

**ANALISIS PENGGUNAAN *DEVICE POLAR* DALAM PERHITUNGAN
EXERCISE ENERGY EXPENDITURE DAN *ENERGY AVAILABILITY*
(Studi Pada Atlet Bola Voli di Yayasan Generasi Indonesia Terpadu
Sumedang)**



SKRIPSI

diajukan untuk memenuhi salah satu syarat memperoleh gelar
Sarjana Gizi

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**PROGRAM STUDI GIZI
FAKULTAS PENDIDIKAN OLAAHRAGA DAN KESEHATAN
UNIVERSITAS PENDIDIKAN INDONESIA**

2025

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gelar Sarjana Gizi pada Fakultas Pendidikan Olahraga dan Kesehatan

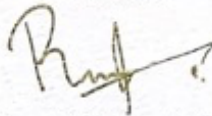
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ENERGY AVAILABILITY
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KATA PENGANTAR

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ABSTRAK

Analisis Penggunaan *Device Polar* Dalam Perhitungan *Exercise Energy Expenditure* Dan *Energy Availability* (Studi Pada Atlet Bola Voli Di Yayasan Generasi Indonesia Terpadu Sumedang)

Latar belakang: Penggunaan *Device Polar* seringkali menghasilkan estimasi nilai energi kurang akurat. Diperlukan informasi yang dapat memastikan ketepatan perhitungan kebutuhan energi atlet. **Tujuan penelitian:** menganalisis perbedaan nilai EEE dan EA dihitung menggunakan metode METs dan *Device Polar* pada atlet bola voli Yayasan Generasi Indonesia Terpadu Sumedang. **Metode:** penelitian ini merupakan studi *cross-sectional* dengan pendekatan deskriptif analitik. Populasi sebanyak 72 atlet, sampel 39 atlet sesuai kriteria inklusi dan eksklusi. Data dikumpulkan melalui pengukuran antropometri, *food record* 24 jam, analisis komposisi tubuh, serta pencatatan aktivitas menggunakan *Device Polar*. Analisis data dengan uji *Paired Samples T-Test* untuk variabel terdistribusi normal dan uji *Wilcoxon Signed Ranks Test* untuk variabel tidak terdistribusi normal. **Hasil:** Rata-rata EEE dihitung dengan metode METs $479,75 \pm 120,30$, sedangkan dengan *Device Polar* adalah $359,73 \pm 107,08$ kkal. Perhitungan nilai EA menggunakan *Device Polar* adalah $50,89 \pm 24,36$ kkal/kg FFM, sedangkan dengan menggunakan METs adalah $47,39 \pm 24,22$ kkal/kg FFM. Terdapat perbedaan nilai EEE sebesar 33,36% antara METs dan *Device Polar*, sedangkan pada perhitungan EA terdapat perbedaan nilai sebesar 7,39%. **Simpulan:** Terdapat perbedaan signifikan antara perhitungan METs dan *Device Polar* pada variabel EEE maupun EA. *Device Polar* cenderung memberikan estimasi EEE lebih rendah dan EA lebih tinggi dibandingkan metode METs.

Kata Kunci : *exercise energy expenditure, energy availability, metabolic equivalent, Device Polar, Bola Voli*

ABSTRACT

Analysis of Polar Device Usage in Calculating Exercise Energy Expenditure and Energy Availability (A Study on Volleyball Athletes at the Integrated Indonesian Generation Foundation Sumedang)

Background: The use of Polar Devices often results in inaccurate energy value estimates. Information is needed that can ensure the accuracy of calculating athletes' energy needs. **Objective:** to analyze the differences in EEE and EA values calculated using the METs method and Polar Devices in volleyball athletes from the Sumedang Integrated Indonesian Generation Foundation. **Methods:** This study is a cross-sectional study with a descriptive analytical approach. The population was 72 athletes, a sample of 39 athletes according to the inclusion and exclusion criteria. Data were collected through anthropometric measurements, 24-hour food records, body composition analysis, and activity recording using Polar Devices. Data analysis used the Paired Samples T-Test for normally distributed variables and the Wilcoxon Signed Ranks Test for non-normally distributed variables. **Results:** The average EEE calculated using the METs method was 479.75 ± 120.30 , while using the Polar Device was 359.73 ± 107.08 kcal. The EA value calculation using the Polar Device is 50.89 ± 24.36 kcal/kg FFM, while using METs is 47.39 ± 24.22 kcal/kg FFM. There is a difference in the EEE value of 33.36% between METs and the Polar Device, while in the EA calculation there is a difference in the value of 7.39%. **Conclusion:** There is a significant difference between the METs calculation and the Polar Device in both EEE and EA variables. The Polar Device tends to provide lower EEE estimates and higher EA than the METs method. **Keywords:** exercise energy expenditure, energy availability, metabolic equivalent, Polar Device, volleyball

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DAFTAR SINGKATAN

BIA	: <i>Bioelectrical Impedance Analysis</i>
DKBM	: Daftar Komposisi Bahan Makanan
EA	: <i>Energy Availability</i>
EC	: <i>Ethical Clearance</i>
EEE	: <i>Exercise Energy Expenditure</i>
EE	: <i>Energy Expenditure</i>
EI	: <i>Energy Intake</i>
FFM	: <i>Fat-Free Mass</i>
FIVB	: <i>Fédération Internationale de Volleyball</i>
GPAQ	: <i>Global Physical Activity Questionnaire</i>
HRmax	: <i>Maximum Heart Rate</i>
KEJURDA	: Kejuaraan Daerah
LEA	: <i>Low Energy Availability</i>
LPPM	: Lembaga Penelitian dan Pengabdian kepada Masyarakat
METs	: <i>Metabolic Equivalents</i>
NCAA	: <i>National Collegiate Athletic Association</i>
PAL	: <i>Physical Activity Level</i>
PAR	: <i>Physical Activity Rate</i>
PBVSI	: Persatuan Bola Voli Seluruh Indonesia
POM	: Pekan Olahraga Mahasiswa
PON	: Pekan Olahraga Nasional
PORPROV	: Pekan Olahraga Provinsi
RED-S	: <i>Relative Energy Deficiency in Sport</i>
RMR	: <i>Resting Metabolic Rate</i>
SPSS	: <i>Statistical Package for the Social Sciences</i>
TDEE	: <i>Total Daily Energy Expenditure</i>
TEE	: <i>Total Energy Expenditure</i>
YMCA	: <i>Young Men's Christian Association</i>

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