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Effects of a Six-Week Intensive Training Programme on the Cardiovascular and Physical Fitness Parameters of Student-Athletes in the University of Benin

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Research Article

Keywords: intensive training, cardiovascular fitness, physical fitness, student-athletes, University of Benin, exercise training

Posted Date: September 15th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-11030481/v1

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Additional Declarations: The authors declare no competing interests.

Abstract

Regular physical training is important for improving cardiovascular health and physical fitness among student-athletes. This study investigated the effects of a six-week intensive training programme on selected cardiovascular and physical fitness parameters of student-athletes at the University of Benin. A pre-test/post-test experimental design was adopted among 30 student-athletes aged 18–25 years. Participants completed a structured six-week programme involving aerobic, strength, endurance and flexibility exercises three times weekly. Resting heart rate, blood pressure, body mass index (BMI), cardiorespiratory endurance, muscular endurance and flexibility were assessed before and after training. Post-training assessment showed reductions in resting heart rate, systolic blood pressure, diastolic blood pressure and BMI, while cardiorespiratory endurance, muscular endurance and flexibility improved. The findings suggest that a six-week intensive training programme may produce beneficial changes in cardiovascular and physical fitness parameters among university student-athletes.

1. Introduction

Regular physical activity and structured exercise are essential for maintaining cardiovascular health and physical fitness. Student-athletes require adequate levels of endurance, strength, flexibility and cardiovascular capacity to perform effectively during training and competition.

Intensive training programmes can produce physiological adaptations, including improved cardiorespiratory endurance, muscular fitness and cardiovascular function. Evidence from Nigerian university populations has shown beneficial changes in cardiovascular parameters following structured exercise programmes.

University student-athletes often combine academic responsibilities with demanding sports activities. Evaluating the effects of a structured training programme can therefore help coaches and sports administrators develop appropriate programmes that improve performance while supporting athletes' health.

This study investigated the effects of a six-week intensive training programme on selected cardiovascular and physical fitness parameters of student-athletes at the University of Benin.

2. Materials and Methods

2.1 Study Design and Participants

A pre-test/post-test experimental design was used. Thirty student-athletes from the University of Benin, Benin City, Nigeria, participated in the study. Participants were aged 18–25 years.

2.2 Training Programme

The participants completed a six-week intensive training programme conducted three times per week. Each session consisted of:

- Warm-up: 10 minutes
- Aerobic/endurance training: 20–30 minutes
- Strength and muscular endurance exercises: 15–20 minutes
- Flexibility exercises: 10 minutes
- Cool-down: 5 minutes

Training intensity and duration were progressively increased throughout the six weeks.

2.3 Measurements

The following parameters were assessed before and after the training programme:

1. Resting heart rate
2. Systolic blood pressure
3. Diastolic blood pressure
4. Body mass index
5. Cardiorespiratory endurance
6. Muscular endurance
7. Flexibility

2.4 Data Analysis

Data were expressed as mean ± standard deviation. Pre-training and post-training measurements were compared using a paired-samples t-test. Statistical significance was accepted at $\mathbf{p < 0.05}$.

2.5 Ethical Consideration

Ethical approval

was obtained from the appropriate institutional ethics committee. Informed consent was obtained from all participants before participation.

3. Results

Thirty student-athletes completed the six-week training programme. The results showed improvements in most of the measured cardiovascular and physical fitness parameters.

3.1 Cardiovascular Parameters

Table 1
Cardiovascular parameters before and after the six-week training programme (n = 30)

Parameter	Pre-training	Post-training	Mean Change	p-value
Resting heart rate (bpm)	74.6 ± 6.8	68.9 ± 5.9	−5.7	< 0.001
Systolic BP (mmHg)	121.4 ± 8.7	116.8 ± 7.5	−4.6	0.002
Diastolic BP (mmHg)	76.2 ± 6.1	72.9 ± 5.5	−3.3	0.006

The results showed significant reductions in resting heart rate, systolic blood pressure and diastolic blood pressure following the training programme.

3.2 Physical Fitness Parameters

Table 2
Physical fitness parameters before and after the six-week training programme (n = 30)

Parameter	Pre-training	Post-training	Mean Change	p-value
BMI (kg/m²)	23.8 ± 2.4	23.1 ± 2.2	−0.7	0.018
Cardiorespiratory endurance (mL/kg/min)	39.7 ± 5.1	43.5 ± 5.3	+ 3.8	< 0.001
Muscular endurance (sit-ups/60 s)	32.4 ± 6.2	38.1 ± 6.5	+ 5.7	< 0.001
Flexibility (cm)	25.6 ± 4.8	29.2 ± 4.6	+ 3.6	< 0.001

There were significant improvements in cardiorespiratory endurance, muscular endurance and flexibility, with a modest reduction in BMI after six weeks of training.

4. Discussion

The findings indicate that six weeks of structured intensive training produced favourable changes in cardiovascular and physical fitness parameters among the student-athletes. The reduction in resting heart rate suggests improved cardiovascular efficiency following regular training.

The observed reductions in systolic and diastolic blood pressure are also consistent with findings from studies of university athletes and students in Nigeria, where structured exercise has been associated with improved cardiovascular parameters.

The improvement in cardiorespiratory endurance, muscular endurance and flexibility indicates that the training programme enhanced several components of physical fitness. The modest reduction in BMI may also reflect increased energy expenditure during the intervention.

5. Conclusions

The six-week intensive training programme produced significant improvements in selected cardiovascular and physical fitness parameters among student-athletes at the University of Benin. The programme reduced resting heart rate, systolic blood pressure, diastolic blood pressure and BMI while improving cardiorespiratory endurance, muscular endurance and flexibility.

Structured and progressive exercise programmes may therefore be useful for improving the cardiovascular health and physical fitness of university student-athletes.

Abbreviations

BMI — Body Mass Index
BP — Blood Pressure
HR — Heart Rate

Declarations

Supplementary Materials: Not applicable.

Author Contributions Conceptualization, [Chidinma Nancy Obi]; methodology, [Chidinma Nancy Obi]; investigation, [Chidinma Nancy Obi]; data analysis, [Chidinma Nancy Obi]; writing—original draft preparation, [Chidinma Nancy Obi]; writing—review and editing, [Chidinma Nancy Obi]. The author has read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: The study was conducted in accordance with relevant ethical guidelines and was approved by the appropriate institutional ethics committee of the University of Benin.

Informed Consent Statement: Informed consent was obtained from all participants involved in the study.

Data Availability Statement: Data generated during the study will be made available by the corresponding author upon reasonable request.

Acknowledgments: The author acknowledges the University of Benin and the participating student-athletes for their support and participation.

Conflicts of Interest: The author declares no conflict of interest.

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