

TheEffect Of Fartlek

by Fais Oktaviansyah

Submission date: 12-Oct-2026 03:01PM (UTC+0700)

Submission ID: 3057597835

File name: document_9.pdf (448.42K)

Word count: 2200

Character count: 12704



The Effect Of Fartlek Training on the Increase of Cardiorespiratory Endurance in Kumite Karateka

Fais Oktaviansyah¹, Ayu Rizky Febriani², Dewi Anggraeni³,
Mohammad Nanang Himawan Kusuma⁴, Jajang Dede Mulyani⁵

^{1,2,3,4,5}Department of Physical Education, Faculty of Health Sciences, Universitas Jenderal Soedirman, Indonesia

email: faisokta21@gmail.com¹, ayu.rizky.febriani@unsoed.ac.id², dewianggraeni@unsoed.ac.id³,
nanang.kusuma@unsoed.ac.id⁴, jajang.dede.mulyani@unsoed.ac.id⁵



: <https://doi.org/10.20884/1.paju.2025.7.1.15773>

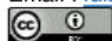
Abstract

Cardiovascular endurance is a crucial component for karate athletes, especially in kumite, where matches require high aerobic and anaerobic capacity. However, the lack of consistent physical training programs often leads to suboptimal performance in student athletes. This study aimed to determine the effect of Fartlek training on improving cardiorespiratory endurance in karate athletes of the Gokasi Student Activity Unit, Universitas Jenderal Soedirman. This research employed a quasi-experimental design with a nonequivalent control group. The population consisted of 32 athletes, from which 20 samples (12 males and 8 females) were selected using purposive sampling. The treatment group underwent Fartlek training for 16 sessions over 4–5 weeks, while the control group continued routine practice without intervention. Cardiorespiratory endurance was measured using the Multistage Fitness Test (MFT) to obtain $VO_2\text{max}$ values. Data analysis used paired sample t-test and independent sample t-test with a significance level of 0.05. Result: The paired sample t-test showed a significant increase in $VO_2\text{max}$ in the treatment group ($p = 0.000$), while no significant change was observed in the control group ($p = 0.651$). The independent t-test revealed a significant difference between the treatment and control groups in post-test results ($p = 0.047$). Conclusion: Fartlek training has a significant effect on improving cardiorespiratory endurance ($VO_2\text{max}$) in karate athletes. Therefore, it can be considered an effective training method to enhance performance in kumite athletes.

Keywords: *Cardiorespiratory endurance, Fartlek training, Karate, Kumite, $VO_2\text{max}$*

Alamat Koresponden : Faculty of Health Sciences, Universitas Jenderal Soedirman

Email : faisokta21@gmail.com



Jurnal Physical Activity Journal (PAJU) This work is licensed under a [Creative Commons Attribution 4.0 International License](#).

INTRODUCTION

Exercise is a physical activity performed regularly to maintain physical and mental health. One form of sport that is developing within the campus environment is the Student Activity Unit (UKM), which serves as a platform for students to explore and enhance their interests and talents, including in martial arts such as karate. Karate is a martial art originating from Okinawa, Japan, which emphasizes techniques of striking, kicking, and self-defense. In karate, there are three main components: *kihon* (basic techniques), *kumite* (sparring), and *kata* (a sequence of movements). Karate athletes, especially in the *kumite* category, require excellent physical condition to compete optimally.

Key factors that support karate athletes' performance include physical condition, technique, strategy, and mental strength (Hindiari and Wismanadi 2022). One crucial physical component is cardiorespiratory endurance, which refers to the capacity of the heart and lungs to support prolonged physical activity (Aliffudin et al. 2022). In this context, VO2MAX is an important indicator for determining an athlete's endurance level, as it is directly related to the body's ability to distribute oxygen efficiently (Noviary 2020). Athletes with high VO2MAX tend to have better endurance and are less likely to experience excessive fatigue during matches. Therefore, effective training methods are needed to increase cardiorespiratory endurance, particularly among *kumite* athletes.

One such training method is *fartlek* training. *Fartlek* training combines varying running speeds to improve aerobic endurance and muscle strength (Pranata 2020). This method has been proven to enhance VO2MAX and endurance in athletes across various sports, including karate (Ryzki et al. 2021). By applying *fartlek* training, it is expected that *kumite* athletes will achieve better endurance, enabling them to perform optimally in every match round.

At the GOKASI Karate Student Activity Unit of Jenderal Soedirman University (UNSOED), there are indications that the physical condition of *kumite* athletes is still suboptimal, which has led to decreased performance in championships. Athletes often experience early fatigue during matches, causing them to play defensively and lose points. Additionally, the lack of certified coaches poses a challenge to athlete development. Based on these issues, this study aims to analyze the effect of *fartlek* training on the increase of cardiorespiratory endurance in *kumite* athletes of the GOKASI Karate UKM at UNSOED. Previous studies have shown that *fartlek* training can increase cardiorespiratory endurance

and VO₂MAX (Manggala et al. 2023). Thus, this research is expected to contribute to improving *kumite* athletes' performance through the application of effective training methods.

METHOD ⁸

This study used a quantitative approach with a Quasi-Experimental Nonequivalent Control Group Design. The participants consisted of 20 *kumite* karateka (12 males and 8 females) from the Gokasi Student Activity Unit at Jenderal Soedirman University. They were selected using purposive sampling based on specific inclusion criteria from a total population of 32 students. Participants were divided into treatment and control groups through an ordinal pairing method (A-B-B-A). The treatment group received a *fartlek* training intervention conducted over 16 sessions within a period of 4–5 weeks, while the control group continued with their regular physical training routines. Cardiorespiratory endurance (VO₂MAX) was measured using the Multistage Fitness Test (MFT) through pretest and posttest procedures.

The data were analyzed using SPSS version 25. Statistical tests included the Shapiro-Wilk test for normality, Levene's test for homogeneity, and the Paired Sample T-Test for hypothesis testing. The normality test ensured the data followed a normal distribution, while the homogeneity test evaluated the equality of variance between groups. The hypothesis test assessed the effectiveness of *fartlek* training on improving VO₂MAX. A significance level of $p < 0.05$ was used as the threshold; if this criterion was met, the alternative hypothesis was accepted, indicating a significant effect of *fartlek* training on the cardiorespiratory endurance of the participants.

RESULT

The paired sample t-test analysis showed that the treatment group experienced a significant increase in VO₂Max values from 27.07 to 33.52 ml/kg/min ($p = 0.000$). Meanwhile, the control group did not show a significant change, with VO₂Max values from 27.11 to 27.43 ml/kg/min ($p = 0.651$). Furthermore, the independent sample t-test on the posttest results between the two groups indicated a significant difference ($p = 0.047$), confirming that *fartlek* training had a greater impact on improving cardiorespiratory endurance compared to the control group.

Hypothesis Testing (Paired Sample T-Test)

Table 1. Results of Paired Sample T-Test

		Paired Sample Test			
		Pretest Mean	Posttest Mean	Sig. (p)	Conclusion
VO2MAX	Treatment	27.07	33.52	0.000	Significant
	Control	27.11	27.43	0.651	Not Significant

Table 2 shows the results of the paired sample t-test analysis. The treatment group experienced a significant increase in VO₂Max values, from a mean pretest score of 27.07 to a posttest score of 33.52 ($p = 0.000 < 0.05$). This indicates that Fartlek training significantly improved the cardiorespiratory endurance of karate athletes. On the other hand, the control group did not show a significant change, with a mean pretest score of 27.72 and a posttest score of 27.55 ($p = 0.651 > 0.05$).

Test of Difference in Effects (Independent Sample T-Test)

Table 2. Results Independent Sample T-Test

Independent Samples T-Test			
	Mean Posttest	Sig. (2-tailed)	Conclusion
Posttest Treatment & Control	33.52 & 27.43	.047	Significant

Furthermore, the independent sample t-test on posttest data (Table 2) revealed a p-value of 0.047 (< 0.05), indicating a significant difference in VO₂Max improvements between the treatment and control groups. These results confirm that the observed improvement was strongly associated with the implementation of Fartlek training.

DISCUSSION

The results of this study show that Fartlek training has a significant effect on improving the cardiorespiratory endurance of karate athletes in the kumite category. This was evidenced by the increase in VO₂Max in the treatment group compared to the control group, with a significant difference ($p = 0.047$). The findings support the assumption that interval-type endurance training, such as Fartlek, is effective in stimulating both aerobic and anaerobic energy systems.

This is in line with Sukma et al. (2017), who reported that Fartlek training significantly improved cardiovascular endurance in combat sports athletes. Similarly, Ryzki et al. (2021) found that Fartlek training increased $VO_2\text{Max}$ levels due to the varied running intensities that enhance oxygen uptake efficiency and accelerate recovery. The mechanism can be explained by the fact that Fartlek training stresses the heart and lungs in a fluctuating manner, which encourages greater adaptation of the cardiovascular and respiratory systems (Bompa & Buzzichelli, 2015).

In the context of karate, especially kumite, athletes are required to perform explosive movements in short durations but repeatedly throughout the bout. This condition requires not only anaerobic power for fast attacks but also aerobic capacity to sustain effort and ensure rapid recovery between exchanges (Chania et al., 2022). The improvement of $VO_2\text{Max}$ in the treatment group shows that Fartlek training is highly relevant to the demands of karate kumite competition.

Meanwhile, the control group did not experience a significant improvement in $VO_2\text{Max}$. This may be due to the lack of training frequency and consistency, as their routine only consisted of jogging every two weeks combined with regular practice. According to Harsono (2017), endurance training should ideally be conducted at least three times a week to achieve optimal adaptation. Inconsistent training reduces the stimulus needed for cardiorespiratory improvement (Kenney et al., 2019).

Therefore, the findings of this study emphasize the importance of structured and consistent endurance training programs such as Fartlek in improving the performance capacity of karate athletes. For practical application, coaches and trainers are encouraged to integrate Fartlek training into their athletes' weekly training plans, especially during the preparation phase before competitions.

CONCLUSION

This study concludes that Fartlek training has a significant effect on improving the cardiorespiratory endurance of karate athletes in the kumite category. The treatment group showed a significant increase in $VO_2\text{Max}$, while the control group did not show significant changes. Furthermore, the independent sample t-test demonstrated a significant difference between the treatment and control groups in the posttest results. These findings indicate that the application of Fartlek training can effectively improve athletes' $VO_2\text{Max}$ and

support the physical demands of karate competitions. Coaches are recommended to include Fartlek training in their training programs to enhance cardiorespiratory fitness and optimize performance.

REFERENCE

- Aliffudin, Muhammad Habib et al. 2022. "Pengaruh Latihan Fartlek Dan Circuit Training Dalam Peningkatan Vo2Max Pada Atlet Karate Kumite Dojo Inkanas Resmata Polres Kota Madiun." *Plyometric : Jurnal Sains Dan Pendidikan Keolahragaan* 2(1):36–43. doi: 10.32534/ply.v2i1.3481.
- Bunga Willena Chania, Aref Vai, Ni Putu Nita Wijayanti, & Aulia Gusdernawati (2022). "Hubungan Menstruasi Terhadap Daya Tahan Kardiovaskular Atlet Karate Putri." *Jurnal Penjakora*, 9(1), 43–50.
- Bompa, Tudor O. G. Gregory Haff, and Carlo A. Buzzichelli. 2015. *Periodization of Strength Training for Sports*.
- Harsono, P. D. M. S. 2017. *Kepelatihan Olahraga Teori Dan Metodologi*. Pt Remaja Rosdakarya.
- Hindiari, Yuandika, and Himawan Wismanadi. 2022. "Tingkat Kecemasan Atlet Karate Menjelang Pertandingan Pada Anggota Cakra Koarmatim." *Jurnal Kesehatan Olahraga* 10(01):179–86.
- Kenney, W. L., Wilmore, J. H., & Costill, D. L. (2019). *Physiology of Sport and Exercise* (7th ed.). Champaign, IL: Human Kinetics.
- Manggala, Aridin et al. 2023. "Latihan Fartlek Dan Latihan Cross Country Untuk Meningkatkan VO2MAX Pemain Sekolah Sepakbola." *Jurnal Educatio FKIP UNMA* 9(4):1734–39. doi: 10.31949/educatio.v9i4.6020.
- Noviary, S. .. 2020. "Perbandingan Hasil Kapasitas Aerobik (VO2Max) Pada Atlet Karate Putra Under-Senior Nomor Kumite Antara Dojo Smaneka Kabupaten Kediri Dan Puslatda Jatim." *Jurnal Kesehatan Olahraga* 8(1):93–98.
- Pranata. 2020. "Latihan Fartlek Untuk Meningkatkan Vo2 Max Pemain Futsal Bbg." *Penjaskesrek Journal* 7(1):134–46. doi: 10.46244/penjaskesrek.v7i1.1014.
- Ryzki, Adilla et al. 2021. "Jurnal Patriot." *Jurnal Patriot* 3(March):71–81. doi: 10.24036/patriot.v.
- Sukma, Rachmawati et al. 2017. "Pengaruh Latihan Fartlek Terhadap Daya Tahan Kardiovaskuler Peserta Ekstrakurikuler Karate Smk Negeri 4 Pontianak." *Jurnal Pendidikan Dan ...* 1–9.

TheEffect Of Fartlek

ORIGINALITY REPORT

17%

SIMILARITY INDEX

15%

INTERNET SOURCES

6%

PUBLICATIONS

1%

STUDENT PAPERS

PRIMARY SOURCES

1	repository.poltekkes-malang.ac.id Internet Source	2%
2	jone.poltekkes-surabaya.ac.id Internet Source	1%
3	Deatri Fizariani, Eka Supriatna, Rubiyatno Rubiyatno. "Effectiveness of setter ability in the provincial sports week championship in 2022", Jurnal Maenpo : Jurnal Pendidikan Jasmani Kesehatan dan Rekreasi, 2023 Publication	1%
4	journal.unesa.ac.id Internet Source	1%
5	www.uc.edu Internet Source	1%
6	ijmra.ijpbms.com Internet Source	1%
7	journal.uniga.ac.id Internet Source	1%
8	journal.unpas.ac.id Internet Source	1%
9	jurnal.umt.ac.id Internet Source	1%
10	jurnalrespirologi.org Internet Source	1%
11	slimemolds.org Internet Source	1%
12	ojs.unsulbar.ac.id Internet Source	1%
13	www.ejurnal.warmadewa.ac.id Internet Source	1%
14	www.sajog.org.za Internet Source	1%

15	brief.land Internet Source	1%
16	pdfs.semanticscholar.org Internet Source	1%
17	ejurnal.untag-smd.ac.id Internet Source	1%
18	ideas.repec.org Internet Source	1%
19	www.journal.privietlab.org Internet Source	1%

Exclude quotes	On	Exclude matches	< 1%
Exclude bibliography	On		

TheEffect Of Fartlek

[GRADEMARK REPORT](#)

FINAL GRADE

GENERAL COMMENTS

/0

PAGE 1

PAGE 2

PAGE 3

PAGE 4

PAGE 5

PAGE 6