

**HUBUNGAN KAPASITAS AEROBIK MAKSIMAL DENGAN
KAPASITAS VITAL PARU-PARU PADA ANAK USIA 11 – 12
BERDASARKAN JENIS KELAMIN**

TESIS

diajukan untuk memenuhi sebagian syarat ujian guna memperoleh gelar Magister
Pendidikan Olahraga Konsentrasi Ilmu Keolahragaan



**Disusun oleh :
FITRIANI DEWI
NIM 1803361**

**PROGRAM STUDI PENDIDIKAN OLAHRAGA
KONSENTRASI ILMU KEOLAHRAGAAN
SEKOLAH PASCA SARJANA
UNIVERSITAS PENDIDIKAN INDONESIA**

2022

LEMBAR HAK CIPTA

**HUBUNGAN KAPASITAS AEROBIK MAKSIMAL DENGAN
KAPASITAS VITAL PARU-PARU PADA ANAK USIA 11 – 12
BERDASARKAN JENIS KELAMIN**

Oleh:
Fitriani Dewi
1803361

Sebuah tesis yang diajukan untuk memenuhi salah satu syarat memperoleh
gelar Magister Pendidikan pada Program Studi Pendidikan Olahraga

© Fitriani Dewi
Universitas Pendidikan Indonesia
Desember 2022

Hak Cipta dilindungi dengan
undang-undang
Tesis ini tidak boleh diperbanyak seluruhnya atau sebagian, dengan dicetak
ulang, difoto kopi, atau cara lainnya tanpa izin dari penulis.

FITRIANI DEWI
HUBUNGAN KAPASITAS AEROBIK MAKSIMAL DENGAN KAPASITAS PARU-
PARU PADA ANAK USIA 11-12 TAHUN BERDASARKAN JENIS KELAMIN

disetujui dan disahkan oleh
Pembimbing I



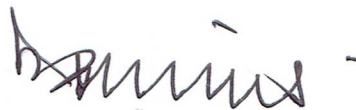
Prof. Agus Rusdiana, S.Pd., MA., Ph.D.
NIP. 19760812 200112 1 001

Pembimbing II



Dr. dr. Imas Damayanti, M.Kes
NIP. 19800721 200604 2 001

Mengetahui,
Ketua Program Studi Pendidikan Olahraga



Prof. Dr. Amung Ma'mun, M.Pd.
NIP. 19600119 198603 1 002

Hubungan Kapasitas Aerobik Maksimal Dengan Kapasitas Paru-Paru Pada Anak Usia 11 – 12 Berdasarkan Jenis Kelamin

ABSTRAK

Penelitian ini bertujuan untuk mengetahui hubungan kapasitas aerobik maksimal dengan kapasitas vital paru-paru pada anak laki-laki dan perempuan. Metode yang digunakan dalam penelitian ini adalah metode penelitian deskriptif korelatif, dengan pendekatan kuantitatif. Sample dalam penelitian ini adalah siswa SD Negeri Pameungpeuk kelas 5 yang berjumlah 60 orang yaitu 30 laki-laki dan 30 perempuan. Instrument yang digunakan yaitu *Vital Capacity Meter* untuk mengukur kapasitas vital paru dan *Multi-Stage Fitness Test (MSFT) Bleep Test* untuk mengukur kapasitas aerobik maksimal. Untuk mengetahui hubungan yang signifikan analisis Korelasi digunakan dalam penelitian ini. Hasil dari penelitian ini menunjukkan bahwa terdapat hubungan kapasitas aerobik maksimal dengan kapasitas vital paru-paru pada anak laki-laki dan perempuan.

Kata Kunci: Kapasitas Aerobik Maksimal, Kapasitas Paru-paru, Jenis Kelamin

Relationship between Maximum Aerobic Capacity and Lung Capacity in Children Age 11 – 12 Based on Gender

ABSTRACT

This study aims to determine the relationship between maximal aerobic capacity and vital lung capacity in boys and girls. The method used in this research is descriptive correlative research method, with a quantitative approach. The sample in this study were students of SD Negeri Pameungpeuk grade 5, totaling 60 people, namely 30 boys and 30 girls. The instruments used are Vital Capacity Meter to measure vital lung capacity and Multi-Stage Fitness Test (MSFT) Bleep Test to measure maximum aerobic capacity. To find out a significant relationship, correlation analysis was used in this study. The results of this study indicate that there is a relationship between maximal aerobic capacity and vital lung capacity in boys and girls.

Keywords: *Maximum Aerobic Capacity, Lung Capacity, Gender*

DAFTAR ISI

KATA PENGANTAR.....	i
UCAPAN TERIMA KASIH	ii
ABSTRAK	iv
ABSTRACT	v
DAFTAR TABEL	vii
DAFTAR GAMBAR.....	viii
BAB I PENDAHULUAN.....	1
1.1. Latar Belakang.....	1
1.2. Rumusan Masalah.....	3
1.3. Tujuan Penelitian	3
1.4. Manfaat Penelitian	3
1.5. Struktur Organisasi Tesis.....	4
BAB II KAJIAN PUSTAKA.....	7
2.1. Kapasitas Vital Paru-paru	7
2.2. Kapasitas Aerobik Maksimal.....	8
2.5. Penelitian Terdahulu yang Relevan	12
2.6. Hipotesis	14
BAB III METODOLOGI PENELITIAN	22
3.1. Metode Penelitian	22
3.2. Populasi dan Sampel.....	23
3.3. Instrumen Penelitian	23
3.4. Analisis Data.....	26
BAB IV TEMUAN DAN PEMBAHASAN.....	28
4.1. Temuan	28
4.2. Karakteristik Sampel	28
4.3. Uji Statistika Deskriptif	29
BAB V SIMPULAN, IMPLIKASI DAN REKOMENDASI	39
5.1. Simpulan	39
5.2. Implikasi	39
DAFTAR PUSTAKA.....	40
LAMPIRAN-LAMPIRAN	44

DAFTAR PUSTAKA

- Afyon, Y. A., Mülazımoğlu, O., Boyacı, A., & İskender, B. (2018). INVESTIGATION OF THE EFFECT OF TABATA TRAINING ON VITAL CAPACITIES OF SWIMMERS. *European Journal of Physical Education and Sport Science*, 0(0). <https://doi.org/10.46827/EJPE.V0I0.2126>
- Betik, A. C., & Hepple, R. T. (2008). CURRENT OPINION / OPINION COURANTE Determinants of VO₂ max decline with aging : an integrated perspective. *Applied Physiology, Nutrition, and Metabolism*, 140.
- Blair, S. N. (2009). Physical inactivity: The biggest public health problem of the 21st century. In *British Journal of Sports Medicine* (Vol. 43, Issue 1). [https://doi.org/10.1016/s1440-2440\(07\)70066-x](https://doi.org/10.1016/s1440-2440(07)70066-x)
- Buskirk, E. R., & Hodgson, J. L. (1987). Age and aerobic power: The rate of change in men and women. *Federation Proceedings*, 46(5).
- Chastin, S. F., Mandrichenko, O., & Skelton, D. A. (2014). The frequency of osteogenic activities and the pattern of intermittence between periods of physical activity and sedentary behaviour affects bone mineral content: The cross-sectional NHANES study. *BMC Public Health*, 14(1). <https://doi.org/10.1186/1471-2458-14-4>
- Çiçek, G., Güllu, A., Güllu, E., & Yamaner, F. (2018). The effect of aerobic and core exercises on forced vital capacity. *Physical Culture and Sport, Studies and Research*, 77(1). <https://doi.org/10.2478/pcssr-2018-0005>
- Dencker, M., Thorsson, O., Karlsson, M. K., Lindén, C., Eiberg, S., Wollmer, P., & Andersen, L. B. (2007). Gender differences and determinants of aerobic fitness in children aged 8-11 years. *European Journal of Applied Physiology*, 99(1). <https://doi.org/10.1007/s00421-006-0310-x>
- Faintuch, J., Souza, S. A. F., Valezi, A. C., Sant'Anna, A. F., & Gama-Rodrigues, J. J. (2004). Pulmonary function and aerobic capacity in asymptomatic bariatric candidates with very severe morbid obesity. *Revista Do Hospital Das Clínicas*, 59(4). <https://doi.org/10.1590/s0041-87812004000400005>
- Falk, B., & Dotan, R. (2019). Measurement and interpretation of maximal aerobic power in children. *Pediatric Exercise Science*, 31(2), 144–151. <https://doi.org/10.1123/pes.2018-0191>
- Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2017). How to design and evaluate

research in education. *McGrawHill*, 91.

Giesbrecht, Richard. (2010). *Fitness for your life : you can do it*. AuthorHouse.

GÖRAL, K. (2014). the Examination of the Relationship Between Maximum Aerobic Power, Forced Vital Capacity and Body Composition in Soccer Players. / FutbolculardaMaksimalAerobik Güç,ZorluVitalKapasite VeVücutkompozisİlişkisiniİncelenmesi. *Journal of Physical Education & Sports Science / Beden Eğitimi ve Spor Bilimleri Dergisi*, 8(2).

Grupe, O., Kurz, D., & Teipel, J. (1973). Sport in the Modern World — Chances and Problems. In *Sport in the Modern World — Chances and Problems*. <https://doi.org/10.1007/978-3-642-65784-9>

Guerra, S., Ribeiro, J. C., Costa, R., Duarte, J., & Mota, J. (2002). Relationship between cardiorespiratory fitness, body composition and blood pressure in school children. *Journal of Sports Medicine and Physical Fitness*, 42(2).

Haff, G. G., & Triplett, T. N. (2016). Essentials of Strength & Conditioning Fourth Edition. *Human Kinetics*.

Harms, C. A. (2006). Does gender affect pulmonary function and exercise capacity? *Respiratory Physiology and Neurobiology*, 151(2–3). <https://doi.org/10.1016/j.resp.2005.10.010>

Hedenstierna, G., Strandberg, A., Brismar, B., Lundquist, H., Svensson, L., & Tokics, L. (1985). *Functional residual capacity, thoraco abdominal dimension and central blood volume, every general anesthesia with muscle paralysis and mechanical ventilation* (p. 8).

Kostić, V. (2017). Differences in aerobic capacity and spirometric parameters between athletes and nonathletes. *Porto Biomedical Journal*, 2(5), 184. <https://doi.org/10.1016/j.pbj.2017.07.022>

Lakka, T. A., Laaksonen, D. E., Lakka, H. M., Männikkö, N., Niskanen, L. K., Rauramaa, R., & Salonen, J. T. (2003). Sedentary lifestyle, poor cardiorespiratory fitness, and the metabolic syndrome. *Medicine and Science in Sports and Exercise*, 35(8). <https://doi.org/10.1249/01.MSS.0000079076.74931.9A>

Lomauro, A., & Aliverti, A. (2018). Sex differences in respiratory function. *Breathe*, 14(2), 131–140. <https://doi.org/10.1183/20734735.000318>

Mcmiken, D. F. (1976). Maximum aerobic power and physical dimensions of children.

- Annals of Human Biology*, 3(2). <https://doi.org/10.1080/03014467600001251>
- Mohammed, Z. (2017). *Maximal aerobic capacity versus vital capacity which Cassel relationships determine the cardiorespiratory fitness among soccer players*. 3(3), 49–53. www.turkishkinesiology.com
- Moreira, C. A., Albergaria, M. B., Rodrigues, A. S. L., da Silva, A. M., & Dantas, E. H. M. (2003). Potencia aerobica maxima, frecuencia cardiaca e capacidade vital em ambientes normo e hiperbarico. / Maximum aerobic power, heart rate, and vital capacity in normal end(sic) hiperbaric environments. *Fitness & Performance Journal (Online Edition)*, 2(3).
- Ogawa, T., Spina, R. J., Martin, W. H., Kohrt, W. M., Schechtman, K. B., Holloszy, J. O., & Ehsani, A. A. (1992). Effects of aging, sex, and physical training on cardiovascular responses to exercise. *Circulation*, 86(2). <https://doi.org/10.1161/01.CIR.86.2.494>
- Pelosi, P., Croci, M., Ravagnan, I., Tredici, S., Pedoto, A., Lissoni, A., & Gattinoni, L. (1998). The effects of body mass on lung volumes, respiratory mechanics, and gas exchange during general anesthesia. *Anesthesia and Analgesia*, 87(3), 654–660. <https://doi.org/10.1213/00000539-199809000-00031>
- Rexhepi, A. M., & Brestovci, B. (2014). Prediction of vo2max based on age, body mass, and resting heart rate. *Human Movement*, 15(1). <https://doi.org/10.2478/humo-2014-0003>
- Rogulj, N., Papić, V., & Čavala, M. (2009). Evaluation models of some morphological characteristics for talent scouting in sport. *Collegium Antropologicum*, 33(1).
- Sable, M., Vaidya, S. M., & Sable, S. S. (2012). Comparative study of lung functions in swimmers and runners. *Indian Journal of Physiology and Pharmacology*, 56(1).
- Santosa, W. R. B., & Gayatri, P. R. (2020). Pengaruh Jenis Kelamin dan Masa Kerja Terhadap Tingkat Ventilasi. *Judika (Jurnal Nusantara Medika)*, 4(2), 126–131.
- Scott, J. R. (1998). Fox's Physiological Basis for Exercise and Sport, 6th Edition. *Medicine & Science in Sports & Exercise*, 30(12). <https://doi.org/10.1097/00005768-199812000-00016>
- Tabata, I., Nishimura, K., Kouzaki, M., Hirai, Y., Ogita, F., Miyachi, M., & Yamamoto, K. (1996). Effects of moderate-intensity endurance and high-intensity intermittent training on anaerobic capacity and VO(2max). *Medicine and Science in Sports and*

- Exercise*, 28(10), 1327–1330. <https://doi.org/10.1097/00005768-199610000-00018>
- Tokics, L., Hedenstierna, G., Strandberg, Å., Brismar, B., & Hans Lundquist. (1987). *Lung Collapse and Gas Exchange during General Anesthesia: Effects of Spontaneous Breathing, Muscle Paralysis, and Positive End-expiratory Pressure* (p. 11).
- Wagner, P. D. (2010). Limiting Factors of Exercise Performance. *Deutsche Zeitschrift Fur Sportmedizin*, 61(5).
- Zerf, M., Ali, B., Mohammed, Z., & Abelatif, H. (2016). *Height versus Weight which Cassel Parameter Determine Pulmonary Functions Fitness among the Algerians Soccer Players Journal of Pulmonary & Respiratory Medicine Height versus Weight which Cassel Parameter Determine Pulmonary Functions Fitness among the Algerians Soccer Players*. <https://doi.org/10.4172/2161-105X.1000353>