IJPESS
Indonesian Journal of Physical Education and Sport Science
p-ISSN 2775-765X | e-ISSN 2776-0200
Volume 3, No. 2, September 2023 Page. 259-264
http://journal.unucirebon.ac.id/index.php ijpess

Vo2max Ability Profile of Physical Education, Health and Recreation Students at University Nadhlatul Ulama Cirebon

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Received: 20 August 2023, Approved: 20 September 2023, Published: 30 September 2023

Abstract

Study purpose. Physical fitness is an important aspect in supporting daily activities, health, and sports performance. Initial observations indicate that students in the PJKR UNU Cirebon study programme do not yet have data related to their level of physical fitness, particularly their maximum oxygen volume capacity (VO_2max). This study aims to determine the VO_2max capacity of PJKR UNU Cirebon students.

Materials and method. The research method used was a quantitative descriptive approach with a survey design without any intervention on the subjects. The instrument used was the bleep test or multi-stage test involving running 20 metres. The study subjects included 20 students from the PJKR programme at UNU Cirebon.

Results. The results showed that 5 students (25%) were in the poor physical fitness category, 10 students (50%) in the moderate category, 5 students (25%) in the good category, and none reached the very good category.

Conclusion. Thus, it can be concluded that the majority of PJKR UNU Cirebon students have moderate physical fitness levels.

Keywords: Profile, Maximum Oxygen Volume (Vo2max), Student

DOI: https://doi.org/10.52188/ijpess.v3i2.1427

Introduction

Physical fitness plays a central role in supporting the quality of life and productivity of individuals, especially for students in the Physical Education, Health, and Recreation (PJKR) programme who are being prepared as educators in the field of physical education. One of the main components of physical fitness is aerobic capacity, which is physiologically measured through the level of maximum oxygen consumption or VO_2Max (maximum oxygen volume). A high VO_2Max level reflects the efficiency of the cardiovascular and respiratory systems in supporting prolonged physical activity (Aziz et al., 2023; Nieto-López et al., 2020; Satriawan et al., 2023). PJKR students are required to have high physical fitness as preparation for learning activities, sports practice, and setting an example for students. However, in reality, it is often found that some students do not have adequate VO_2Max levels. This can be caused by a lack of

active lifestyles, sedentary lifestyles, and a lack of awareness of the importance of regular aerobic exercise.

Based on field observations, the observation identified an issue regarding UNU Cirebon PJKR students, namely the absence of VO2Max data, resulting in the unknown level of physical fitness among UNU Cirebon PJKR students. It is hoped that with good physical fitness levels, students can quickly recover their condition, enabling them to be ready to resume their studies for the next course. (Erickson & Sherry, 2017; Liza et al., 2024; Turnagöl, Koşar, Güzel, Aktitiz, & Atakan, 2022) One factor that can accelerate the recovery process is building good endurance, as endurance essentially refers to an individual's ability to perform physical activities without experiencing significant fatigue. Thus, with a brief rest, students can quickly regain their fitness.

Therefore, to determine the VO2Max capacity of PJKR UNU Cirebon students, it is necessary to conduct a physical fitness test to determine their maximum oxygen volume (VO2max) capacity. One indicator of this is the lack of VO2max data for PJKR UNU Cirebon students.

Materials and Methods

Study participants

This study involved sixth-semester students of the Physical Education, Health, and Recreation (PJKR) Study Programme at Nahdlatul Ulama University (UNU) Cirebon in the 2023/2024 academic year. The total population consisted of 30 students. Purposive sampling was used to determine the sample, selecting participants based on specific inclusion criteria: actively enrolled in the sixth semester, physically healthy and able to perform the VO_2Max test, and willing to participate in the study as indicated by informed consent.

Study organization

This research method uses a quantitative descriptive method and this type of research is a survey (Faridah, Rubiyatno, Adam, & Suganda, 2021; Risjanna et al., 2022; Setiawan, Priyanto, & Yudhistira, 2023). This means that the researcher does not give treatment to the research subjects, so it is not an exposfacto or experimental study. This study only seeks to determine the Vo2max capacity of PJKR UNU Cirebon students.

Statistical analysis

The data collected from the VO_2Max test was analysed using descriptive statistical methods. Before analysis, all raw data was compiled and entered into SPSS software (version 25.0) for processing (Nugroho, Nasrulloh, Gula, Mulyawan, & Pradana, 2024; A. P. Singh & Mishra, 2020; V. Singh, Kulandaivelan, Prakash, Punia, & Kulandaivelan, 2017). The analysis procedure included:

1. Descriptive statistics, such as mean, minimum, maximum, and standard deviation, to summarise the participants' VO_2Max performance.
2. Frequency and percentage distributions were used to categorise participants into five VO_2Max fitness levels according to normative standards: Very Poor, Poor, Fair, Good, and Very Good.
3. A normality test was conducted using the Kolmogorov-Smirnov test to evaluate whether the VO_2Max data were normally distributed, which is a prerequisite for certain inferential analyses (although no inferential statistics were applied in this descriptive study).
4. The results were presented in tables and graphs to provide a clear picture of the distribution of VO_2Max among participants. This analysis helps draw meaningful conclusions about the aerobic fitness levels of PJKR students.

Results

The implementation of this research was conducted on PJKR UNU Cirebon students, with the following research procedures. On Friday, 28 December 2023, the researcher explained the Vo2 max assessment instrument that would be given to the students later, then provided instructions for the selected students to prepare for the test, and also advised the students to prepare themselves individually by eating nutritious food, getting regular sleep, and avoiding excessive activities.

Table 1. Maximum oxygen volume data for PJKR UNU Cirebon students.

NO	NAMA	USIA	TB	BB	LEVEL	BALIKAN	HASIL Vo2max
1	ARF	21	168	60	9	11	46,8
2	JAL	19	168	54	10	2	47,4
3	MSN	20	162	70	6	4	34,4
4	RZI	19	184	82	7	5	38,2
5	PRJ	19	170	62	7	3	37,5
6	AGN	22	165	55	10	4	48,0
7	AHM	21	163	60	8	2	40,5
8	DPA	23	172	62	7	5	38,2
9	HSN	20	166	55	10	1	47,1
10	PRM	22	170	63	7	9	39,6
11	SLM	18	162	65	7	4	37,8
12	AGS	19	165	70	6	2	33,6
13	IDR	21	168	75	6	1	33,2
14	ADN	18	178	65	9	11	46,8
15	FZN	20	175	75	7	1	36,8
16	ALI	21	166	80	6	1	33,2
17	ADL	31	164	60	7	10	39,9
18	UMR	19	170	65	7	9	39,6
19	UDN	21	169	70	6	5	34,7
20	AMR	19	167	60	8	4	41,1
JUMLAH		**413**	**3372**	**1308**			**794,4**
MEAN		**20,65**	**168,6**	**65,4**			**39,72**
NILAI MAX		**31**	**184**	**82**			**48,0**
NILAI MIN		**18**	**163**	**54**			**33,2**
SD		**2,725344**	**5,323533**	**7,838367**			**4,912087**

Based on the table in this study, the average age of respondents was 20.65 years, with a standard deviation of 2.725344, a maximum age of 31 years, and a minimum age of 18 years. The average height of respondents was 168.6 cm, with a standard deviation of 5.323533, a maximum height of 184 cm, and a minimum height of 163 cm. The average weight of respondents was 6 (tb) of the respondents is 168.6 cm, with a standard deviation of 5.323533, a maximum height of 184 cm, and a minimum height of 163 cm. The average body weight (bb) of the respondents is 65.4 kg, with a standard deviation of 7.838367, a maximum weight of 82 kg, and a minimum weight of 54 kg.

The data collected and analysed were the results of the bleeptest method obtained from the research subjects. This was done to determine the maximum oxygen volume (Vo2 max) of PJKR UNU Cirebon students.

Statistical calculations using Microsoft Excel computer software from the bleeptest data of students who took the test, namely maximum score = 48.0, minimum score = 33.2, average = 39.72, standard deviation = 4.912087.

Next, the data was arranged in a frequency distribution table based on cardiorespiratory categorisation norms. Maximum oxygen volume (VO2 max) based on the bleeptest was divided

into five categories, namely low, moderate, fair, good, and high. The frequency distribution of the cardiorespiratory levels of PJKR UNU Cirebon students who took the test is as follows.

Table 2. Frequency Distribution of Cardiorespiratory Fitness of PJKR UNU Cirebon students.

NO	NORMA	KATEGORI	FREKUENSI	PRESENTASE
1	≥ 54,50	BAIK SEKALI	0	0
2	46,07-54,49	BAIK	5	25%
3	37,66-46,06	SEDANG	10	50%
4	29,14-37,65	KURANG	5	25%
5	≤ 29,13	KURANG SEKALI	0	0
JUMLAH			**20**	**100**

Based on the VO2Max level table, it was found that 5 students (25%) had poor physical fitness, 10 students (50%) had moderate physical fitness, 5 students (25%) had good physical fitness, and no students had excellent physical fitness. The most frequent category was moderate (50%), indicating that the maximum oxygen uptake of PJKR UNU Cirebon students is predominantly moderate. If represented in a circular diagram, Figure 1 below shows the bar chart of VO2Max capacity for PJKR UNU Cirebon students.

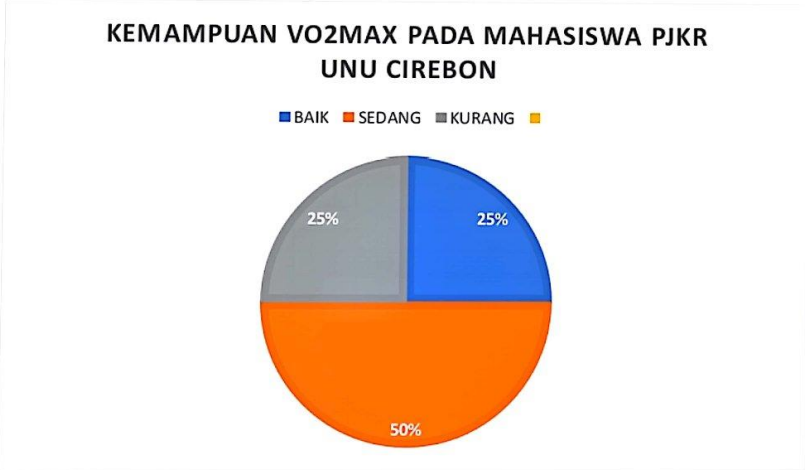

Figure 1. Circle diagram of Maximum Oxygen Volume (Vo2 Max) of PJKR UNU Cirebon students.

Discussion

Based on the research results, the discussion in this study can be explained that, based on the average maximum oxygen volume (VO2max) of PJKR UNU Cirebon students, which is 39.72, it is classified as moderate. The research activities were conducted in accordance with the research procedures established by the programme. The research data obtained through the Multi Fitness Test (MFT) revealed that the maximum aerobic endurance capacity (VO2Max) of students in the Physical Education, Health, and Recreation programme was categorised as moderate (Kerksick et al., 2018; Rampinini & Maridaki, n.d.; Savvides, Giannaki,

Vlahoyiannis, Stavrinou, & Aphamis, 2020). The research results indicate that the poor maximum aerobic endurance capacity (VO2max) of PJKR UNU Cirebon students is caused by several factors, including the timing of the test, particularly weather conditions, the readiness of test participants, particularly in terms of physical condition, motivation, and activity levels.

Conclusions

Based on the research findings and discussion, it can be concluded that the maximum oxygen uptake (VO2max) capacity of the 20 students in the Physical Education and Health Education programme at UNU Cirebon shows that 5 students (25%) have poor physical fitness, 10 students (50%) have moderate physical fitness, 5 students (25%) have good physical fitness, and none are in the excellent category. The highest frequency is in the moderate category at 50%, indicating that the physical fitness of PJKR UNU Cirebon students is predominantly moderate.

Acknowledgment

Thank you to all those involved in this research. For the sake of the perfection of this research, the author greatly appreciates constructive suggestions and criticism. Hopefully, this journal article will be useful and can make a meaningful contribution to those who need it.

Conflict of interest

There is none.

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Cite this article as: Ramadhan, Abdulah Hafid et al. (2025). Vo2max Ability Profile of Physical Education, Health and Recreation Students at University Nadhlatul Ulama Cirebon. *Indonesian Journal of Physical Education and Sport Science (IJPESS), 3*(2), 259-264. https://doi.org/10.52188/ijpess.v3i2.1427