (03): Presentation and discussion of the results of differences in the effect of training programs according to the variable BMI:

It was evident from Table No. (3) through statistical treatment of the total results of the experimental research sample using the "F" significance test as shown in the table that the calculated "F" value (28.53) at the degree of freedom (N -3 = 78) and the level of significance 0. 05, as all sig values were equal to 0.000, where we see that the sig value is smaller than the significance level 0.05, as well as the calculated "F" value is greater than the tabular and estimated "F" (1.35) which confirms the existence of significant differences between these averages, in favor of the posttest The second is a value (3.10 *) of the Tukey test, meaning that the differences between the averages have a statistical significance in all the tests under consideration in favor of the dimensional tests, which confirms the presence of significant differences between these averages.

Table No. (04): Presentation and discussion of the results of differences in the effect of training programs according to the variable of FM:

Test	Pre-Test	Post-Test1	Post-Test2	Val	Value F	Corre	Sig

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Varia ble	Mean	Std Deviati on	Mean	Std Deviation	Mean	Std Deviation	F	Tabular	lation	
FM	11.19	3.41	9.30	2.98	8.06	2.52	7.44	1.35	0.994	.001
Mean				9.52						
Standard deviation /(averages)				3.23						
Statistic Levene				1.10						0.33
Difference Significative Tukey				*3.13Benefit of Post-test (2)						0.01
Statistical significance				0.05						

It was evident from Table No. (04) through statistical treatment of the total results of the experimental research sample using the "F" significance test, as shown in the table that the calculated "F" value (7.44) is at the degree of freedom (N -3 = 78) and the significance level is 0. 05, as all sig values were equal to 0.001, where we see that the sig value is smaller than the significance level 0.05, as well as the calculated "F" value is greater than the tabular and estimated "F" (1.35) which confirms that there are differences between these averages, in favor of the second dimensional test A value of (3.13 *) for the Tukey test, meaning that the differences between the averages are statistically significant in all the tests under consideration in favor of the dimensional tests, which confirms the existence of differences between these averages.

Table N (05): shows the correlation between the pre and posttests of the study sample for the variable muscle mass and body fatty proportion.

Variable		Mean	Std Deviation	Correlation Coefficient r						Sig
				Body mass index			Fatty Mass			
				Pre-Test	Post-Test1	Post-Test2	Pre-Test	Post-Test1	Post-Test2	
Body mass index	Pre-Test	22.48	1.86	1.00	**0.894	**0.863	**0.718	**0.693	**0.693	.000
	Post-Test1	20.30	1.41	**0.894	1.00	**0.922	**0.657	**0.638	**0.666	.000
	Post-Test2	19.35	1.31	**0.863	**0.922	1.00	**0.512	**0.508	**0.567	.002
Fatty Mass	Pre-Test	11.19	3.41	**0.718	**0.657	**0.512	1.00	**0.972	**0.926	.000
	Post-Test1	9.30	2.98	**0.693	**0.638	**0.508	**0.972	1.00	**0.958	.000
	Post-Test2	8.06	2.52	**0.690	**0.666	**0.567	**0.926	0.958	1.00	.000

Through table No. (05), we note that the value of correlation coefficients is between (0.508 ** and 0.958 **) with a significance level (0.05) degrees of freedom (n -1 = 26) and at the level of Sig (0.000) which is less than the significance level, and this is what It indicates the presence of a statistically significant positive correlation between the variables of the research sample.

VI - Discussion:
After presenting and analyzing the results of the tests, the researcher attributes that the improvement achieved at the level of the studied elements is due to the codified training

Corresponding author: FEDLAOUI HASNI*[1], E-mail: h.fadlaoui@cu-elbayadh.dz

program because of the characteristics that allow the athlete to increase his physical ability due to the presence of a statistically significant effect on the body mass index variable and thus the level of athletic achievement and therefore it must be emphasized The necessity to consider the scientific aspect in program planning, this was confirmed by the study **"Abdel Nasser Al-Qaddoumi and Ali Al-Taher (2010).** About building standard levels of body mass index, body surface area, and ideal weight, and this was proven by **Baloufa Bujoma's 2019** study and others that the use of the approved training program is characterized by its ability to increase physical efficiency that requires more pregnancy, which results in an increase in physical requirements so that the individual can continue Physical exertion and enjoy fitness. **Agata Hurbaz Study (2016).**

The researcher refers to the statistical significance at the level of the fat mass to codify the training loads as an organized and continuity in them on scientific grounds that keep us away from randomness; this is what **Dr. Study agreed with. Nidal Abdul Rahman Turki (2011).**

To compare the differences between the values obtained before season preparation, after season preparation and after three months of the season. And it was supported by a study of **Gendrich Pavlik and Thomas Zimon (2015)** study on the effect of training programs on weight reduction and the percentage of fat for the sample in question, and for this to build standard levels of body mass index, fat mass, ideal weight and fat percentage, the relationship between these variables must be determined in the research sample, and to achieve this it must Preparing sports programs for various sports, to improve fitness related to specialization or even health only to form a strong base and one of the types of sports training.

Suggestions:

- Providing all capabilities and seeking to build modern training curricula in line with requirements.
- Opening new horizons to understand the reasons for success or low level in light of achieving results.
- Carry out training operations according to individual differences under the reference standards.
- To integrate, exploit and employ all sciences in football.
- Taking into account the sports system and giving importance to planning training programs under the general policy.
- The use of modern devices to advance the training process and the optimal formulation of training programs in light of recent developments.
- Attention to the player by providing the capabilities and means for modern training to support the elite level.

V - Conclusion:

Through what we reached from studying the theoretical side we were able to extract the importance that the sports training system has through its codified training programs that have

Corresponding author: FADLAOUI HASNI*[1],   E-mail: h.fadlaoui@cu-elbayadh.dz

become using modern equipment and devices to reach athletes, especially for our sample individuals to the highest levels, through which some of the indicators and physical characteristics and impact can be identified Direct for accredited training programs. This was confirmed by the field study, which is the true proof that maintains the validity of the hypotheses presented by the researcher.

In light of the conclusions and based on this study that we conducted, which confirmed that the approved training program plays an important role in increasing the body mass index or keeping it, and it reduces the fat mass at all levels, and finally we mention that this topic remains open to research and delve into it in studying other aspects We did not touch upon it,

and a start for studies coming from other perspectives and perspectives.

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Corresponding author: FEDLAOUI HASNI*[1],   **E-mail: h.fadlaoui@cu-elbayadh.dz**

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Corresponding author: FADLAOUI HASNI*[1],   E-mail: h.fadlaoui@cu-elbayadh.dz