ABSTRAK

Perbedaan Hasil *6-Minute Walk Test* (6MWT) sebagai Indikator Kebugaran Kardiovaskular pada Anak SMP di Dataran Tinggi dan Dataran Rendah

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Latar belakang: Kebugaran kardiovaskular anak dapat dipengaruhi oleh usia, jenis kelamin, status gizi, derajat anemia dan lingkungan. Data kebugaran kardiovaskular berdasarkan ketinggian wilayah pada anak SMP di Indonesia masih terbatas.
Tujuan: Menganalisis kebugaran kardiovaskular pada anak SMP di dataran tinggi dan rendah dengan menggunakan *6-Minute Walk Test* (6MWT)
Metode: Penelitian kasus kontrol dengan 122 anak SMP usia 12–14 tahun sebagai subjek penelitian yang tinggal minimal dua tahun di dataran tinggi (n= 64 siswa) atau dataran rendah (n=58 siswa). Lokasi penelitian di dataran tinggi dengan ketinggian 1200 mdpl (Wonosobo) dan dataran rendah <200 mdpl (Semarang). Parameter kebugaran kardiovaskular yang dinilai adalah jarak 6MWT dan estimasi VO2 max. Faktor faktor risiko yang dapat memengaruhi kebugaran kardiovaskular yaitu usia, jenis kelamin, status gizi, aktivitas fisik, derajat anemia dan paparan asap rokok. Terdapatnya perbedaan kebubgaran kardiovaskular dinalisis menggunakan uji beda, faktor risiko dan perancu dianalisis dengan uji chi-square dan MANCOVA.
Hasil: Jarak 6MWT dan estimasi VO2 max lebih tinggi pada anak dataran tinggi dibandingkan dataran rendah (455,4 m vs 383 m; p<0,01 dan 25,53±3,37 vs 21±4.34 mL/kg/menit; p <0,01). Titik potong 6MWT sebesar 436 meter memiliki sensitivitas 56,3% dan spesifisitas 69%. Anak di dataran rendah berpeluang 7,3 kali lebih besar untuk tidak bugar (OR 7,3; 95%CI 3,2–16,6; p=0,0001). Aktivitas fisik dapat memengaruhi kebugaran kardiovaskular (p<0,01).
Kesimpulan: Kebugaran kardiovaskular pada anak usia 12-14 tahun di dataran tinggi lebih baik dibandingkan dataran rendah. Aktivitas fisik turut memengaruhi kebugaran kardiovaskular.

Kata kunci: 6MWT, kebugaran kardiovaskular, dataran tinggi, dataran rendah.

ABSTRACT

Differences in 6-Minute Walk Test (6MWT) Results as an Indicator of Cardiovascular Fitness among Junior High School Students Living in High- and Low-Altitude Areas

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Background: Children's cardiovascular fitness can be influenced by age, gender, nutritional status, degree of anemia and environmental factors. Data on among Indonesian adolescents remains limited.
Objective: To determine differences in 6-Minute Walk Test (6MWT) performance between children living at high and low altitude, identify associated factors, and determine the optimal 6MWT cutoff for cardiovascular fitness screening.
Methods: This case-control study included 122 students aged 12–14 years who had lived for at least two years in either a highland area (n=64) or a lowland area (n=58). The highland site was located at 1,200 m above sea level in Wonosobo, while the lowland site was below 200 m in Semarang. Cardiovascular fitness was assessed using 6MWT distance and estimated VO_2max. Potential influencing factors included age, sex, nutritional status, physical activity, anemia severity, and cigarette-smoke exposure. Group differences were analyzed using comparative tests, while risk and confounding factors were assessed using chi-square tests and MANCOVA
Results: The 6MWT distance and estimated VO_2 max was higher in high-altitude than low-altitude students (455.4 vs 383 m; $p<0.01$ and 25.53±3.37 vs 21±4.34 mL/kg/min; $p<0.01$). A 6MWT cut-off point 436 m had 56.3% sensitivity and 69% specificity. Low-altitude children had 7.3 times higher odds of poor cardiovascular fitness (OR 7.3; 95% CI 3.2–16.6; p=0.0001). Physical activity significantly influenced cardiovascular fitness ($p<0.01$).
Conclusion: Cardiovascular fitness among children aged 12–14 years was better in high-altitude than low-altitude areas. Physical activity also influenced cardiovascular fitness.

Keywords: 6MWT, cardiovascular fitness, high-altitude, low-altitude