AEROBIC BOXING TRAINING PROGRAM TO DEVELOP CERTAIN ASPECTS OF PHYSICAL FITNESS AMONG FEMALE TRAINEES IN GYMS

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ABSTRACT

Background. The research problem lies in need to investigate the effectiveness of a training method that combines motor continuity, time management, and variety in motor performance positions. Despite increasing prevalence of training programs within women's gyms, many of these programs still focus on general motor activity without precise guidance towards developing functional physical abilities related to efficiency of daily motor performance. **Objectives.** The study aimed to identify effect of an aerobic boxing training program on developing some elements of physical fitness among female trainees in gyms. **Method.** The researcher used the experimental method with a single group design with pre- and post-measurements. The research sample consisted of 10 female trainees practicing physical activity aged 24-26 years. The training program lasted 8 weeks with three training units per week. After applying tests under investigation and carrying out exercises prepared by the researcher. After conducting post-tests, results were statistically processed using Statistical Package System SPSS version 24. **Results.** Results showed statistically significant differences in favor of post-test in all variables, indicating effectiveness of aerobic boxing training in producing positive physical and motor adaptations in trainee. **Conclusion.** This study concluded that a training program using the air boxing method has proven effective in developing physical fitness components among the participants, reflecting the efficiency of this training method in improving overall physical performance in the gym. This contributes to developing the muscular endurance of the legs and arms, improving dynamic agility, and enhancing motor balance within a structured, applied framework.

Keywords; aerobic boxing, physical fitness, muscular endurance, agility, balance.

INTRODUCTION

In the contemporary context, physical fitness has become a pivotal indicator of integrated health and functional balance for the individual, as it forms the basis upon which the efficiency of vital systems and the individual's ability to adapt to the demands of fast-paced daily life are based , and with the technological transformations that have reduced the amount of physical effort in modern lifestyle, the need has emerged for organized training programs that restore the mechanism of balance between motor activity and the requirements of functional health. Regular exercise has proven its effectiveness in enhancing the efficiency of the circulatory and respiratory systems, developing muscular capabilities, and supporting motor stability, as well as its preventive role in limiting or reducing the manifestations of physical inactivity and the functional disorders associated with it (Arsil et al., 2024; Suryadi et al., 2024; Umar et al., 2023).

Sports training is a structured scientific process based on precise physiological and mechanical principles. It aims for physical and functional adaptations that are compatible with the characteristics and capabilities of the trainees (Medrano-Ureña et al., 2020; Widyastari et al., 2022). In this context , aerobic boxing training is a modern training model that combines regular movement rhythm and continuous muscular work, as it depends on the sequence of movements of the upper and lower limbs, which enhances the efficiency of muscular performance and develops the ability to continue kinetic work for longer periods (Hemphill et al., 2019; Kutseryb et al., 2017).

Nature of these exercises contributes to the development of muscular endurance in the legs and arms as a result of continuous and repeated muscle contractions within moderate and varying intensities. It also works to develop dynamic agility through the continuous change in directions and movement positions during performance. At same time, the demands of continuous rhythmic performance impose a high degree of control over body positions and center of gravity, leading to improved motor balance and enhanced neuromuscular coordination. Organized movement rhythm contributes to raising the motivation of the trainees and increases the accuracy of the movement response, which provides a suitable training environment to bring about comprehensive physical and functional adaptations (Aaltonen et al., 2021; Coulter et al., 2020; Tay et al., 2023). Importance of research is evident in adopting a training program based on the method of aerobic boxing as a training approach that can contribute to developing the elements of physical fitness related to functional and motor performance, especially the endurance of the muscular power of the upper and lower limbs, dynamic agility, and motor balance among female trainees in sports halls, according to organized scientific principles that seek to raise level of physical and health efficiency for this group.

Despite increasing prevalence of training programs within women's gyms, many of these programs still focus on general motor activity without precise guidance towards developing functional physical abilities related to efficiency of daily motor performance. This is particularly evident in limited balanced improvement in the endurance of the muscular power of upper and lower limbs, the weakness of ability to move in an organized manner, as well as the variation in level of control over body balance during motor performance. Moreover, the adoption of traditional training methods often does not take into account

integration between muscular effort, motor rhythm, and continuous changes in body positions, which may limit or reduce expected physical adaptations of trainees.

In light of foregoing, the research problem lies in need to investigate the effectiveness of a training method that combines motor continuity, time management, and variety in motor performance positions. This contributes to developing the muscular endurance of the legs and arms, improving dynamic agility, and enhancing motor balance within a structured, applied framework. Research problem is defined as attempting to answer the following question: To what extent does a training program based on aerobic boxing techniques affect the development of upper and lower limb muscular endurance, dynamic agility, and motor balance among female trainees in gyms? And does this method contribute to achieving comprehensive physical improvement that reflects the efficiency of functional adaptation in motor performance?

Research objective to identifying the impact of an aerobic boxing training program on developing certain fitness components among female trainees in gyms. Research hypothesis there are statistically significant differences between the pre-test and post-test. Endurance of muscular strength of legs and arms, dynamic agility and kinetic balance of female trainees in gyms.

METHOD

Participants:

The research community comprised all practices of physical activity in Tigris gym. In Baghdad Governorate during the year 2025-2026, number of sample is 15 female trainees in gyms, aged between 24-26 years, research sample was deliberately selected to suit study objectives. It included 10 training sessions from same age group 5 of members were excluded because there was no partnership in exploratory experiment, representing 66.66% of original research population. To ensure that sample distribution was statistically normal, the researcher used skewness coefficient, as shown in Table (1).

Table 1. Homogeneity and equivalence of research sample using skewness coefficient in variables under investigation

Variables	Measurement unit	Mean	St.d	Mediator	skewness coefficient
Height	cm.	169.50	2.273	169,500	0.284
Mass	Kg.	73.70	1.636	73.50	0.03
Age	Year	25.20	0.19	25.50	0.47
Leg muscle strength	Rep.	17.40	1.83	18	0.33
Arm muscle strength	Rep.	14.90	1.52	15	0.67
Dynamic agility	Sec.	29.73	2.14	29.32	2.14
Motor balance	Sec.	7.80	0.78	8	0.40

Research Design.

The researcher used experimental methodology by designed experimental for experimental group one through data processing for pre and post measurements for this group. After reviewing many scientific sources and references related to study, the researcher selected a number of variables to achieve research objectives

Table 2. Variables and tests used in the research

Variables	Tests
Leg muscle strength	From standing, bend and extend the knees completely as far as possible (Kamel Aboud Hussein and others: 2009, p. 150).
Arm muscle strength	Arm bending from the modified inclined prone position for girls (Muhammad Subhi Hassanin: 2003, p. 227)
Dynamic agility	Barrow's zigzag run (Mohammed Hassan Alawi And Muhammad victory Religion Radwan, 1982, pp. 302-304) .
Motor balance	Measuring kinetic balance (Adnan , 2022) , p. 51)

The researcher was keen to conduct a pilot study involving 5 female trainees for physical activity in TIGRIS gym sports program will be conducted on Thursday, October 30, 2025, at 5:00 PM, to identify potential obstacles that may hinder the implementation of the field experiment. The experiment aims to ensure the suitability of the tests for the trainees, measure the time taken to complete each test, verify the validity of the tools and equipment used in the research, and evaluate the duration of the training unit and the periods allocated for work and rest. The experiment also addressed determining the appropriate intensity for the participants. Identifying potential errors and working to avoid them In addition to identifying external variables that may appear during the implementation of the tests and training program, and clarifying the tasks of the support team to ensure that the experiment proceeds smoothly and effectively.

Table 3. A training session from air boxing program

Week: 3 Training No. 9 Day: Sunday
Total time: 50 minutes Category: Gym trainees (24–26 years old)
First: preparatory section (warm-up) 10 minutes

Exercise	Time	Load	Physiological goal
Walk in place with arm movements	2 Min.	Low	Stimulates blood circulation
Dynamic limb stretching movements	3 Min.	Low	Preparing muscles and joints
Side steps with a light punch	3 Min.	50 %	Neuromuscular conditioning
Simple balance exercise (standing on one leg)	2 Min.	Low	Activating balance

Second: Main Section 35 minutes
Training style: Continuous, with a musical rhythm
Power system: Antenna with anaerobic input
Pregnancy intensity: 65–75 %
Main Section Exercise Schedule

No.	Targeted capacity type	Exercise	Load	Performance time	Rep.	Set	Rest between Rep.	Rest between Sets	Total time
1	Leg muscle strength	Squat followed by an alternating front kick between the two legs.	70 %	40 Sec.	6	3	20 Sec.	60 Sec.	9 Min.

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2	Arm muscle strength	A series of straight, consecutive punches (front-straight-side) with a front step	75 %	45 Sec.	6	3	20 Sec.	60 Sec.	10 Min.
3	Dynamic agility	A quick lateral move accompanied by a frontal punch	70 %	40 Sec.	6	3	20 Sec.	60 Sec.	9 Min.
4	Kinetic balance	Standing on one leg while performing a slow, controlled punch	65 %	30 Sec. each leg	5	3	20 Sec.	60 Sec.	7 d

Third: Ending section (cool-down) 5 minutes

No.	Exercise	Time	Goal
1	Deep, regulated breathing	2 Min.	Recovery
2	Stretching leg and arm muscles	3 Min.	Reducing muscle tension

Pre - tests were conducted on 2/11/2025. Starting from 3/11/2025 until 27/12/2025. The researcher prepared a training program based on air boxing method. Boxing Aerobic for female physical activity trainees in gyms aged (24–26) years, the training program lasted for eight weeks. At a rate of three training units per week (Sunday, Tuesday, Thursday), for a total of 24 units. Each training session lasted between 40 and 60 minutes. Program included warm-up exercises and a main section based on aerobic boxing movements. And calming and relaxation exercises were applied, with an escalating training load intensity, starting at 50% of trainees' maximum capacity for each exercise, and gradually reaching 75%, thus ensuring gradual adaptation of the cardiovascular muscular system. Program also adopted a continuous training method with the principle of varying intensity and variety in exercises, while taking into account balance between upper and lower limb movements. Developing dynamic agility and controlling motor balance, which enhances development of targeted physical fitness elements among trainees. Post-tests were conducted under the same conditions as the testing procedures. Tribalism dated 29/12/2025.

Data Analysis

Statistical Package for the Social Sciences SPSS was used V.24, to address results of the research variables. Iman, Ronald. L. and WH Convev: 1983:p248.

RESULTS AND DISCUSSION

In this study, the researcher presented results of experimental group, specifically results of some elements of physical fitness. Analyzing and discussing them scientifically and relying on scientific sources.

Table 4. Study presents means and standard deviations of research group, calculated t -value, and significance of differences between pre- and post-test results in some elements of physical fitness experimental research group

Variables	Pre-test		Post-test		Calculated (t) value	Sig. level	Sig. value
	Mean	St.d	Mean	St.d			
Leg muscle strength	17.40	1.838	21.70	1.703	9.58	0.000	Sig.
Arm muscle strength	14.90	1.52	17.30	1.25	10.85	0.000	Sig.

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Dynamic agility	29.3	0.93	28.45	0.63	5.72	0.000	Sig.
Motor balance	7.80	0.78	6.90	0.73	9	0.000	Sig.

* Degrees of freedom (10 - 1 = 9)
* Significant when level Significance (0.005) if He was level The mistake ≥ from (0.005)

Table (4) shows that there are statistically significant differences between the results of the pre- and post-tests for the research group in the elements of each of Muscular strength, balance, and dynamic agility, reflecting the ability of the training program prepared by the researcher to improve these physical abilities. The researcher also attributes this improvement to the nature of the training boxing aerobics the music accompanying the exercises contributed significantly to enhancing the efficiency of performing sports movements, especially compound movements, and increasing the motivation of trainees to repeat the exercises continuously without feeling tired or bored.

Discussion

The improvement in these variables is attributed to the design of the training program, which took into account the abilities and capabilities of each trainee, while applying the principle of undulation in the intensity of the training load during the units, which contributed to increasing the endurance of the muscular power of the legs and arms. And improving both dynamic agility and kinetic balance, as well as training boxing Aerobic operates within an aerobic system to produce energy. This increases the muscles' ability to perform their functions for longer periods, and leads to improved anaerobic performance as a result of the integration of energy systems.

Use of musical rhythms, both fast and slow, contributes to development of circulatory and respiratory systems. Training loads and intensity were determined according to trainees' abilities and capabilities, taking into account individual differences, and the exercise time, rest periods, and recovery were adjusted according to scientific principles, in order to achieve safe and effective physical adaptations. Results showed a significant improvement in leg muscle endurance after the training program. This improvement is explained by McArdle et al. (2010) stating that repeated aerobic exercise increases the efficiency of the circulatory-respiratory system, enhancing its ability to supply muscles with oxygen for longer periods and reducing the accumulation of fatigue byproducts, which contributes to improved lower body muscle endurance. Training program which included multiple rapid transitions in different directions, effectively stimulated both slow-twitch and aerobic muscle fibers. Which is considered the basis for the development of endurance in trainees (Apriandi et al., 2023; Gunawan et al., 2023).

As for improvement in the muscular endurance of the arms, the researcher attributes this to the fact that aerobic boxing training included continuous repetition of punching movements that require repeated contractions of the upper muscle fibers. This is what Cormie et al. (2011) indicated: High-intensity repetitive exercises that target the upper body muscles are able to improve the muscles' ability to resist fatigue." This is due to the increased effectiveness of the nervous system in stimulating muscle fiber contraction while maintaining the ability to produce force for longer periods, as well as maintaining the

technical performance of the movement during repeated punches, which is attributed to increased neuromuscular coordination between the working muscle groups.

Improvement in dynamic agility, nature of aerobic boxing training, which involved continuous changes in direction and speed of movement, led to an increase in the trainees' ability to move quickly and control their body trajectory. This is what Sheppard & Young (2006) indicated: that training that relies on frequent changes of direction contributes to development of neuromuscular response, leading to increased speed of performance and improved agility. As a functional motor ability. Improvement in dynamic agility can be explained by the effectiveness of the combination of repetitive muscle work and advanced coordination between muscles during the accelerated kinetic rhythm. Ali Bin Saleh pointed out that agility is the most difficult of the kinetic qualities due to the multiplicity of its components and the comprehension and understanding of the complex coordination of the kinetic duty. Kinetic experience, the greater the individual's ability to determine the precise kinetic pathways within the central nervous system, which is reflected positively on the ability to coordinate and flow in performance and execute new kinetic duties in the best way (Ali et al., 2026; Athaya et al., 2023; Balore et al., 2026; Haniyyah et al., 2025).

Kinetic balance, improvement is due to the fact that compound aerobic exercises require high coordination between the basic muscles of the spine, trunk and limbs to keep the center of gravity within a moving frame. This is consistent with what is confirmed by Purnomo et al., (2023) that the state of balance is achieved when the radiation of the body's center of gravity falls in the middle of the area of balance. In the case of movements, the radiation moves away from the area of balance. Islam et al., (2024) indicated Exercises that require dynamic changes in movement positions stimulate improved neural control patterns that support balance during movement. This is achieved by enhancing the integration of sensory-motor perception and effective response to external stimuli and this was confirmed by Khalil (2000), that balance is of great importance in the sports field, as an athlete's good balance contributes to their ability to improve and develop their performance level in many movements or positions in most sports activities. Improvement in motor balance in this study can be attributed to the sequential exercises that included multidirectional transitions and movements, which require effective dynamic stability.

CONCLUSION AND RECOMMENDATIONS

Based on results the following conclusions were reached in light of research objectives, field procedures, and statistical results obtained, following conclusions can be drawn training program using air boxing method has proven effective in developing elements of physical fitness among trainees, reflecting efficiency of this training method in improving overall physical performance within sports halls. Exercises accompanied by musical rhythm contributed to enhancing motivation towards performance and continuity in training, which was reflected positively on level of motor interaction and commitment to training units. Application of training program led to a significant improvement in endurance of muscular power of upper and lower limbs, as well as an improvement in dynamic agility and motor balance, which confirms integrated effect of program in developing studied variables. Scientific organization of training load according to principle of undulation in training

intensity contributed to achieving required adaptations without causing fatigue, which contributed to improving the efficiency of circulatory and respiratory systems. Nature of combined exercises contributed to developing speed of muscle response and reducing feeling of fatigue during performance, which enhances trainees' ability to continue physical activity with higher efficiency. Based on what has been concluded, The researcher recommends following it is necessary to adopt air boxing method within training programs in women's sports halls due to its positive impact on developing various elements of physical fitness. Need to employ musical rhythm in gym training programs due to its stimulating role in improving motor performance and increasing motivation towards training. Adopting principle of gradual progression and wavering in organizing intensity of training load to ensure optimal functional adaptation and avoid physical strain. Conducting similar studies on different samples in terms of age, gender, and physical level to verify the generalizability of the results. Benefit of this type of program is to promote public health and improve the active lifestyle of women.

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