Thi Qar University Journal of Physical Education Vol 2 Issue 2

مجلة جامعة ذي قار لعلوم التربية البدنية

مجلة علمية محكمة تصدرها كلية التربية البدنية وعلوم الرياضة

Aerobic potential training and its effect on some physiological indicators For young handball players

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Article history:
Received:30/ 2/ 2025
Received in revised from: 1/ 3 /2025
Accepted: 2/ 4/ 2025
Published online: 11/4/ 2025

Keywords:
Physiological indicators
Pneumatic voltage
handball

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ABSTRACT

Each method or method of training has a differentiated impact on the level of performance of players in all aspects, including functional, so it is necessary to know the physiological effects of physical effort associated with the type of training, methods used and the level of training doses. And the changes it may cause on the body's systems, and the importance of research lies in the preparation of exercises to find out the extent to which aerobic exercise affects the physiological indicators of handball players in order to upgrade the player and reach integration in terms of physical and physiological fitness, either The research problem is through the researcher's observation of the tournaments and matches held inside and outside the province noted the decrease in the level of physical fitness as a result of lack of interest in physiological indicators by coaches and thus the weak ability to keep pace with modern methods as well as lack of interest in aerobic effort exercises that represent the physiological aspect of the players, and was one of the objectives of the research Is the preparation of aerobic endurance exercises and their impact on some physiological indicators, as well as identify the effect of aerobic exercise in some physiological indicators of young handball players for the control and experimental groups in the pre- and post-tests, and the researcher assumes that there are statistically significant significant differences between the pre- and post-tests of the experimental and control groups in some physiological indicators of handball players and in favor of post-tests, the researcher used the experimental approach to suit the nature of the problem, and the research community was represented by Al-Nasr Handball Club players for the season (2024-2025), and (10) players were selected from them in a deliberate way to form the research sample, so the sample constitutes (55.5%) and they were divided into two groups randomly, as each group consisted of (5) players, after which the researcher processed the extracted values statistically using the statistical bag spss. The fourth chapter included the presentation, analysis and discussion of the results.

1- Definition of research

1-1 Research Introduction and Importance: -

In order for handball coaches to be able to ration training loads and to be training in the best health and guide the players to recover recovery, it is necessary to know and familiarize them with physiological indicators and the relationships between them to understand the physiological rule that confirms that the body works as a single unit, and that handball players do not differ from the players of the rest of the games and events in the need to develop their physical and physiological ability, And that the components of the sports training load mean all the characteristics of the load on the shoulders of the athlete, so any physical exercise performed by the athlete leads to anatomical, physiological, chemical, psychological changes, inside his body, and that the handball player needs very high physical requirements useful and help him to implement the basic skills of what this game has of high speed in performance within a small space as well as a small number of players that makes the match always moving and free From stopping because one of the duties of each player is to attack and defend at the same time in order to reach the highest levels in this game and achieve the best achievements and the importance of research lies in the preparation of exercises to see the extent of the impact of aerobic exercise on the physiological indicators of the handball player in order to upgrade the player to integration in terms of fitness.

1-2 Search problem:

Through the researcher's follow-up of the championships, he noticed a decrease in the level of physical fitness when handball players as a result of the lack of interest in physiological indicators by coaches and thus the weak ability to keep pace with modern methods as well as the lack of interest in aerobic exercise exercises, which being a physiological characteristic in the first place, so the researcher decided to study this problem and develop appropriate scientific solutions to it.

1-3 Research Objectives:

1- Preparation of aerobic exercise exercises in some physiological indicators for young handball players.

2- Identify the effect of aerobic exercise exercises on some physiological indicators of young handball players for the control and experimental groups in the pre- and post-tests.

3- Identify the effect of aerobic exercise on the physiological indicators of young handball players for the control and experimental groups in the post-tests.

1-4 Research hypotheses:

1- The existence of statistically significant differences between the pre- and post-tests of the experimental and control groups in some physiological indicators for young handball players and in favor of post-tests.
2- The existence of statistically significant differences between the post-tests of the experimental and control groups in some physiological indicators for young handball players and in favor of the experimental group.

1-5 Research Areas :

1-5-1 Human field : Al-Nasr Youth Handball Club players for the season 2024-2025.

1.5.2 Time Range : For the period from (22/10/2024) to (12/2/2025).

1-5-3 Spatial area : closed sports hall in Al-Nasr Sports Club in Dhi Qar Governorate.

2- Research methodology and field procedures

2.1 Research Methodology

The researcher adopted the experimental approach with pre- and post-tests by designing the control and experimental groups "is a deliberate and controlled change of the specific conditions of an incident and note the resulting changes in the incident itself" [(1)] because it is the best approach that the researcher reached to achieve the most important research hypotheses.

2.2 Research community and sample

The researcher determined the research community in the deliberate way, represented by the players of Al-Nasr Handball Club, who numbered (13) players, and (3) players were selected by the researcher conducted the exploratory experiment and (10) of them were selected in a deliberate way to form the research sample, and thus the sample constitutes a percentage of (55.5%) and they were divided into two equal groups using the lottery method, as each group included (5) players.

2.2.1 Homogeneity of the research sample :

The researcher conducted the homogenization process of the sample in some specifications that may have an impact on the experimental variable (height, mass, chronological age, training age) and Table (2) shows that

Table (1)

Shows variables, arithmetic mean, standard deviation and coefficient of variation for the members of the research sample

[(1)] Zafer Hashem Al-Kazemi: Practical applications of writing educational and psychological theses and theses , 1st Edition, Beirut, Dar Al-Kutub Al-Ilmiyya, 2013, p. 121.

Coefficient of variation	Standard deviation	Arithmetic mean	Unit of measurement	Variables	t
2.11%	3.74	176.5	poison	Length	1
13.97%	10.30	73.7	kg	Mass	2
3.57%	0.64	17.9	month	Chronological age	3
21.08%	0.78	3.7	month	Training age	4

2.2.2 Equivalence of the research sample

At the same time, the researcher conducted equivalence between the control and experimental groups in the research variables

Table No. (2)

Table (2) shows the equivalence of the members of the research sample for the control and experimental groups

Significance	SIG value	t Calculated	Experimental Group		Control group		Variables
			on	Going to	on	Going to	
Immoral	0.858	0.185	0.712	73.920	0.976	74.020	Pulse before voltage
Immoral	0.654	0.466	2.000	163.000	2.074	163.600	Pulse after voltage
Immoral	0.242	1.265	0.084	99.520	0.114	99.440	O2 ratio before voltage
Immoral	0.694	0.408	0.071	100.500	0.084	100.480	O2 ratio after voltage
Immoral	0.718	0.374	0.807	117.980	1.187	117.740	High pressure after voltage
Immoral	0.817	0.239	1.342	141.600	1.304	141.800	High pressure before voltage

2-3 Means, devices and tools used in research.

2.3.1Means of gathering information

_audition

_ Observation

_ Personal Interview

_ Arab and foreign sources and references

_ International Information Network (Internet)

2.3.2 Devices: - The researcher used the following devices:

- Stopwatch
- Weighing device
- Canon camera
- DELL COMPUTER

_ Blood pressure monitor

_ Pulse rate meter

2.3.3 Tools used in research

- Legal handballs (10)

_ Tape to measure length

_ Distance tape

_ Tapes measuring

2.4 Field research procedures

2.4.1 Identification of research variables

2.4.1.1 Identification of physiological indicators

For the purpose of determining the physiological indicators of the members of the research sample, the researcher after reviewing the sources and scientific references decided to choose the following physiological indicators:

1- Pulse before effort

2- Pulse after effort

3- O2 in the blood before the effort

4- O2 percentage in the blood after exertion

5- High pressure before voltage

6- High pressure after voltage

2.4.2 Description of tests used in research

Test name: 25m x 8 high start shuttle running test.

Test objective: Measurement of physiological indicators.

Test instruments: metric tape measure, electronic stopwatch, flat ground with a length of (25) m, timer. **How to perform the test**: draw two parallel points distance between them (25) m, the player stands on one of the two points of the high start, when hearing the start signal he runs at maximum speed heading to the second point to touch it with his foot and then turns around to return at the same speed to the first point again, repeats this performance (8) eight times to become the distance traveled (25 m ×8) times = (200) meters.

2.4.3 Exploratory experiment:

The researcher conducted his exploratory experiment with the help of the assistant team on a sample consisting of (3) handball players young Al-Nasr Sports Club.

2.5 Main experience

2.5.1 Pre-tests

The tests and pre-measurements were conducted in the sports hall of the athlete / victory, where the variables of weight, height and age were measured, as well as a test for physiological indicators, and the researcher adopted the conditions related to the tests in terms of time, place, tools used, method of implementation and the auxiliary team in order to work to provide them in the post-tests.

2 – 5 – 2 exercise aerobic effort:

The researcher prepared exercises in a training curriculum, aimed at upgrading the aerobic effort of young handball players, where the application of the curriculum took (12) weeks, at a rate of (3) training units per week, where Saturday, Monday, Wednesday were training days, thus reaching the total training units (36) training units with a time limit of (30-40) minutes of the training unit.

This is consistent with the opinion of both Klinzing (1:78) and Sharky (2:115) that the number of units per week was between (2-3) units, and the number of weeks was not less than (6) weeks until evolution could appear**.** The researcher relied on the opinions of experts and specialists in preparing the proposed curriculum, and thus the curriculum was applied from the period 1/11/2024 until 1/2/2025, and the design of the training curriculum relied on scientific foundations in terms of:

1- The content of the proposed training curriculum is appropriate to the level and abilities of the members of the research sample.
2- Taking into account the appropriate formation of the training load in terms of intensity, size and comfort.
3- The researcher used the method of continuous training and the method of low-intensity interval training to develop aerobic voltage.

2.5.3 Post-tests

The researcher conducted the post-tests for the research sample from 10/2/2025 to 12/2/2025. In the sports hall in the district of victory, Dhi Qar Governorate, after the completion of the period of application of the training curriculum, which took (12) weeks, the researcher was keen to provide the same conditions in the tribal tests.

3. Presentation and discussion of results

3.1.1 Presentation of the results of some physiological indicators, analysis and discussion of the control and experimental groups: -

Table (3)

Shows the differences between the control and experimental groups in the post-test in some physiological indicators

Significance	SIG value	t Calculated	Experimental Group		Control group		Unit of measurement	Variables	t
			on	Going to	on	Going to			
Moral	0.000	12.944	0.707	65.000	0.894	71.600		Pulse before voltage	1
Moral	0.000	8.918	0.707	156.000	1.095	161.200		Pulse after voltage	2
Moral	0.002	4.427	0.005	99.014	0.084	99.180		O2 ratio before voltage	3
Moral	0.001	5.118	0.005	100.014	0.055	100.140		O2 ratio after voltage	4
Moral	0.008	3.500	0.707	115.000	0.548	116.400		High pressure after voltage	5
Moral	0.000	5.715	0.837	137.200	0.707	140.000		High pressure before voltage	6

SIG ≥ value below significance level 0.05

In the light of the data extracted for the members of the research sample, Table (3) shows the differences in the values of some physiological indicators in the post-test and as shown in the table above, the nature of the sample members of the control and experimental groups showed differences in the post-test.

In the pulse variable before the voltage and using the test (T) for independent samples to extract the differences, as the calculated values reached (12.944) at the level of significance (0.000) and the degree of freedom (8), in the post-test for the control and experimental groups and in favor of the experimental group.

In the variable pulse after the effort and using the test (T) for independent samples to extract the differences, as the calculated values reached (8.918) at the level of significance (0.000) and the degree of freedom (8), in the post-test for the control and experimental groups and in favor of the experimental group, and in the variable of O2 ratio before the effort and using the test (T) for independent samples to extract differences, as its calculated values reached (4.427) at the level of significance (0.002) and the degree of freedom (8), in the post-test for the control and experimental groups and in favor of the experimental group. In the variable of O2 ratio after the effort and using the test (T) for independent samples to extract the

differences, as its calculated values reached (5.118) at the level of significance (0.001) and the degree of freedom (8), in the post-test for the control and experimental groups and in favor of the experimental group. Experimental . In the variable of low pressure before the effort and using the test (T) for independent samples to extract differences, as the calculated values reached (7.071) at the level of significance (0.000) and the degree of freedom (8), in the post-test for the control and experimental groups and in favor of the experimental group, and in the variable of high pressure before the effort and using the test (T) for independent samples to extract differences, as their calculated values reached (5.715) at the level of significance (0.000) and the degree of freedom (8), in the post-test for the control and experimental groups and in favor of the experimental group.

3.1.2 Discussion of some physiological indicators before and after the control and experimental groups: -

The results showed in the table for tests (physiological indicators) that there are statistically significant significant differences between the pre- and post-tests of the control and experimental groups and in favor of the post-test and in the post-test in favor of the experimental group as we found that the development in the experimental group was higher than its counterpart in the control group and the researcher attributes this because of the use of aerobic exercise had a significant impact on the development of the level of functional devices by the experimental group and in the post-test as the physiological indicators are the most important Means to know the effect of exercise on the body because the measuring devices indicators are very accurate, and to know what the exercises have caused of results, whether positive or negative, and this is what the statistical figures showed after conducting aerobic exercise by methods of interval training of low intensity and continuous impact on many physiological functions, including the heart, where in the post-test of the experimental group we note a decrease in the heartbeat before the effort and this indicates the development of the heart muscle and the ability to pump blood more as well as a decrease The heartbeat after the effort indicates the speed of recovery in the player.

Sharkey suggests that endurance training leads to lower heart rate at rest and at lower than maximum loads, and to increased heart attack volume (4:92).

Sharida states that endurance training leads to a decrease in the number of heartbeats as a result of the development in the internal and external mechanism of the heart, and makes this decrease in rest time (5:37-38).

In this regard, Clausen explained that the decrease in the pulse rate at rest time is a result of endurance training and special exercises (3: 779-81).

4. Conclusions and recommendations

4.1 Conclusions

1. Through the results it was shown that aerobic exercise has a positive effect on some physical abilities and physiological indicators of young handball players.
2. Aerobic exercise had a more effective effect when interfered with special endurance components and this was shown by the results of the experimental group
3. The results show that the control group that did not use aerobic exercise did not have a significant improvement at the statistical level in all the variables under study.

4.2 Recommendations

1. The need to use aerobic exercise to develop some physical abilities and physiological indicators of players.
2. The need to work on conducting similar studies to develop aerobic voltage in other samples and in other sports games and events.
3. It is necessary to work on the use of all physiological measurements and tests within the periodic tests of the players to determine the reality of the responses and effects of the exercises followed.

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