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Cardiorespiratory Endurance Levels of Physical Education Students at FKIP Universitas Syiah Kuala, Class of 2023

[1]Fachrul Azmi[*], [1]Ifwandi, [1]Masri , [1]Zulfikar, [1]Chairul Mufida

*Corresponding Author: **Fachrul Azmi**, e-mail: fachrulazmi@usk.ac.id

[1]Physical Education, Health and Recreation Study Program, Universitas Universitas Syiah Kuala, Aceh, Indonesia.

Abstract

Objectives. This study aims to determine the level of cardiorespiratory endurance among students of the Physical Education, Health, and Recreation Study Program (Penjaskesrek), Faculty of Teacher Training and Education (FKIP), Universitas Syiah Kuala (USK), class of 2023. Cardiorespiratory endurance is one of the essential indicators that support physical fitness, which directly influences students' learning capacity and daily physical activities.

Material and Method. This research employed a quantitative approach with a descriptive study design. The population consisted of 100 students from the Penjaskesrek FKIP USK class of 2023. A sample of 56 students was selected using purposive sampling. Data were collected through the 15-minute running test (Balke test), which aimed to measure the working endurance of the heart and lungs and to calculate the students' VO2 Max capacity.

Results. The findings revealed that the cardiorespiratory endurance level of male students was categorized as excellent, with an average VO2 Max of 63.27 ml/kg/min, achieved by 30 students (71.42%). Similarly, female students also demonstrated an excellent category, with an average VO2 Max of 56.21 ml/kg/min, achieved by 13 students (92.85%).

Conclusion. In general, the cardiorespiratory endurance of Penjaskesrek FKIP USK students from the class of 2023 is classified as excellent. Based on these results, it is recommended that a structured and continuous physical fitness training program be implemented to maintain and improve students' cardiorespiratory endurance. Furthermore, the study suggests that the study program should reinstate regular physical fitness tests as part of the routine evaluation of students' physical capabilities to support their readiness for practice-based coursework.

Keywords: Cardiorespiratory Endurance , VO2 Max, Physical Fitness, Physical Education Students.

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Introduction

Lack of physical activity can significantly affect an individual's physical fitness, making it difficult to perform daily physical tasks optimally. One of the most important components of physical fitness is cardiorespiratory endurance. According to Irianto (2002:72), endurance is defined as the ability to perform physical work over an extended period of time. Endurance is closely related to the duration and intensity of physical activity—the longer the duration and the higher the intensity that an individual can sustain, the better their endurance level. Febriyanti et al. (2015:2) further emphasize that good cardiorespiratory endurance enhances a person's capacity to perform physical work for longer durations and at greater intensities. Cardiorespiratory endurance plays a crucial role in supporting physical performance, athletic achievement, academic success, work productivity, and the ability to perform tasks effectively without experiencing significant fatigue.

This component is especially important for students in the Physical Education, Health, and Recreation Study Program (Penjaskesrek), who are required to participate in both theoretical and practical courses on a daily basis. In addition to possessing talent and interest in sports, these students must also maintain a high level of physical fitness and optimal health. Physical fitness and overall health are essential for enhancing learning abilities and successfully completing academic tasks. Students who are physically active typically demonstrate better cardiorespiratory endurance and physical fitness, which positively impacts their academic performance compared to those with lower fitness levels. According to Tona et al. (2017:171), cardiorespiratory endurance is the most critical factor in determining an individual's physical fitness, serving as a key indicator of athletic performance and general physical condition.

Based on interviews conducted with students from the class of 2023, several factors were found to influence their cardiorespiratory endurance, including diet, rest, daily activities, and exercise habits. Nutritional intake varied among students; some reported irregular meal times and inadequate nutrient intake, while others maintained consistent eating schedules. Rest patterns also differed, with some students getting the recommended eight hours of sleep per night and others sleeping less. Additionally, students engaged in varying levels of activity outside their academic schedule; some rested at home after lectures, while others continued with sports training. Exercise frequency was also inconsistent—some students exercised once a week, others two or three times a week, daily, or not at all. Among

these factors, physical activity or exercise was identified as the most significant contributor to cardiorespiratory endurance.

The importance of this research lies in the fact that cardiorespiratory endurance is a primary component of physical fitness that directly supports learning quality and physical activity among Penjaskesrek students. These students are expected to excel not only in theoretical knowledge but also in practical sports activities. Therefore, assessing their fitness levels—particularly cardiorespiratory endurance—is essential as a benchmark for their readiness to engage in practice-based courses at FKIP USK.

The novelty of this study is the provision of up-to-date data on the cardiorespiratory endurance levels of Penjaskesrek FKIP USK students from the class of 2023. This specific cohort had not previously been studied in this regard. Furthermore, this study offers new insights into the physical fitness condition of students after the COVID-19 pandemic, which likely affected their activity levels and overall fitness.

The urgency of this research stems from the discontinuation of physical fitness tests as an admission requirement for new Penjaskesrek students at FKIP USK. These tests were previously an important tool for evaluating the baseline physical abilities of incoming students, which are crucial for their participation in physically demanding practical courses, such as athletics, soccer, and fitness training. This study is expected to serve as a reference for program administrators to reconsider the implementation of regular physical fitness assessments to ensure and maintain the quality of students' physical fitness.

Another issue is the absence of mandatory physical fitness tests, as was practiced with previous cohorts. Such tests provided a clear picture of new students' physical readiness, which is essential when they begin practice-based courses in the field, including subjects like athletics, football, and physical fitness training.

Materials and Methods

Study participant

The population in this study consisted of all students enrolled in the Physical Education, Health, and Recreation (Penjaskesrek) Program at the Faculty of Teacher Training and Education (FKIP), Universitas Syiah Kuala (USK), class of 2023. A population is defined as the entire group of people, events, or objects that a researcher intends to study (Sekaran & Bougie, 2017:121). In other words, it encompasses the total collection of measurements, objects, or individuals being examined. This study employed purposive sampling, a technique that selects participants based on specific considerations (Sugiyono, 2007:85). Due to limitations in time and resources, a sample of 56 students was chosen as

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representatives from the Penjaskesrek FKIP USK class of 2023. Data were collected through a 15-minute run test, known as the Balke Test, which aims to assess cardiorespiratory endurance by estimating each participant's VO2 Max. During the test, participants were instructed to run continuously for 15 minutes, after which the total distance covered was recorded. The results were then used to calculate their VO2 Max, providing an indication of their aerobic endurance levels.

Study Organization

This study employed a quantitative approach because the data collected was based on information provided by respondents, allowing the researcher to analyze the data in numerical form. According to Sugiyono (2019), quantitative research is a method grounded in the philosophy of positivism and follows the principles of scientific inquiry, as it adheres to empirical, objective, measurable, rational, and systematic criteria. The type of research used in this study is descriptive research, which aims to measure the abilities or characteristics possessed by individuals. As stated by Sugiyono (2019:206), descriptive research is conducted to identify the existence and value of independent variables, either for a single variable or more, without making comparisons or examining relationships between variables. This research specifically aimed to determine the cardiorespiratory endurance levels of students enrolled in the Physical Education, Health, and Recreation (Penjaskesrek) Program at FKIP Universitas Syiah Kuala (USK), class of 2023.

Statistical Analysis

VO2 Max : Aerobic capacity measured in ml O2/kg body weight/minute

X : Distance covere dinmeters

15 : Duration of the run in 15 minutes

The illustration above explains the variables used to calculate VO2 Max. It shows that VO2 Max represents the aerobic capacity (ml O2/kg body weight/min), which is determined based on the distance covered (X) by the participant during a 15-minute run.

Results

Based on the data collected and analyzed using the predetermined statistical approach, the results are as follows:

Table 1. Percentage of 15-Minute Run Results for Male Students

No	Category	Frequency	Percentage
1	Excellent	30	71.42%
2	Good	11	26.19%
3	Fair	1	2.38%

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4	Poor	1	2.38%
5	Very Poor	0	0%
	Total	**42**	**100%**

For a clearer illustration of the cardiorespiratory endurance levels among Penjaskesrek FKIP USK male students, refer to the following diagram:

Table 2 Percentage of 15-Minute Run Results for Female Students**.**

No	Category	Frequency	Percentage
1	Excellent	13	92.85%
2	Good	0	0%
3	Fair	1	7.14%
4	Poor	0	0%
5	Very Poor	0	0%
	Total	**14**	**100%**

For a clearer illustration of the cardiorespiratory endurance levels among Penjaskesrek FKIP USK female students, refer to the following diagram:

Discussion

Based on the results of the study described previously, the levels of cardiorespiratory endurance can be explained as follows: (1) male students were classified in the excellent category, with a total of 30 students representing 71.42%, and an average VO2 Max score of 63.27 ml/kg/min; (2) female students were also classified in the excellent category, with 13 students representing 92.85%, and an average VO2 Max score of 56.21 ml/kg/min. These findings can serve as valuable input for lecturers to raise students' awareness of the importance of improving their cardiorespiratory endurance. This can be achieved by encouraging better nutritional intake, engaging in regular physical exercise, and adopting healthier lifestyles. Furthermore, when delivering practical course materials, especially in game-based formats, lecturers are expected to foster active student participation in training and gameplay, as these activities can gradually enhance students' physical fitness.

Cardiorespiratory endurance is a crucial component that must be possessed by physical education students. With adequate endurance, students will be better prepared to complete various practical activities and coursework in the physical education program. Most of the subjects in this program involve physical movements and exercises, making cardiorespiratory endurance an essential factor for students to succeed in their studies. The significance of cardiorespiratory endurance for students is not limited to academic purposes;

it also plays an important role in enhancing overall physical health, promoting emotional and social well-being, fostering a spirit of sportsmanship, and encouraging healthy competition.

One of the key indicators of a person's health and fitness is their physical appearance, including the ability to perform physical activities without experiencing excessive fatigue. Individuals with good physical fitness typically maintain energy and enthusiasm even after completing strenuous activities. According to Wahjoedi (2005:59), cardiorespiratory endurance is vital in supporting muscle function by ensuring adequate oxygen uptake and distribution to active muscle tissues, enabling efficient metabolism. Tintingon et al. (2022) also state that optimal cardiorespiratory endurance is the body's physiological ability to minimize fatigue during prolonged and continuous activities. When cardiorespiratory endurance is well developed, the heart, respiratory system, and blood circulation will function effectively. Consequently, improved cardiorespiratory endurance is expected to enhance both the quality and quantity of students' learning experiences, contributing to better academic performance and achievements during their studies.

Conclusion

Based on the results of the study, it can be concluded that the cardiorespiratory endurance levels of both male and female students in the Physical Education, Health, and Recreation Program (Penjaskesrek), FKIP Universitas Syiah Kuala, are generally classified as excellent. This indicates that the students possess a high level of aerobic fitness, which is essential for supporting their academic activities, particularly in practical and physical education courses.

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