



PRIN
PUSAT RISET & INOVASI NASIONAL

P-ISSN: 2828-934X
E-ISSN: 2828-9358

Jurriike

Jurnal Riset Rumpun Ilmu Kedokteran



Vol. 4 No. 1 (2025): April : Jurnal Riset Rumpun Ilmu Kedokteran



Jurnal Riset Rumpun Ilmu Kedokteran (JURRIKE) adalah jurnal yang ditujukan untuk publikasi artikel ilmiah yang diterbitkan oleh Pusat riset dan Inovasi Nasional, Lembaga Pengembangan Kinerja Dosen. Jurnal ini adalah jurnal Riset Rumpun Ilmu Kedokteran yang bersifat peer-review dan terbuka. Bidang kajian dalam jurnal ini termasuk sub rumpun Ilmu Kedokteran Spesialis, Ilmu Kedokteran Akademik, Spesialis Kedokteran gigi dan mulut, Kedokteran Gigi Akademik. Jurnal Riset Rumpun Ilmu Kedokteran menerima artikel dalam bahasa Inggris dan bahasa Indonesia dan diterbitkan 2 kali setahun: **April dan Oktober**. Silakan buat Artikel Template baru lalu kirimkan naskah Anda.

DOI: <https://doi.org/10.55606/jurriike.v4i1>

PUBLISHED: 2025-04-11

ARTICLES

Profil Bakteri dari Usap Tenggorok Penderita Infeksi Saluran Pernapasan Usia Sekolah Dasar di Puskesmas Tamalanrea Makassar

Nomarihi Goraah, Universitas Islam Negeri Alauddin Makassar, Indonesia

Nadyah Haruna, Universitas Islam Negeri Alauddin Makassar, Indonesia

Najamuddin Najamuddin, Universitas Islam Negeri Alauddin Makassar, Indonesia

Andi Irhamnia Sakinah, Universitas Islam Negeri Alauddin Makassar, Indonesia

Arifuddin Ahmad, Universitas Islam Negeri Alauddin Makassar, Indonesia

01-09

 DOI : <https://doi.org/10.55606/jurrike.v4i1.4313>


 PDF  Views: 163 times |  Download : 133 times

Hubungan Sumber Informasi Pasangan Usia Subur Dengan Pemilihan Kontrasepsi Jangka Panjang di Puskesmas Baamang 2 Sampit Tahun 2024

Puspita Sari Pribadi, Universitas Muhammadiyah Sampit, Indonesia

Tri Agustin, Universitas Muhammadiyah Sampit, Indonesia

10-15

 DOI : <https://doi.org/10.55606/jurrike.v4i1.4347>

 PDF  Views: 63 times |  Download : 48 times


Analisis Distribusi Persentase Pareto Kualitas Stok pada Jaringan Apotek Kimia Farma di Sulawesi Tenggara Tahun 2024

Optimalisasi Manajemen Persediaan Berbasis ABC Analysis

Faisal Faisal, Universitas Megarezky Makassar, Indonesia

Irman Idrus, STIKes Pelita Ibu, Indonesia

16-28


 DOI : <https://doi.org/10.55606/jurrike.v4i1.4330>

 PDF  Views: 78 times |  Download : 43 times

Hubungan Antara Kepadatan Penduduk dengan Kejadian Pneumonia Balita di Provinsi Bali Tahun 2021-2023

Bella Ainur Rokhma, Universitas Airlangga, Indonesia

29-37


 DOI : <https://doi.org/10.55606/jurrike.v4i1.4370>

 PDF  Views: 124 times |  Download : 128 times

Peta Persebaran Kasus Diare Menurut Kepadatan Penduduk di Provinsi Bali Tahun 2020-2022

Ainiyah Hasna Fadhilah, Universitas Airlangga, Indonesia

38-50

 DOI : <https://doi.org/10.55606/jurrike.v4i1.4371>

 PDF  Views: 96 times |  Download : 101 times

Pendekatan Kimia Medisinal dalam Optimasi Senyawa Bioaktif dari Bahan Alam sebagai Kandidat Obat Antikanker

Saeful Amin, Universitas Bakti Tunas Husada, Indonesia

Neng Padia Amelia, Universitas Bakti Tunas Husada, Indonesia

Tiara Oktavia Ramadhan, Universitas Bakti Tunas Husada, Indonesia

Silvia Dwi Putri, Universitas Bakti Tunas Husada, Indonesia

51-60

 DOI : <https://doi.org/10.55606/jurriike.v4i1.4430>

 PDF  Views: 174 times |  Download : 140 times

Faktor-Faktor yang Berhubungan dengan Kekurangan Energi Kronik (KEK) pada Ibu Hamil di Wilayah Kerja Puskesmas Putri Ayu Kota Jambi

Leony Lorenza, Universitas Jambi, Indonesia


Usi Lanita, Universitas Jambi, Indonesia

Silvia Mawarti Perdana, Universitas Jambi, Indonesia

Asparian Asparian, Universitas Jambi, Indonesia

Sri Astuti Siregar, Universitas Jambi, Indonesia

61-71


 DOI : <https://doi.org/10.55606/jurriike.v4i1.4428>

 PDF  Views: 161 times |  Download : 152 times

Hubungan Pengetahuan Dengan Perilaku Pemeriksaan IVA (Inspeksi Visual Dengan Asam Asetat) Pada Wanita Usia Subur di Wilayah Kerja Puskesmas Kowel

Berliana Ayuning Asmara, Universitas Airlangga, Indonesia

72-78

 DOI : <https://doi.org/10.55606/jurriike.v4i1.4449>

 PDF  Views: 76 times |  Download : 38 times


Pengaruh Lama Penggunaan Handphone terhadap Kecerdasan Emosional Siswa Kelas 4-6 SD Negeri 2 Kedungwringin

Susan Venasari, Universitas Harapan Bangsa, Indonesia

Maya Safitri, Universitas Harapan Bangsa, Indonesia

Noor Yunida Triana, Universitas Harapan Bangsa, Indonesia

79-95

 DOI : <https://doi.org/10.55606/jurriike.v4i1.4447>

 PDF  Views: 94 times |  Download : 43 times

Gambaran Kadar Gula Darah dan Tekanan Darah Penderita Diabetes Melitus Tipe 2 di Puskesmas Kalibagor

Azzalia Nur Rahma, Universitas Harapan Bangsa, Indonesia

Suci Khasanah, Universitas Harapan Bangsa, Indonesia

Indri Heri Susanti, Universitas Harapan Bangsa, Indonesia

96-109

 DOI : <https://doi.org/10.55606/jurriike.v4i1.4445>

 PDF  Views: 154 times |  Download : 107 times

Hubungan Kepatuhan Minum Obat dengan Kejadian Cacat kusta di Puskesmas Batumarmar Pamekasan

Vadya Friska, Universitas Airlangga, Indonesia

110-114

 DOI : <https://doi.org/10.55606/jurrike.v4i1.4462>

 PDF  Views: 73 times |  Download : 22 times

Tingkat Pengetahuan, Sikap, dan Perilaku Warga Kecamatan Ngaliyan Mengenai Nevus Pigmentosus


Puguh Riyanto, Universitas Diponegoro, Indonesia

Danisa Diandra Safarina, Universitas Diponegoro, Indonesia

Dini Hisan Wijdani, Universitas Diponegoro, Indonesia

Cindy Cindy, Universitas Diponegoro, Indonesia

115-126

 DOI : <https://doi.org/10.55606/jurrike.v4i1.4490>


 PDF  Views: 89 times |  Download : 28 times

Jalur Saraf Vergence : Systematic Literature Review

Zalafi Kartika Azka, Universitas Sebelas Maret, Indonesia

Alvian Dwisakti Kurniatio, Universitas Islam Sultan Agung, Indonesia

127-136

 DOI : <https://doi.org/10.55606/jurrike.v4i1.4548>

 PDF  Views: 79 times |  Download : 37 times

Kesesuaian Diagnosis Klinis dan Hasil Pemeriksaan Histopatologi Psoriasis Vulgaris

Puguh Riyanto, Universitas Diponegoro, Indonesia

Felicia Yora Afrilia Putri, Universitas Diponegoro, Indonesia

Myrna Adiwijaya, Universitas Diponegoro, Indonesia

Rima Adjani Nugroho, Universitas Diponegoro, Indonesia

Hani Nur Rahmawati Purwanto, Universitas Diponegoro, Indonesia

137-143

 DOI : <https://doi.org/10.55606/jurrike.v4i1.4554>

 PDF  Views: 80 times |  Download : 39 times


Pengaruh Intradialytic Exercise terhadap Tingkat Kecemasan pada Pasien Gagal Ginjal Kronik di Ruang Hemodialisa RSUD Kota Tanjungpinang

Yopy Octaviana Hasibuan, Universitas Awal Bros, Indonesia

Mira Agusthia, Universitas Awal Bros, Indonesia

Rachmawaty M. Noer, Universitas Awal Bros, Indonesia

144-152

 DOI : <https://doi.org/10.55606/jurrike.v4i1.4565>

 PDF  Views: 100 times |  Download : 57 times

Hubungan antara Asupan Makanan dan Status Kekurangan Energi Kronis pada Calon Pengantin Pasangan Usia Subur

Putri Ranatul Agustri, Institut Kesehatan Mitra Bunda, Batam, Indonesia

Haqqelni Nur Rosyidah, Institut Kesehatan Mitra Bunda, Batam, Indonesia

Siska Pratiwi, Institut Kesehatan Mitra Bunda, Batam, Indonesia

153-164

 DOI : <https://doi.org/10.55606/jurrike.v4i1.4556>


 PDF  Views: 92 times |  Download : 46 times

Pasien Pleuritis TB Terkonfirmasi ADA Test Dengan Efusi Pleura Massif Yang Mendapat Penanganan Chest Tube, WSD, dan OAT

Imam Mukti Wibowo, Universitas Islam Al-Azhar Mataram & RSUD Patut Patuh Patju, Lombok Barat, Indonesia

Sahrin, Universitas Islam Al-Azhar Mataram & RSUD Patut Patuh Patju, Lombok Barat, Indonesia

165-173

 DOI : <https://doi.org/10.55606/jurrike.v4i1.4555>

 PDF  Views: 52 times |  Download : 54 times

Potential Of Probiotics and Natural Ingredients As Antibiofilm And Antibacterial : A Systematic Review

Kadek Dwi Adi Mas Putrayana, Universitas Udayana, Indonesia

Ida Bagus Nyoman Putra Dwija, Universitas Udayana, Indonesia


Komang Vindya Triananda, Universitas Udayana, Indonesia

I Gusti Ayu Nastiti Wahyu Handayani, Universitas Udayana, Indonesia

Luh Putu Rinawati, Universitas Udayana, Indonesia

Ni Putu Kusuma Santhi Y, Universitas Udayana, Indonesia

174-187

 DOI : <https://doi.org/10.55606/jurrike.v4i1.4620>

 PDF  Views: 91 times |  Download : 42 times

Determinan Kejadian Stunting pada Balita di Wilayah Kerja Puskesmas Banda Sakti Kota Lhokseumawe

Murniati Murniati, Universitas Negeri Semarang, Indonesia

Bambang Budi Raharjo, Universitas Negeri Semarang, Indonesia

188-196

 DOI : <https://doi.org/10.55606/jurrike.v4i1.4643>

 PDF  Views: 47 times |  Download : 23 times

Faktor yang Memengaruhi Kepatuhan Minum Obat pada Lansia Penderita Hipertensi di Wilayah Kerja Puskesmas Pelawan Sarolangun

Solihin Solihin, Universitas Negeri Semarang, Indonesia
Bambang Budi Raharjo, Universitas Negeri Semarang, Indonesia

197-204

 DOI : <https://doi.org/10.55606/jurrike.v4i1.4647>

 PDF  Views: 78 times |  Download : 60 times


Gambaran Faktor Lingkungan dan Host pada Pasien Demam Berdarah Dengue di Rumah Sakit Umum Cut Meutia

Wina Adelia Pasaribu, Universitas Malikussaleh, Indonesia

Mauliza Mauliza, Universitas Malikussaleh, Indonesia

Mardiati Mardiati, Universitas Malikussaleh, Indonesia

205-212

 DOI : <https://doi.org/10.55606/jurrike.v4i1.4710>

 PDF  Views: 62 times |  Download : 35 times

Evaluasi Pelaksanaan Sekolah Sehat di TK Negeri Pembina 2 Merangin

Elsa Dwi Saputri, Universitas Jambi, Indonesia


Puspita Sari, Universitas Jambi, Indonesia

Muhammad Rifqi Azhary, Universitas Jambi, Indonesia

Oka Lesmana S, Universitas Jambi, Indonesia

Herwansyah Herwansyah, Universitas Jambi, Indonesia

213-219

 DOI : <https://doi.org/10.55606/jurrike.v4i1.4516>

 PDF  Views: 59 times |  Download : 22 times

Hubungan Pola Makan dengan Kejadian Dispepsia pada Remaja Putri di Pesantren Hidayatullah Tanjung Morawa pada Tahun 2023

Naela Alfin Ni'mah, Universitas Islam Sumatera Utara, Indonesia

Faisal Balatif, Universitas Islam Sumatera Utara, Indonesia

Marzuki Samion, Universitas Islam Sumatera Utara, Indonesia

Anna Yusria, Universitas Islam Sumatera Utara, Indonesia

220-229

 DOI : <https://doi.org/10.55606/jurrike.v4i1.4715>

 PDF  Views: 58 times |  Download : 75 times

Hubungan Antara Umur dan Jenis Kelamin dengan Kualitas Hidup Pasien Gagal Ginjal Kronik yang Menjalani Hemodialisis

Pius A. L. Berek, Universitas Timor, Indonesia

Yoakim Lay Un Fun Dales, Universitas Timor, Indonesia

Maria Fatimah W. A. Fouk, Universitas Timor, Indonesia

230-242


 DOI : <https://doi.org/10.55606/jurrike.v4i1.4419>

 PDF  Views: 72 times |  Download : 83 times

Peran Apolipoprotein B, Apolipoprotein A, dan Rasio ApoA/ApoB sebagai Prediktor Terjadinya Demensia pada Kelompok Lanjut Usia

Alfred Sutrisno Sim, Universitas Tarumanagara, Indonesia
Alexander Halim Santoso, Universitas Tarumanagara, Indonesia
Farell Christian Gunaidi, Universitas Atmajaya, Indonesia
Khalisyia Alifia, Universitas Tarumanagara, Indonesia
Vincent Aditya, Universitas Tarumanagara, Indonesia
Edwin Destra, Universitas Atmajaya, Indonesia

243-254

 DOI : <https://doi.org/10.55606/jurrike.v4i1.4891>

 PDF  Views: 27 times |  Download : 16 times

Correlation of Hemoglobin, Uric Acid, and Anthropometric as Predictor Parameters in Subcutaneous Fat Deposition

Triyana Sari, Universitas Tarumanagara, Indonesia
Erik Sidharta, Universitas Tarumanagara, Indonesia
Alexander Halim Santoso, Universitas Tarumanagara, Indonesia
Stanislas Kotska Marvel Mayello Teguh, Universitas Tarumanagara, Indonesia
Brian Albert Gaofman, Universitas Tarumanagara, Indonesia
Bruce Edbert, Universitas Tarumanagara, Indonesia

255-266


 DOI : <https://doi.org/10.55606/jurrike.v4i1.4890>

 PDF  Views: 51 times |  Download : 13 times

Association Of Anthropometric Measurement, Uric Acid, Vitamin D, Albumin, And Diabetes Mellitus With Frailty In The Elderly A Study At Bina Bhakti Elderly Home

Alexander Halim Santoso, Tarumanagara University , Indonesia
Alfianto Martin, Tarumanagara University , Indonesia
Ayleen Nathalie Jap, Tarumanagara University , Indonesia
Valentino Gilbert Lumintang, Tarumanagara University , Indonesia
Fidelia Alvianto, Tarumanagara University , Indonesia

267-276

 DOI : <https://doi.org/10.55606/jurrike.v4i1.4929>

 PDF  Views: 22 times |  Download : 11 times

Hubungan Pengetahuan dan Sikap Upaya Pencegahan Tuberculosis (TBC) di Wilayah Kerja Puskesmas Geureudong Pase Aceh Utara

Muslim Amin, Universitas Abulyatama, Indonesia
Ahmad Fausi, Universitas Abulyatama, Indonesia

277-284

 DOI : <https://doi.org/10.55606/jurrike.v4i1.4988>

 PDF  Views: 51 times |  Download : 35 times

Faktor-Faktor yang Berhubungan dengan Kejadian Tuberkulosis di Kecamatan Nisam, Kabupaten Aceh Utar

Dian Rahayu, Universitas Abulyatama, Indonesia

Elly Safwani, Universitas Abulyatama, Indonesia

Intan Rizqi, Universitas Abulyatama, Indonesia

Khairuman Khairuman, Universitas Abulyatama, Indonesia

285-293

 DOI : <https://doi.org/10.55606/jurrike.v4i1.4989>

 PDF  Views: 70 times |  Download : 30 times

Prosedur Pemeriksaan Radiografi Vertebrae Cervical pada Kasus Phlegmon di Instalasi Radiologi RSUD Kota Yogyakarta

Sefiana Nurul Hikmah, Universitas 'Aisyiyah Yogyakarta, Indonesia

Amril Mukmin, Universitas 'Aisyiyah Yogyakarta, Indonesia

Ayu Mahanani, Universitas 'Aisyiyah Yogyakarta, Indonesia

294-307

 DOI : <https://doi.org/10.55606/jurrike.v4i1.4997>

 PDF  Views: 78 times |  Download : 38 times

Pengaruh Peer Education terhadap Sikap Remaja tentang Pernikahan di Kabupaten Mimika

Neny San Agustina Siregar, Poltekkes Kemenkes Jayapura, Indonesia

Dedy Arisjulyanto, Poltekkes Kemenkes Jayapura, Indonesia

Tri Noviyanti Mansur, Poltekkes Kemenkes Jayapura, Indonesia

Yumi Abimulyani, Poltekkes Kemenkes Jayapura, Indonesia

308-317

 DOI : <https://doi.org/10.55606/jurrike.v4i1.5042>

 PDF  Views: 38 times |  Download : 33 times

Regulation of Fasting Blood Glucose, Insulin, and Homa-1r in Relation to Malnutrition Among the Elderly: Mechanisms and Clinical Implications

Robert Kosasih, Tarumanagara University, Indonesia

Triyana Sari, Tarumanagara University, Indonesia

Alexander Halim Santoso, Tarumanagara University, Indonesia

Ayleen Nathalie Jap, Tarumanagara University, Indonesia

Vincent Aditya Budi Hartono, Tarumanagara University, Indonesia

Andini Ghina Syarifah, Tarumanagara University, Indonesia

318-333

 DOI : <https://doi.org/10.55606/jurrike.v4i1.5057>

 PDF  Views: 36 times |  Download : 12 times

Uji Insektisida Ekstrak Daun Zodia (*Evodia Sauveolens*) terhadap Nyamuk Anopheles Sp.

Sugiarto I Hamzah, Politeknik Kesehatan Kemenkes Jayapura, Indonesia

Dina Vita Aprilia, Politeknik Kesehatan Kemenkes Jayapura, Indonesia

Shintia Puspita Ningrum, Politeknik Kesehatan Kemenkes Jayapura, Indonesia

Fajar Bakti Kurniawan, Politeknik Kesehatan Kemenkes Jayapura, Indonesia

Risda Hartati, Politeknik Kesehatan Kemenkes Jayapura, Indonesia

Indra Taufik Sahli, Politeknik Kesehatan Kemenkes Jayapura, Indonesia

Asrianto Asrianto, Politeknik Kesehatan Kemenkes Jayapura, Indonesia

Afika Herma Whardani, Politeknik Kesehatan Kemenkes Jayapura, Indonesia

Rina Purwati, Politeknik Kesehatan Kemenkes Jayapura, Indonesia

334-342

 DOI : <https://doi.org/10.55606/jurrike.v4i1.5046>

 PDF  Views: 36 times |  Download : 34 times

Hubungan Perilaku Masyarakat dengan Penyakit Malaria di Puskesmas Koya Barat, Distrik Muara Tami, Kota Jayapura

Konstantina Marthina Pariaribo, Universitas Cenderawasih, Indonesia

343-356

 DOI : <https://doi.org/10.55606/jurrike.v4i1.5074>

 PDF  Views: 63 times |  Download : 28 times


Formulasi Sediaan Gel Variasi Konsentrasi Ekstrak dan Limbah Bunga Mawar Merah (*Rosa damascena* Mill.)

Diyani Sakti Purwanto, Politeknik Indonusa Surakarta, Indonesia

Dewi Weni Sari, Politeknik Indonusa Surakarta, Indonesia

Diana Tanafasa, Politeknik Indonusa Surakarta, Indonesia

357-373

 DOI : <https://doi.org/10.55606/jurrike.v4i1.5197>

 PDF  Views: 25 times |  Download : 11 times


Gambaran Karakteristik Retinopati Diabetik pada Penderita Diabetes Melitus Tipe 2

Syu'a Al Madina, Universitas Muslim Indonesia, Indonesia

Muhammad Jabal Nur, Universitas Muslim Indonesia, Indonesia

Hikmah Hiromi Razak Datu, Universitas Muslim Indonesia, Indonesia

374-383

 DOI : <https://doi.org/10.55606/jurrike.v4i1.5194>

 PDF  Views: 36 times |  Download : 22 times

Peran Antioksidan dan Agen Antiinflamasi dalam Proses Penyembuhan Luka Bakar

Nining Nurnanengsih, Universitas Muslim Indonesia, Indonesia

Fendy Dwimartyono, Universitas Muslim Indonesia, Indonesia

Adliah Purnawaty Harifuddin, Universitas Muslim Indonesia, Indonesia

384-391

 DOI : <https://doi.org/10.55606/jurrike.v4i1.5271>

 PDF  Views: 25 times |  Download : 22 times

Formulasi Mie Kering Bahan Dasar Ikan Kembung dan Bayam Hijau sebagai Pangan Balita Stunting

Maria Magdalena Fetowin, Poltekkes Kemenkes Jayapura, Indonesia


Melanie Christine Kamo, Poltekkes Kemenkes Jayapura, Indonesia

Nurhayati Prinanda Putri Embisa, Poltekkes Kemenkes Jayapura, Indonesia

Sarah Petronela Demena, Poltekkes Kemenkes Jayapura, Indonesia

Nia Budhi Astuti, Poltekkes Kemenkes Jayapura, Indonesia

392-402

 DOI : <https://doi.org/10.55606/jurrike.v4i1.5441>

 PDF  Views: 11 times |  Download : 9 times

Uji Organoleptik Teh Herbal Kulit Buah Naga (*Hylocereus Polyrhizus*) Kombinasi Jahe (*Zingiber Officinale*) sebagai Minuman Alternatif Tinggi Antioksidan

Meilan Cefinaayu Mayor, Poltekkes Kemenkes Jayapura, Indonesia

Yusvin Sampe, Poltekkes Kemenkes Jayapura, Indonesia

Jane Josina Antje Wambrauw, Poltekkes Kemenkes Jayapura, Indonesia

Riska Salenda Wandik, Poltekkes Kemenkes Jayapura, Indonesia

Endah Sri Rahayu, Poltekkes Kemenkes Jayapura, Indonesia

Ferry Wicaksono, Poltekkes Kemenkes Jayapura, Indonesia

403-413

 DOI : <https://doi.org/10.55606/jurrike.v4i1.5443>

 PDF  Views: 13 times |  Download : 6 times

Penerapan Problem Solving Cycle dalam Perencanaan Intervensi Perilaku Kesehatan: Analisis Situasi Berbasis Data Sekunder

Irfan Sazali Nasution, Universitas Islam Negeri Sumatera Utara, Indonesia

Maya Adella Zuliana, Universitas Islam Negeri Sumatera Utara, Indonesia

Rika Halimah, Universitas Islam Negeri Sumatera Utara, Indonesia

Devi Helma Fitri Hasibuan, Universitas Islam Negeri Sumatera Utara, Indonesia

Nuraini Nuraini, Universitas Islam Negeri Sumatera Utara, Indonesia

Shinta Aulia Augusta, Universitas Islam Negeri Sumatera Utara, Indonesia

414-425

 DOI : <https://doi.org/10.55606/jurrike.v4i1.5037>

 PDF  Views: 0 times |  Download : 0 times



E-ISSN .: 2828-9358 .:



P-ISSN .: 2828-934X .:



Menu Jurnal

[Kontak](#)

[Dewan Editorial](#)

[Reviewers](#)

[Proses Peer Review](#)

[Fokus dan Ruang Lingkup](#)

[Etika Publikasi](#)

[Kebijakan Akses Terbuka](#)

[Kebijakan Arsip](#)

[Pernyataan Akses Terbuka](#)

[Kebijakan Plagiarisme](#)

HOME / Editorial Team

Editorial Team

Editor in chief/ Ketua Dewan Editor

Zaenal Mustofa, M.Kom , Universitas Negeri Yogyakarta

Editorial Board/ Anggota Dewan Editor

1. Margiyati, M.Kep.
Stikes Kesdam IV Diponegoro Semarang
2. Syurrahmi, S.Fis., M.Or.
Stikes Kesdam IV Diponegoro Semarang
3. Ni Putu Eka Febianingsih, MPH
Stikes Kesdam IX / Udayana Bali
4. Ni Wayan Desi Bintari
STIKES Kesetiakawanan Sosial Indonesia
5. Zuraida, S.KM., M.KM
STIKES Kesetiakawanan Sosial Indonesia
6. Kristine Dareda. S.KM., M.Kes
Universitas Muhammadiyah Manado
7. Dr apt Fef Rukminingsih, M.Sc
Politeknik Katolik Mangunwijaya Semarang
8. dr. Siska Telly Pratiwi, M.Kes.
Universitas Jenderal Achmad Yani

Accreditation



E-ISSN .: 2828-9358 .:



P-ISSN .: 2828-934X .:



Menu Jurnal

[Kontak](#)

[Dewan Editorial](#)

[Reviewers](#)

[Proses Peer Review](#)

[Fokus dan Ruang Lingkup](#)

[Etika Publikasi](#)



Correlation of Hemoglobin, Uric Acid, and Anthropometric as Predictor Parameters in Subcutaneous Fat Deposition

Triyana Sari^{1*}, Erick Sidarta², Alexander Halim Santoso³, Stanislas Kotska Marvel Mayello Teguh⁴, Brian Albert Gaofman⁵, Bruce Edbert⁶

^{1,2} Department of Biology, Faculty of Medicine, Tarumanagara University

³ Department of Nutrition, Faculty of Medicine, Tarumanagara University

^{4,6} Medical Profession Study Program, Faculty of Medicine, Tarumanagara University

triyanas@fk.untar.ac.id^{1*}

Address: Letjen S. Parman Street No. 1, Tomang, Grogol Petamburan, RT.6/RW.16, Tomang, Grogol Petamburan, West Jakarta City, Special Capital Region of Jakarta 11440, Indonesia

Corresponding Author: triyanas@fk.untar.ac.id

Abstract. *Subcutaneous fat deposition is a key factor influencing overall health, playing a significant role in metabolic regulation, energy balance, and the risk of chronic diseases such as obesity and cardiovascular conditions. Understanding and accurately predicting subcutaneous fat accumulation is critical for early intervention and effective management of these health risks. This study aims to analyze the correlation between hemoglobin levels, uric acid, and anthropometric parameters as predictors of subcutaneous fat deposition in elderly individuals. A cross-sectional study was conducted on 32 elderly participants at St. Asisi Church. Anthropometric measurements, including body weight, height, muscle composition, and circumferences, were assessed using OMRON Body Composition Monitor HBF-375, elastic tape and GEA Medical HT721. Biochemical tests for hemoglobin and uric acid levels were performed using Fora 6 Plus. Spearman correlation analysis was used to evaluate the relationship between these variables and subcutaneous fat deposition. Body weight, upper arm circumference, abdominal circumference, and calf circumference showed strong positive correlations with subcutaneous fat ($r > 0.9$, $p < 0.001$). Skeletal muscle percentage exhibited a negative correlation with fat accumulation. Hemoglobin and uric acid levels had weaker correlations, suggesting more complex metabolic interactions. Anthropometric parameters serve as strong predictors of subcutaneous fat deposition in elderly individuals, while hemoglobin and uric acid levels show limited predictive capability.*

Keywords: Anthropometry, Uric Acid, Hemoglobin, Metabolic Health, Subcutaneous Fat,

Abstrak. Penumpukan lemak subkutan merupakan faktor kunci yang memengaruhi kesehatan secara keseluruhan, memainkan peran penting dalam regulasi metabolisme, keseimbangan energi, dan risiko penyakit kronis seperti obesitas dan kondisi kardiovaskular. Memahami dan memprediksi secara akurat akumulasi lemak subkutan sangat penting untuk intervensi dini dan manajemen risiko kesehatan yang efektif. Penelitian ini bertujuan untuk menganalisis korelasi antara kadar hemoglobin, asam urat, dan parameter antropometri sebagai prediktor penumpukan lemak subkutan pada individu lanjut usia. Sebuah penelitian cross-sectional dilakukan pada 32 peserta lanjut usia di Gereja St. Asisi. Pengukuran antropometri, termasuk berat badan, tinggi badan, komposisi otot, dan lingkar, dinilai menggunakan OMRON Body Composition Monitor HBF-375, pita elastis, dan GEA Medical HT721. Uji biokimia untuk kadar hemoglobin dan asam urat dilakukan menggunakan Fora 6 Plus. Analisis korelasi Spearman digunakan untuk mengevaluasi hubungan antara variabel-variabel ini dan penumpukan lemak subkutan. Berat badan, lingkar lengan atas, lingkar perut, dan lingkar betis menunjukkan korelasi positif yang kuat dengan lemak subkutan ($r > 0,9$, $p < 0,001$). Persentase otot rangka menunjukkan korelasi negatif dengan akumulasi lemak. Kadar hemoglobin dan asam urat memiliki korelasi yang lebih lemah, yang menunjukkan interaksi metabolik yang lebih kompleks. Parameter antropometri berfungsi sebagai prediktor kuat pengendapan lemak subkutan pada orang lanjut usia, sementara kadar hemoglobin dan asam urat menunjukkan kemampuan prediksi yang terbatas.

Kata kunci: Antropometri, Asam Urat, Hemoglobin, Kesehatan Metabolik, Lemak Subkutan

1. INTRODUCTION

Subcutaneous fat deposition is a key factor influencing overall health, playing a significant role in metabolic regulation, energy balance, and the risk of chronic diseases such as obesity and cardiovascular conditions. Understanding and accurately predicting subcutaneous fat accumulation is critical for early intervention and effective management of these health risks. To achieve this, simple and accessible predictive tools, such as anthropometric measurements and laboratory variables, play an essential role. (Chandrasekaran & Weiskirchen, 2024; Després, 2012)

Anthropometric measurements, including body weight, body height, body mass index, total trunk muscle, total leg muscle, total arm muscle, and waist circumference, are widely used indicators that reflect body composition and fat distribution. These measurements are non-invasive, cost-effective, and provide direct insights into regional fat and muscle patterns, which are essential for evaluating health risks (Kwon et al., 2017; Wajchenberg, 2000). In parallel, simple laboratory variables such as hemoglobin and uric acid levels offer additional information about physiological and metabolic states that may influence fat deposition. (Blüher, 2020; Chandrasekaran & Weiskirchen, 2024) Despite the availability of these parameters, their combined predictive capability for subcutaneous fat deposition remains inadequately studied (Kwon et al., 2017; Yu, 2024). This study aims to investigate the correlation between hemoglobin levels, uric acid, and anthropometric parameters as predictors of subcutaneous fat deposition in elderly individuals.

2. METHODS

This study employs a cross-sectional design conducted at St. Asisi Church, involving 32 elderly groups. The research focuses on variables such as hemoglobin levels, uric acid, muscle composition, basic anthropometry, and subcutaneous fat deposition. Anthropometric measurements are carried out using the Body Composition Monitor (OMRON HBF-375), elastic tape, and digital height meter (GEA Medical HT721). Hemoglobin and uric acid levels are analyzed with the Fora 6 Plus device. Participants in this study are individuals aged 60 and above. Exclusion criteria include those who are uncooperative, unwilling to undergo examinations, or have incomplete data. The study procedure begins with participants completing a questionnaire, followed by anthropometric assessments. Statistical analysis is performed using the Spearman correlation test, with subcutaneous fat deposition as the reference standard. This study has undergone ethical review by Tarumanagara University.

3. RESULT AND DISCUSSION

The study included a total of 32 participants, all of whom were women (100%). The characteristics of the study respondents are presented in Table 1.

Table 1. Respondents Characteristics

Parameter	Results
Gender (%):	
• Woman	32(100)
• Man	0 (0)
Age, years	73 (55 – 87)
Body Weight, kg	55,18 (26,6 – 84,6)
Body Height, cm	151,25 (144 – 161)
Upper Arm Circumference, cm	27,5 (17 – 38)
Abdominal Circumference, cm	90 (73 – 119)
Calf Circumference, cm	33,5 (11,8 – 48)
Uric Acid, mg/dL	5,3 (3,4 – 8,8)
Hemoglobin, mg/dL	11,35 (4,4 – 13,9)
Total Skeletal Muscle, %	21,4 (14,9 – 26)
Trunk Skeletal Muscle, %	15,05 (12,4 – 20,6)
Upper Extremity Skeletal Muscle, %	22,75 (15,7 – 32,6)
Lower Extremity Skeletal Muscle, %	34,4 (30,3 – 38,3)
Total Subcutaneous Fat, %	31,15 (14,4 – 42,1)
Trunk Subcutaneous Fat, %	28,1 (11,2 – 37,7)
Arm Subcutaneous Fat, %	48,45 (29 – 56,7)
Leg Subcutaneous Fat, %	40,15 (20,2 – 53,4)

The table 2 shows the correlation analysis results between various parameters and subcutaneous fat distribution (total, trunk, arm, and leg) in a sample of 32 individuals. Body weight and upper arm circumference exhibit strong positive correlations ($r > 0.9$, $p < 0.001$) with total, trunk, arm, and leg subcutaneous fat. Abdominal and calf circumferences also show significant positive correlations across all fat regions ($p < 0.001$). In contrast, skeletal muscle percentage (total, trunk, and upper extremity) has strong negative correlations with all subcutaneous fat measures (r ranging from -0.493 to -0.978, $p < 0.001$). Other variables, like age, height, and hemoglobin levels, show weaker or non-significant correlations, with some exceptions, such as uric acid moderately correlating with trunk and leg subcutaneous fat.

Table 2. Correlation of Hemoglobin, Uric Acid and Anthropometric to Subcutaneous Fat Deposition

Parameter (N=32)	Total Subcutaneous Fat, %		Trunk Subcutaneous Fat, %		Arm Subcutaneous Fat, %		Leg Subcutaneous Fat, %	
	r	p	r	p	r	p	r	p
	Age, years	-0,293	0,103	-0,269	0,137	-0,239	0,189	-0,324
Body Weight, kg	0,915	<0,001	0,874	<0,001	0,762	<0,001	0,884	<0,001
Body Height, cm	-0,085	0,646	-0,129	0,482	-0,186	0,308	-0,075	0,684
Upper Arm Circumference, cm	0,927	<0,001	0,900	<0,001	0,800	<0,001	0,894	<0,001
Abdominal Circumference, cm	0,845	<0,001	0,824	<0,001	0,751	<0,001	0,821	<0,001
Calf Circumference, cm	0,663	<0,001	0,618	<0,001	0,536	0,002	0,653	<0,001
Uric Acid, mg/dL	0,486	0,005	0,462	0,008	0,369	0,038	0,445	0,011
Hemoglobin, mg/dL	0,039	0,833	0,071	0,699	0,108	0,555	0,058	0,753
Total Skeletal Muscle, %	-0,493	0,004	-0,579	<0,001	-0,670	<0,001	-0,535	<0,001
Trunk Skeletal Muscle, %	-0,827	<0,001	-0,885	<0,001	-0,936	<0,001	-0,851	<0,001
Upper Extremity Skeletal Muscle, %	-0,976	<0,001	-0,993	<0,001	-0,971	<0,001	-0,978	<0,001
Lower Extremity Skeletal Muscle, %	0,095	0,606	-0,007	0,970	-0,211	0,246	0,010	0,959

*Analysis using Spearman Correlation

**r: r-correlation; p: p-value (5%)

Waist circumference is commonly used to assess central obesity, but its positive association with subcutaneous fat. It primarily correlates with visceral fat, which accumulates around internal organs rather than beneath the skin. Visceral fat differs from subcutaneous fat in its metabolic activity and stronger connection to health risks. It is metabolically more active, releasing inflammatory cytokines and free fatty acids that can contribute to insulin resistance, elevated blood pressure, and an increased risk of metabolic disorders such as type 2 diabetes and cardiovascular disease. (Indraswari et al., 2021; Ross et al., 2020)

While waist circumference reflects visceral fat more strongly, it can also give some indication of subcutaneous fat, especially in individuals with more abdominal fat. However, waist circumference alone is not an accurate measure of subcutaneous fat, as it does not differentiate between the two types of fat. In individuals with a leaner build or more evenly distributed subcutaneous fat, waist circumference may not offer an accurate assessment. (Nauli & Matin, 2019; Sanches et al., 2008)

The association between height and trunk subcutaneous fat highlights height as a possible protective factor against central fat deposition, likely due to differences in body proportions and metabolic efficiency. This more balanced fat distribution results in less fat

buildup in the central area. (Wajchenberg, 2000) This could also be due to body proportions, as taller people often have longer limbs and torsos, which facilitates a more efficient allocation of fat and muscle. (Kahn et al., 2014) In this case, the processes that regulate fat storage may be better spread across the body, reducing excess fat in the trunk. Taller individuals may also experience greater metabolic efficiency, which further prevents the accumulation of central fat. This suggests that height, through body proportions and metabolic factors, could naturally protect against trunk fat storage. (Wajchenberg, 2000)

The connection between height and reduced central fat may also involve hormonal and genetic factors that influence how fat is distributed. Taller individuals often have a higher lean body mass, especially in muscle, which can improve insulin sensitivity and fat metabolism. (Kahn et al., 2014) These factors, along with height-related body proportions, help achieve a more even fat distribution and lower the risk of central obesity, which is linked to various metabolic and cardiovascular conditions. (Wajchenberg, 2000) This relationship between the BMI to trunk subcutaneous fat is likely reflects the influence of muscle mass or lean body composition in individuals with higher BMI, which can counterbalance fat accumulation. (Kahn et al., 2014) This underscores the complexity of BMI as a measure, demonstrating that it does not always directly equate to excess fat storage, especially in specific body regions like the trunk. (Wajchenberg, 2000)

Individuals with higher BMI due to increased muscle mass often show a negative correlation with trunk subcutaneous fat, reflecting the balancing role of lean tissue in fat accumulation. Muscle actively boosts the basal metabolic rate (BMR), helping regulate energy balance and reducing fat storage, particularly in the trunk. (Gilsanz et al., 2009) Additionally, individuals with greater lean body mass often maintain better metabolic health, with enhanced insulin sensitivity that mitigates central fat deposition. (Kahn et al., 2014) This correlation underscores the importance of incorporating additional measures alongside BMI to assess body fat and its distribution accurately. (Wajchenberg, 2000) Methods like dual-energy X-ray absorptiometry (DEXA) or bioelectrical impedance analysis (BIA) effectively differentiate between lean and fat mass, offering a clearer picture of body composition. (Pereira et al., 2015) These findings reveal that BMI reflects more than just fat mass, especially in individuals with higher muscle development or other weight-contributing components. (Kahn et al., 2014)

Fat distribution variability among individuals further complicates BMI interpretation. (Kahn et al., 2014) Subcutaneous fat, stored beneath the skin, and visceral fat, surrounding internal organs, differ in their metabolic and health effects. (Gilsanz et al., 2009)

A higher BMI may indicate increased visceral fat rather than subcutaneous fat in some individuals, explaining the negative association between BMI and trunk subcutaneous fat in specific cases. (Pereira et al., 2015)

Muscle mass in the arms and legs and trunk subcutaneous fat emphasizes the protective role of muscle against central fat accumulation. (Ferreira et al., 2004) Higher muscle mass increases basal metabolic rates and enhances insulin sensitivity, which can reduce fat deposition in the trunk. (Contreiro et al., 2020) With more muscle, the body responds better to insulin, helping to prevent fat accumulation in the trunk area. (Kahn et al., 2014) Muscles can store and use glucose more effectively, reducing the likelihood of fat being deposited in the central region. (Contreiro et al., 2020) Additionally, greater muscle mass helps shift the balance between fat and lean tissue, leading to more even fat distribution. (Ferreira et al., 2004) This prevents fat from accumulating in the trunk, reducing the risks of metabolic disorders, insulin resistance, and cardiovascular diseases associated with central obesity. (Wajchenberg, 2000)

Hemoglobin, a protein responsible for oxygen delivery to tissues and the removal of carbon dioxide, plays a central role in cellular respiration and energy production. Elevated hemoglobin levels may enhance oxygen availability, potentially influencing metabolic activity in ways that promote fat storage in the trunk region. (Kuroiwa et al., 2019; Sucharita et al., 2019) This relationship may also reflect an adaptive response to increased energy demands or underlying metabolic conditions that affect fat distribution. For instance, higher hemoglobin levels could indicate heightened metabolic processes, which may inadvertently contribute to localized fat deposition. (Tapio et al., 2021) Additionally, systemic factors like inflammation or oxidative stress, often associated with elevated hemoglobin levels, could play a role. (T. Wang et al., 2023)

Chronic low-grade inflammation linked to increased red blood cell production might disrupt normal fat metabolism, favoring fat accumulation in central areas. (Tapio et al., 2021; T. Wang et al., 2023) Despite these observations, the exact mechanisms driving the association remain unclear. The interplay between hemoglobin and fat storage likely involves multiple factors beyond oxygen transport, including hormonal, inflammatory, and metabolic pathways. (Kuroiwa et al., 2019; Sucharita et al., 2019) Future studies should explore whether hemoglobin actively contributes to trunk fat deposition or serves as a biomarker for other underlying processes. Clarifying this link could offer valuable insights into the metabolic regulation of fat distribution and its implications for health. (Tapio et al., 2021; T. Wang et al., 2023)

Serum uric acid (SUA) levels have been strongly associated with increased visceral fat and the components of metabolic syndrome. (Li et al., 2023) Previous studies have demonstrated a positive correlation between SUA and visceral fat area, linking higher uric acid levels to central fat accumulation. (Ran et al., 2021) However, the inverse association with trunk subcutaneous fat observed in this study indicates that uric acid may influence fat distribution differently, favoring visceral over subcutaneous fat deposition. (H. P. Wang et al., 2023)

This inverse relationship could stem from metabolic processes driven by elevated uric acid that preferentially promote visceral fat accumulation. (Li et al., 2023) Visceral fat, located around internal organs, is metabolically active and associated with insulin resistance and inflammation. (Ran et al., 2021) In contrast, subcutaneous fat, stored beneath the skin, is less metabolically detrimental. The findings suggest that uric acid may modulate pathways that increase visceral adiposity while limiting subcutaneous fat storage. (Li et al., 2023)

Genetic and hormonal factors may further mediate this relationship, contributing to variations in fat distribution and uric acid metabolism across individuals. (Ran et al., 2021) For instance, studies in populations with metabolic-associated fatty liver disease (MAFLD) have shown that higher SUA levels are linked to increased abdominal fat and insulin resistance. (H. P. Wang et al., 2023) These observations highlight the importance of individual variability in understanding the complex role of uric acid in fat storage dynamics. (Li et al., 2023)

The negative correlation between height and arm fat indicates that taller individuals tend to store less fat in their arms, likely due to their larger body surface area and higher metabolic activity. According to the energy expenditure theory, taller individuals generally have elevated basal metabolic rates, which promote greater overall energy utilization and reduce localized fat storage in the arms. (Rask-Andersen et al., 2019) The inverse link between BMI and arm fat reflects a shift in fat storage to other areas, such as the abdomen or thighs, in individuals with higher body mass. This pattern aligns with the regional fat storage theory, which suggests that hormonal and metabolic factors influence where fat is deposited. Central fat storage, driven by insulin resistance and elevated cortisol levels, often takes priority over peripheral fat storage in those with higher adiposity. (Ceccarelli et al., 2020; J. Wang et al., 2022)

The positive association between upper body muscle mass and arm fat reveals a systemic interaction between muscle and fat within the same region. (Landers et al., 2001) According to the metabolic coupling theory, an increase in muscle mass signals the body to store more fat in nearby areas, such as the arms, to provide additional energy reserves needed for muscle function. This suggests that muscle growth in a specific area may lead to greater fat accumulation in the same region to meet the energy demands of the muscle. (Ran et al., 2021)

Conversely, the competitive allocation theory highlights that muscle and fat compete for resources in the body. (Ran et al., 2021) As muscle mass increases in the arms, fewer resources are available for fat storage in the same area, resulting in less fat in regions with more muscle development. (Ferreira et al., 2004) This theory is supported by the negative relationship between arm muscle mass and arm fat, where greater muscle mass correlates with reduced fat storage in the arms. (Li et al., 2023)

The positive link between leg muscle mass and arm fat highlights the systemic influence of muscle tissue on fat storage. Greater leg muscle mass may reflect an overall increase in energy storage, including fat in the arms, to support metabolic demands. (Rask-Andersen et al., 2019) Similarly, the significant positive association between hemoglobin levels and arm fat points to the role of hemoglobin in oxygen delivery. Higher hemoglobin levels enhance oxidative capacity, enabling a balance between energy storage and usage, which supports fat deposition in the arms. (Kuroiwa et al., 2019; Tapio et al., 2021)

The analysis highlights several important relationships that help explain subcutaneous fat. The analysis reveals critical insights into the factors influencing subcutaneous fat distribution in the legs. The negative association between height and leg fat can be explained by differences in body proportions and metabolic efficiency. Taller individuals often possess greater lean mass and longer limbs, which promote higher energy expenditure and fat oxidation, reducing fat accumulation in the legs. This observation aligns with the energy balance theory, which posits that individuals with elevated metabolic rates are less likely to store fat in specific regions due to increased caloric demands. (Bender et al., 2020; Shirley et al., 2022)

The inverse relationship between BMI and leg fat reflects a pattern where individuals with higher BMI store fat preferentially in other areas, such as the abdomen. This supports the regional fat distribution theory, which suggests that hormonal factors like cortisol and insulin resistance drive central fat deposition in individuals with greater overall adiposity. This pattern

aligns with the concept of metabolic prioritization, where fat is stored in regions that play a more active role in energy regulation and hormonal signaling. (Alser et al., 2024)

The positive link between upper body muscle mass and leg fat highlights systemic interactions between muscle and fat. According to the metabolic coupling theory, muscle and fat tissues across the body work together to balance energy storage and utilization. Increased upper body muscle mass may signal a need for greater energy reserves, resulting in higher fat storage in the legs. On the other hand, the negative association between arm muscle mass and leg fat aligns with the competitive resource allocation theory, which suggests that muscle growth in one area may reduce the resources available for fat storage in other regions. (Blüher & Laufs, 2019; Lassek & Gaulin, 2006)

The positive correlation between leg muscle mass and leg fat further supports the concept of localized energy demands. Muscles in the legs require substantial energy for movement and weight support, leading to localized fat deposition as a convenient energy source. This aligns with the functional adaptation theory, which posits that fat is stored near regions with high energy needs to optimize function and endurance. Additionally, the role of hemoglobin in influencing leg fat can be attributed to its critical function in oxygen delivery. Hemoglobin enhances the oxidative capacity of leg muscles, helping to balance fat storage and usage effectively. (Blüher & Laufs, 2019)

4. CONCLUSION

This study highlights the significant correlations between hemoglobin levels, uric acid, and anthropometric parameters in predicting subcutaneous fat deposition among elderly individuals. Findings indicate that body weight, upper arm circumference, abdominal circumference, and calf circumference are strong positive predictors of subcutaneous fat, while skeletal muscle percentage has an inverse relationship with fat accumulation. Notably, hemoglobin levels and uric acids showed a weaker correlation with fat deposition, suggesting a more complex interplay between oxygen transport and metabolic activity.

REFERENCES

- Alser, M., Naja, K., & Elrayess, M. A. (2024). Mechanisms of body fat distribution and gluteal-femoral fat protection against metabolic disorders. *Frontiers in Nutrition, 11*, Article 1368966. <https://doi.org/10.3389/fnut.2024.1368966>
- Bender, R. L., Bekelman, T. A., Sandberg, P. A., Dufour, D. L., & Reina, J. C. (2020). Shift in body fat distribution from lower body to upper body among urban Colombian women, 1988–1989 to 2007–2008. *Public Health Nutrition, 23*(8), 1320–1328. <https://doi.org/10.1017/S1368980019004099>
- Blüher, M. (2020). Metabolically healthy obesity. *Endocrine Reviews, 41*(3), 405–420. <https://doi.org/10.1210/endrev/bnaa004>
- Blüher, M., & Laufs, U. (2019). New concepts for body shape-related cardiovascular risk: Role of fat distribution and adipose tissue function. *European Heart Journal, 40*(34), 2856–2858. <https://doi.org/10.1093/eurheartj/ehz411>
- Ceccarelli, G., Bellato, M., Zago, M., Cusella, G., Sforza, C., & Lovecchio, N. (2020). BMI and inverted BMI as predictors of fat mass in young people: A comparison across the ages. *Annals of Human Biology, 47*(3), 237–243. <https://doi.org/10.1080/03014460.2020.1738551>
- Chandrasekaran, P., & Weiskirchen, R. (2024). The role of obesity in type 2 diabetes mellitus—An overview. *International Journal of Molecular Sciences, 25*(3), 1882. <https://doi.org/10.3390/ijms25031882>
- Contreiro, C. D. E., Caldas, L. C., Nogueira, B. V., Leopoldo, A. S., Lima-Leopoldo, A. P., & Guimarães-Ferreira, L. (2020). Strength training reduces fat accumulation and improves blood lipid profile even in the absence of skeletal muscle hypertrophy in high-fat diet-induced obese condition. *Journal of Obesity, 2020*, Article 8010784. <https://doi.org/10.1155/2020/8010784>
- Després, J. P. (2012). Body fat distribution and risk of cardiovascular disease: An update. *Circulation, 126*(10), 1301–1313. <https://doi.org/10.1161/CIRCULATIONAHA.111.067264>
- Ferreira, I., Snijder, M. B., Twisk, J. W. R., Van Mechelen, W., Kemper, H. C. G., Seidell, J. C., & Stehouwer, C. D. A. (2004). Central fat mass versus peripheral fat and lean mass: Opposite (adverse versus favorable) associations with arterial stiffness? The Amsterdam Growth and Health Longitudinal Study. *The Journal of Clinical Endocrinology & Metabolism, 89*(6), 2632–2639. <https://doi.org/10.1210/jc.2003-031619>
- Gilsanz, V., Chalfant, J., Mo, A. O., Lee, D. C., Dorey, F. J., & Mittelman, S. D. (2009). Reciprocal relations of subcutaneous and visceral fat to bone structure and strength. *The Journal of Clinical Endocrinology and Metabolism, 94*(9), 3387–3393. <https://doi.org/10.1210/jc.2008-2422>
- Indraswari, D. A., Ahmadi, H. U. A., Sari, D. W. A., Jordan, T., Puruhito, B., Basyar, E., Bakri, S., & Muniroh, M. (2021). Body mass index and waist circumference are associated with visceral fats measured by bioelectrical impedance analysis in adolescents. *Jurnal Kedokteran Diponegoro, 10*(5), 351–356. <https://doi.org/10.14710/dmj.v10i5.32040>

- Kahn, S. E., Cooper, M. E., & Del Prato, S. (2014). Pathophysiology and treatment of type 2 diabetes: Perspectives on the past, present, and future. *The Lancet*, 383(9922), 1068–1083. [https://doi.org/10.1016/S0140-6736\(13\)62154-6](https://doi.org/10.1016/S0140-6736(13)62154-6)
- Kuroiwa, M., Fuse, S., Amagasa, S., Kime, R., Endo, T., Kurosawa, Y., & Hamaoka, T. (2019). Relationship of total hemoglobin in subcutaneous adipose tissue with whole-body and visceral adiposity in humans. *Applied Sciences*, 9(12), Article 2442. <https://doi.org/10.3390/app9122442>
- Kwon, H., Kim, D., & Kim, J. S. (2017). Body fat distribution and the risk of incident metabolic syndrome: A longitudinal cohort study. *Scientific Reports*, 7, Article 9703. <https://doi.org/10.1038/s41598-017-09723-y>
- Landers, K. A., Hunter, G. R., Wetzstein, C. J., Bamman, M. M., & Weinsier, R. L. (2001). The interrelationship among muscle mass, strength, and the ability to perform physical tasks of daily living in younger and older women. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, 56(10), B443–B448. <https://doi.org/10.1093/gerona/56.10.b443>
- Lassek, W. D., & Gaulin, S. J. C. (2006). Changes in body fat distribution in relation to parity in American women: A covert form of maternal depletion. *American Journal of Physical Anthropology*, 131(2), 295–302. <https://doi.org/10.1002/ajpa.20394>
- Li, S., Feng, L., Sun, X., Ding, J., & Zhou, W. (2023). Association between serum uric acid and measures of adiposity in Chinese adults: A cross-sectional study. *BMJ Open*, 13(5), Article e072317. <https://doi.org/10.1136/bmjopen-2023-072317>
- Nauli, A. M., & Matin, S. (2019). Why do men accumulate abdominal visceral fat? *Frontiers in Physiology*, 10, Article 1486. <https://doi.org/10.3389/fphys.2019.01486>
- Pereira, P. F., Serrano, H. M. S., Carvalho, G. Q., Ribeiro, S. M. R., Peluzio, M. D. C. G., Franceschini, S. D. C. C., & Priore, S. E. (2015). Measurements of body fat distribution: Assessment of collinearity with body mass, adiposity and height in female adolescents. *Revista Paulista de Pediatria (English Edition)*, 33(1), 63–71. [https://doi.org/10.1016/s2359-3482\(15\)30032-4](https://doi.org/10.1016/s2359-3482(15)30032-4)
- Ran, Z., Xue, X., Han, L., Terkeltaub, R., Merriman, T. R., Zhao, T., ... & Li, C. (2021). Decrease in serum urate level is associated with loss of visceral fat in male gout patients. *Frontiers in Endocrinology*, 12, Article 724822. <https://doi.org/10.3389/fendo.2021.724822>
- Rask-Andersen, M., Karlsson, T., Ek, W. E., & Johansson, Å. (2019). Genome-wide association study of body fat distribution identifies adiposity loci and sex-specific genetic effects. *Nature Communications*, 10, Article 339. <https://doi.org/10.1038/s41467-018-08000-4>
- Ross, R., Neeland, I. J., Yamashita, S., Shai, I., Seidell, J., Magni, P., ... & Després, J. P. (2020). Waist circumference as a vital sign in clinical practice: A consensus statement from the IAS and ICCR Working Group on Visceral Obesity. *Nature Reviews Endocrinology*, 16(3), 177–189. <https://doi.org/10.1038/s41574-019-0310-7>
- Sanches, F. M. R., Avesani, C. M., Kamimura, M. A., Lemos, M. M., Axelsson, J., Vasselai, P., ... & Cuppari, L. (2008). Waist circumference and visceral fat in CKD: A cross-sectional study. *American Journal of Kidney Diseases*, 52(1), 66–73. <https://doi.org/10.1053/j.ajkd.2008.02.004>

- Shirley, M. K., Arthurs, O. J., Seunarine, K. K., Cole, T. J., Eaton, S., Williams, J. E., ... & Wells, J. C. K. (2022). Implications of leg length for metabolic health and fitness. *Evolution, Medicine, and Public Health*, 10(1), 316–324. <https://doi.org/10.1093/emph/eoac023>
- Sucharita, S., Pranathi, R., Correa, M., Keerthana, P., Ramesh, L. J., Bantwal, G., ... & Kurpad, A. V. (2019). Evidence of higher intramyocellular fat among normal and overweight Indians with prediabetes. *European Journal of Clinical Nutrition*, 73(10), 1373–1381. <https://doi.org/10.1038/s41430-019-0402-4>
- Tapio, J., Vähänikkilä, H., Kesäniemi, Y. A., Ukkola, O., & Koivunen, P. (2021). Higher hemoglobin levels are an independent risk factor for adverse metabolism and higher mortality in a 20-year follow-up. *Scientific Reports*, 11(1), Article 18942. <https://doi.org/10.1038/s41598-021-99217-9>
- Wajchenberg, B. L. (2000). Subcutaneous and visceral adipose tissue: Their relation to the metabolic syndrome. *Endocrine Reviews*, 21(6), 697–738. <https://doi.org/10.1210/edrv.21.6.0415>
- Wang, H. P., Xu, Y. Y., Xu, B. L., Lu, J., Xia, J., Shen, T., ... & Lei, T. (2023). Correlation between abdominal fat distribution and serum uric acid in patients recently diagnosed with type 2 diabetes. *Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy*, 16, 3751–3762. <https://doi.org/10.2147/dms0.s430235>
- Wang, J., He, L., Yang, N., Li, Z., Xu, L., Li, W., ... & Li, Y. (2022). Large mid-upper arm circumference is associated with reduced insulin resistance independent of BMI and waist circumference: A cross-sectional study in the Chinese population. *Frontiers in Endocrinology*, 13, Article 1054671. <https://doi.org/10.3389/fendo.2022.1054671>
- Wang, T., Gao, Q., Yao, Y., Luo, G., Lv, T., Xu, G., ... & Yan, M. (2023). Causal relationship between obesity and iron deficiency anemia: A two-sample Mendelian randomization study. *Frontiers in Public Health*, 11, Article 1188246. <https://doi.org/10.3389/fpubh.2023.1188246>
- Yu, C. (2024). *Body fat types (brown, white, visceral) and locations (belly, butt, and more)*. Retrieved from [exact URL not provided].