An Analytical Study of Effective Time as a Physical Indicator in 1st Professional League of Football.
(Going phase 2018/2019)

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Abstract

The Object of the study aims to evaluate the effective time as a physical indicator in 1st Professional League of Football of Algeria, for this purpose, we used the analytical descriptive method using the note method by recording on a sample composed of 20 matches chosen at random, and for data collection, we used spss23. After collecting the results and having treated them statistically, we found that the level of actual play as one of the indicators of physical performance is relatively weak, as it reached the limits of 49.08 d, noting that this indicator in high-level matches ranges between 55'- 60' d and more. In addition to the decline in physical fitness during the second half, the analysis also showed that the total playing sequences are limited on a sequence 1" – 20". Also, playing in the entirety of the game is classified as a non-influential player who prevails

I.   Introduction

The general rule is that a football match lasts at least 90 m, but in reality, it is easy to imagine that this number is inflated by the many stoppages that occur in a football match. However, it is less obvious to put a value on actual playing time, which can be extremely useful in comparing two performances or judging the effectiveness of the conditional time system.

This is what prompted many researchers to pay attention to the chronology of football matches, especially at the high level, to know the requirements and characteristics of playing on the one hand, and on the other hand to define what is known as the "actual playing time" variable. Several researchers specializing in the field of physical preparation and physiology have been interested in studying this component.

As many types of research indicate that in the match of 90 minutes, the effective playing time ranges between 50 to 55 min in amateur level matches, and can increase from 60 to 65 min in high-level matches (Ancien, 2008; Dellal, 2008; physicfootball.com, 2007; Sylvain, 2011).

So being aware of the physical factor of high-level matches as well as the various types of efforts that the player makes during the competition allow us to adapt and direct the training (Bensalem, 2015). This brings us to perhaps the most basic reason why we need to know the physical effect of high-level matches "elite", meaning how the player consumes his energies. With what kind of effort "type of the exerted the effort, the performed", are the activities coinciding all along the course of the football match. These elements must be known and clear in the form of a quantitative analysis content (total analysis, size, number of iterations, this data allow us to adapt and direct training (Dellal, 2008, p 03), which shows the necessity of a special type of training that may keep up with the fast and changeable playing situations (kherfan, 2011).

In modern football, the footballer must be both fast and powerful to produce short and intense actions (Bensalem, Hobara, Menella, 2020). Training is not necessarily an attempt to adapt only, but it is to know of all aspects that can help the athlete reach the best level in his specialty within the limits of his capabilities (Cazorla, 2009, p. 406), Moreover, it allows determining the level of physical performance that is the basis for the rest of the factors determining performance (Hadji, Benmesbah, Benbousta, 2019).

One of the most important levels of competition evaluation is the level of physical performance that we can express through some indicators such as the indication of effective and passive play, which was studied by many researchers and specialists in the field of training (Ancien, 2008).

Many studies have examined this aspect as a study by Zaboub (2009) that evaluates the physical performance during training and official competitions. The case of the national team and the first national football league, in the end, it was found that competitive and training physical performance is weak compared to its English counterpart, which is a model of physical performance. These differences show various efforts produced by the players. In addition to Bensalem (2015) study, which aims to determine the competitive performance pattern and the most used energy systems. The study showed that the performance pattern of the Algerian players is translated into short efforts followed by incomplete retrieval periods, and that the player performs approximately 30 to 40 minutes of physical exertion, an estimated approximation 33-44% of the total match time indicating poor physical performance.

The researcher Kaci (2016) also discussed where the most important results of it were that the style of the player and the team is carried out roughly without commitment to apply a specific system and formation of the game.

Concerning studies that dealt directly with real and passive time, we find a study at the continental level of the researcher Sagna (1989) which aimed to study the effective playing time and its effectiveness in making sports achievement. In addition, he concluded that the effective play of the teams affects the outcome of the match.

Speaking about the effective time in the first pro-league, one who follows it from the majority of people does not enjoy watching it and does not arouse his curiosity. By contrast, we find a great interest in tracking and watching the various European championships, and this is due to the level of competition physically, technically as well as planning and other performance requirements. Some reasons make these differences, and we are still unaware of them. Since we are part of the academic field of research in this specialty, our scientific curiosity and love of discovery have prompted us to delve into the study of this complicated topic, and we focused on the physical side in particular, which is the base for the rest of the requirements in terms of some indications.

To know the real values of some indicators describing the level of physical performance and its evaluation, we concluded to formulate the following questions:

- Are there any statistically significant differences between the effective playtime of the first professional league competition and some European?
- Are there statistically significant differences between the effective playtime between the first and second halves in the first professional league?
- How are the effective playing sequences distributed in the first professional league in football?

II.   Method and Materials:

2.1. Participants

Research community: the research community means all the elements to be studied, and our research community is the First Professional League of Football Matches in the outgoing period 2018/2019 season that is broadcasted on national and non-national channels.

Research sample: to get information from the original community the researcher relies on a group of principles that provide him with information concerning the research topic, returning to the units that can represent the research thesis society (Khalil, Hani, Fellih,2020), So we relied on what is known in the scientific research to the sampling method, which is defined as a group of selected units on the basis that they have the same nature (Mazari and Himani, 2018, p 88), and the sample is considered good if it represents all the characteristics of the indigenous community (Al-Fadhil, 2001, p 104) and is considered in descriptive studies acceptable and is applied to its results if it reaches 10 to 20% of the total population of the study (Meter, 2002, p 154), and our sample was estimated at 20 out of 120 matches, or 16.66%, thus the results of the sample are generalized.

Table 1, show the characteristics of the sample studied.

TEAMS	JSK vs JSS	NADH vs USMA	PAC vs OM	ASAM vs JSS	MCA vs ESS
	ASAM vs JSK	PAC vs CABBA	JSK vs OM	ESS vs USMBA	JSS vs MCO
	MCO vs ESS	USMA vs CSC	CSC vs NAHD	DRBT vs MOB	USMBA vs MOB
	USMA vs DRBRT	OM vs MOB	CABBA vs CSC	MCO vs CABBA	NADH vs MCO
LEVEL	1ST PROFESSIONNEL LEAGUE OF ALGERIA				
PERIOD	GOING PERIOD-SEASON 2018/2019				
CATEGORIE	SENIORS				
SAMPLE	N= 20/120				
GENDER	MALE				

2.2. Materials

Because of the specificity of our research, we relied on several methods to look for information, as follows:

1- Books, references and scientific publications in Arabic and foreign languages.

2- A note card examined by specialists.

3- National and international TV channels.

4- Personal computer, flash disk, semi-automatic video reading software, internet/modem.

Validity and Reliability

Truthfulness: I presented the note card to a group of experts and academic researchers in the field of physical preparation and soccer training, and it was agreed to make some partial adjustments at the level of the card in line with the requirements of the research.

Consistency: this means to obtain the same result of the scale after repeating the operation several times and on the same individual (Latrech and Benabderrahmane, 2020, p 257).

The researcher here used the method of re-testing over a time difference of 15 days while calculating the correlation coefficient between the two tests.

Knowing the degree of stability of the research tool, we selected 10 games, and then we conducted the analysis process on one side to determine the readiness of the researcher and the note card match with the information we seek, on the other hand, to limit the things observed in a limited framework, and then after a period repeated the same test to determine the validity and reliability of the research tool and the eligibility of the researcher to do this.

Table 02, The results were as follows:

Themes	Test		Re-test		Sig	correlation	Significance
	average	s.d	average	s.d			
RPH1	26.10	1.20	25.91	1.27	0.094	0.96	0.05
RPH2	22.79	0.77	22.81	0.75	0.76	0.95	0.05
RP	48.80	1.47	48.73	1.55	0.93	0.93	0.05
TP	94.96	0.60	94.85	0.63	0.26	0.88	0.05

The results show the strong stability of the research.

2.3. Design and Procedure

Match Analysis means a tool used to analyze the actions carried out during a match,(https://www.youcoach.it/en/article/matchanalysismethod?language=it.viewed in 08/09/2020)(Bensalem, 2020),and for that, we used in our

research the descriptive analytical approach as the most appropriate for our study, and this after reviewing previous studies similar to ours.

Study protocols are as follows:

- Stage 1: The stage of feeling the problem.
- Stage 2: Conducting an exploratory study in which the researcher determined the dimensions of research from different angles, through which we were able to visualize the course of our research and define our questions, hypotheses, and our purpose in this research, through which we assumed the selection and control of the sample and the research community
- Stage 3: identifying tools for collecting scientific material and conducting a comprehensive examination thereof.
- Stage 4: Prepare and design a note card in line with the research plan and objectives.
- Stage 5: The researcher conducts a training and experimental observation to determine the extent of his eligibility and readiness to perform these important tasks.
- Stage 6: Starting the process of observing and recording data.
- Stage 7: Starting data analysis and coding process.
- Stage 8: Starting discussion and interpretation of data.
- Stage 9: Starting to draw conclusions and discuss research. Hypotheses related to induction.

Research variables:

Independent variable: Effective Time.
Dependent variable: Physical indicator in 1st Pro- League of Football.

2.4. Statistical Analysis

To examine the validity and reliability of the tool, we adopted: Pearson correlation coefficient

The following statistical methods were adopted in the description process: medium, standard deviation, highest value and lowest value.

It was approved: T-test for one sample, T-test for two double samples for significance, and we used SPSS 23 program in the calculation process.

III.   Results

Table 3, shows the distribution of the actual playing during the match.

Variable/statistics	Effective play half 1/ passive play	Effective play half 2/ passive play	Effective play / passive play	Total match time	Effective play percentage of total match
Arth average	25.91/20.97	25.03/23.15	49.08/45.98	95.06	51.36%
S.D	1.26	1.06	1.70	0.63	0.63%
Max	24.28	21.23	46.60	94.06	49.54%
Min	28.76	25.81	52.81	96.01	55%

The above table shows the effective playtime during the match has reached an estimated 49.08 of the total playing time of 95.06 or 51.36%, which is a relatively weak percentage. Talking about effective play data in the first half we find it has reached the threshold of 25.91 min. of the total match in the first half 46.88, i.e., the rate of 55.26%, while the effective time to play was 23.15 of the total playtime in the second half reached 48.18, i.e., 48.04%.

We notice that the effective play decreased in the second half, as it was 55.26% in the first one, then this percentage decreased relatively to 48.04% threshold, which means that the players' physical efficiency decreased in the second half.
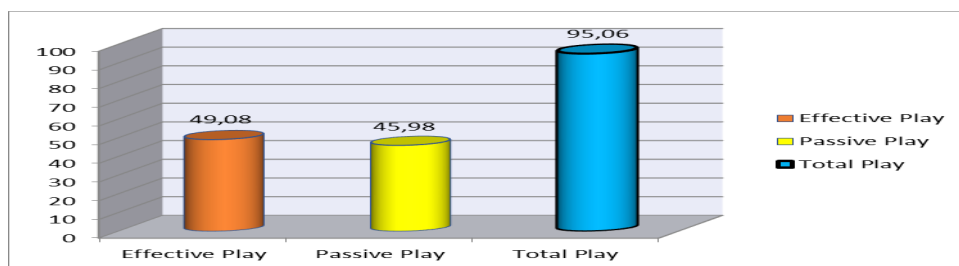

Figure 1: shows the Effective and passive play during the match

Table 4: shows Actual Play data with the evaluation criterion.

Statistics/variable	sample	average	s. deviation	T-test	Sig.
Effective Play Time	20	49.08	1.70	15.27	0.000

The above table shows that the value of sig (bilateral) -0,000 which is less than a = 0.05 and therefore, we reject the zero hypotheses and accept the alternative hypothesis, that is to say, the differences between the real performance at the level of the first professional league championship and the criterion on which the evaluation was performed are statistically significant in favor of the evaluation criterion. This confirms and supports

the validity of our hypothesis, which was (the level of actual play at the level of the first professional league championship based on indicators of effective and passive play are weak compared to real professional standards).
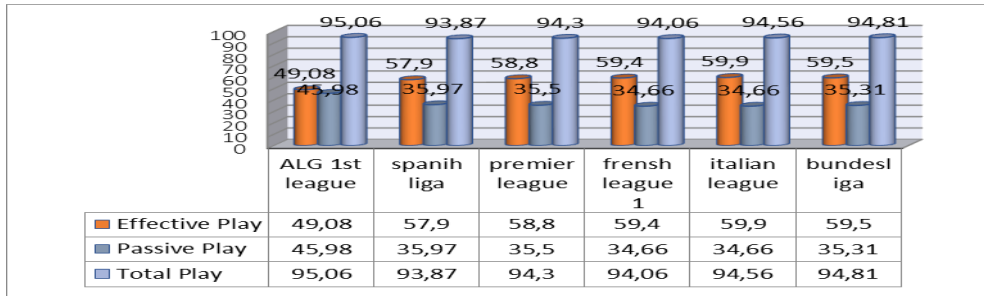

Figure 2: shows indicators of effective and passive play in the 1st pro- league championship compared to some major European championships.

Table 5: shows the real performance time and its distribution between the two halves of the match.

Statistics/variable	sample	correlation	a-average	s. d	T-test	Sig.	DF
Half 1	20	0.063	25.91	1.26	7.71	0.000	19
Half 2	20		23.15	1.06			

As shown in the above table which represents indicative and descriptive data, a comparison between the real performance variable in the first and second halves. knowing that the real performance gives us a picture of the physical performance in the competition, we find that the average effective play in the first half has reached the limits of 25.91 minutes of the total performance of 46.88 min., or 55.26%, while the average effective play during the second half reached a threshold of 23'.15 of total performance, estimated at 48.18, or 48.04%.

Effective Time According to the Play Sequences:

Table 6: shows the distribution of playing sequences.

Playing seq	1 "___10"		11"___20"		21"____30"		31"___40"		41"____1'		1'____ ++	
Repetitions	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2
	30.8	13.8	12.6	16	10.4	11	6.8	4.2	4.2	5.4	3.6	4.6
Total	44		28.6		21.4		11		9.6		8.2	

The above table is a data statement that shows the distribution of the effective play periods (sequence of the game), as they were distributed from the lowest level of play that is in the field of (1 "___ 10") to the goal of most field of play 1 minute and more, and as a reading of the data obtained from the table, we find that the playing scope from (1 "___ 10") has reached 44 times, or 35.83% of the total, which reaches the combined playing limits,

i.e., 122.8, and the number of iterations of the playing scope confined between (1"__20") 28.6, i.e., a rate of 23.28%, while the total number of iterations of the playing scope (21 "_ 30") has reached a threshold of 21.4, which is equivalent to a percentage of 17.42%, and the playing scope confined between (31 "__40") has reached 08.95%, i.e., the equivalent of 11 repeats out of a total of 122.8, while the field of play confined between   (41 "__ 1') has been repeated 9.6 times, which is 7.81%, while the average playing in the field (1' __++ ') has reached 8.2, or 6.67% .

IV.   Discussion

  The competitive sports milieu does not stop progress and development and continuous research to develop the physical preparation and training of the athlete, and the latest scientific developments related to several fields come every day to move the world and the field of training and lead it little by little to be more rational and effective (Belghoul, 2011, p 92).

To evaluate the real level of physical performance based on effective and passive play data, it had to be subjected to criteria and standards to know the real levels of professionalism. For this reason, we made a comparison between the first Algerian Professional League Championship and its counterparts from well-known world championships.
 The aforementioned data give us an overall picture of the poor physical performance in the first professional league championship. Real performance in our matches did not reach what was set as a criterion for evaluation. Even in the highest match in terms of real performance, it reached 52.81, while the established professional standards say that in High-level matches, it must reach at least 55' min. (55' – 60') and more) and this is confirmed by (Dellal, 2008; Jaquet, 2002; Lukchiouv, 1981; Mombaerts, 1991), and this explains the fluctuation in the level and the best evidence for that is the participation of national clubs in international forums, and more than that, we not that the basic composition of the national team is mostly if not all of them made up of European school players (Ben Kased and Dahmene, 2010).
 As a descriptive analysis of the numbers derived from the descriptive statistics, we see that the indicator of actual play rate in the second half, which was estimated at 48.4%, has decreased from what it was in the first half, 55.26%. This gives us an indication that the physical side has decreased relatively, and to check if these numbers are of statistical significance we applied the T-test, and we found that the calculated T value

was (7.71) and that the value of 0.000 SIG = which means that the differences are significant and that they did not come by chance but rather due to the low physical efficiency of the players and this is confirmed by Disalvio (2007) when he found that all indicators of physical performance decrease in the second half to 10-11%, all of these results are very important because they show weakness and low physical fitness in the second half and rarely found in football matches of a high level, but it exists among amateur and professional players who are less exposed to this is what confirms Dellal (2008).

The previous methods came to reinforce the validity of the hypothesis that led to "a decrease in the level of physical performance in the 2nd half based on the greatness of effective and passive play, where the differences were an indication in favor of passive play in the first half and this is logical because physical fitness at the beginning of the game is at its highest levels and symptoms of fatigue appear only during the second half. This explains the true decline in performance in the second half, as the player tends to recover by wasting time on violations, errors, and replacements, usually in the second half, because they occur at the time of passive play and the below table gives a clearer picture of what has been presented.

According to the data shown above, we see that the percentage that had the greatest chance in playing is the time confined between the two playing sides (1" __ 10"), where it represents 35.38%, which means that the game is not organized and characterized by randomness and haste. This was among the major causes that led to an increase in the passive time in the game; the ball in this scope is in the passive performance mode more than it is in the active playing mode. As we also note that there is a slight difference between the first and second halves where the frequency of playing decreased in this scope, also we notice that whenever the playing scope increases, the frequency decreases. This means that the players at the championship level are not able to control the ball inside the playing field, as the overall play was mostly between (1"—10") and (10"__20"), where the performance scope reached the limits of 60%, meaning that most of the real performance is limited to these two. The two scopes, which gives us a negative image of the true performance of the first professional league matches and this explains the great convergence between the effective performance time and the passive performance time from the total playing time. So the competition in our championship is only one half, which confirms to us the poor level of performance. While doing the analysis

process, I had a feeling as if the players were not programmed to implement a specific playing plan to the point that you do not know what the playing plan is in which each team plays, and that the individual character and long balls are the most seen during the analysis process.

V.   Conclusions

Through what was discussed and based on what was analyzed in this study, we reached a set of conclusions that will depict reality for us that was unknown to its features so far and we will summarize the most important points as follows:

The real level of competition in the 1ˢᵗ professional league is weak and did not reach the actual values in professionalism and did not go beyond the scope of amateur data, based on the physical indicators of the matches, which were represented in the effective and passive play, as it reached 49'.08, i.e. 51.36% of the total time of the game, which is relatively a weak number.

We see that the effective play rate in the second half, which was estimated at 48.4%, decreased from what it was in the first half, 55.26%. This gives us an indication that the physical side has decreased relatively, due to the low 2physical efficiency of the players and this is confirmed by Disalvio (2007) and Dellal (2008),when he reached the idea that all physical performance indicators drop in the second half to 10-11%, all of these results are very important because they show weakness and low physical fitness in the second half and rarely find matches of high level, but it is abundant in amateur and professional players who are less exposed to this. This argument came to reinforce the validity of the hypothesis that resulted in "the level of physical performance decreases in the second half based on the indications of effective and passive performance", where the differences were indicative in favor of effective play in the 1ˢᵗ half and this is logical because physical fitness at the beginning of the game at its highest levels and symptoms of fatigue appear only during the 2ⁿᵈ half. This explains the real decrease in performance in the second half. The player tends to recover by wasting time in the violations, errors, and substitutions are usually in the second half, as they fall into the passive playing time.

Depending on the data related to the distribution of sequences of the effective play, it was confined between the areas of (1" _ 10") and (10" _ 20"), where the ratio reached the limits of 60%, that is, most of the effective play is limited to these two areas, which gives us a negative image of the

true performance of the first professional league matches, and this explains the great convergence between effective playtime and the passive playtime from the total play. So the competition in our championship is only one half, which confirms to us the poor level of performance that is dominated by the character of improvisation, during the course of the analysis process, I had the feeling that the players were not programmed to implement a specific playing plan.

Knowing all the subtle particles help us to direct the training process in an accurate and similar manner to what happens in the match, and this helps us reach the principle of what is known as an adaptation in the science of training, that is to create the creation of a player who can compete with the rhythm of competition efficiently at all levels, and this is the nerve to achieve without Resorting to the analysis process to know the player's actual playing time, and how to distribute the playing limits according to the phases of the competition and this is confirmed by each of Dellal (2008) and S.Alain (2015).

VI.   References

A Sagna. (1989). effective play Time And Football Performance, master's thesis ES-STAPS, higher national institute of popular education and sports, Senegal.

A. Dellal., (2008). from training to performance in football. Belgium, Boeck.

A,Benkaced., Bendahmene.N., (2010). The training culture of Algerian football coaches and the extent of its reflection on the components of the training process, Scientific Journal of Science and Technology for Physical and Sports Activities, Institute of Physical Education and Sports, univ-mostaghanem, volume 07, p 43-60.

Bensalem, S., Hobara., Menella.R. (2020), Comparative study of the aerobic and anaerobic alactic work capacity according to the positions occupied by footballers. journal of science and technology of physical and sports activities, univ- mostganem, volume 17 n 02, p 13 - 28.

G, Cazorla. The Sports Educator, France, edit-vigot. 2009.

Hadji. A., Benmesbah. K., Benbousta.R., (June 2019), techno-tactical performance indicators for the Algerian national football team, Scientific Journal of Science and Technology for Physical and Sports Activities, Institute of Physical Education and Sports, univ-mostaghanem, volume 16, n 01, P 01 - 13.

J. Paul-ancien. (2008). FOOTBALL, a programmed physical preparation. Paris - France: @mphora.

Khalil. M.S., Ahmed. H., Fellah.M., June (2020). The predictive value of some types of numbers in terms of some mental capabilities of the player prepared volleyball, Scientific Journal of Science and Technology for Physical and Sports Activities, Institute of Physical Education and Sports, univ-mostaghanem, volume 17, num 01, p 135-155.

Kherfane. M. The impact of a proposed training program in mini-stadiums on hoping for some basic physical characteristics and skills for young footballers, Scientific Journal of Science and Technology for Physical and Sports Activities, Institute of Physical Education and Sports, univ-mostaghanem, vol 08, p 80-88.

Latrech. A., Benabderrahmane.S. A., dec 2020. The role of the teacher of physical and sports education in establishing health and postural awareness of middle school pupils, Scientific Journal of Science and Technology for Physical and Sports Activities, Institute of Physical Education and Sports, univ-mostaghanem, vol 17, num 02, p 250-264.

Mazari, F., Himani N., (2018). Achieving the cohesion of the sports team and stimulating achievement motivation by applying the coach's democratic style to handball players, Scientific Journal of Science and Technology for Physical and Sports Activities, Institute of Physical Education and Sports, univ-mostaghanem, Issue of the International Forum 08, pages 81-102.

Salem, K. (2016). Method and tools for analyzing the organization of the game of Algerian first division football teams. Maaref.STPSA, Bouira-Algeria, number 21.p 03-14.

Sylvan. A. (2011). Evolution of football and consequences on training and physical preparation: theses to obtain the degree of doctor of the university, university of Strasbourg-France.

Zaboub,D.(2009). Evaluation of the workload in training and during Official Football Competitions. IEPS. university of Algeria, number00. p 45-54.

(https://www.youcoach.it/en/article/matchanalysismethod?language=it.viewedIn08/09/2020).

(https://www.merriamwebster.com/dictionary/hypothesisviewedin14/01/2021).