# A Comparison Effect of the Integrated Training and Training with Small-Sided Games in Developing the Aerobic Endurance During the Preparatory Period of Young Football Players Under 17 Years Old

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**Abstract:**

The study aims to make a comparison between integrated training and training with a small-sided games, in developing aerobic endurance of young football Players under 17 years old in the preparatory period, After applying the two programs and using the (Test Vameval) in to measure aerobic endurance, the study concluded that both integrated training and training with a small-sided games contribute to the developments of aerobic endurance, to a convergent degree. This means no difference between them

**Keywords:** integrated training, small-sided games training, aerobic endurance, football Players under 17 Years old.

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**Introduction:**

The game of football requires a large amount of movement, resulting in continuous performance, which requires the possession of highly efficient vital systems to meet and keep up with what is required (Hijab, 2018), and (A. Dellal, 2008) pointed out that "physical preparation must be dominated by the quantitative aspect represented by "On the Attribute of Persistence" (pp. 380-398), where aerobic endurance plays a prominent role in this game due to the effort that the athlete exerts during training and competition, which is reflected in the occurrence of the phenomenon of fatigue, and for this reason coaches seek to diversify training methods away from traditional work that He overlooked the technical and tactical aspects, especially in the preparatory stage, which is considered the cornerstone for developing various physical qualities that allow performing a season at the level without injuries (Bin Rashid Yassin and others, 2022).

The famous coach Didier Deschamps previously stated that the most important thing in the physical preparation of a player is for the coach to be knowledgeable and capable of how to integrate physical effort with the ball, and to determine and direct the physiological impact of the exercise, as this integration ensures integrated development of the technical, tactical and physical aspects" (N.Ghennam). , A. Abbad, 2016, p. 12).

This logic has forced coaches and specialists in the field of physical preparation for football to investigate new techniques and methods more specifically in the form of integrated training to transfer physical work towards a better specificity of the game. From here emerged the idea of integrated training, which is considered one of the new methods in football training, which meets the requirements of integrated preparation of the player according to the logic of football, according to a perspective indicated by (A. Dellale, 2008), it is embodied in "integrating the ball into physical work, which allows players to acquire skill and physical abilities."

Through analytical observation by coaches of playing situations, and those new responses and reactions that players create, including stimuli and stimuli, according to the circumstances and course of the matches, coaches have created many ideas that they can implement to integrate into training and play, as the method of training with small sided games has emerged as more Combined with the privacy of the activity, fun and excitement in the eyes of the players, its features became clear in raising the ability, level of performance and its accuracy in an integrated manner that saves time and effort at work (Suhayb Zigham, Belkacem Boukratam, 2022), multi-use and in various forms, according to the goal and philosophy of the coach by controlling the

variables of the game. , rules of play, as well as spaces and number of players (D. Casamichna, J. Castellano, 2010, pp. 1615 - 1623).

Many scholars and researchers agree that these new methods, which include incorporating the ball into physical exercises and small sided games, can enable the development and development of physical qualities, especially among young people, because of the fun they entail in training, stimulation, and achieving comprehensive goals. Scientific research that has delved into this topic has documented Well, those positive effects on various aspects of preparation, but most of them focused on studying the effect of each method separately without addressing a field comparison based on statistics and field data that show the extent of the superiority of one method over the other, especially in light of the widespread demand of coaches in football schools and at the level of sports clubs for it. Its use in preparing and shaping players, in addition to the difference in visions about the comparison between the two methods Which prompted the researchers to direct their focus in this study on the junior category as it is a preferred stage in selecting endurance abilities, and in an attempt to draw the attention of coaches to the necessity of relying on field work based on measurement, evaluation and evaluation by conducting a field comparison of the effect of both combined training and training with small sided games in developing Aerobic endurance among junior footballers To clarify the vision and reveal the difference between them, it is decided to ask the following question: Is there a difference between training with small sided games and combined training in developing aerobic endurance among junior footballers under 17 years of age? In order to summarize the study more clearly and accurately, it was divided into This question is divided into sub-questions, which are:

Are there statistically significant differences between the pre- and post-measurements of the combined training group in developing aerobic endurance?

- Are there statistically significant differences between the pre- and post-measurements of the small sided games training group in developing aerobic endurance?

- Are there statistically significant differences in the post-tests between the two experimental groups in developing aerobic endurance?

### 1.1 Study hypotheses:

- There are statistically significant differences between the pre- and post-measurements of the combined training group in the aerobic endurance test.

- There are statistically significant differences between the pre- and post-measurements of the small sided game training group in the endurance test. Antenna.

- There are statistically significant differences in the post-tests between the two experimental groups in developing aerobic endurance.

### 1.2 Objectives of the study:

- Identifying the differences in dimensional measurements between the two experimental groups in developing aerobic endurance.

### 1.3 Defining the study terms:

#### 1 .3. 1 The integrated method:

- Terminologically: "Integrated term (intégration) that is called complete in all three behavioral aspects: (mental, motor, emotional, and emotional." (Barwaq, Muqran, 2012, pp. 97-111), which is the integration of the ball into physical work. Which allows players to acquire the skill and physical capabilities" (A. Dellal, 2008, p. 8).

- Procedurally: After reviewing the various literature that dealt with the definition of integrated training, it can be said that it is those physical exercises mixed with the ball during training sessions, that is, the integration of physical work with the ball in line with the objectives of the session, the specifics of the game, and the age group to achieve the desired goal.

#### 1 .3. 2 Training with small sided games:

- Technically: It is the concept that allows for the integration of the specific movement of football activity into the physical training of the player with a close connection between the technique and tactics of the game (Fifa, 2013, p. 15) in the form of exercises conducted in narrow spaces and with a certain number of players, and this number may be equal or uneven. According to the established objectives" (Hijab, 2018, pp. 24-40).

- Procedurally: These represent the exercises included in the training program, which include competitive ball games with different numbers of players and within different spaces according to the goal of each session and according to specific conditions according to the load and location of each training session in the program proposed by the researchers for junior players under 17 years of age.

#### 1 .3. 3 Aerobic endurance:

Terminologically: "datchnof" defines it as "the ability to resist fatigue from any activity for the longest possible period" (Resan, 1989, p. 186). It also means the player's ability to continue performing throughout the match, using his physical and skill proficiency positively and effectively, without experiencing fatigue and stress that hinder him from performing accurately and completely to the extent required" (Taelman, 1990, p. 25).

- Procedurally: The researcher defines it as those exercises contained in the training program that include competitive ball games with different numbers of players, and within different spaces

according to the goal of each session and according to specific conditions according to the load and location of each training session in the proposed program for junior players under 17 years of age.

**1 .3. 4 Youth under 17 years of age**: This means middle adolescence, which is characterized by the completion of biological changes and changes in the various aspects of development (physical, physiological, mental, social, emotional, religious, and moral).

**3. Field procedures for the study:**

**3. 1** Research methodology: The nature of the problem at hand imposed the researchers' reliance on the experimental method with the design of two experimental groups

**3. 2** Study population and sample: The study included football players under 17 years of age in the Constantine Association Regional Championship, Group (A), who numbered 12 teams. Two teams were selected in a deliberate manner, with each group including 15 players as follows: Group (1) trained using the combined training method. Experimental (2) is trained using a small sided game method. The same conditions for implementing the exercises and measurement have been taken into account, and the two samples have not previously been subjected to any training program.

**3. 3 The exploratory study**: The exploratory study was conducted in order to test the research tools and determine their characteristics in terms of their validity and their ability to measure the research variables among the selected age group. Before commencing the exploratory experiment, the researchers took preliminary steps aimed at identifying appropriate tests and providing the necessary equipment and means to measure the specified indicator. For the study variable on the selected study sample, and to identify the negatives facing the researcher in order to avoid them in the main experiment, and to ensure the safety of the devices and methods used, as the exploratory experiment for the physical test was conducted on the "Middle Union of Setif (SMS) sample on 09/12/2022 And retest on September 17, 2022.

**3.4 Homogeneity of the two study groups:**

The researchers verified the homogeneity of the members of the two experimental groups in some physiological and morphological characteristics. The values of the "T" statistical test for some morphological characteristics (height, weight, training age, total body index) were respectively (0.34/0.73/0.47/0.25), which are values It is not statistically significant with the significance value of the differences, respectively (0.73/0.53/0.64/0.77) at the significance level of 0.05, which means that there are no differences between the members of the two groups in some morphological characteristics, and thus homogeneity of the members of the two study samples.

**3. 5 Parity:**

In order to achieve equality between the two groups to attribute the differences to the experimental factor, the two researchers verified the extent of the equality of the two research groups in the study variable before implementing the training programs. The value of the "T" statistical test, which amounted to "0.71", was not statistically significant with a significance value of 0.48 because it is greater than the level of significance. 0.05", and therefore it can be said that the two groups are equivalent in maximum oxygen consumption (Vo2 max).

**3.6 Determine the study variables:**

- Independent variable: the small sided games training program + the combined training program.

- Dependent variable: aerobic endurance.

**3.7 Areas of study:** The study included the teams of the Pre-Chorif Football Championship for juniors under 17 years of age in the state of Setif.

- Time range: from 09/20/2021 to 11/17/2022.

- Spatial field: Neighborhood annexes of the May 8, 1945 complex in Setif.

**3. 8 study tools:**

**3. 8 . 1 The two training programs:** The researchers prepared two programs in two different ways (the combined training method and the training method with small sided games), in the preparatory period for the 2022/2023 sports season, with a total of training sessions (24 sessions) in each program at a rate of 4 training sessions per week, according to the capabilities And the level of trainees and competition. Each program contains several training courses that are subject to the principle of variation, diversity, and undulation in the direction of the load according to the requirements of the preparatory stage. The time of the training units in each program ranges from (70 to 120 minutes), as well as the intensity of training ranges from (60 to 100%). .

The researchers were keen to provide the same training conditions for the two samples, which were training at a relatively similar time and in the same place, while monitoring the conditions and method of implementation.

**3. 8 . 2 Physical test used:**

- Test Vamevale (Cazorla (1990): This test aims to measure aerobic capabilities (aerobic endurance, maximum aerobic capacity (Vma) and maximum oxygen consumption (Vo2 max), and it is a test similar to the LEGER-B test (1980).

-Tools: timer, cones every 20 m around a 200 m or 400 m circular path, timer, audio recorder, recording sheets.

- Testing procedures: The track is prepared in an oval or circular shape of 200 – 400 m. A 200 m circle can be created using a tape measure from a central point (radius 31.85) distance between the cones (20 m).

- Performance method: After preparing the running track or field, the test begins at a speed of 8 km/h and then increases by 0.5 km/h every minute. The correct speed must be maintained according to the audio recording. If the athlete is one meter or more behind, a warning is given. If he is behind by more than Two meters complete the test and record the results.

- Recording method: The maximum airspeed (VMA) is recorded for the last distance achieved between two funnels. VMA: (Km/h)

**3. 9 Statistical processing:** The researchers used the statistical package of the program (spss.v 26), relying on the following statistical tests: Pearson correlation coefficient, arithmetic mean, standard deviation, "Shapiro-Wilk" and "Kolmogorov Smirnov" coefficients to verify the normal distribution of the study data, statistical testing. "T" for two linked samples. and "T" for two independent samples.

**4. Presentation and analyze results:**

**4. 1 Presentation and analysis of the results of the pre-test of the study variable:**

**4. 2 The significance of the difference between the pre- and post-measurements for the combined training group in the aerobic endurance test:**

**Table No. (01) shows the significance of the difference between the pre- and post-measurements for the combined training group in the aerobic endurance test**

| sample / variable | Pre test | | Post test | | Value of T | P value | Level of sig |
|---|---|---|---|---|---|---|---|
| | X | S | X | S | | | |

| | Unite of mesur | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Aerobic endurance | Km/h | 13,90 | 0,98 | 15,60 | 0,98 | 8,76 | 0,000 | 0,05 |

***X: mean*** ***S :*** **standard deviation**

It is clear from Table (01) that the average value of the pre-test for the combined aerobic endurance training group amounted to 14.13 km/h with a standard deviation of 0.78 before applying the program, and it increased to 15.70 km/h with a standard deviation of 0.79 after training for a period of 8 weeks, considering the value of the statistical test "T". Which amounted to (-16.32), which is statistically significant with a significance value of 0.00 P= because it is smaller than the significance level value of 0.05. Therefore, it can be said that there are statistically significant differences between the pre- and post-measurements of the aerobic endurance test and in favor of the post-measurement, which indicates the positive effect of the integrated training program. In developing aerobic endurance on the study sample.

**4. 3 . The significance of the difference between the pre- and post-measurements of the small sided games training group in the aerobic endurance test:**

**Table No. (02) shows the significance of the difference between the pre- and post-measurements for the training group with small sided games in the aerobic endurance test**

| sample / variable | Pre test | | Post test | | | | |
|---|---|---|---|---|---|---|---|
| | X | S | X | S | Value of T | P value | Level of sig |

| | Unite of mesur | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Aerobic endurance | Km/h | 14,3 | 0,78 | 15,70 | 0,79 | 16,32 | 0,000 | 0,05 |

***X: mean*** ***S :*** **standard deviation**

It is clear from Table (02) that the average value of the pre-test for the training group with mini-games for aerobic endurance reached 13.90 km/h with a standard deviation of 0.98 before applying the program, and it increased to 15.60 km/h with a standard deviation of 0.91 after training for a period of 8 weeks and considering the value of the statistical test. "T", which amounted to -8.76) and is statistically significant with a significance value of 0.00 P= because it is smaller than the value of the significance level of 0.05. Therefore, it can also be said that there are statistically significant differences between the pre- and post-measurements of the aerobic endurance test and in favor of the post-measurement, which indicates the positive impact of the program. Training using small sided games to develop aerobic endurance on the study sample.

### 4. 4 . The significance of the difference between the post-measurement of the two groups of combined training and training with small sided games in the endurance test

**Table No. (03) shows the significance of the difference between the two groups' post-measurements in the aerobic endurance test**

| sample / variable | Small sided games | | Integrated method | | Value of T | P value | Level of sig |
|---|---|---|---|---|---|---|---|
| | Post test | | Post test | | | | |
| | X | S | X | S | | | |

| | Unite of mesur | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Aerobic endurance | Km/h | 15,60 | 0,91 | 15,70 | 0,79 | 0,32 | 0,75 | 0,05 |

***X: mean*** ***S :*** **standard deviation**

Table No. (03) shows that the average value of the post-test for the combined aerobic endurance training group was 15.70 km/h with a standard deviation of 0.79. The average value of the post-test for the training group with mini-games was also 15.60 km/h with a standard deviation of 0.91, considering the value of the statistical test "T." Which amounted to (0.32), which is a statistically non-significant value at a significance value of 0.75 P = because it is greater than the value of the significance level of 0.05, which means that there are no differences between the two groups in developing endurance among soccer players under 17 years old after 8 weeks of training.

## 5. Interpretation and discussion of the study results.

### 5. 1 Interpretation and discussion of the results of the first hypothesis:

The results of the comparison between the pre-test and the post-test among the players of the combined training sample resulted in the presence of statistically significant differences between the two measurements in the aerobic endurance test in favor of the post-test. The researchers attribute this difference to the impact of the combined training program that was prepared and implemented on the sample members, as the introduction of the ball into Physical training makes players more motivated, enthusiastic and excited to continue working, in addition to training simulating the reality of competition, and the diversity of movements such as continuous movement with the ball, fast running with the ball, launching jumping movements...etc., which contribute to the development of physical qualities in a comprehensive and integrated way (Hijab, 2022) , Some studies that dealt with the effect of combined training on physical characteristics, including aerobic endurance, have shown results similar to the results of the current study, such as the study of Abdel Haq Abbad (2019), which demonstrated that after exercising in the combined training method for a period of 7 weeks and during the preparatory stage, there was an improvement in various physical characteristics, including Aerobic endurance compared to analytical training, as well as for the study of Barwaq Hassan

(2021), which was conducted on a sample similar to the sample of our study and in the same period, and concluded to prove the effect of the integrated, structured training program for 8 weeks in developing physical qualities, including aerobic endurance, and Asali's study was also recorded. Hussein et al. (2021) A relative development of the integrated training method on a sample of middle-class football players from the regional championship of western Algeria (Tlemcen).

The results of our study also differed from the study of Ghanem Nour El-Din (2019) on a sample different from our research sample (juniors under 15 years of age), which concluded in its results to prove the effect of the integrated training program applied in developing general persistence on this group due to considerations that the researcher explained by not taking into account basic characteristics. To develop this trait, it consists of planning long-term basic training courses that ensure integrated training with the rest of the physical traits, and include the players' prior cognitive, theoretical, and mental abilities to compete, and a study by Touhami Hamdaoui (2017) on a sample similar to the sample of our study in middle school football (17-18 years old). In which the researcher attributes, in addition to the aforementioned reasons, the influence of traditional training and previous training methods in the stages of basic formation of young people, in which the psychological and mental conditions were not taken into account, given that aerobic endurance requires patience and concentration" (Touhami, 2017, pp. 193-216).

Hence, we conclude, through the results of previous studies and the results of the current study, that combined training plays an effective role in developing aerobic endurance among 17-year-old football players across the various stages of training, and it is also one of the most important factors that help young people adapt to the contents of training and continue to engage in it.

**5.2 Interpretation and discussion of the second hypothesis:**

The results of the study also showed a significant improvement in the post-test for aerobic endurance compared to the pre-test in the small sided games training group. The researchers explain this development to the effect of the small sided games training program that aims to develop aerobic endurance, as the small sided games allow continuous work with high quality that integrates various aspects of special preparation. In the game, which makes it easier for the coach and trainee to integrate the various physical elements, as indicated by "Muhammad Khallaf," technically and tactically, according to the nature and conditions of work, available means, the number of players and playing spaces, as well as work and recovery periods (Khalaf, 2022), So that it imposes appropriate physical requirements, especially with regard to aerobic capabilities, as the study (Qaroumi Al-Hussein and Wadh Ahmed, 2021) indicated, "Increasing the playing area and maintaining an appropriate number of players increases the relative space for each player, and gives freedom to move and cover distances" (p. p. 663-680), thus increasing the

total size of the distance traveled, in addition to the fun, suspense, excitement, and realism that distinguishes this method from what happens in official competitions, unlike the traditional methods that coaches used, believing that the principle of repeating the exercise is the key to benefiting from training programs (Saudi (Eder, 2018).

Most of the studies that dealt with the effect of training with small sided games also demonstrated the presence of differences in post-tests on various physical components, including aerobic endurance, such as the study of A. Dellal (2008) and the study of Kallis and Katis (2009). In this way, we can consider the results of this study and previous studies. Another guide to a new vision, and an alternative way to benefit from the training process from various aspects, in addition to restoring psychological activity, interest, focus, and continuing to practice training, especially among the junior category.

**5. 3 Interpretation and discussion of the results of the third hypothesis:**

By comparing the post-test results between the first group to which the ball-integrated training program was applied, and the second group which was training with small sided games, which resulted in no and no statistically significant difference between the two groups in the post-test for aerobic endurance, meaning that both of them contribute in a similar way to developing endurance. Aerobic Contrary to what was stated in the general hypothesis that included the existence of a difference between training with mini-games and combined training in developing aerobic endurance among junior football players under 17 years of age, According to what was indicated by the results of the partial hypotheses, which proved that there was a difference between the pre-test and post-test for each group due to the effect of the two training programs, the researchers explain this to the effect of the training units completed using the blended training method and training with small sided games for this group, and the appropriate time period for applying the units of the two programs because The physical condition of the player is considered the solid foundation upon which various aspects of performance are based, and the endurance element is part of the first basic stages of general physical preparation, as small sided games allow for the development of the aerobic capabilities of football players" (Impellizzeri et al, 2006, pp. 483–92).

Also, the training load for a continuous activity is sufficient to develop or maintain the quality of persistence among the players, and this is what distinguishes small sided games, as "Bodineau" indicates that the time during which the ball is out of play is 8% of the time with a small number of players, compared to the number of competing players (11 players), which allows for continuous performance and thus adapting aerobic capabilities to performance requirements, according to conditions similar to the competition" (F. Bodineau, 2007), since the higher the level of the player, the greater the distance he covers, and this is confirmed by the results of comparative studies between the areas and the number of players participating in Performance,

such as the study of Hoff et al (2002), the study of Rampinini (2007), and the study of Muhammad Khallaf (2002) where it confirmed that the work load of the soccer player in small sided games, and In small spaces, and with different working times and recovery periods, it is sufficient to develop the endurance characteristics of the players, and training with high intensity and for long periods of time contributes to raising the maximum ability of the athlete's body to transport relative oxygen (Vo2max), which is considered one of the most important factors of athletic performance in endurance events, in addition to In addition to the multiple aerobic effects of this method on various adaptation variables, it also contributes to the development of various productive characteristics such as acceleration, deceleration, jumps, and change of direction (Clemente, et al, 2014, pp. 712–727), and delaying the onset of early fatigue in players.

Some studies also indicate that integrating physical, skill, and tactical exercises into football in a systematic manner based on scientific foundations has various effects on the individual's systems, the development of his physical characteristics, and his body's adaptation to the efforts of football" (Mohamed Hassan Allawi, 2002, p. 23), and also his interest in Practicing training, and (Mohaimdat, 2013) points out, "Stripping physical exercises from the ball or skill and tactical exercises leads the player to lose pleasure in training and aborts the aesthetic spirit of the game, and consequently feels bored and fed up, which makes him stop training" (pp. 23-34), In addition, many specialists confirm that developing physical qualities requires stabilizing and maintaining them throughout the sports path through integrated guidance according to each age stage (Ghannam Nour El-Din et al., 2019, pp. 70-92).

The results of this study were similar to the results of most studies that dealt with each method separately and its different effects on developing aspects of performance, given that they contain similar psychological characteristics that push the athlete to continue working with passion and enjoyment, which makes him bear the burden of training and competition.

This study also contributed to alleviating confusion and answering many inquiries, to resolve the conflict of opinions between coaches and supervisors of youth groups about the effectiveness of each method over the other in the stage of preparing young players, by arriving at proving the positive effect of each of them in developing aerobic endurance based on The appropriate scientific foundations for its development, development and stabilization in accordance with sound principles for developing training programmes, and in accordance with the characteristics and components of the basic structure of young people, to ensure sound and continuous progress in various aspects of performance.

## 6. Conclusion:

In this study, the researchers attempted to reveal the difference between combined training and training with mini-games on the physical side, specifically on aerobic endurance, which is

considered the basic basis for physical fitness during the preparatory stage for junior football players under 17 years of age, and after applying the two training programs to the two samples and the necessary statistical treatment of the data. In the study, the researchers concluded that both combined training and training with small sided games have a positive effect in developing aerobic endurance. By comparing the results of the post-test between the two groups, it became clear that each of them contributes to a similar degree in developing aerobic endurance, which means that there is no discrepancy between the two methods, and in light of the results obtained. On it researcher Which remains relative to the study sample and competition conditions, as well as the characteristics of the age group. The researchers hope that this study will be an extension of other similar research on other categories and variables. They also point out the necessity of integrating physical and technical training during training sessions, across the various stages of preparation for the junior category, without neglecting training methods. The other, with the regulation of training loads based on the data of physical tests and observation, and the use of various modern technologies before, during and after the implementation of the sessions and the training program, to ensure sound and continuous training for the player.

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