

PROCEEDING BOOK



3rd BALI CLINICAL NUTRITION UPDATE BALI CLIN-UP 2025

KUTA

*Keeping Up with Trends in Anti-aging,
Cancer Prevention Research and
Clinical Nutrition*

24th - 26th
October 2025

Discovery Kartika
Plaza Hotel

WELCOME SPEECH

BALI CLINICAL NUTRITION UPDATE 2025

**Om Swastiastu,
Namo buddhaya
Assalamu'alaikum warahmatullahi wabarakatuh ,
Greetings of peace to us all,**

First and foremost, let us express our deepest gratitude to God Almighty. By His grace, we are able to organize and plan the Bali Clinical Nutrition Update 2025, which is scheduled to take place in October 2025 at the Discovery Kartika Plaza Hotel.

This symposium and workshop will carry the theme KUTA: Keeping Up with Trends in Anti-aging, Cancer Prevention Research and Clinical Nutrition. The theme reflects the urgency and relevance of nutritional science in supporting public health on a broader scale. By bringing together experts in their respective fields, we hope this event will serve as an inspiring and beneficial platform for all participants—academicians, practitioners, and healthcare professionals alike.

We hope that the discussions and training sessions throughout this event will provide practical insights and enhance our competencies in daily clinical practice. We would also like to extend our heartfelt gratitude to all parties who have provided support, be it in the form of resources, manpower, or ideas, enabling the smooth preparation of this event. Our highest appreciation also goes to our sponsors who have contributed significantly to the success of this event.

May the Bali Clinical Nutrition Update 2025 become a strong starting point for the continuous development of clinical nutrition science, advancing for the greater good of society. We sincerely hope the event runs successfully and brings meaningful benefits to the field of healthcare.

**Om Shanti Shanti Shanti Om,
Namo Buddhaya
Wassalamu'alaikum warahmatullahi wabarakatuh.
Greetings of peace to everyone.**

**Chairperson
Bali Clinical Nutrition Update 2025**



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ORGANIZING COMMITTEE

Organizing Committee	Ketua PP PDGKI
Steering Committee	Prof. Dr. dr. I Wayan Weta, MS, Sp.GK (K) Dr. dr. I Gde Ngurah Indraguna Pinatih, Msc., Sp.GK (K) dr. Agustinus I Wayan Harimawan, MPH. Sp.GK(K) (Ketua PDGKI Cabang Bali)
Chairman	dr. Ni Ketut Sumartini, M.Kes, Sp.GK(K)
Secretary & Secretariat	dr. I Putu Prayoga Ratha, Sp.GK
Treasurer	dr. Eni Yuliani, Sp.GK
Scientific Committee	dr. I Wayan Gede Sutadarma, M.Gizi, Sp.GK(K) dr. Felita Surya Rini, Sp.GK AIFO-K
Program Committee	dr. Christian, MMRS, MH, Sp.GK
Fundraising & Sponsorship Committee	dr. Syuma Adhy Awan, M.Kes, Sp.GK(K) dr. Rini Siallagan, Sp.GK
Catering & Spiritual Support Team	dr. Ni Made Dwi Asti Lestari, M.Kes, Sp.GK
Publication :	dr. Rafael Kosasih,Sp.GK

BACKGROUND

The advancement of science and technology in the fields of medicine and healthcare has proven that integrated nutritional interventions can lead to improved clinical outcomes. While these developments have had a positive impact, the implementation of comprehensive and continuous nutrition therapy remains a challenge within healthcare systems and daily clinical practice. Suboptimal nutrition therapy may hinder the recovery process in patients with acute, critical, or chronic illnesses, increase morbidity and mortality rates, prolong hospital stays, and escalate the overall burden of healthcare costs.

Globally, the aging population is expected to continue rising, with the number of older adults (over 60 years) projected to double from 1 billion in 2020 to more than 2 billion by 2050. Aging is associated with an increased risk of degenerative diseases, including cancer, cardiovascular disease, and metabolic disorders. Nutritional factors play a crucial role in slowing the aging process and improving quality of life in older adults. Furthermore, recent research has shown that nutritional approaches targeting molecular mechanisms—such as low-grade chronic inflammation and oxidative stress—can help extend healthy lifespan and reduce the risk of degenerative diseases.

In line with the growing aging population, the prevalence of cancer continues to rise. Cancer remains one of the leading causes of death worldwide, with over 19 million new cases and 10 million cancer-related deaths reported in 2020. In Indonesia, cancer is the second leading cause of death after cardiovascular disease, with its prevalence steadily increasing. Lifestyle factors—including unhealthy dietary patterns, lack of physical activity, and the consumption of alcohol and tobacco—contribute significantly to the elevated risk of cancer. Appropriate nutritional interventions have been proven to improve patients' tolerance to cancer treatments such as chemotherapy and radiotherapy, as well as to accelerate recovery following medical procedures.

Clinical nutrition plays a vital role in the prevention and management of cancer through targeted, nutrition-based approaches. Proper nutrient intake can help strengthen the immune system, reduce inflammation, and suppress cancer cell growth. In addition, optimal nutrition contributes to improved patient response to cancer therapies, reduces treatment side effects, and enhances the nutritional status and quality of life of oncology patients. Therefore, strengthening the role of clinical nutrition in the field of oncology is essential to ensure that cancer treatment approaches are more effective and holistic.

As part of efforts to enhance the competencies of medical professionals, the Indonesian Clinical Nutrition Physician Association (PDGKI) intends to organize the **"Bali Clinical Nutrition Update 2025."** This event is a regular scientific agenda aimed at providing knowledge updates for clinical nutrition specialists, residents of the Clinical Nutrition Specialist Training Program (PPDS), as well as general practitioners with an interest in this field.

This year, Bali Clinical Nutrition Update 2025 carries the theme: **"KUTA: Keeping Up with Trends in Anti-aging, Cancer Prevention Research and Clinical Nutrition"** featuring a series of scientific sessions including Workshops, Plenary Sessions, Symposia, and a Travelling Symposium. The event will take place on **October 24–26, 2025, at Discovery Kartika Plaza Hotel, Bali.**

Through the implementation of this event, it is expected that participants will enhance their understanding and skills in the professional management of clinical nutrition, based on evidence-based medicine and tailored to the clinical conditions of each patient. In doing so, the quality of healthcare services in the field of clinical nutrition can be continuously improved for the benefit of patient well-being and the overall efficiency of the healthcare system.

EVENT INFORMATION

Event Format

- Symposium
- Workshop

Participants

- Clinical Nutrition Specialists
- Residents of the Clinical Nutrition Specialist Training Program (PPDS)
- General Practitioners

Objectives

1. To enhance knowledge of the latest advancements in integrated clinical nutrition therapy, specifically for hospitalized patients.
2. To improve competency skills in delivering integrated clinical nutrition therapy tailored to hospitalized patients.
3. To strengthen the professionalism of clinical nutrition physicians in providing healthcare services in the era of digitalization.

Time & Date

October 24–26, 2025

08.00–17.00 (WITA)

Venue: Discovery Kartika Plaza Hotel, Bali

Organizing Committee Secretariat

PT. Kongres Manajemen Indonesia
(Indonesian Congress Management)

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WORKSHOP

3rd Bali Clinical Nutrition Update WORKSHOP DAY

KEEPING UP WITH TRENDS IN ANTI-AGING,
CANCER PREVENTION RESEARCH & CLINICAL NUTRITION

Friday, October 24th 2025

Discovery Room

TIME	WORKSHOP 1 Workshop ESPEN LLL Course	
	TOPIC	SPEAKER
07.30-08.00	REGISTRATION	
08.15-12.00	Modul 1 ESPEN LLL Course: Approach to Oral and Enteral Nutrition (EN) Adult	
08.15-08.55	Indications, Contraindications, Complications and Monitoring of EN	dr. Josef Hartono, PhD
08.55-09.35	Hospital Diet and Oral Nutritional Supplement (Sip Feeding)	Dr.dr. I Putu Pramana Suarjaya, Sp.An-TI, Mkes, Subsp.M.N. (K), Subsp.N.An (K), FIP
09.35-10.15	Formulae for EN	Dr. dr. Niken Puruhita, M.Med.Sc, Sp. GK (K)
10.15-10.30	Coffee Break	
10.30-11.10	Technique of EN	dr. Josef Hartono, PhD
11.10-12.00	Cases & Test	dr. Josef Hartono, PhD
12.00-13.45	LUNCH AND FRIDAY PRAYER	
13.45-18.00	Modul 2 ESPEN LLL Course: Approach to Parenteral Nutrition	
13.45-14.25	Module 9.2 Techniques of Parenteral Nutrition	dr. Josef Hartono, PhD
14.30-15.10	Module 9.1 Indications and Contraindications for Parenteral Nutrition	Dr.dr. I Putu Pramana Suarjaya, Sp.An-TI, MKes, Subsp.M.N. (K), Subsp.N.An (K), FIP
15.10-15.50	Module 9.3 Compounding and Ready-to-use Preparation of PN: Pharmaceutical Aspects. Compatibility and Stability Considerations; Drug Admixing	Dr. dr. Niken Puruhita, M.Med.Sc, Sp. GK (K)
15.55-16.35	Module 9.4 Monitoring and Complications of Parenteral Nutrition	dr. Josef Hartono, PhD
16.35-17.35	Cases & Test	
17.35-17.50	Coffee Break	
17.50-18.00	WORKSHOP CLOSING BEST PARTICIPANT DOOR PRIZE ANNOUNCEMENT	

WORKSHOP

3rd Bali Clinical Nutrition Update WORKSHOP DAY

**KEEPING UP WITH TRENDS IN ANTI-AGING,
CANCER PREVENTION RESEARCH & CLINICAL NUTRITION**
Friday, October 24th 2025

Rama Room

TIME	WORKSHOP 1 Workshop ESPEN LLL Course	
	TOPIC	SPEAKER
07.30-08.00	REGISTRATION	
08.15-12.00	Modul 1 ESPEN LLL Course: Approach to Oral and Enteral Nutrition (EN) Adult	
08.55-09.35	Formulae for EN	Dr. dr. Niken Puruhita, M.Med.Sc, Sp. GK (K)
09.35-10.15	Hospital Diet and Oral Nutritional Supplement (Sip Feeding)	Dr.dr. I Putu Pramana Suarjaya, Sp.An-TI, MKes, Subsp.M.N. (K), Subsp.N.An (K), FIP
12.00-13.45	LUNCH AND FRIDAY PRAYER	
13.45-18.00	Modul 2 ESPEN LLL Course: Approach to Parenteral Nutrition	
14.30 - 15.10	Module 9.3 Compounding and Ready-to-use Preparation of PN: Pharmaceutical Aspects. Compatibility and Stability Considerations; Drug Admixing	Dr. dr. Niken Puruhita, M.Med.Sc, Sp. GK (K)
15.10 - 15.50	Module 9.1 Indications and Contraindications for Parenteral Nutrition	Dr.dr. I Putu Pramana Suarjaya, Sp.An-TI, MKes, Subsp.M.N. (K), Subsp.N.An (K), FIP

WORKSHOP

3rd Bali Clinical Nutrition Update WORKSHOP DAY

KEEPING UP WITH TRENDS IN ANTI-AGING,
CANCER PREVENTION RESEARCH & CLINICAL NUTRITION

Friday, October 24th 2025

Shinta Room

TIME	WORKSHOP 2	
	Workshop Advanced Management Obesity	
07.30-08.00	REGISTRATION	
08.00-08.30	OPENING & PRATEST	
08.30-11.30	Session 1 Managing Stress and Impulsive Eating in Obesity: A Psychiatric Perspective on Behavioral Control	Moderator : Dr. dr. Syuma Adhy Awan, M.Kes.
	Introduction dan Lecture Coffee Break Small Group Discussion Video Session Wrapped Up and Discussion	Dr. dr. Anak Ayu Sri Wahyuni, Sp.KJ
08.30-09.30		
09.30-09.45		
09.45-10.45		
10.45-11.00		
11.00-11.30		
11.30-13.00	LUNCH AND FRIDAY PRAYER	
13.00-16.00	Session 2 Beyond Body Contours : A Practical Approach to Localized Fat and Cellulite with Fat Dissolving Injection	Moderator : Dr. dr. Syuma Adhy Awan, M.Kes., Sp.GK., Subsp.PK
	Introduction dan Lecture Live Demo Small Group Hands On Wrapped Up and Discussion + Coffee Break	Dr. med. dr. Maya Surjadjaja, M.Gizi., Sp.GK., FAAMFM
	Sponsor Session	
	Post Test + Evaluasi + Closing	
16.05-16.10	WORKSHOP CLOSING BEST PARTICIPANT DOOR PRIZE ANNOUNCEMENT	

SYMPOSIUM

3rd Bali Clinical Nutrition Update

SYMPOSIUM DAY 1

KEEPING UP WITH TRENDS IN ANTI-AGING,
CANCER PREVENTION RESEARCH & CLINICAL NUTRITION

Saturday, October 25th 2025

Kharisma Ballroom

TIME	TOPIC	SPEAKER
07.15-08.00	Registration Photo Session with the Organizing Committee and Special Guests	
08.00-08.05	Safety Briefing	
	Opening ceremony	MC : dr. Made Kurnia Alvina, S.Ked.
08.05-08.10	National Anthem “ INDONESIA RAYA”	
08.10-08.12	PDGKI Mars	
08.12-08.15	Hymne PPDS Gizi Klinik FK Univeristas Udayana	
08.15-08.20	Pray	
08.20-08.25	Welcome Speech & Committee Report	dr. Ni Ketut Sumartini, M.Kes., SpGK., Subsp.P.K.
08.25-08.30	Welcome Speech by the Director of RSUP Prof Ngoerah	dr. I Wayan Sudana, M.Kes
08.30-08.35	Welcome Speech by Dean Faculty of Medicine, Universitas Udayana	Prof. Dr. dr. I Gede Eka Wiratnaya, Sp OT. Subsp.Onk.Ort.R(K)
08.35-08.45	Welcome Speech and Opening by By Chairperson of PDGKI Bali / Representative of PP PDGKI	dr. Agustinus I Wayan Harimawan, MPH, Sp.GK., Subsp.P.K
08.45-08.55	Bali Dancer Performance	
08.55-09.00	Lifetime Achievement Award	
09.00-10.00	Plenary Session	Moderator : dr. Eni Yuliani, Sp.GK
09.00-09.15	Plenary Ethicomedicolegal Medicolegal Aspects in Clinical Nutrition Practice: Ethical, Legal, and Professional Considerations	dr. Nur Ashari, M.Kes., Sp.GK., Subsp.KM
09.15-09.30	Plenary Lecture 1 Bridging Epigenetics and Surgical Oncology: Toward Precision Cancer Treatment	Prof. Dr. dr. Putu Anda Tusta Adiputra, Sp.B., Subsp. Onk(K)
09.30-09.45	Plenary Lecture 2 Skin Aging: Mechanisms, Prevention, and Therapeutic Innovations	Dr. dr. I. G. A. A. Praharsini, Sp.D.V.E., Subsp.D.K.E., FINS DV, FAADV
09.45-10.00	Plenary Lecture 3 Adiposity and Metabolic Dysfunction: Unraveling the Complexities of Obesity	Prof. dr. Agussalim Bukhari, M.Med., Ph.D., Sp.GK., Subsp.KM
10.00-10.15	Coffee Break 1	

SYMPOSIUM

3rd Bali Clinical Nutriton Update

SYMPOSIUM DAY 1

**KEEPING UP WITH TRENDS IN ANTI-AGING,
CANCER PREVENTION RESEARCH & CLINICAL NUTRITION**

Saturday, October 25th 2025

TIME	TOPIC	SPEAKER
10.15-11.30	Session 1 Wellness Nutrition	Moderator : dr. I Putu Prayoga Ratha., Sp.GK
10.15-10.45	Topic 1.1 Semaglutide 2.4 : Evidence, Integration, and Clinical Pearls for Clinical Nutrition Specialist	DR Med. dr. Maya Surjadjaja, M.Gizi, Sp.GK, FAAMFM
10.45-11.15	Topic 1.2 Redefining Wellness: The Role of Semaglutide in Clinical Anti-Aging Strategies	Dr. dr. Gde Ngurah Indraguna Pinatih, M.Sc., Sp.GK., Subsp.KM
11.15-11.30	Discussion	
11.30-12.30	Lunch	
12.30-13.15	Session 2 The Role of Muscle Preservation and Aerobic Capacity in Lifespan and Healthspan	Moderator : dr. Rini Siallagan, Sp.GK
12.30-12.45	Topic 2.1 Creatine Beyond Muscle: Its Role in Brain Health, Aging, and Mitochondrial Function	Prof. Dr. dr. Hertanto Wahyu Subagio, M.S., Sp. GK., Subsp. KM
12.45-13.00	Topic 2.2 Targeting Body Composition through Exercise in Obesity: Evidence and Practice	Prof. Dr. dr. Nurpudji Astuti Taslim MPH., Sp.GK Subsp. KM
13.00-13.15	Topic 2.3 Enhancing Patient Outcomes with Fish Oil-Based 3CBs in the Hospital Setting	dr. Agustinus I Wayan Harimawan, MPH., SpGK(K)
13.15-13.25	Discussion	
13.25-14.10	Session 3 Nutrition, Wellness, and Skin Longevity: Science vs. Trend	Moderator : dr. Ni Made Dwi Asti Lestari, M.Kes., Sp.GK
13.25-13.40	Topic 3.1 The Underrated Link: How Nutritional Deficiencies Pre-Surgery Contribute to Post-Plastic Surgery Complications	Dr. dr. I Gusti Putu Hendra Sanjaya, Sp.B., Sp.B.P.R.E., Subsp. L.B.L.(K)
13.40-13.55	Topic 3.2 The Hidden Link: Diet, Metabolic Health, and Alzheimer's Risk from Youth to Old Age	Dr. dr. Ketut Widyastuti, Sp.N(K)
13.55-14.10	Topic 3.3 Nutrition and Alzheimer's Disease: Unlocking the Role of Diet in Cognitive Health	dr. Ni Ketut Sumartini, M.Kes., SpGK., Subsp.PK
14.10-14.20	Discussion	
14.20-14.35	Coffee Break 2	

SYMPOSIUM

3rd Bali Clinical Nutrition Update

SYMPOSIUM DAY 1

**KEEPING UP WITH TRENDS IN ANTI-AGING,
CANCER PREVENTION RESEARCH & CLINICAL NUTRITION**

Saturday, October 25th 2025

TIME	TOPIC	SPEAKER
14.35-15.20	Session 4 The Longevity Code: How Hormones Shape Aging, Resilience, and Regenerative Capacity	Moderator : dr. I Wayan Gede Sutadarma, M.Gizi., Sp.GK., Subsp.KM
14.35-14.50	Topic 4.1 The Interplay Between Insulin, IGF-1, and Dietary Interventions in Longevity	Dr.dr. Made Ratna Saraswati, Sp.PD-KEMD., FINASIM
14.50-15.05	Topic 4.2 Optimizing Recovery After Cardiac Surgery: The Negative Impact of Sarcopenia and Visceral Fat on Cardiac Rehabilitation Programs	dr. I Nyoman Wiryawan Sp.JP P.R.Kv.(K), FIHA, FAPSC
15.05-15.20	Topic 4.3 Metabolic Modulators in Clinical Nutrition: Current Evidence on L-Carnitine and Coenzyme Q10, Vitamin E	dr. Cindia waty Josito Pudjiadi, MARS, MS, Sp.GK
15.20-15.30	Discussion	
15.30-15.45	Best Participant Door Prize Yoga on the Beach Announcement	

SYMPOSIUM

3rd Bali Clinical Nutrition Update
SYMPOSIUM DAY 2

KEEPING UP WITH TRENDS IN ANTI-AGING, CANCER PREVENTION RESEARCH & CLINICAL NUTRITION
Sunday, October 26th 2025

TIME	TOPIC	SPEAKER
05.30-06.30	Yoga on The Beach	
07.30-08.00	Re-registration	
08.00-08.05	OPENING DAY 2	
08.05-08.50	Session 5 Optimizing Nutrition in Cancer Prevention and Treatment: The Power of Food as Medicine	Moderator : dr. Ni Ketut Sumartini, M.Kes., SpGK., Subsp.PK
08.05-08.20	Topic 5.1 The Role of Lean Body Mass in Enhancing Chemotherapy Efficacy and Reducing Toxicity	Dr. dr. I Wayan Losen Adnyana, Sp.PD-KHOM
08.20-08.35	Topic 5.2 Liver Detox as Cancer Prevention: Evidence, Mechanisms, and Application	Prof. Dr. dr. I Wayan Weta, MS. Sp.GK., Subsp.KM
08.35-08.50	Topic 5.3 Fasting-Mimicking Diets (FMD) and Autophagy in Cancer Therapy	dr. Eni Yuliani, Sp.GK
08.50-09.00	Discussion	
09.00-09.10	Coffee Break 1	
09.10-09.55	Session 6 Feeding the Gut: The Impact of Diet on Gastrointestinal Cell Function and Integrity	Moderator : dr. Rini Siallagan, Sp.GK
09.10-09.25	Topic 6.1 Gut Dysbiosis and Cancer Risk: Diet-Driven Mechanisms in Colorectal Tumorigenesis	Dr. dr. Made Agus Dwianthara Sueta, Sp.B-KBD
09.25-09.40	Topic 6.2 Trimethyl Amines N-Oxide in Carnivore Diets: Emerging Links to Cancers Risk	Dr. dr. Gde Ngurah Indraguna Pinatih, M.Sc., Sp.GK., Subsp.KM
09.40-09.55	Topic 6.3 Single Strain or Multi Strain Probiotics in Precision Nutrition: Potential to optimize gut-brain and gut-immune communication	dr. Christian, MM.RS, MH, Sp.GK.
09.55-10.05	Discussion + Doorprize	
		Moderator : dr. Felita Surya Rini, Sp.GK., AIFO-K
10.05-10.20	Topic 7.1 Estrogen-Rich Diets in Early Life: A Potential Pathway to Endometriosis and Endometrial Malignancy	Dr. dr. I Nyoman Gede Budiana, Sp.O.G, Subsp.Onk.
10.20-10.35	Topic 7.2 Targeting Estrogen Pathway in Cancer: The Emerging Role of Resveratrol	Prof. Dr. dr. I Wayan Weta, MS. Sp.GK., Subsp.KM

SYMPOSIUM

3rd Bali Clinical Nutrition Update SYMPOSIUM DAY 2

KEEPING UP WITH TRENDS IN ANTI-AGING, CANCER PREVENTION RESEARCH & CLINICAL NUTRITION
Sunday, October 26th 2025

	TOPIC	SPEAKER
10.35-10.50	Topic 7.3 The Role of FTO Gene Polymorphism in Cancer	dr. Agustinus I Wayan Harimawan, MPH., Sp.GK., Subsp.PK
10.50-11.00	Discussion	
	Session 8 Nutritional Interventions in Brain Cancer: From Ketogenic Therapy to Functional Preservation	Moderator : dr. Ni Made Dwi Asti Lestari, M.Kes, Sp.GK
12.00-12.15	Topic 8.1 Challenges in Brain Tumor Surgery: Why Pre- and Postoperative Nutrition Is Crucial	Dr. dr. Nyoman Golden, Sp.BS, Subsp. N-Onk
12.15-12.30	Topic 8.2 Optimizing Chemotherapy Outcomes: The Emerging Role of Vitamin D Supplementation	dr. I Wayan Gede Sutadarma, M.Gizi., Sp.GK., Subsp.KM
12.30-12.45	Topic 8.3 Precision Nutrition in Oncology: Targeting Metabolic Pathways in Cancer Cells	dr. Felita Surya Rini, Sp.GK., AIFO-K
12.45-12.55	Discussion	
	Session 9 Optimizing Outcomes in Head and Neck Cancer Through Surgery and Nutrition	Moderator : dr. Christian, MM.RS., MH., Sp.GK.
13.20-13.35		Dr. dr. I Gde Ardika Nuaba, Sp.T.H.T.B.K.L., Subsp.Onk(K), FICS
13.35-13.50	Topic 9.2 Micronutrient-Based Approaches in Cancer Therapy: Current Clinical Evidence	dr. I Wayan Gede Sutadarma, M.Gizi., Sp.GK., Subsp.KM
13.50-14.05	Topic 9.3 Glutamine and Omega-3 Supplementation to Prevent Oral Mucositis in Head and Neck Cancer Patients Undergoing Radiotherapy	dr. I Putu Prayoga Ratha., Sp.GK
14.05-14.15	Discussion	
14.15-14.30	Closing Ceremony : Poster Winner Announcement Door Prize Day 2 Closing Speech Closing Remaks	

Plenary Ethicomedicolegal

Medicolegal Aspects in Clinical Nutrition Practice: Ethical, Legal, and Professional Considerations

dr. Nur Ashari, M.Kes., Sp.GK.,Subsp.KM

Abstract

Clinical nutrition practice lies at the intersection of ethical responsibility, legal accountability, and professional competence. This paper explores the medicolegal dimensions of clinical nutrition, emphasizing ethical principles, legal frameworks, and professional standards. Ethically, the principles of autonomy, beneficence, non-maleficence, and justice guide clinical decisions such as initiating, withholding, or withdrawing nutritional and hydration support. Legally, practitioners must navigate issues surrounding informed consent, patient capacity, duty of care, and documentation to prevent malpractice claims and ensure patient. From a professional standpoint, dietitians and clinical nutrition specialists must adhere to scope-of-practice regulations, maintain evidence-based standards, and engage in continuous professional development to uphold ethical and legal integrity. The discussion underscores that ethical dilemmas particularly in end-of-life nutrition care require balancing patient rights with professional judgment and institutional policy. Ultimately, integrating ethical reasoning, legal compliance, and professional accountability ensures the delivery of safe, equitable, and legally defensible nutrition care. Continuous education, interprofessional collaboration, and cultural sensitivity are essential for minimizing medicolegal risks and promoting patient-centered practice in clinical nutrition.

Keywords: clinical nutrition, medicolegal aspects, ethics, legal framework, professional practice, informed consent, patient autonomy, duty of care.

Plenary Lecture 1

Bridging Epigenetics and Surgical Oncology: Toward Precision Cancer Treatment

Putu Anda Tusta Adiputra

Surgical Oncology Division, Surgery Department, Faculty of Medicine, Udayana
University/Prof Ngoerah Hospital, Denpasar, Bali, Indonesia

Epigenetics, defined as molecular modifications regulating gene expression without altering the DNA sequence, plays a pivotal role in oncogenesis through diverse mechanisms including DNA methylation, histone modifications, chromatin remodeling, and non-coding RNA regulation, which collectively interact with genetic mutations to drive the cancer phenotype by activating oncogenes, silencing tumor suppressor genes, and promoting genomic instability; characteristic patterns in malignant cells, such as global hypomethylation with consequent chromosomal instability and local hypermethylation at CpG islands of tumor suppressor genes that repress protective transcription, are complemented by histone modifications mediated by writers, erasers, and readers that alter chromatin accessibility, thus influencing critical cellular processes such as proliferation, apoptosis, metastasis, and tumor-immune interactions; furthermore, RNA epigenetics, including modifications of mRNA and microRNA, modulate transcript stability and translation, with dysregulated microRNA expression contributing actively to tumor initiation and progression, highlighting the multilayered complexity of cancer epigenetics; these insights have paved the way for novel therapeutic approaches, with DNA methyltransferase inhibitors (DNMTi) and histone deacetylase inhibitors (HDACi) already applied in certain malignancies, while BET protein inhibitors and modulators of histone enzymes remain under investigation, although monotherapies frequently encounter resistance and heterogeneous efficacy, thereby underscoring the promise of combinatorial strategies involving chemotherapy, immunotherapy, or targeted therapy; simultaneously, epigenetic signatures demonstrate potential as diagnostic and prognostic biomarkers, as DNA methylation profiles often arise early in tumorigenesis, exhibit cancer-type specificity, and can be detected via minimally invasive sampling, with studies reporting predictive value in breast, lung, nasopharyngeal, prostate, and colorectal cancers, though none have yet secured FDA approval; ultimately, in the precision medicine era, the integration of genetic and epigenetic information through multi-omics platforms and artificial intelligence (AI) is expected to refine biomarker discovery, enable more accurate patient stratification, and inform the development of personalized therapies, positioning epigenetics as a crucial bridge between fundamental molecular oncology and surgical

oncology practices, and offering innovative prospects for early detection, precision therapeutics, and improved clinical outcomes.

Keywords: Epigenetics; DNA methylation; Histone modification; Cancer biomarkers; Precision oncology

Plenary Lecture 2

Skin Aging: Mechanisms, Prevention and Therapeutic Innovations

I Gusti Ayu Agung Praharsini

Departemen Dermatolog dan Venerologi/ RSUP Prof. dr. IG.N.G. Ngoerah/ FK UNUD

Abstrak

Penuaan kulit dipengaruhi oleh faktor intrinsik seperti genetik dan metabolisme sel, perubahan hormonal, pemendekan telomer, stres oksidatif, dan sistem imun yang menurun serta faktor ekstrinsik seperti paparan lingkungan (radiasi UV), polusi dan gaya hidup (pola makan, merokok, konsumsi alkohol, dan pola tidur). Interaksi antara faktor-faktor ini mempercepat proses penuaan, yang menyebabkan berbagai manifestasi klinis seperti kerutan, hilangnya elastisitas kulit, perubahan pigmentasi, dan perubahan tekstur. Mekanisme molekuler yang mendasari penuaan kulit, meliputi kerusakan kolagen dan elastin, metaloproteinase matriks (MMP), glikasi, dan peradangan kronis. Berbagai intervensi dan strategi pencegahan, mulai dari pengobatan topikal, modifikasi gaya hidup terapi sistemik dan prosedur minimal invasif/invasif

Kata kunci; penuaan kulit, intrinsik, ekstrinsik, terapi penuaan kulit

Plenary Lecture 3

Adiposity and Metabolic Dysfunction: Unraveling the Complexities of Obesity

Agussalim Bukhari

Faculty of Medicine, Hasanuddin University

Abstract

Obesity represents a global health pandemic characterized by pathological adiposity, which is intimately linked to severe metabolic dysfunction, including Type 2 Diabetes Mellitus (T2DM), non-alcoholic fatty liver disease (NAFLD), and cardiovascular disease (CVD). This complexity arises not merely from excess body mass, but from profound cellular and molecular alterations within the adipose tissue (AT) itself. This analysis addresses the critical transition from healthy lipid storage to dysfunctional AT pathology, which subsequently drives systemic metabolic disease.

The core pathology is the failure of AT to maintain safe lipid buffering capacity. As adipocytes undergo hypertrophy and reach their storage limit, this capacity is exceeded, triggering ectopic fat deposition in vital organs such as the liver and pancreas. This organ stress initiates systemic insulin resistance, the hallmark of metabolic syndrome. Concurrently, the AT shifts into a state of chronic, low-grade inflammation. Dysfunctional adipocytes and recruited macrophages secrete proinflammatory cytokines (e.g., TNF-, IL-6) that directly interfere with insulin signaling pathways. AT endocrine function is also severely impaired, marked by reduced insulin-sensitizing adiponectin and elevated leptin levels.

Advances in multi-omics technologies (genomics, metabolomics) offer new insights, highlighting gene markers associated with compromised mitochondrial function and revealing circulating biomarkers such as branched-chain amino acids (BCAAs) that predict disease risk. Furthermore, the gut microbiome is increasingly recognized as a key modulator of systemic inflammation. In **Conclusion**, overcoming obesity necessitates a shift away from traditional caloric restriction alone. Future therapeutic efforts must prioritize precision medicine approaches focused on restoring AT health, function, and plasticity to combat the molecular root causes of obesity-related chronic diseases.

Session 1

Topic 1.1

Semaglutide 2.4 mg: Evidence, Integration, and Clinical Pearls for Clinical Nutrition Specialists

Maya Surjadjaja

Klinik Spesialis Gracia Patricia, FK UKRIDA, RSAL Dr. Mintohardjo

“We are what we repeatedly do. Excellence, then, is not an act, but a habit.” – Aristotle

Background:

Obesity is a chronic, relapsing, multifactorial disease linked to accelerated biological aging and increased cardiometabolic morbidity. Global prevalence has tripled since 1975, while Indonesia now reports rates above 23%, with a clear upward trend across urban and rural populations. Lifestyle therapy alone often fails to achieve long-term weight control, highlighting the need for effective pharmacological adjuncts.

Methods:

This review summarizes pivotal phase 3 trials of semaglutide 2.4 mg, including the STEP program, SELECT cardiovascular outcomes trial, and population-specific studies (East Asian cohorts, adolescents, and patients with heart failure with preserved ejection fraction). Evidence was contextualized with *PNPK Obesitas 2025* and international guidelines, focusing on translation to clinical nutrition practice in Indonesia.

Results:

Semaglutide 2.4 mg achieved ~15% sustained weight loss at 68 weeks in STEP 1 and 5, maintained up to two years with continued therapy. SELECT demonstrated a 20% reduction in major adverse cardiovascular events in people with obesity and established cardiovascular disease, independent of diabetes. Additional benefits included improvements in blood pressure, glycemia, lipid profile, visceral adiposity, quality of life, and functional outcomes in HFpEF and osteoarthritis. Gastrointestinal adverse events were most common, generally mild to moderate and transient. Rare risks included gallbladder disease and a boxed warning for thyroid C-cell tumors based on animal data.

Conclusion:

Semaglutide 2.4 mg is a transformative therapy in obesity management, providing durable weight reduction and cardiometabolic protection. For clinical nutrition specialists, integration requires combining pharmacotherapy with individualized medical nutrition therapy, adequate protein intake, and structured long-term follow-up. Barriers in Indonesia include limited access, cost, and cultural stigma, but opportunities exist in developing multidisciplinary care pathways and adapting nutrition strategies to local contexts.

Keywords: Obesity, Semaglutide 2.4 mg, STEP trials, Cardiovascular Outcomes, Clinical Nutrition, Indonesia

Topic 1.2

THE ROLE OF SEMAGLUTIDE IN CLINICAL ANTI AGING STRATEGIES

By

Gde Ngurah Indraguna Pinatih

Faculty of Medicine University of Mahasarakswati

ABSTRACT

Semaglutide first time used as an anti Diabetic property for patient with Diabetes Mellitus type II and obesity. Later, it is also used as an effective antiobesity drug.

Obesity is a disease and it speeds the aging process, anti aging medicine tries to fight it by preventing, delaying, suspend and even reversing the process.

Fat cells from the adipose tissue of people with obesity is an endocrine organ producing cytokine pro inflammation such as TNF and IL-6 and reduce the Leptin and adiponectin. Therefore, obesity can continue to many other degenerative diseases such as non alcoholic fatty liver disease (NAFLD), cardiovascular disease, insulin resistance leading to DM type II etc. Semaglutide and its potentially effect on suppressing glucagon secretion by pancreatic α - cells, contributing to improved glycemic control. The central effects of semaglutide as mediator through its action on GLP-1 receptors in the hypothalamus and brainstem, leading to reduced appetite and food intake. Many studies also show the benefit of Semaglutide to prevent inflammation as well as reduce the mortality of Cardio Vascular Disease. However, besides of many benefits can be taken from Semaglutide, the side effect shall also put into account to educate the patient who want to use semaglutide as their addjuvant therapy for obesity.

Keyword: *semaglutide, obesity, anti aging medicine*

Session 2
Topic 2.1

**Creatine Beyond Muscle :
Its role on Brain Health, Aging and Mitochondrial Function**

Hertanto W Subagio

ABSTRACT

Creatine is a naturally occurring compound primarily found in muscle tissue and the brain, derived from amino acids. It plays a crucial role in energy production within cells, particularly during high-intensity exercise. Creatine supplementation is often used to enhance physical performance, increase muscle mass, and potentially improve brain function.

Creatine supplementation may have positive effects on brain health, particularly in areas like memory, reasoning, and neuroprotection, especially in older adults and improve cognitive function, potentially aiding in conditions like mild traumatic brain injury and even showing promise in some aspects of Alzheimer's disease.

Meta-analyses on creatine supplementation in aging populations consistently demonstrate its positive impact on muscle mass, strength, and physical function, particularly when combined with resistance training. These studies indicate that creatine supplementation can help mitigate the age-related decline in muscle mass and improve muscle strength, potentially enhancing physical performance and reducing the risk of falls.

Creatine plays a significant role in supporting mitochondrial function by acting as an energy buffer, a stabilizer of mitochondrial function, and a modulator of inflammation and oxidative stress. It can be particularly helpful in conditions where mitochondria are underperforming or stressed, by providing a readily available energy source and promoting overall mitochondrial health. However, more research, particularly larger and more targeted studies, is needed to fully understand its benefits and potential sex-related differences in response to supplementation.

Key word : creatine, brain health, aging, mitochondrial function

Topic 2.2

Targeting Body Composition through Exercise in Obesity: Evidence and Practice

Prof. Dr. dr. Nurpudji Astuti Taslim MPH., Sp.GK Subsp. KM

Obesity represents a multifactorial chronic disease associated with excessive adipose tissue accumulation and significant metabolic disturbances. Beyond simple weight reduction, the optimization of body composition specifically the reduction of fat mass and preservation of lean mass has emerged as a crucial therapeutic objective. Exercise interventions are fundamental in achieving these outcomes, supported by robust evidence from both clinical and experimental research. Aerobic training promotes substantial reductions in total and visceral adiposity through enhanced lipid oxidation and improved mitochondrial efficiency. In contrast, resistance exercise contributes to the maintenance and hypertrophy of skeletal muscle, thereby sustaining resting metabolic rate and functional capacity. Integrated aerobic–resistance programs yield synergistic effects, producing superior outcomes in fat distribution, insulin sensitivity, and cardiometabolic health. Recent investigations have underscored the necessity of individualized exercise prescriptions, considering physiological variability, sex-based differences, and genetic determinants of training responsiveness. Furthermore, the incorporation of precise body composition assessment tools such as dual-energy X-ray absorptiometry and bioelectrical impedance analysis facilitates targeted and quantifiable interventions. Despite strong empirical support, translation into clinical and community settings remains suboptimal due to adherence barriers and misperceptions regarding exercise intensity and volume. This paper synthesizes current evidence and practical frameworks for implementing exercise-based strategies to optimize body composition in obesity management. Targeting body composition through exercise represents a paradigm shift from weight-centric approaches toward metabolic restoration and long-term health improvement.

Topic 2.3

Enhancing Patient Outcomes with Fish Oil–Based Three-Chamber Bags (3CBs) in the Hospital Setting

Agustinus I Wayan Harimawan
RS Ngoerah/FK Universitas Udayana

Background: Malnutrition remains a common and underestimated issue among hospitalized and critically ill patients, affecting 20–50 % of admissions. It contributes to infection, prolonged intensive-care and hospital stay, and delayed recovery. When enteral nutrition (EN) is not feasible or insufficient, parenteral nutrition (PN) becomes essential. Lipids, beyond their caloric value, play a key role in modulating inflammation and immune response.

Objective: To summarize mechanistic and clinical evidence supporting the integration of fish-oil–based lipid emulsions into three-chamber PN formulations and their impact on clinical outcomes in surgical and critically ill patients.

Methods: Evidence was drawn from ESPEN/ASPEN guidelines and meta-analyses of randomized controlled trials comparing omega-3–enriched PN versus conventional omega-6–dominant emulsions. Outcomes included infection rate, sepsis incidence, ICU/hospital length of stay (LOS), and muscle preservation parameters.

Results: Omega-3 fatty acids (EPA, DHA) attenuate pro-inflammatory cytokines (IL-6, TNF- α) and promote inflammation-resolving mediators (resolvins, protectins). Compared with standard lipid emulsions, fish-oil–based PN significantly reduced infection risk by 40 %, sepsis by 56 %, ICU LOS by 1.95 days, and hospital LOS by 2.14 days. Additional benefits include improved immune balance and maintenance of skeletal muscle mass through enhanced protein synthesis and reduced catabolism.

Conclusion: Fish-oil–enriched 3CBs represent an evidence-based immunonutrition strategy that optimizes recovery, reduces infectious complications, preserves lean mass, and improves overall patient outcomes. Their inclusion in hospital nutrition protocols should be considered as part of comprehensive clinical nutrition management.

Keywords: Omega-3 fatty acids; Parenteral nutrition; Three-chamber bags; Inflammation; Immunonutrition; Critical care; Clinical outcomes

Session 3

Topic 3.1

The Underrated Link: How Nutritional Deficiencies Pre-Surgery Contribute to Post-Plastic Surgery Complications

I Gst. Pt. Hendra Sanjaya

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Abstract

Plastic and aesthetic surgery outcomes are often measured by technical precision, yet an equally important factor is the patient's nutritional status. Nutritional deficiencies—both macro- and micronutrient—can impair wound healing, immune response, and overall recovery, but remain underrecognized in surgical planning.

This presentation explores how preoperative nutritional deficiencies contribute to complications following plastic and reconstructive procedures, and how early intervention may improve outcomes. A narrative review of recent literature was performed to evaluate the relationship between nutrition and surgical outcomes in plastic surgery.

Up to 25% of plastic surgery outpatients are at risk of malnutrition. Protein-energy deficiency delays fibroblast proliferation, collagen synthesis, and angiogenesis. Micronutrient deficits—particularly vitamins A, C, D, and zinc—compromise immune defense and tissue repair. Both obesity and restrictive diets increase susceptibility to infection, wound breakdown, seroma, hypertrophic scarring, and poor aesthetic **Results**. Evidence demonstrates that preoperative nutritional screening and timely correction of deficiencies reduce complication rates, shorten recovery, and enhance surgical outcomes.

Nutritional assessment and optimization should be integrated into preoperative planning as a standard of care in plastic and aesthetic surgery. Addressing deficiencies through screening, dietary counseling, and supplementation when needed can reduce preventable complications, improve patient safety, and support better functional and aesthetic **Results**.

Keywords: Nutrition, Plastic Surgery, Wound Healing, Complications, Prehabilitation

Abstrak

The Hidden Link: Diet, Metabolic Health, and Alzheimer Risk from Youth to Old Age

Ketut Widyastuti

Departemen/ KSM Neurologi FK Universitas Udayana RSUP Ngoerah Denpasar

Peningkatan prevalensi penyakit Alzheimer (AD) tidak hanya dikaitkan dengan penuaan tetapi juga dengan gangguan metabolik yang telah dimulai sejak usia muda. Kajian terbaru menunjukkan adanya hubungan tersembunyi antara pola makan dengan resistensi insulin, *gut-brain axis*, dan *glymphatic system* dalam patogenesis AD. Resistensi insulin akibat pola diet tinggi gula dan lemak jenuh, tidak hanya berdampak pada regulasi glukosa perifer tetapi juga mengganggu sinyal insulin di otak, yang akhirnya memperburuk metabolisme energi neuron dan mempercepat akumulasi β -amiloid serta fosforilasi tau.

Peran penting *gut-brain axis* untuk memediasi komunikasi dua arah antara mikrobiota usus dan sistem saraf pusat. Disbiosis usus akan menurunkan produksi metabolit protektif seperti asam lemak rantai pendek (SCFA) dan meningkatkan permeabilitas usus, yang dapat memicu inflamasi sistemik dan neuroinflamasi. Sementara itu *glymphatic system* berperan dalam pembuangan limbah metabolik otak termasuk β -amiloid, sangat bergantung pada kualitas tidur, status hidrasi, dan keseimbangan metabolik, sehingga gangguan pada *glymphatic system* dapat mempercepat akumulasi zat yang bersifat toksin bagi saraf.

Pendekatan nutrisi untuk menurunkan risiko AD perlu mempertimbangkan integritas dari ketiga mekanisme tersebut. Diet mediterania, DASH (*Dietary Approaches to Stop Hypertension*), dan diet MIND (*Mediterranean-DASH Intervention for Neurodegenerative Delay*) terbukti mendukung sensitivitas insulin, menjaga keseimbangan mikrobiota, dan memperkuat fungsi sistem glimfatik. Asupan makanan tinggi polifenol, asam lemak omega-3, serta serat prebiotik mendukung efek antiinflamasi serta dapat menjaga homeostasis metabolik jangka panjang. Diperlukan optimalisasi pola makan sejak usia muda yang berpotensi sebagai strategi preventif untuk menekan risiko Alzheimer di usia lanjut.

Kata kunci: resistensi insulin, *gut-brain axis*, *glymphatic system*, Alzheimer

Topic 3.3

Nutrition and Alzheimer's Disease: Unlocking the Role of Diet in Cognitive Health

Ni Ketut Sumartini

Abstract

Background: Alzheimer's Disease (AD) is a progressive neurodegenerative condition that leads to cognitive dysfunction, with current treatments unable to halt its progression. As a modifiable risk factor, nutrition is pivotal in preventing or delaying AD onset. Diets such as the Mediterranean, DASH, and MIND diets have shown a positive impact on AD biomarkers and cognitive performance. Moreover, disruptions in BCAA metabolism and the resulting metabolites like HMB may exacerbate AD pathology, particularly through their effects on the mTOR pathway and tau hyperphosphorylation.

Objective: This review synthesizes the latest molecular findings, focusing on BCAAs, their metabolites, and their potential role in AD progression. Specifically, it investigates how BCAA metabolism, via HMB and mTOR signaling, can influence neuroinflammation, oxidative stress, and amyloid deposition, critical processes in AD.

Findings: BCAA metabolism is disrupted in AD, leading to altered neuroinflammatory responses and accelerated amyloid-beta aggregation. A modified Mediterranean-ketogenic diet (MMKD) was shown to modulate gut microbiome composition and improve cerebrospinal fluid (CSF) AD biomarkers, including A β -40, A β -42, and tau proteins. Diets rich in antioxidants and omega-3 fatty acids were also found to reduce oxidative stress and inflammatory pathways, highlighting their neuroprotective potential.

Conclusion: Nutrition, particularly the regulation of BCAA metabolism and dietary patterns like the MMKD, offers promising strategies to manage and prevent AD. These approaches target neuroinflammation, tau phosphorylation, and amyloid-beta deposition, key players in AD progression. Further studies on dietary interventions, especially those focusing on microbiome modulation, could provide insights into new therapeutic avenues for AD prevention.

Session 4

Topic 4.1

The Interplay Between Insulin, IGF-1, and Dietary Interventions in Longevity

Dr.dr. Made Ratna Saraswati, Sp.PD-KEMD., FINASIM

Abstract

The insulin/insulin-like growth factor-1 (IGF-1) signaling axis is increasingly recognized as a central regulator of longevity across species. Attenuation of this pathway has been shown to extend lifespan in model organisms through enhanced autophagy, reduced oxidative stress, and modulation of the PI3K/AKT/mTOR and FOXO transcriptional pathways. Evidence from murine and human studies suggests that reduced insulin/IGF-1 signaling enhances metabolic flexibility, decreases chronic inflammation, and delays age-associated pathologies. In humans, however, the relationship exhibits a non-linear pattern: while lower IGF-1 levels are linked to extended lifespan in some populations, excessively low concentrations may impair anabolic function and increase frailty risk in older adults. Dietary interventions such as caloric restriction, intermittent fasting, and low-protein or plant-based diets have demonstrated significant effects in modulating insulin and IGF-1 activity, thereby promoting cellular stress resistance and metabolic efficiency. Emerging evidence from clinical and translational studies indicates that these dietary patterns can influence systemic insulin sensitivity, reduce circulating IGF-1, and alter nutrient-sensing pathways without compromising nutritional adequacy. Despite promising **Results**, interindividual variability—driven by genetic, hormonal, and lifestyle factors—remains a key determinant of response. This paper synthesizes mechanistic insights and human data, proposing evidence-based frameworks for leveraging dietary modulation of the insulin/IGF-1 axis to promote longevity and healthy ageing.

Keywords: Insulin, IGF-1, Longevity, Caloric Restriction, Intermittent Fasting, mTOR Pathway, Healthy Ageing

Topic 4.2

Optimizing Recovery After Cardiac Surgery: Negative Impact of Sarcopenia and Visceral Fat on Cardiac Rehabilitation Programs

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Abstract

Cardiac surgery has emerged as a critical intervention for treating various cardiovascular conditions, such as coronary artery disease and valve disorders. Following surgical procedures, patients face significant physical and emotional challenges that can impact their recovery trajectory. The importance of postoperative recovery cannot be overstated, as successful rehabilitation is essential for restoring functional capacity and enhancing quality of life. However, factors such as sarcopenia and excess visceral fat can adversely affect recovery outcomes that often exhibit decreased strength and endurance, leading to complications including increased risk of infections and prolonged hospital stays, primarily due to their adverse effects on inflammatory processes and metabolic regulation, which also can impede their ability to engage in rehabilitative activities effectively. Research indicates that a multidimensional approach that includes tailored nutrition and physical activity interventions is vital in mitigating these negative impacts. Studies highlight that optimizing diet and encouraging physical exercise can significantly improve recovery rates and overall health outcomes for cardiac surgery patients, particularly concerning for older adults who are prone to comorbidities that increase the likelihood of sarcopenic obesity, demonstrating the need for targeted and individualized cardiac rehabilitation programs that address issues like sarcopenia and visceral fat effectively. And by addressing visceral fat and sarcopenia comprehensively, it may thus enhance rehabilitation effectiveness, significantly improving patient outcomes and overall quality of life.

Keywords: Cardiac surgery, Sarcopenia, Cardiac rehabilitation programs, Nutrition, Quality of life

Topic 4.3

“The Role of L-Carnitine and Coenzyme Q10 in Weight Management”

dr. Cindiawaty Josito, MARS, MS, Sp.GK
Clinical Nutrition Specialist

Abstract

Obesity is a major global health crisis characterized by excessive body fat accumulation, often associated with impaired energy metabolism and increased oxidative stress.

L-Carnitine and Coenzyme Q10 (CoQ10) play essential roles in cellular energy metabolism and fat oxidation, making them promising adjuncts in weight management strategies. L-Carnitine facilitates the transport of long-chain fatty acids into mitochondria for β -oxidation, thereby promoting fat utilization as an energy source. Meanwhile, CoQ10 serves as a key component in the mitochondrial electron transport chain and functions as a potent antioxidant, supporting both energy production and protection against oxidative stress linked to obesity and metabolic disorders.

Both L-carnitine and CoQ10 show promise in weight management by targeting mitochondrial dysfunction, a root cause of metabolic inefficiency in obesity. These supplements can be part of a comprehensive weight loss management.

Keywords: L-Carnitine; Coenzyme Q10; Weight Management; Mitochondrial Function; Fat Metabolism.

Session 5

Topic 5.1

The Role of Lean Body Mass in Enhancing Chemotherapy Effect and Reducing Toxicity

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ABSTRACT

Chemotherapy remains a mainstay of cancer treatment, yet its efficacy and toxicity vary greatly among patients, even when the same drug and dose are used. Traditionally, chemotherapy dosing is based on body surface area (BSA), which fails to distinguish between fat and lean mass. As a result, patients with low lean body mass (LBM) may experience increased toxicity, while those with high LBM may receive subtherapeutic doses. Lean Body Mass (LBM) represents the non-fat component of the body—muscles, organs, and fluids—and plays a vital role in drug metabolism, distribution, and elimination. LBM is frequently reduced in cancer patients due to cachexia or sarcopenia, conditions associated with poor treatment tolerance, prolonged hospitalization, and higher mortality. Adjusting chemotherapy doses based on LBM rather than BSA can significantly reduce neurotoxicity and other adverse effects without compromising therapeutic efficacy. From a clinical standpoint, LBM-based assessment is essential for predicting chemotherapy toxicity, particularly for fluoropyrimidines, taxanes, and platinum agents, optimizing individualized dosing to prevent over- or under-treatment, and monitoring nutritional and muscle status during therapy to maintain treatment safety and effectiveness. LBM can be accurately measured using CT, DXA, or bioelectrical impedance analysis. Regular monitoring allows early detection of muscle loss and supports timely dose adjustments. In conclusion, BSA-based dosing alone is insufficient for precision oncology. Incorporating LBM into chemotherapy planning allows for more accurate drug dosing, reduces toxicity, and enhances treatment outcomes. A multidisciplinary approach involving oncology, clinical nutrition, pharmacology, and rehabilitation is crucial to integrate LBM-guided strategies into cancer care.

Keywords : Lean Body Mass, Body Surface Area, Chemotherapy, Precision Oncology

Topic 5.2

Liver Detox as Cancer Prevention: Evidence, Mechanisms, and Application

Prof. Dr. dr. I Wayan Weta, MS, SpGK, Subsp KM

Department of Clinical Nutrition School of Medicine Udayana University- RSUP Prof.
IGNG Ngurah

ABSTRACT

One of most important the role of liver is detoxification. There is two phase pathway of lever detoxification. Phase1 with the cytochrome P450 enzymes to bio-transform; xenobiotics, steroid hormones, and pharmaceuticals, with mechanism to add a reactive group such as; a hydroxyl, carboxyl, or an amino group through oxidation, reduction, and/or hydrolysis reactions to be more water-soluble substance. Phase 2, Conjugation Enzymes transfer the intermediate substance of phase 1 to be hydrophilic compounds, trough sulfonation, glucuronidation, glutathione conjugation, amino acid conjugation, acetylation and methylation enhanced excretion in the bile and/or urine. Polymorphism of gene those involved in detoxification pathway disrupted this pathway. Certain nutrients with deferent dose may may induce or inhibit certain enzymes activity. Supportive with certain nutrients and antioxidant substances may commonly improve detoxification, through induce the enzyme expression activity, in order to prevent of many metabolic degenerative diseases including cancer. It important for clinician designing the clinical recommendations to maximize the effects of food and reduce the impact of toxins is essential. There for a detoxification protocol should be assembled for patients by trained clinicians.

Key words: liver detoxification, Cytochrome P450 enzymes, Conjugation enzymes, gen polymorphism, nutrient, antioxidant.

Topic 5.3

The Role of Fasting-Mimicking Diet (FMD) in Cancer Therapy

dr. Eni Yuliani, Sp.GK

Background:

The fasting-mimicking diet (FMD) is a low-calorie, low-protein, and low-carbohydrate nutritional intervention designed to reproduce the metabolic effects of fasting without complete food deprivation. Over the past two decades, FMD has gained growing attention as an adjunctive strategy in oncology due to its potential to enhance therapeutic efficacy, mitigate chemotherapy-induced toxicity, and modulate metabolic and immune pathways involved in cancer progression.

Objective:

To review the current preclinical and clinical evidence on the effects of FMD in cancer patients, focusing on its ability to enhance anticancer therapy efficacy and reduce treatment-related side effects.

Methods:

This review integrates findings from recent key studies, including a systematic review and meta-analysis (*Ferro et al., Nutrients*, 2023), randomized controlled trials such as the *DIRECT* phase II trial (*de Groot et al., Nat Commun*, 2020), the Iranian RCT (*Bahrami et al., Front Nutr*, 2024), and the Chinese feasibility trial (*Xue et al., Breast Cancer Res Treat*, 2025), along with mechanistic reviews (*Vernieri et al., Cell Metab*, 2024; *Kikomeko et al., Ther Adv Med Oncol*, 2023; *Pio et al., J Physiol Biochem*, 2025).

Results:

- **Mechanistic insights:** FMD induces metabolic reprogramming characterized by reductions in blood glucose, insulin, and insulin-like growth factor-1 (IGF-1) levels, creating a mild metabolic stress that suppresses cancer cell proliferation while protecting normal cells through *differential stress resistance (DSR)*. FMD also promotes CD8⁺ T-cell infiltration and enhances antitumor immune responses.
- **Clinical evidence:**
 - In the *DIRECT trial* (n=131, HER2-negative breast cancer), patients following FMD showed higher radiological and pathological response rates (OR = 3.17, $p = 0.039$) and reduced chemotherapy-induced DNA damage, without increased toxicity.

- The *Front Nutr* (2024) Iranian RCT confirmed that FMD significantly reduced grade III vomiting and neutropenia, decreased IGF-1 and hs-CRP levels, and improved tumor response (90–100% cell loss).
 - The *Chinese pilot trial* (2025) demonstrated that a recipe-based FMD was well tolerated, with a 5.9% incidence of grade III adverse events, reduced IGF-1, fat mass, and visceral adiposity, while preserving muscle mass.
 - Conversely, meta-analysis data (*Nutrients*, 2023) showed heterogeneous results, with some studies failing to detect significant reductions in chemotherapy toxicity, emphasizing the need for standardized FMD protocols.
- **Immunotherapy implications:** Evidence from *Pio et al. (2025)* suggests that fasting-like conditions can enhance immune checkpoint inhibitor efficacy while reducing immune-related adverse events (irAEs), mediated by metabolic remodeling of the tumor microenvironment.

Conclusion:

FMD represents a promising, safe, and metabolically active dietary intervention for cancer management. Consistent preclinical evidence supports its synergistic antitumor and cytoprotective properties, while emerging clinical data—particularly in breast cancer—highlight its potential to reduce chemotherapy toxicity and improve treatment response. Nevertheless, variations in protocol design, fasting duration, and patient adherence remain key challenges. Large-scale, multicenter randomized trials with standardized nutritional guidelines are warranted to establish FMD as an evidence-based integrative approach in oncology.

Keywords:

Fasting-mimicking diet, cancer, chemotherapy, immunotherapy, toxicity, IGF-1, metabolic reprogramming.

Session 6

Topic 6.1

Disbiosis Usus dan Risiko Kanker: Pengaruh Pola Makan dan Mekanisme Tumorigenesis terhadap Kanker Kolorektal

DR dr Made Agus Dwianthara Sueta, Sp.B Subsp BD (K)

Abstrak:

Kanker kolorektal (CRC) merupakan salah satu jenis kanker paling umum dan mematikan di dunia. Meskipun faktor genetik berperan, faktor lingkungan seperti pola makan memiliki kontribusi signifikan. Penelitian terkini menunjukkan adanya hubungan kuat antara ketidakseimbangan mikrobiota usus (**disbiosis**) dan risiko CRC. Makalah ini mengkaji bagaimana disbiosis, yang dipengaruhi oleh pola makan, memicu mekanisme biologis yang berperan dalam tumorigenesis CRC. Mekanisme tersebut meliputi peradangan kronis, produksi genotoksin oleh bakteri, gangguan fungsi imun, dan kerusakan *gut barrier*. Memahami interaksi kompleks ini penting untuk mengembangkan strategi pencegahan dan terapi baru.

Topic 6.2

TRIMETYLAMIN N-OXIDES in CARNIVORES DIETS: EMERGING LINKS TO CANCER RISKS

By

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ABSTRACT

Trimethyl Amine N-Oxides (TMAO) is a gut microbiota metabolite from people consuming animal base food. Whilst fish and sea food will directly produce TMAO in the gut, the animal base foods especially red meat that composes of the precursor of TMAO such as choline, L-carnitine, Ergothioneine and their biproduct such as betaine and α -butyrobetaine, with intestinal gut bacteria will form Trimethylamine (TMA). Subsequently, this product will be oxidized in the Liver to form Trimethyl Amine N-oxide (TMAO).

TMAO correlates with atherosclerosis causing heart disease, chronic kidney disease, DM type II and other chronic diseases. The correlation TMAO and Cancers is still on debate. There is strong evidence shows the correlation between gut microbiota that not producing SCFA with colon cancer and those same microbiotas also producing highly TMAO concentration. Besides, TMAO also support cancer cell proliferation and angiogenesis. In Liver cancer, TMAO promotes the proliferation, migration and epithelial-mesenchymal transformation of the Hepato Cellular Carcinoma via activating MAPK pathway. However it is used to increase efficacy of immunotherapy against Triple Negative Breast Cancer (TNBC)

Reducing the TMAO production can be done by reducing the TMAO precursors such as Cholin and L-carnitin, control the gut bacteria producing TMA, and taking antibiotics.

Keywords: *TMAO, Cancers, chronic diseases, gut microbiota*

Topic 6.3

Single Strain or Multi Strain Probiotics in Precision Nutrition : Potential to Optimize gut-brain and gut-immune communication

Christian

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Abstract

Background

The communication between the gut, immune system, and brain is a rapidly advancing research domain in clinical nutrition. The gut microbiota significantly regulates systemic health, making probiotics a leading strategy in precision nutrition. There is ongoing debate over whether single strain or multi strain probiotics are more effective for optimizing host health, particularly regarding gut-brain and gut-immune communication.

Objective

To compare the potential of single strain and multi strain probiotics in precision nutrition, focusing on optimizing gut-brain and gut-immune communication.

Discussion

Single-strain probiotics provide well-established, targeted effects—such as the use of *Lactobacillus rhamnosus* GG for acute diarrhea or *Bifidobacterium* strains for supporting immune or digestive health^{2,4}. Their purity, standardized dosing, and extensive clinical evidence enable precise application and easier monitoring, especially for specific or acute indications. However, single strains may confer limited effects in multifactorial or chronic conditions. In contrast, multistrain probiotics—especially those combining *Bifidobacterium* and *Lactobacillus*—offer broader and synergistic benefits, including enhanced gut barrier function, modulation of neuroactive signaling (serotonin, GABA, BDNF), increased microbial diversity, reduced allergy and infection rates, and greater resilience to stress and inflammation.^{1,3,5} Clinical and preclinical studies indicate that multistrain formulations provide cumulative and occasionally superior outcomes for neuropsychological and immunological health by leveraging complementary mechanisms, but the most suitable strategy should be individualized based on patient and strain specificity.

Conclusion

Both single-strain and multistrain probiotics offer unique advantages for modulating gut-brain and gut-immune communication. Precision nutrition should guide probiotic selection based on patient characteristics, clinical goals, and the evolving evidence base.

Keywords : probiotics, precision nutrition, single strain, gut-brain communication, gut-immune communication

Session 7

Topic 7.1

Estrogen-Rich Diets in Early Life: A Potential Pathway to Endometriosis and Endometrial Malignancy?

I Nyoman Gede Budiana

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Abstract:

The relationship between estrogen-rich diets in early life and the development of endometriosis and endometrial malignancy represents a complex area of research with significant clinical implications. Both conditions are estrogen-dependent diseases affecting reproductive-age women, with endometriosis affecting 10-15% of women of reproductive age and endometrial cancer being the fourth most common cancer in women. Understanding how dietary estrogens, particularly phytoestrogens from plant sources, influence disease development is crucial for prevention and management strategies.

In most such experimental models, solid evidence about the anti-inflammatory, proapoptotic, antioxidant, and immunomodulatory functions of phenolic compounds (e.g., flavonoids and phenolic acids) have translated into an effect of inhibiting the development of endometriosis via the modulation of estrogen activity.

However, the effects of phytoestrogens are complex and can vary depending on the individual, the specific phytoestrogen, and the extent of exposure, leading to varied effects on endometriosis risk and progression. The inconclusive or (less commonly) opposing **Results** are understandable with so few human studies and their varied **Methodologies** (e.g., differences in the amount and content of phytoestrogens in the diet, different duration of the study and/or size of the sample, imprecise inclusion/exclusion criteria, and interpretation of **Results** of measured outcomes in inconsistent manners).

While there is evidence of a link between dietary phytoestrogens and endometriosis, the **Results** from studies are often ambiguous, making it difficult to definitively conclude whether a phytoestrogen-rich diet is positive or negative for the disease.

Key words: phytoestrogens, endometriosis, endometrial malignancy

Topic 7.2

Targeting Estrogen Pathway in Cancer: The Emerging Role of Resveratrol

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Abstract

Resveratrol (3,5,4'-trihydroxystilbene), is a nutraceutical, found in grapes, red wine and many other plants (70 plants). Known as anticancer and chemo-preventive properties, as well as an antioxidant and phytoestrogen.

Estrogens implicated in the development of breast cancer, and other related cancer. The strongly evidence that the role of estrogen-metabolism-mediated oxidative stress in induced breast carcinogenesis.

Induction of antioxidant and/or detoxification enzymes by natural compounds is one of the approaches that can be used to inhibit the oxidative stress in the estrogen-induced carcinogenic process. Resveratrol is a strong antioxidant, interacts with estrogen receptors and functions as a mixed agonist/antagonist. Hydroxyl groups of resveratrol are crucial for cytotoxic and antioxidative activity and are responsible for binding estrogen receptors.

Resveratrol is anticancer through mechanism; protects against estrogen-mediated tumors, induces NRF2 and NRF2-regulated antioxidant genes, epigenetically regulates NRF2 expression, induces apoptosis and inhibits oxidative DNA damage of cancer cell.

Key words: resveratrol, anticancer, estrogen, estrogen receptor, breast cancer

Topic 7.3

The Role of FTO Gene Polymorphism in Cancer

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Background: The fat mass and obesity-associated (FTO) gene, initially identified for its contribution to obesity, is now increasingly recognized as a determinant of cancer susceptibility and progression. Functional single-nucleotide polymorphisms (SNPs)—notably rs9939609 and rs1421085—affect appetite regulation, lipogenesis, and leptin signaling, thereby linking metabolic imbalance with oncogenic processes.

Objective: To review the role of FTO gene polymorphisms in cancer development and progression, emphasizing molecular mechanisms, ethnic variations, and interactions with dietary and lifestyle factors.

Methods: A narrative synthesis of experimental, epidemiological, and meta-analytic studies was undertaken to summarize the association between FTO expression and SNP variants with various cancers. Evidence included studies of breast, endometrial, pancreatic, thyroid, and colorectal cancers, as well as nutrigenomic interventions such as omega-6 fatty acid intake, dietary fiber consumption, and flavonoid (chrysin) modulation of FTO activity.

Results: Overexpression of FTO has been reported in glioblastoma, leukemia, breast, and colorectal cancers. Meta-analyses reveal significant associations between rs9939609 and increased risks of endometrial and pancreatic cancers, while a protective relationship appears in papillary thyroid cancer. These effects vary among ethnic groups and are strongest in Asian populations. Dietary interactions further influence risk: omega-6 fatty acids elevate breast-cancer susceptibility among FTO risk-allele carriers, whereas high fiber intake reduces colorectal-cancer risk. Encapsulated chrysin nanoparticles demonstrate an antitumor effect by down-regulating FTO expression. Mechanistically, hypoxia-induced FTO degradation enhances metastasis through m⁶A-dependent stabilization of oncogenic mRNAs.

Conclusion: FTO represents a central molecular bridge between genetics, metabolism, and oncogenesis. Understanding the gene's epigenetic and dietary interactions highlights its potential as a biomarker and therapeutic target for nutrigenomics-based prevention and personalized cancer management.

Keywords: FTO gene, polymorphism, m⁶A demethylase, obesity, cancer susceptibility, nutrigenomics, dietary interaction

Session 8

Topic 8.1

Title: Challenges in Brain Tumor Surgery: Why Pre- and Postoperative Nutrition Is Crucial

Author: Dr. dr. Nyoman Golden, Sp.BS, Subsp.N-Onk, FICS

Institution: Department of Neurosurgery, Ngoerah Hospital, Bali

Background:

Despite advances in microsurgical and adjuvant therapies, the prognosis for patients with brain tumors remains poor, with malnutrition often overlooked as a modifiable prognostic factor. Studies report that 20–70% of brain tumor patients present with nutritional deficits at diagnosis, which directly influence postoperative outcomes, wound healing, and overall survival.

Objective:

To highlight the importance of nutritional optimization as an integral part of brain tumor surgery—before and after the surgery—and its relationship with inflammation, immune function, and treatment response.

Discussion:

Malnutrition and systemic inflammation synergistically impair recovery in neurosurgical oncology. Parameters such as serum albumin, Prognostic Nutritional Index (PNI), and CONUT score have emerged as independent predictors of progression-free and overall survival in glioma and other malignancies. Prehabilitation strategies, including individualized dietary counseling, oral nutritional supplements (ONS), and carbohydrate loading (as part of ERAS protocols), improve physiological reserve and reduce postoperative complications. Nutritional interventions such as high-protein energy support (25–35 kcal/kg/day and 1.2–1.8 g protein/kg/day), lycopene supplementation, and ketogenic regimens show promise in enhancing tumor metabolism control and oxidative balance. Postoperatively, structured feeding protocols and early enteral nutrition significantly shorten hospital stay and accelerate recovery.

Conclusion:

Perioperative nutrition is not ancillary but fundamental in neuro-oncology care. Early identification and correction of malnutrition enhance surgical resilience, reduce complications, and improve survival. A collaborative approach between neurosurgeons, oncologists, and nutritionists is essential to implement evidence-based nutritional prehabilitation and recovery programs—ultimately advancing patient outcomes in brain tumor management.

Keywords: brain tumor, malnutrition, prehabilitation, PNI, ERAS, ketogenic diet, neuro-oncology, perioperative nutrition

Topic 8.2

Optimizing Chemotherapy Outcomes: The Emerging Role of Vitamin D Supplementation

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Background:

Cancer remains one of the most significant global health challenges of the 21st century, accounting for nearly one in six deaths and serving as a leading cause of premature mortality from non-communicable diseases. Beyond cancer characteristics and therapeutic modalities, host factors such as vitamin D status play a crucial role in influencing disease progression and response to chemotherapy. Through its active form, 1,25(OH)₂D₃, vitamin D binds to the vitamin D receptor (VDR) and regulates the expression of over 1,000 genes involved in proliferation, differentiation, apoptosis, and DNA repair.

Objective:

This review aims to explore the role of vitamin D in optimizing chemotherapy effectiveness by elucidating underlying biological mechanisms, assessing the impact of vitamin D status on clinical outcomes, and highlighting the potential benefits of supplementation as an adjunctive therapeutic strategy.

Main Content:

The sensitivity of cancer cells to the antitumor effects of vitamin D may be influenced by genetic variations, mutations, and alterations in VDR expression. Vitamin D deficiency is highly prevalent among cancer patients and often worsens during chemotherapy due to metabolic disturbances, systemic inflammation, and reduced nutritional intake. Low pre-treatment vitamin D levels are associated with a 47% increased risk of mortality and a 38% higher risk of disease progression. Supplementation has been shown to enhance chemotherapy response, improve nutritional status, reduce inflammatory and cardiotoxic biomarkers, and increase pathological complete response rates in various cancers, including breast and colorectal cancer.

Clinical Implication:

Baseline screening of serum 25(OH)D and targeted supplementation represent key strategies to support chemotherapy efficacy. Further research is needed to determine optimal dosing, timing, and potential synergies with other nutritional interventions to improve therapeutic outcomes and patient quality of life.

Keywords: Vitamin D, chemotherapy, VDR receptor, supplementation, cancer

Topic 8.3

Precision Nutrition in Oncology: Targeting Metabolic Pathways in Cancer Cells

dr. Felita Surya Rini, Sp.GK, AIFO-K

Abstract

Background:

Vitamin D deficiency is highly prevalent among neurosurgical and brain cancer patients, yet its clinical implications beyond bone health are often overlooked. Growing evidence highlights vitamin D's neuroprotective, anti-inflammatory, and immunomodulatory effects, suggesting a potential role in improving perioperative and oncologic outcomes.

Objective:

To explore the mechanisms and clinical impact of vitamin D status and supplementation on outcomes in neurosurgical and brain tumor patients, focusing on inflammation, neurorecovery, and hospital course.

Methods:

A literature-based review of recent experimental and clinical studies (2013–2024) examining the relationship between vitamin D, neuroinflammation, and outcomes in neurosurgery and neuro-oncology. Key studies included mechanistic data on vitamin D receptor (VDR) signaling, tumor growth modulation, and clinical observations of vitamin D deficiency and length of hospital stay.

Results:

Vitamin D modulates neuroinflammation by downregulating proinflammatory cytokines (IL-6, TNF- α) and inhibiting the NF- κ B pathway, while enhancing anti-inflammatory signaling and neuronal resilience. In glioma models, vitamin D analogs promote apoptosis, inhibit angiogenesis, and sensitize tumor cells to chemotherapy and radiotherapy. Clinically, low preoperative vitamin D levels are associated with prolonged hospitalization, increased brain edema, and delayed recovery. Preliminary trials suggest that vitamin D supplementation may improve postoperative outcomes, though optimal dosing and timing remain to be established.

Conclusion:

Vitamin D plays a multifaceted role in neural health and oncologic recovery. Regular screening and correction of vitamin D deficiency in neurosurgical and brain cancer patients could serve as a simple, low-cost adjunct to enhance recovery, modulate neuroinflammation, and potentially improve treatment response. Further randomized controlled trials are warranted to define clinical protocols and establish causality.

Keywords: Vitamin D, brain cancer, neuroinflammation, neurosurgery, supplementation, recovery, glioma.

Session 9

Topic 9.1

Improving Outcome in Head and Neck Oncology through Nutrition Strategies: A Multidisciplinary Approach

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Abstract

Patients with head and neck cancer are highly susceptible to malnutrition due to swallowing dysfunction, mucositis pain, and treatment side effects. Malnutrition is associated with poorer treatment response, increased complications, and decreased quality of life.

Common cases in head and neck oncology are nasopharyngeal cancer, sinonasal cancer, laryngeal cancer, oral cavity cancer, salivary gland cancer, thyroid gland cancer and ear cancer. Treatment of these cases are surgery, chemotherapy, radiotherapy, targeted therapy and immunotherapy. Side effect of these treatment can contribute to malnutrition, as anorexia, nausea, inadequate mastication, xerostomia, dysgeusia, dysphagia or odynophagia. Over 55% of patients experience significant nutritional deficits during treatment. Causes: tumor location, treatment toxicity, reduced oral intake, psychosocial barriers. Malnutrition increases infection risk, delays recovery, prolongs hospital stay, and reduces survival. Weight loss during therapy predicts worse disease-free survival and overall survival. Optimal nutritional management involves oncologists, surgeons, dietitians, nurses, speech/swallow therapists, and psychosocial support. Early, ongoing dietitian involvement improves outcomes throughout the cancer care continuum. Structured counseling and nutrition support improve treatment completion, reduce complications and enhance quality of life. Proactive intervention linked to better three-year survival rates. Regular monitoring of body composition, nutritional risk, and laboratory markers is recommended.

Nutrition strategies through improving outcome in head and neck oncology are proactive nutritional assessment, medical nutrition therapy (MNT), adequate protein and calorie intake, oral nutritional supplements (ONS), enteral nutrition (tube feeding), nutraceuticals and supplements, dental care consideration

Key word: Head and Neck Oncology, Nutrition Strategies, Multidisciplinary Approach

Topic 9.2

Micronutrient-Based Approaches in Cancer Therapy: Current Clinical Evidence

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Background:

Cancer is a leading global health challenge, causing nearly one in six deaths and contributing significantly to premature mortality. While advances in oncologic therapies have improved outcomes, they also increase the risk of micronutrient deficiencies due to metabolic changes, reduced intake, and treatment-related effects. These deficiencies compromise immune function, lower therapeutic efficacy, and worsen prognosis. Moreover, 30–90% of patients use micronutrient supplements without medical supervision, highlighting the need for evidence-based recommendations.

Objective:

This review aims to synthesize current clinical evidence on the role of micronutrients in cancer prevention and therapy, elucidating their biological mechanisms, therapeutic potential, and clinical relevance.

Main Content:

Micronutrients exert significant anticancer effects through diverse molecular mechanisms. Vitamin A regulates gene expression and cell differentiation, while vitamin C acts as an antioxidant and selective pro-oxidant targeting cancer cells. Vitamin D influences over 1,000 genes involved in proliferation, apoptosis, and DNA repair, and vitamin E provides antioxidant and antiproliferative effects. Zinc supports immune regulation, magnesium maintains mitochondrial function and genomic stability, and manganese enhances antitumor immunity through cGAS–STING activation and tumor microenvironment modulation. Clinical evidence indicates that targeted supplementation can improve survival, reduce treatment-related complications, and enhance therapy outcomes.

Clinical Implication:

ESPEN guidelines emphasize early and comprehensive nutritional assessment and correction of deficiencies according to dietary reference intakes. High-dose supplementation during chemotherapy or radiotherapy is not routinely recommended due to potential interference with treatment efficacy. Future research should focus on precision micronutrient interventions tailored to cancer type, disease stage, and therapeutic regimen.

Keywords: cancer therapy, vitamins, zinc, magnesium, manganese

Topic 9.3

GLUTAMINE AND OMEGA-3 SUPPLEMENTATION TO PREVENT ORAL MUCOSITIS IN HEAD AND NECK CANCER PATIENTS UNDERGOING RADIOTHERAPY

dr. I Putu Prayoga Ratha, SpGK

Abstract

Oral mucositis (OM) is a common complication in head and neck cancer patients undergoing radiotherapy and/or chemotherapy, characterized by painful erythematous ulcerative lesions of the oral mucosa. This condition leads to dysphagia, taste alterations, weight loss, and secondary infections that significantly impair patients' quality of life and may disrupt treatment continuity. Supplementation with glutamine and omega-3 fatty acids has been investigated as a potential intervention to prevent and mitigate the severity of OM. Glutamine, a conditionally essential amino acid and a precursor of glutathione, helps maintain mucosal integrity by reducing oxidative damage, inhibiting proinflammatory factor secretion, and supporting collagen synthesis and epithelial tissue regeneration. Meta-analyses indicate glutamine supplementation can reduce the severity of mucositis and opioid analgesic requirement without significantly lowering the absolute incidence of OM. Omega-3 fatty acids function as immunomodulators exerting anti-inflammatory effects through modulation of cell membranes, intracellular signaling pathways, and production of specialized pro-resolving mediators derived from EPA and DHA. Although specific clinical evidence for omega-3 in OM prevention is limited, cancer patient data show improved nutritional status, decreased inflammatory markers, and reduced therapy-related adverse events. Combined supplementation of glutamine, omega-3, and other immunonutrients such as arginine demonstrates synergistic benefits in reducing treatment toxicity and improving nutritional status. Nevertheless, study **Results** remain heterogeneous, warranting further research to define optimal dosing, duration, and target patient populations. Overall, glutamine and omega-3 supplementation can be recommended as part of a multimodal approach for the prevention and management of oral mucositis in head and neck cancer patients receiving radiotherapy and chemoradiotherapy, with particular benefits in alleviating symptom severity and supporting patient nutritional status.

Posters

P1

Medical Nutrition Therapy in Patient with Severe Malnutrition, Pulmonary Tuberculosis, Pneumocystis Pneumonia (PCP) and HIV Infection: A Case Report

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ABSTRACT

BACKGROUND

Human Immunodeficiency Virus (HIV) infection progressively impairs the immune system and predisposes patients to opportunistic infections such as tuberculosis (TB) and Pneumocystis pneumonia (PCP). These conditions often lead to severe malnutrition, hypoalbuminemia, and gastrointestinal symptoms, which complicate treatment and impair clinical outcomes. This case report describes the implementation of individualized medical nutrition therapy (MNT) in a patient with newly diagnosed pulmonary TB, HIV infection, and severe malnutrition.

CASE REPORT

A 59-year-old female was admitted with complaints of reduced appetite, dyspnea, intermittent fever, cough with sputum, and oral thrush. She had lost 32% of her body weight in 1.5 years, with current body weight 42.3 kg and BMI 16.1 kg/m². The patient was clinically diagnosed with pulmonary TB (on anti-TB drugs), pre-HAART HIV, oral candidiasis, non-severe community-acquired pneumonia (PSI class 2), and hypoalbuminemia (2.7 g/dL). Nutritional screening and assessment (MNA and GLIM) indicated severe malnutrition (SGA C). MNT was initiated gradually, targeting 1997 kcal/day and 84 g protein/day. The patient received a soft diet (starting at 1500 kcal/day), oral supplementation (Low-carbohydrate oral nutritional supplements (ONS), oral albumin), and dietary education. Clinical follow-up showed improved intake and nutritional status. After 8 days the nutrition assessment intake was increase, hand grip strength test result increased and the complaint was subsided.

DISCUSSION

Patients with HIV and pulmonary TB are at high risk of wasting syndrome due to increased metabolic demands, inflammation, reduced oral intake, and malabsorption. Malnutrition in such patients exacerbates immune dysfunction, reduces treatment adherence, and worsens prognosis. Early and individualized MNT—emphasizing adequate energy-protein intake, symptom management, and education—is essential to

support recovery and optimize immune response. Micronutrient along with monitoring for treatment interactions, are also important.

CONCLUSION

Medical nutrition therapy plays a central role in the management of patients with severe malnutrition, HIV infection, and tuberculosis. Comprehensive and early intervention improves clinical symptoms, supports immune function, and enhances overall prognosis.

Keyword: HIV, Tuberculosis, Severe malnutrition, Medical nutrition therapy (MNT), Low-carbohydrate oral nutritional supplements (ONS), Hypoalbuminemia

THE EFFECT OF THE COMBINATION OF RED DAYAK ONION EXTRACT (*ELEUTHERINE PALMIFOLIA*), KALIMANTAN FOREST MUSHROOMS (*LENTINUS POLYCHROUS*), AND ORTHOPEDIC THERAPY ON OSTEOSARCOMA TUMOR DEVELOPMENT: IN VIVO STUDY.

dr. Martin Agusta

ABSTRACT

Introductions : Osteosarcoma is a type of malignant bone tumor that commonly affects children and adolescents. Conventional therapies such as surgery and chemotherapy have limitations, including severe side effects and high recurrence rates. Red Dayak onion (*Eleutherine palmifolia*) has long been recognized as a traditional medicinal plant with various pharmacological activities, including antioxidant, anti-inflammatory, and anticancer properties. Meanwhile, Kalimantan forest mushroom (*Lentinus polychrous*) has potential as an immunomodulator and antitumor agent. The aim of this study is to explore the potential of a combination therapy based on red Dayak onion extract, Kalimantan forest mushrooms, and orthopedic approaches in the treatment of osteosarcoma.

Method: This study uses an in vivo experimental design on Sprague-Dawley rats induced with osteosarcoma to evaluate the effects of the combination of Red Dayak Onion Extract (*Eleutherine palmifolia*), Kalimantan Forest Mushroom (*Lentinus polychrous*), and orthopedic therapy on osteosarcoma tumor development. The treatment involved administering a combination of plant extracts and orthopedic therapy.

Results: The **Results** of this study indicate that the combination of Red Dayak Onion Extract (*Eleutherine palmifolia*), Kalimantan Forest Mushroom (*Lentinus polychrous*), and orthopedic therapy significantly slowed the development of osteosarcoma tumors in Sprague-Dawley rats.

Conclusion: The combination of Red Dayak Onion Extract, Kalimantan Forest Mushroom, and orthopedic therapy may serve as an effective alternative treatment for osteosarcoma, with the potential to reduce tumor size, repair bone tissue, and improve survival rates. Further research is needed to optimize the dosage and duration of treatment, as well as to explore the molecular mechanisms underlying the therapeutic effects of this combination therapy.

Keywords: Red Dayak Onion, Kalimantan Forest Mushroom, Orthopedic Therapy, Osteosarcoma, Combination Therapy, In Vivo Study.

INTERVENSI NUTRISI BERBASIS EVIDENCE UNTUK SARCOPENIA: SYSTEMATIC REVIEW RANDOMIZED CONTROLLED TRIALS

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Abstract

Latar Belakang: Sarkopenia adalah kondisi progresif yang ditandai dengan penurunan massa, kekuatan, dan fungsi otot rangka, yang berdampak pada penurunan kualitas hidup lansia. Intervensi nutrisi menjadi salah satu pendekatan potensial dalam manajemen sarkopenia, namun efektivitasnya masih menunjukkan **Hasil** yang bervariasi.

Tujuan: Menilai efektivitas berbagai intervensi nutrisi terhadap massa otot, kekuatan otot, dan fungsi fisik pada individu dengan sarkopenia atau yang berisiko mengalaminya.

Metode: Tinjauan sistematis dilakukan sesuai pedoman PRISMA 2020. Pencarian literatur secara komprehensif dilakukan melalui database PubMed/MEDLINE, Science Direct, dan Google Scholar sejak awal hingga Januari 2025. Kriteria inklusi mencakup studi *randomized controlled trials* (RCT), *quasi-experimental*, atau kohort yang mengevaluasi intervensi nutrisi pada populasi ≥ 50 tahun dengan sarkopenia. Risiko bias dinilai menggunakan Cochrane RoB 2 dan ROBINS-I. Analisis dilakukan secara naratif dan dikelompokkan berdasarkan jenis intervensi.

Hasil: Sebanyak 15 studi dengan total 4.319 partisipan memenuhi kriteria inklusi. Mayoritas studi (73,3%) menggunakan desain RCT double-blind, dengan durasi intervensi antara 8 minggu hingga 3 tahun. Suplementasi protein yang diperkaya leucine dan vitamin D secara konsisten meningkatkan *appendicular lean mass* secara signifikan (0,17 kg; $P=0,045$). Asam lemak omega-3 terbukti efektif meningkatkan massa otot rangka, kekuatan otot, dan ketebalan *vastus lateralis* hingga 3,5%. Kombinasi nutrisi dan latihan fisik memberikan **Hasil** paling optimal, dengan peningkatan bermakna pada kekuatan genggam, massa otot, dan fungsi fisik. Sebagian besar intervensi ditoleransi dengan baik tanpa efek samping serius.

Kesimpulan: Intervensi nutrisi, khususnya protein dengan leucine, vitamin D, dan omega-3, efektif memperbaiki parameter sarkopenia. Pendekatan kombinasi dengan latihan fisik memberikan **Hasil** terbaik dalam manajemen sarkopenia.

Kata kunci: sarkopenia, intervensi nutrisi, suplementasi protein

Nutritional Status of Adolescents in Ianatut Tholibin Islamic Boarding School Pungging-Mojokerto: A Descriptive Study

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ABSTRACT

Background: Nutritional status plays crucial role on cognitive, physical, and reproductive health. Nutritional problem usually arises during adolescent because of the increasing nutritional needs as a result of rapid growth and development. Islamic boarding school which demands independence and having restricted resources potentially giving challenge in meeting these nutritional needs. This study aims to assess the nutritional status of the adolescent at Ianatut Tholibin Islamic Boarding School.

Method: this descriptive cross-sectional study had 80 students from grades 7-9 (13 – 15 years old). The study measures weight and height. The nutritional status classified based on Body Mass Index for age Z-Score.

Result: The majority of students classified as having normal nutritional status (63,75%). However, 6.25% students include as thinness and even 1.25% are severely thinness. Meanwhile, 22.5% students were overweight and 6.25% were obese.

Conclusion: Although the majority of adolescents were classified as normal nutritional status, there's still problem at solving the undernutrition and overnutrition. Education and improvement in dietary pattern within Islamic Boarding School is important to support the growth and development of the student for the future health

Keywords: Nutritional status, Adolescents, Islamic boarding school

Medical Nutrition Therapy Using Homebrew Diabetes-Specific Enteral Nutrition for Glycemic Control in a Burn Patient with Diabetic Ketoacidosis: A Case Report

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ABSTRACT

Introduction: Managing burn patients with diabetes is challenging due to high metabolic demands, glycemic instability, and infection risk. Evidence suggests that homebrew enteral formulas can be as effective as commercial alternatives. This case report evaluates medical nutrition therapy (MNT) using a hospital's homebrew diabetes-specific formula (DSF) to improve glycemic control in a burn patient with type 2 Diabetes Mellitus (T2DM).

Case: A 35-year-old normoweight male with 35% total body surface area burns developed new-onset T2DM with diabetic ketoacidosis (blood glucose: 457 mg/dL). Continuous insulin infusion (5 IU/hour) was initiated. Nutrition support used a homebrew DSF providing 3.7 g monounsaturated fatty acids (MUFA) and 3 g fiber per serving, with average daily intakes of 19.3 ± 6 g MUFA and 15.8 ± 3 g fiber. Insulin infusion was tapered and basal insulin was commenced by day 16. By day 20, He was discharged with stable glycemic control on reduced insulin, improved wound healing, and no hospital-related malnutrition.

Discussion: High intake of MUFA and fiber is linked to improved glycemic outcomes. Ojo et al. reported better glycemic profiles with DSFs enriched in MUFA and fiber versus standard formulas. Mezzomo et al. showed homebrew DSFs are comparable to commercial products at lower cost. The patient's modest weight loss (8%) aligns with Graves et al., while the length of stay (20 days) was shorter than Aschacher et al. (29 days).

Conclusion: Homebrew DSF supported glycemic control and recovery in a burn patient with DKA, highlighting its feasibility and potential benefits. Further studies are warranted to confirm these findings.

Keywords: burn injuries, diabetes-specific formula, glycemic control, type 2 diabetes mellitus

The Role of N-Acetylcysteine as an Adjuvant Therapy for Metabolic Syndrome: A Systematic Review

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Metabolic syndrome (MetS) is a constellation of interrelated metabolic disturbances such as central obesity, insulin resistance, dyslipidemia, and hypertension that significantly increasing the risk of type 2 diabetes mellitus and cardiovascular diseases¹. Increasing evidence has demonstrated that oxidative stress and chronic inflammation are the main mechanisms in the development and progression of this syndrome². N-acetylcysteine (NAC), a thiol containing compound and a well known precursor of glutathione (GSH), exerts antioxidant and anti inflammatory effects that may provide therapeutic benefits in this context³. This systematic review was conducted to synthesize current evidence regarding the role of NAC in improving insulin resistance, lipid profiles, and oxidative stress in patients with metabolic syndrome and related conditions. Literature searches were performed across PubMed, ScienceDirect, SpringerLink and Google Scholar for articles published between 2020-2025 using Bolean **Method**. After screening for duplication, the literature obtained then screened according to predetermined eligibility criteria. The appropriate literatures were critically reviewed and the level of evidence determined based on the Oxford Centre for Evidence Based Medicine. The result of the review obtained 10 studies out of 1707 articles. NAC demonstrates promising potential as an adjunctive therapy for MetS, not only by targeting oxidative stress and inflammation but also by supporting glycaemic and lipid control⁴. Nevertheless, current evidence remains limited by small sample sizes and short follow up periods so that further research is needed with a larger sample, a longer duration, and with dose adjustment of N-acetylcysteine.

Keywords: N-acetylcysteine, metabolic syndrome, oxidative stress, insulin resistance

WOUND DEHISCENCE PASCA LAPARATOMI PADA MALNUTRISI ANAK: SEBUAH LAPORAN KASUS

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ABSTRAK

Pendahuluan: Malnutrisi masih menjadi masalah di negara berkembang termasuk di Indonesia hal ini disebabkan oleh beberapa faktor misalnya sosial, ekonomi, dan lingkungan. Malnutrisi disebabkan karena kurangnya energi atau protein harian. *Wound dehiscence* merupakan salah satu komplikasi bedah abdominal yang jarang ditemui namun sering menyebabkan peningkatan lama rawat, biaya, dan risiko infeksi berat hingga kematian. Insiden terjadinya *wound dehiscence* berdasarkan studi dari Meilany et al. (2016) berkisar antara 0.2% - 3% dan kasus terbanyak terjadi pada anak yang menjalani pembedahan mayor laparatomi. Malnutrisi dianggap sebagai salah satu yang berkontribusi terhadap angka kejadian *wound dehiscence*. Kami melaporkan kasus *wound dehiscence* pasca laparatomi pada malnutrisi anak, sehingga kami dapat menunjukkan pentingnya status nutrisi dan terapi gizi medik terhadap penyembuhan luka.

Laporan Kasus: Anak laki laki berusia 4 tahun 11 bulan datang ke RS dengan keluhan nyeri perut 3 hari sebelum masuk rumah sakit, nyeri dirasakan pada seluruh bagian perut disertai demam. Riwayat sosial dan ekonomi berasal dari keluarga yang tidak utuh dan berpeng**Hasilan** menengah kebawah. Pada antropometri ditemukan BB 10.5 kg dan kurva WHO 2005 menunjukkan **Hasil** *severely underweight*, *severely stunted* dan *severely wasted*. Pemeriksaan fisik ditemukan nyeri tekan seluruh lapang perut. **Hasil** laboratorium menunjukkan adanya hipoglikemia, hipoalbuminemia, dan leukositosis, USG Abdomen menunjukkan gambaran appendicitis, pasien segera dilakukan operasi laparatomi. Pada perawatan hari ke 4 mulai muncul infeksi pada luka operasi dan pada hari ke 7 terdapat dehisensi pada luka operasi, terapi dilakukan antara lain antibiotik intravena, perawatan luka, tatalaksana gizi buruk, dan terapi gizi medis dengan diit tinggi kalori dan tinggi protein.

Kesimpulan: Prosedur pembedahan darurat pada kasus malnutrisi meningkatkan risiko komplikasi pasca pembedahan seperti *wound dehiscence*, peningkatan lama rawat inap, dan sepsis.

Kata kunci: *Wound Dehiscence*, Malnutrisi, Appendicitis, Laparatomi, Sepsis.

Tirzepatide versus Placebo on Top of Lifestyle Intervention for Body Composition and HOMA-IR in Adults with Overweight or Obesity: A Systematic Review of Randomized Controlled Trials

Hendriana, Vincentia; Harimawan, Agustinus I Wayan | Siloam Hospitals

ABSTRACT

Background: Tirzepatide, a dual glucose-dependent insulinotropic polypeptide (GIP) and glucagon-like peptide-1 (GLP-1) receptor agonist, has shown strong weight-reducing effects. Prior reviews have emphasized cardiovascular or metabolic outcomes, but the specific impact on nutrition-linked endpoints remains unclear.

Objective: To systematically evaluate tirzepatide versus placebo, both with lifestyle counseling, on body composition and insulin resistance in adults with overweight or obesity without diabetes.

Methods: PubMed, Embase, and Cochrane CENTRAL, together with ClinicalTrials.gov and WHO ICTRP, were searched up to 2025 in accordance with PRISMA 2020. Eligible studies were phase 2/3 randomized controlled trials (RCTs) in adults (18–64 years) without type 1 or type 2 diabetes. Primary outcomes were body weight, body mass index (BMI), and waist circumference; the secondary outcome was insulin resistance (HOMA-IR or HOMA2-IR). Screening, extraction, and risk-of-bias assessment (Cochrane RoB 2.0) were performed independently in duplicate.

Results: From 530 records, 304 unique reports were screened and 31 full texts reviewed; nine RCTs (n=4,302) were included. Across the SURMOUNT program and regional trials in Japan and China, tirzepatide produced significantly greater reductions in body weight (–15% to –21%), BMI, and waist circumference at 72 weeks compared with placebo (all $p<0.001$). A DXA substudy confirmed preferential fat-mass loss with relative preservation of lean mass. Exploratory post hoc analyses demonstrated improvements in HOMA-IR, partly weight mediated. Risk of bias was generally low.

Keywords: tirzepatide; overweight; obesity; body composition; HOMA-IR

Vitamin D and Stroke: A Systematic Bibliometric Review of the Research Landscape and its Central Paradox

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ABSTRACT

Background: The relationship between vitamin D and stroke is a highly controversial topic. A significant conflict exists between numerous observational studies, which link deficiency to poor outcomes, and major interventional trials, which have failed to show a clear benefit from supplementation. A comprehensive synthesis of this complex field is needed.

Objective: To systematically map the intellectual structure of the vitamin D and stroke field, synthesize its core evidence, and identify the research trends that are attempting to resolve this central paradox.

Methods: Author conducted a systematic bibliometric review using the Scopus database (2004-2024), retrieving 1,258 relevant publications. VOSviewer was used to analyze

Keyword co-occurrence, identify thematic clusters, and map the field's temporal evolution. The findings from these clusters were then synthesized to analyze the state of the evidence.

Results: Study analysis revealed the field is defined by a persistent paradox between strong observational associations (Cluster 3) and negative interventional trials (Cluster 1). Author identified four dominant themes: (1) Pathophysiology and Cardiovascular Risk; (2) Bone Metabolism and Fracture Prevention; (3) Clinical Outcomes and Prognosis; and (4) COVID-19-related intervention. Temporal analysis showed a clear evolution in research focus, shifting from broad cardiovascular/bone risk (2010-2012) to specific, mechanistic inquiries (2021-2024), such as genetics, synergistic nutrients (e.g., K2), and specific complications (e.g., post-stroke depression).

Conclusion: This systematic mapping of 1,258 papers provides a data-driven synthesis of the vitamin D and stroke field. It demonstrates how the scientific community is actively moving beyond the central "association vs. causation" paradox by investigating more specific, nuanced mechanistic pathways to explain this complex clinical relationship.

Keywords: bibliometric analysis; vitamin D; stroke; trends

Prevalensi dan Kesesuaian Penilaian Malnutrisi pada Pasien Kanker Saluran Pencernaan menggunakan SGA, IMT, dan Albumin

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Abstrak

Latas Belakang

Malnutrisi sering dijumpai pada pasien kanker saluran pencernaan dan berdampak pada kualitas hidup, respon terapi serta mortalitas. Penelitian ini bertujuan untuk mengetahui prevalensi malnutrisi pada kasus kanker saluran pencernaan berdasarkan SGA, IMT, dan albumin, serta menilai kesesuaian dan akurasi IMT dan albumin terhadap SGA.

Metode

Studi *cross sectional* pada 46 pasien kanker saluran pencernaan di RSU St. Antonius Pontianak Kalimantan Barat yang dirawat pada Agustus 2024-Agustus 2025. Status gizi dinilai menggunakan SGA (B/C = malnutrisi), IMT ($<18,5 \text{ kg/m}^2$), dan albumin ($<3,5 \text{ g/dL}$). Analisis mencakup prevalensi (95% CI Wilson), kesesuaian (κ , % kesepakatan, McNemar), dan akurasi (sensitivitas, spesifisitas).

Hasil

Prevalensi malnutrisi menurut SGA adalah 65,2% (95% CI 50,5–77,9), IMT 17,4% (95% CI 8,7–31,9), dan albumin 47,8% (95% CI 33,7–62,3). Kesesuaian sedang diperoleh antara SGA vs IMT ($\kappa=0,32$; % kesepakatan 67,4%; $p=0,289$) dan SGA vs albumin ($\kappa=0,36$; % kesepakatan 69,6%; $p=0,371$). IMT menunjukkan sensitivitas 36% dan spesifisitas 83%, sedangkan albumin menunjukkan sensitivitas 75% dan spesifisitas 72%.

Kesimpulan

Prevalensi malnutrisi pada pasien kanker saluran pencernaan tinggi, terutama bila dinilai dengan SGA. IMT lebih spesifik namun kurang sensitif, sedangkan albumin lebih sensitif namun kurang spesifik. SGA tetap menjadi metode utama, sementara IMT dan albumin dapat digunakan sebagai skrining komplementer.

Kata kunci : malnutrisi; kanker saluran pencernaan; *Subjective Global Assessment (SGA)*; Indeks Massa Tubuh (IMT); albumin serum; status gizi; prevalensi; kesesuaian

Systematic Review: Peranan Vitamin D dalam Regulasi Hormon Testosteron dan Implikasinya terhadap Pencegahan Penuaan

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ABSTRAK

Suplementasi vitamin D saat ini banyak dikonsumsi oleh berbagai kalangan, khususnya dalam upaya pencegahan penuaan. Penuaan dipengaruhi oleh dua faktor utama, yaitu faktor eksternal (pola hidup tidak sehat, stres, polusi, paparan bahan kimia dan sinar UV-B) serta faktor internal (genetik dan hormonal). Vitamin D merupakan mikronutrien larut lemak yang dalam metabolisme eksogen membentuk *chylomicrons* D2/D3 dan kemudian disintesis menjadi lipoprotein yang mengandung kolesterol. Lipoprotein tersebut berperan sebagai prekursor dalam pembentukan hormon steroid, termasuk testosteron. Testosteron sendiri merupakan salah satu hormon penting yang berhubungan dengan proses penuaan. Studi ini bertujuan meninjau efektivitas vitamin D terhadap regulasi hormon testosteron dalam kaitannya dengan pencegahan penuaan. Metode yang digunakan adalah systematic review dengan panduan *PRISMA*, melalui pencarian literatur dari database *EBSCO*, *PubMed*, dan *ScienceDirect*. Dari total 1.225 artikel yang teridentifikasi, hanya 5 artikel yang memenuhi kriteria inklusi. **Hasil** tinjauan menunjukkan tidak terdapat hubungan yang signifikan antara suplementasi vitamin D dengan peningkatan kadar hormon testosteron. Hal ini mengindikasikan bahwa efektivitas vitamin D dalam regulasi testosteron pada proses penuaan masih belum dapat disimpulkan. Kesimpulan: Vitamin D berpotensi berperan dalam metabolisme hormon steroid, namun bukti ilmiah terkait kaitannya dengan testosteron dalam pencegahan penuaan masih terbatas. Penelitian lebih lanjut diperlukan untuk mengeksplorasi faktor-faktor lain yang mungkin memengaruhi, seperti penurunan kapasitas sintesis vitamin D pada usia lanjut. Intervensi suplementasi vitamin D sebaiknya dipertimbangkan sejak dini, sebelum proses penuaan berlangsung lebih jauh.

Kata kunci: Vitamin D, Hormon steroid, Testosteron, Penuaan.

Vitamin D Supplementation as a Clinical Nutrition Strategy for Neuroprotection and Inflammation Modulation in Traumatic Brain Injury: A Systematic Review and Meta- analysis of Randomized Controlled Trials

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Background: Traumatic brain injury (TBI) is a leading global cause of morbidity and mortality. Beyond the primary mechanical insult, secondary processes particularly neuroinflammation—worsen outcomes. Vitamin D, increasingly recognized as a neuroimmunomodulator, may exert neuroprotective and anti-inflammatory effects, yet clinical evidence remains limited and inconclusive.

Objective: To assess the effects of vitamin D supplementation on neurological recovery and inflammatory biomarkers in TBI patients. The review was registered with PROSPERO (ID: CRD42024607945).

Methods: A systematic review and meta-analysis were conducted in line with PRISMA 2020. PubMed, Scopus, and Google Scholar were searched (2015–2025) for randomized controlled trials (RCTs) of vitamin D in TBI. Outcomes included Glasgow Coma Scale (GCS), Glasgow Outcome Scale (GOS/GOS-E), and inflammatory biomarkers (IL-6, TNF- α , IL-1 β). Data were pooled in RevMan 5.4 using fixed-effect models. Risk of bias was assessed with the Cochrane RoB 2.0 tool.

Results: Three RCTs (n = 154) met inclusion criteria. Vitamin D significantly improved neurological recovery, with higher GCS scores versus control (SMD 1.20; 95% CI 0.81–1.60; $p < 0.00001$; $I^2 = 0\%$). IL-6 reduction was not statistically significant (SMD –0.44; 95% CI –0.91–0.04; $p = 0.07$; $I^2 = 0\%$), though the trend favored vitamin D. Single trials reported decreased TNF- α and IL-1 β , suggesting potential anti-inflammatory effects. Two studies showed trends toward improved GOS/GOS-E at three months.

Conclusion: Vitamin D supplementation significantly enhances neurological recovery in TBI and shows promising, though inconclusive, anti-inflammatory benefits. It may represent a safe, low-cost adjunct in neurocritical care, warranting confirmation in larger multicentre RCTs.

Keywords: Vitamin D, traumatic brain injury, GCS, IL-6, systematic review, meta-analysis

PERAN SUPLEMENTASI ASAM LEMAK OMEGA-3 TERHADAP *FAT-FREE MASS INDEX* PASIEN KANKER LARING DENGAN MALNUTRISI YANG MENJALANI TERAPI KEMORADIASI: LAPORAN KASUS

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Latar Belakang: Kanker kepala leher termasuk tujuh kanker terbanyak di dunia. Kanker laring merupakan yang paling umum dalam bidang otolaringologi dengan 30-40% kasus dan berada di urutan ke-17 di Indonesia dengan 10.315 kasus tahun 2022. Kemoradiasi merupakan salah satu modalitas utama. Kanker dan kemoradiasi menimbulkan efek samping yang berkontribusi terhadap malnutrisi dan penurunan massa otot. Suplementasi omega-3 terbukti mengurangi efek samping kemoradiasi, tingkat inflamasi dan meningkatkan massa otot sehingga mendukung pemulihan klinis. Laporan kasus ini bertujuan mengetahui peran omega-3 terhadap *fat-free mass index* (FFMI) pasien kanker laring yang menjalani kemoradiasi.

Ilustrasi Kasus: Seorang pria berusia 60 tahun mengeluhkan suara serak sejak satu tahun lalu dan didiagnosis kanker laring berdasarkan **Hasil** biopsi. Pasien menjalani kemoradiasi dalam 35 fraksi dan kemosensitizer 6 kali. Nutrisi melalui jalur oral, rerata asupan energi 27-32 kkal/kgBB, protein 1,2-1,3 g/kgBB dan suplementasi omega-3 2 g/hari. Evaluasi hari ke- 42 didapatkan peningkatan massa otot dari 28,2% menjadi 29,2% dan FFMI dari 14,9 kg/m² menjadi 15,7 kg/m².

Diskusi: Kanker menyebabkan inflamasi sistemik, produksi sitokin pro inflamasi dan katabolisme yang memicu perubahan metabolisme dan degradasi massa otot. Suplementasi omega-3 mengurangi sitokin pro inflamasi (IL-1, IL-6 dan TNF- α), meningkatkan nafsu makan dan menghambat degradasi otot rangka. *Eicosapentaenoic acid* (EPA) dan *Docosahexaenoic Acid* (DHA) meningkatkan *mammalia target of rapamycin* (mTOR) dan p70S6K1 yang berperan dalam sintesis protein. Perubahan massa otot dievaluasi dengan pemeriksaan komposisi tubuh.

Kesimpulan: Suplementasi omega-3 2 g/hari dan asupan protein adekuat dapat meningkatkan FFMI selama 42 hari pada pasien kanker laring yang menjalani kemoradiasi.

Kata kunci: *fat free mass index*, kanker laring, malnutrisi, massa otot, omega-3

Terapi Medik Gizi Pada Perempuan 29 Tahun Dengan Malnutrisi sedang, Dermatitis Eksfoliatif, Psoriasis Pustulosis Generalisata

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Latar Belakang: Psoriasis adalah penyakit kulit dengan inflamasi kronis yang dimediasi imun bercirikan hiperproliferasi keratinosit disertai infiltrasi sel inflamasi pada dermis dan epidermis. Psoriasis berkaitan dengan defisiensi mikronutrien. Terapi medik gizi berperan mencukupi kebutuhan makronutrien, mikronutrien serta membantu penyembuhan lesi.

Kasus: Pasien mengeluh kulit mengelupas di seluruh tubuh disertai gatal sejak 1 bulan terakhir. Asupan indekuat karena sulit membuka mulut. Antropometri: TB aktual 150 cm, LLA 26 cm, IMT 22,22 kg/m², LOSF +2, MW +2, kapasitas fungsional *Bedridden*, *Handgrip Strength* 10,2 kg / F | 8,4 kg / F. Pemeriksaan laboratorium menunjukkan kadar ureum 11 mg/dl, kadar kreatinin 0.7 mg/dl. Diet diberikan sesuai target 35 kkal/1.7 gP/kgBB setara 1750 kkal/85 gP berupa nasi tim, lauk, sayur dan *snack*. Suplementasi vitamin A 100.000 IU, vitamin B kompleks 1 tab/8 jam, vitamin C 250 mg/8 jam, zinc 20 mg/12 jam, vitamin D 1000 IU/24 jam. Pasien pulang hari ke-16 perawatan dengan perbaikan lesi kulit, peningkatan kapasitas fungsional menjadi *Chair-ridden*, serta peningkatan *Handgrip Strength* menjadi 14,8 kg / F | 13,7 Kg / F .

Diskusi: Malnutrisi pada psoriasis memperburuk inflamasi. Terapi medik gizi dengan energi-protein adekuat serta suplementasi vitamin A, D, C, B kompleks dan zinc memperbaiki status gizi, mendukung regenerasi epitel, dan menurunkan inflamasi, sehingga mempercepat perbaikan lesi pada pasien.

Kesimpulan: Pemenuhan kebutuhan energi-protein dan suplementasi mikronutrien pada pasien psoriasis dengan malnutrisi sedang efektif memperbaiki status gizi, mempercepat penyembuhan lesi kulit, dan meningkatkan kapasitas fungsional, sehingga terapi medik gizi menjadi bagian penting dari tata laksana komprehensif.

Kata kunci: Terapi Medik Gizi; Malnutrisi; Psoriasis

TERAPI NUTRISI MEDIK PADA PASIEN ADENOKARSINOMA REKTUM POST KOLOSTOMI

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Latar Belakang

Adenokarsinoma kolorektal menduduki peringkat ketiga menurut *Global Burden of Cancer* (GLOBOCAN) tahun 2020, menempati peringkat kedua penyebab kematian dengan tingkat mortalitas sebesar 9,40%. Nutrisi medik memiliki peran penting dalam pencegahan, pengendalian perjalanan penyakit, serta sebagai terapi suportif untuk meningkatkan kualitas hidup.

Ilustrasi Kasus

Wanita usia 71 tahun post kolostomi adeno ca recti T4bN1bMx. Keluhan benjolan di anus disertai sulit BAB sejak 1 bulan yang lalu, dan terkadang keluar darah merah segar. Pasien memiliki riwayat hipertensi tidak terkontrol. Pemeriksaan antropometri BB 62kg, TB 158cm, IMT 24,84 kg/m².

Diskusi

Kalori terkontrol pasien 1800 kkal, protein 80 gram. Terapi nutrisi awal air gula 3x100cc, *clear juice* 3x100cc dengan terapi parenteral D5:kalbamin:smoflipid. Terapi medik gizi ditingkankan bertahap, pada hari ketiga post operasi sudah bisa makan lunak dengan susu Oligo 2x200 kkal.

Pasien yang diberikan suplemen nutrisi oral tiga bulan setelah operasi mengalami penurunan berat badan lebih sedikit dibandingkan dengan pasien yang menerima konseling gizi saja. Asupan energi yang dianjurkan ESPEN untuk pasien kanker adalah 25–30 kkal/kg/hari, protein 1-1,5 g/kg/hari.

Penting juga menilai nutrisi pasien sebelum operasi untuk memulihkan kondisi saluran cerna. Pasien yang menjalani prosedur *Hartman*, diidentifikasi berisiko malnutrisi. Pemberian nutrisi yang tidak adekuat juga dikaitkan dengan **Hasil** pasca operasi yang kurang optimal, termasuk infeksi luka atau kematian pasien.

Kesimpulan

Dukungan nutrisi yang optimal menunjukkan perbaikan status gizi, perbaikan status metabolik sehingga dapat mempercepat proses perbaikan keadaan umum.

Kata kunci: Nutrisi; kolostomi; adeno ca recti.

OPTIMALISASI DUKUNGAN NUTRISI PADA PASIEN KANKER PAYUDARA RESIDIF DENGAN MALNUTRISI, *FEBRILE NEUTROPENIA*, DAN PANSITOPENIA PASCA KEMOTERAPI

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Latar Belakang

Kanker payudara adalah kanker dengan insidensi tertinggi pada perempuan. Malnutrisi ditemukan pada 30–50% pasien kanker yang dirawat di rumah sakit. Sekitar 10–20% pasien kanker meninggal bukan karena progresi tumor, melainkan komplikasi malnutrisi.

Ilustrasi Kasus

Perempuan 58 tahun dengan penurunan nafsu makan pasca kemoterapi sejak 2 minggu, demam, mual, muntah, diare, dan penurunan berat badan 3 kg dalam 2 bulan.

Pemeriksaan antropometri BB 48 kg, TB 165 cm, IMT 17,6 kg/m².

Diskusi

Pasien mendapatkan terapi nutrisi medis peroral berupa makan lunak, formula peptisol 2x200 kkal sebagai suplemen nutrisi oral, dan vitamin B12 2x500 mcg. Rencana intervensi diet 2100 kkal dan protein 90 gram dengan target asupan 80%. Target asupan dapat terpenuhi di hari ketiga perawatan (86%=1806 kkal) dan tertinggi di hari keempat (93%=1953 kkal).

Menurut kriteria GLIM, pasien dikategorikan malnutrisi sedang. Asupan energi yang direkomendasikan ESPEN sebesar 25-30 kkal/kg/hari dan protein 1 g/kg/hari-1,5 g/kg/hari, hingga 2 g/kg/hari untuk pasien dengan fungsi ginjal normal. Terbukti adanya perbaikan status gizi dan kondisi klinis pada pasien setelah pemberian terapi nutrisi individual selama 6 hari perawatan.

Kesimpulan

Dukungan nutrisi yang adekuat berperan penting dalam memperbaiki status gizi, mendukung fungsi imun, mengurangi komplikasi terapi, serta meningkatkan respons terapi dan kelangsungan hidup pasien kanker.

Kata kunci

Kanker Payudara, Malnutrisi, *Febrile Neutropenia*, Pansitopenia, Dukungan Nutrisi

Komplikasi Kardiovaskular pada Remaja dengan Malnutrisi Energi Protein

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Abstrak

Latar Belakang: Malnutrisi energi protein (MEP) merupakan penyebab utama morbiditas dan mortalitas anak di negara berkembang. Kekurangan energi dan protein berat dapat memicu komplikasi kardiovaskular langka namun fatal seperti kardiomiopati dilatasi (KMD).

Ilustrasi Kasus: Remaja perempuan 15 tahun datang dengan sesak napas progresif, edema perifer, dan penurunan berat badan drastis dari 42 kg menjadi 28 kg dalam dua bulan. Pemeriksaan menunjukkan gizi buruk berat (BMI 11,38 kg/m²), kehilangan massa otot dan lemak subkutan, serta edema *non-pitting*. Laboratorium mengungkap hemoglobin 7,1 g/dL, albumin 2,8 g/dL, dan CRP 48 mg/L. Ekokardiografi menunjukkan dilatasi seluruh ruang jantung dengan fraksi ejeksi 28%, sesuai KMD. Asupan energi berdasarkan *semi-quantitative food frequency questionnaire* hanya sekitar 980 kkal/hari dan protein <40 g/hari, jauh di bawah kebutuhan remaja. Pasien mendapat nutrisi parenteral awal 600 kkal/hari yang ditingkatkan bertahap, transfusi darah, infus albumin, diuretik, ACE-inhibitor, dan *beta-blocker*. Meskipun terapi multidisiplin telah diberikan, pasien mengalami henti jantung pada hari ke-6 perawatan.

Diskusi: Kasus ini menyoroti keterlambatan diagnosis MEP berat dengan komplikasi KMD. Defisiensi energi-protein kronis, inflamasi sistemik, dan kekurangan mikronutrien (selenium, karnitin, tiamin) berkontribusi pada disfungsi miokard dan *cardiac cachexia*. Risiko tinggi sindrom refeeding memerlukan pemberian nutrisi bertahap sesuai rekomendasi *American Society for Parenteral and Enteral Nutrition* (ASPEN).

Kesimpulan: MEP berat pada remaja dapat menimbulkan KMD yang mengancam jiwa, terutama bila terdeteksi pada stadium lanjut. Deteksi dini, skrining nutrisi rutin, pemenuhan energi-protein yang adekuat, serta intervensi gizi multidisiplin sangat penting untuk mencegah progresi malnutrisi dan komplikasi kardiovaskular fatal.

Kata kunci: malnutrisi energi protein, kardiomiopati dilatasi, remaja, sindrom *refeeding*

ABSTRAK

Efek Suplementasi Probiotik Terhadap Nafsu Makan dan Asupan Energi pada Orang Dewasa dengan *Overweight* dan Obesitas: Suatu Tinjauan Literatur Sistematis dari *Randomised Controlled Trials*

Karina Agustin

ZAP Clinic Cemara Asri

Probiotik telah banyak diteliti pada individu dengan *overweight* dan obesitas, serta terbukti memberikan manfaat, seperti mengurangi akumulasi lemak, menurunkan kadar glukosa darah puasa, menyeimbangkan mikrobiota usus, dan mendukung penurunan berat badan. Oleh karena itu, probiotik dipandang berpotensi dalam strategi pengelolaan obesitas melalui modifikasi pola makan. Namun, penelitian yang mengevaluasi efek suplementasi probiotik terhadap regulasi nafsu makan dan asupan energi masih terbatas. Penelitian ini bertujuan untuk mengkaji secara sistematis efek suplementasi probiotik terhadap nafsu makan dan asupan energi pada orang dewasa dengan *overweight* dan obesitas. Tinjauan dilakukan sesuai pedoman PRISMA dengan pencarian literatur pada PubMed, Google Scholar, dan Cochrane sejak Januari 2014 hingga Agustus 2025 dengan **Kata kunci:** *probiotic supplementation, energy intake, appetite, caloric intake, overweight adults, obese adults*, dan *randomized controlled trial*. Dari 757 publikasi awal, empat studi RCT memenuhi kriteria seleksi. **Hasil** analisa menunjukkan variasi jenis probiotik, dosis, dan intervensi tambahan, termasuk pembatasan diet dan suplementasi lain. Suplementasi probiotik dilaporkan berdampak pada beberapa parameter subjektif nafsu makan, seperti rasa lapar, keinginan makan, dan rasa kenyang. Namun, temuan antar studi belum konsisten, dengan sebagian melaporkan perbaikan berupa peningkatan *satiety quotient*, penurunan rasa lapar, serta kecenderungan kenaikan kadar GLP-1, sementara studi lainnya tidak menemukan perbedaan bermakna terhadap asupan energi maupun parameter hormonal yang meregulasi nafsu makan. Dengan demikian, probiotik berpotensi memodulasi aspek subjektif nafsu makan, tetapi belum terbukti konsisten menurunkan asupan energi. Diperlukan studi RCT lebih lanjut dengan desain yang lebih beragam untuk memperjelas peran probiotik terhadap regulasi nafsu makan dan asupan energi pada individu dewasa dengan *overweight* dan obesitas.

Kata kunci: Probiotik, nafsu makan, asupan energi, *overweight*, obesitas

Omega 3 sebagai Terapi Tambahan untuk Pencegahan Migrain: Tinjauan Sistematis tentang Khasiat dan Keamanan Klinis

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Abstrak

Pendahuluan:

Migrain adalah gangguan neurologis yang umum ditandai dengan serangan sakit kepala sedang hingga berat yang berulang, sering disertai mual, fotofobia, dan fonofobia. Bukti yang muncul menunjukkan bahwa pola makan dan suplementasi nutrisi dapat berperan dalam pencegahan migrain. Asam lemak omega-3 dapat memodulasi neuroinflamasi dengan mengurangi produksi eikosanoid dan sitokin pro-inflamasi, serta dengan memengaruhi aktivitas sistem trigeminovaskular. Tujuan penelitian ini adalah untuk mengevaluasi efektivitas dan keamanan klinis omega-3 untuk pencegahan migrain.

Metode:

Protokol PRISMA digunakan dalam penelitian ini, yang melibatkan PubMed, ScienceDirect, SpringerLink, ProQuest, Cochrane Library, dan Nature Portfolio. Kriteria inklusi penelitian ini adalah pasien migrain episodik (berusia ≥ 18 tahun) yang diterapi dengan omega 3. Ekstraksi data dan penilaian risiko bias dilakukan menggunakan Cochrane Risk of Bias 2 (RoB 2).

Hasil:

Dari 65 artikel yang disaring, lima studi memenuhi kriteria kelayakan. Studi yang diikutsertakan menggunakan desain acak, tersamar ganda, terkontrol plasebo, yang diterbitkan selama periode 2017-2025, dan dilakukan di Taiwan dan Iran. Durasi studi berkisar antara 8-12 minggu. Penggunaan omega 3 dapat mengurangi frekuensi, durasi, dan tingkat keparahan migrain serta gejala psikologis dan meningkatkan kualitas hidup pasien migrain episodik. Omega 3 juga dapat meningkatkan kadar HDL-C plasma dan menurunkan kadar laktat dan VCAM-1 serum, TC, LDL-C, dan TG pada pasien dengan serangan migrain.

Kesimpulan:

Omega-3 dapat menjadi terapi tambahan yang menjanjikan untuk pencegahan migrain karena tolerabilitas, keamanan, dan efektivitas biayanya yang tinggi.

Kata kunci:

Omega 3, Migrain Episodik, Neuroinflamasi, Neuroproteksi

***Overweight* atau Obesitas dan Gula Darah Tidak Terkontrol Meningkatkan Risiko terjadinya Diabetes Neuropati pada Pasien Diabetes Mellitus Tipe 2 di Klinik Pucang Sidoarjo pada Januari 2024-Juni 2025**

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Latar Belakang : Manajemen diabetes mellitus yang kurang baik menyebabkan terjadinya komplikasi pada diabetes mellitus, salah satunya adalah diabetes neuropati.¹ Faktor yang mempengaruhi terjadinya diabetes neuropati pada pasien diabetes adalah durasi lamanya menderita diabetes, kadar gula darah, obesitas, genetika, usia, jenis kelamin, tipe diabetes.^{2,3}

Tujuan : Penelitian ini dilakukan untuk melihat apakah ada hubungan antara indeks massa tubuh (IMT) dan kadar gula darah pada pasien diabetes mellitus tipe 2 dengan diabetes neuropati.

Metode : Penelitian ini menggunakan metode kuantitatif dengan pendekatan *cross-sectional*. Jumlah sampel yang didapatkan sebanyak 75 orang dengan usia antara 40-65 tahun dengan diagnosa diabetes mellitus tipe 2 pada Klinik Pucang Sidoarjo dengan teknik *purposive sampling*. Kriteria inklusi penelitian ini adalah tersedianya diagnosa diabetes neuropati, data indeks massa tubuh, dan data kadar gula darah. Uji hubungan Analisis bivariat menggunakan uji *Pearson Chi-square* dan besarnya kekuatan asosiasi ditunjukkan dengan *Prevalence Odds Ratio* (POR) .

Hasil : Terdapat hubungan yang bermakna antara IMT dan kejadian neuropati diabetik dengan nilai $p = 0,003$ dimana IMT meningkat memiliki peluang 4,85 kali lebih tinggi untuk mengalami neuropati dibandingkan IMT normal (POR=4,85; 95% CI=1,63–14,49).. Terdapat hubungan yang bermakna antara kadar gula darah dan kejadian neuropati diabetik dengan nilai $p = 0,009$ dimana gula darah tidak terkontrol memiliki risiko 4,13 kali lebih tinggi dibandingkan dengan yang terkontrol untuk mengalami diabetes neuropati. (POR=4,13; 95% CI=1,38–12,35).

Kesimpulan : Terdapat hubungan antara IMT dan kadar gula darah dengan diabetes neuropati.

Kata kunci : Indeks Massa Tubuh, Gula Darah, Diabetes Mellitus, Diabetes Neuropati.

Efek Suplementasi Vitamin D terhadap Stunting pada Anak Usia dibawah 5 Tahun : Sebuah Meta Analisis

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ABSTRAK

Stunting berdampak panjang pada kesehatan dan perkembangan anak. Vitamin D berperan dalam metabolisme kalsium–fosfor, tetapi efektivitas suplementasinya terhadap pertumbuhan linear masih tidak konsisten. Tujuan penelitian ini untuk mengevaluasi efek suplementasi vitamin D terhadap panjang/tinggi badan dan z-score panjang/tinggi-menurut-usia (LAZ/HAZ) pada anak <5 tahun. Metode tinjauan sistematis dan meta-analisis mengikuti PRISMA 2020 dan Cochrane Handbook. Pencarian PubMed, ScienceDirect, dan Google Scholar (2011–2026). Inklusi: RCT pada anak 0–59 bulan dengan intervensi vitamin D. Data kontinu dipool sebagai Mean Difference (MD) atau Standardized Mean Difference (SMD) dengan model efek acak; heterogenitas dinilai dengan I^2 ; risiko bias menggunakan RoB 2; analisis di RevMan 5.4. **Hasil** enam RCT memenuhi kriteria pada penelitian ini. Untuk panjang/tinggi badan (3 studi; $n=971$) tidak terdapat perbedaan bermakna antara vitamin D dan kontrol (MD $-2,38$ cm; 95% CI $-7,70$ hingga $2,93$; $p=0,38$; $I^2=80\%$). Untuk LAZ/HAZ (3 studi; $n=1.555$) juga tidak signifikan (SMD $0,50$; 95% CI $-1,05$ hingga $2,05$; $p=0,53$; $I^2=99\%$). Kesimpulan: Suplementasi vitamin D tidak meningkatkan panjang/tinggi badan maupun LAZ/HAZ pada anak <5 tahun secara signifikan.

Kata kunci: Vitamin D, Stunting, Anak Usia Dibawah 5 Tahun, Meta-analisis.

Terapi Medik Gizi pada Perempuan 33 Tahun dengan Obesitas Derajat 1 dan Pemfigus Vulgaris

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Latar Belakang

Pemfigus Vulgaris adalah penyakit autoimun langka pada kulit dengan gejala munculnya lepuhan dan luka pada kulit/selaput lendir. Pasien pemfigus vulgaris berisiko malnutrisi karena katabolisme dan kehilangan protein pada luka kulit yang luas. Terapi medik gizi berperan mencukupi kebutuhan makronutrien dan mikronutrien serta membantu penyembuhan luka.

Kasus

pasien mengeluh keluar lepuhan sejak 1 bulan terakhir. Keluhan lepuhan di seluruh tubuh, mulut disertai sariawan. Asupan masih adekuat, namun pasien kesulitan makan nasi biasa karena nyeri. Antropometri: TB 150 cm, BB 57 kg, BB ideal 51 kg, IMT 25,33 kg/m², LOSF dan MW 0. Pemeriksaan laboratorium Hb 13,3g/dL, leukosit 9.400/μL, albumin 3,8g/dL, tes ANA 3,61. Diet diberikan sesuai target 30 kkal/1,5 gP/kgBBi setara 1530 kkal/76 gP berupa nasi tim, lauk dan sayur serta *snack* kacang hijau. Suplementasi vitamin A 100.000 IU/5 hari, vitamin B kompleks 1 tab/8 jam, vitamin C 250 mg/8 jam, zinc 20 mg/12 jam dan vitamin D 5000 IU/12 jam. Hari ke-5 *follow-up* tidak muncul lepuhan baru dan sariawan membaik. Konsistensi diet dimodifikasi hingga keluhan membaik. Pasien pulang hari ke-7 dengan perbaikan lesi kulit dan asupan oral adekuat.

Diskusi

Tatalaksana gizi pasien pemfigus vulgaris perlu mempertimbangkan penyesuaian konsistensi makanan, pemberian makronutrien dan mikronutrien yang adekuat untuk mencukupi kebutuhan gizi dan menekan katabolisme yang berlebihan. Mikronutrien dalam bentuk suplementasi dapat membantu menurunkan peradangan dan mempercepat penyembuhan luka.

Kesimpulan

Terapi medik gizi yang adekuat meliputi kecukupan makronutrien, mikronutrien serta pemilihan konsistensi diet sesuai daya terima pasien, turut berperan dalam mendukung penyembuhan pasien.

Kata kunci : Terapi Medik Gizi; Malnutrisi; Pemfigus Vulgaris

Terapi Medik Gizi pada Pasien Meningoensefalitis Tuberkulosis, Gagal Ginjal Akut, Hematemesis dengan Malnutrisi Berat dan Hipoalbuminemia

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Latar Belakang:

Meningoensefalitis tuberkulosis (TB) merupakan komplikasi serius dari infeksi tuberkulosis paru, yang ditandai dengan hidrosefalus dan penurunan kesadaran. Adanya hematemesis, yang merupakan perdarahan saluran cerna atas memperburuk kondisi malnutrisi dan hipoalbuminemia. Intervensi nutrisi menjadi krusial dalam mendukung perbaikan klinis termasuk kapasitas fungsional.

Kasus:

Laki-laki usia 35 tahun dirawat dengan penurunan kesadaran serta residu hitam pada selang *naso-gastric* selama 3 hari. Penilaian status gizi awal menggunakan *Subjective Global Assessment* (SGA) termasuk ke dalam kategori C, status gizi buruk. Dengan kriteria *Global Leadership Initiative on Malnutrition* (GLIM), ditegakkan diagnosis malnutrisi berat. Intervensi awal meliputi pemberian nutrisi parenteral kombinasi enteral, kemudian transisi dan dinaikkan bertahap ke oral seiring perkembangan pasien. Terjadi perbaikan klinis bertahap, termasuk kesadaran, kapasitas fungsional dan fungsi ginjal.

Diskusi:

Proses inflamasi sistemik pada meningoensefalitis TB menyebabkan gangguan gastrointestinal seperti kerusakan mukosa lambung ditandai dengan hematemesis, yang menjadi perhatian khusus dalam intervensi nutrisi. Kebutuhan energi menggunakan perhitungan *harris-benedict*, protein mengikuti rekomendasi ESPEN 2024 dimulai dari 1 gram/ KgBB/ hari ditingkatkan mengikuti perbaikan fungsi ginjal.

Kesimpulan:

Terapi medik gizi bersifat individual ditingkatkan bertahap efektif dalam mendukung perbaikan klinis, termasuk kapasitas fungsional pasien dengan malnutrisi berat dan hipoalbuminemia akibat meningoensefalitis TB.

Kata kunci: Hematemesis, Meningoensefalitis TB, Malnutrisi Berat

ABSTRACT

Various Factors Affecting Body Weight Changes in Burn Patients with $\geq 40\%$ Total Body Surface Area due to Flame Injury

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Background:

Significant weight loss (WL) in burn patients with $\geq 40\%$ TBSA involvement, impairs immune function, wound healing, and increase mortality. Graves et al., reported 7.1% WL despite adequate nutritional intervention. Some contributing factors include prolonged hypermetabolism, chronic inflammation, and suboptimal intake also influence WL. This paper aims to explore various factors contributing to WL in burn patients with $\geq 40\%$ TBSA.

Case:

A retrospective case series on two patients with $\geq 40\%$ TBSA burns treated at Burn Unit of Cipto Mangunkusumo Hospital between March–April 2025. Data collected included body weight, nutritional intake, inflammatory markers (CRP, procalcitonin), WL, and clinical outcome. Without indirect calorimetry, energy requirements were estimated at 30 kcal/kg/day, targeting full needs from day one. Daily energy balance (delivery minus target) was analyzed weekly over four weeks. Both patients experienced moderate caloric deficits in week 1 (-5483 kcal in Case 1, -6686 kcal in Case 2), improving by week 3 (-1755 kcal in Case 1, -3906 kcal in Case 2).

Discussion:

The WL in Case 1 was 13% and Case 2 was 14%, consistent with Lagziel et al., who reported WL under 15%. Despite both cases received adequate nutritional intervention to help manage inflammation as noted by Clark et al., the WL findings differ from Graves et al., which might be due to high inflammation that persists until week 4 (CRP 64.6 mg/dL in Case 1 and 190.2 mg/dL in Case 2).

Conclusion:

Uncontrolled inflammation increases catabolism, reduce the efficiency of nutrient utilization, and leads to greater WL despite adequate nutrition.

Keywords: burn, calorie deficit, inflammation

Terapi Medik Gizi pada Pasien Malnutrisi Berat dengan Karsinoma Esofagus Pasca Jejunostomy Feeding : Laporan Kasus

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Abstrak

Latar Belakang

Malnutrisi pada pasien karsinoma esofagus pasca *jejunostomy feeding* merupakan komplikasi utama akibat disfagia, intoleransi nutrisi, dan peningkatan stres metabolik. Insidensi malnutrisi berat pada kanker esofagus mencapai 60–80% dan berkontribusi meningkatkan morbiditas, mortalitas, serta menurunnya respons terapi. Terapi medik gizi yang adekuat berperan penting untuk mempertahankan status gizi dan menunjang keberhasilan terapi onkologi.

Ilustrasi Kasus

Pasien laki-laki usia 25 tahun dengan karsinoma esofagus mengalami penurunan asupan >50% dalam 1 bulan serta penurunan berat badan 24% dalam 2 bulan. Status gizi tergolong malnutrisi berat dengan indeks massa tubuh (IMT) 15,6 kg/m². Terapi nutrisi pasca *jejunostomy feeding* diberikan kombinasi enteral (jejunostomi) dan parenteral yang ditingkatkan bertahap hingga mencapai kebutuhan energi total 1.800 kkal (40 kkal/kgBB) dengan protein 1,7 g/kgBB. Suplementasi mikronutrien diberikan berupa vitamin B kompleks 3x1 tablet, vitamin C 100 mg, dan seng 20 mg. Pemantauan selama 1 bulan pasca *jejunostomy feeding* menunjukkan perbaikan status gizi menjadi malnutrisi sedang.

Diskusi

Estimasi kebutuhan energi berdasarkan formula Harris Benedict dengan faktor stres 1,3 yang ditingkatkan bertahap dengan protein >1,4 g/kgBB. Suplementasi mikronutrien yang diberikan berperan sebagai antioksidan, mendukung regenerasi jaringan, dan memperbaiki metabolisme sel. **Hasil** menunjukkan peningkatan berat badan dan perubahan IMT.

Kesimpulan

Terapi medik gizi yang adekuat pasca *jejunostomy feeding* dapat memperbaiki status gizi pasien karsinoma esofagus dengan malnutrisi berat.

Kata kunci

karsinoma esofagus, *jejunostomy feeding*, malnutrisi.

ABSTRAK

Analisis Faktor Risiko Kejadian Kekurangan Energi Kronis (KEK) Pada Ibu Hamil Di Daerah *Illegal Drilling* Wilayah Kerja Puskesmas Mekar JayaEstilia Ledyani¹, Ni Nyoman Sri Yuliani²¹Program Studi Kedokteran Program Sarjana, Fakultas Kedokteran, Universitas Palangka Raya²Departemen Gizi, Fakultas Kedokteran, Universitas Palangka Raya

Kekurangan Energi Kronis (KEK) pada ibu hamil masih menjadi masalah kesehatan yang berdampak pada ibu maupun janin. Aktivitas *Illegal Drilling* di Musi Banyuasin turut memperburuk kondisi melalui pencemaran lingkungan yang berpotensi memengaruhi status gizi. Penelitian ini bertujuan menganalisis faktor risiko KEK pada ibu hamil di wilayah kerja Puskesmas Mekar Jaya. Penelitian menggunakan desain *cross-sectional* dengan 66 responden yang dipilih secara *simple random sampling*. Variabel yang diteliti meliputi asupan makronutrien (protein, lemak, karbohidrat), pengetahuan ibu, status ekonomi, perilaku hidup bersih dan sehat (PHBS), serta status psikologis. Data diperoleh melalui kuesioner dan wawancara, kemudian dianalisis dengan uji *chi-square* dan regresi logistik. **Hasil:** Penelitian menunjukkan prevalensi KEK sebesar 16,7% dan pada uji *chi-square* semua variabel independen berhubungan signifikan dengan kejadian KEK ($p < 0,05$). **Hasil** analisis multivariat menunjukkan bahwa pada kluster asupan makronutrien, kekurangan protein (OR=9,45) dan karbohidrat (OR=8,49) merupakan faktor dominan terhadap kejadian KEK. Pada kluster sosial-perilaku, PHBS (OR=9,68) dan pengetahuan ibu hamil (OR=5,42) merupakan faktor dominan terhadap kejadian KEK. Sementara itu, pada kluster psikososial, pengetahuan ibu hamil (OR=9,44) dan status psikologis (OR=9,33) menjadi faktor paling berpengaruh. Kesimpulannya, kejadian KEK pada ibu hamil dipengaruhi oleh faktor asupan makronutrien, pengetahuan, status ekonomi, PHBS, dan status psikologis, sehingga intervensi perlu difokuskan pada edukasi gizi, perbaikan PHBS, serta dukungan sosial-ekonomi di daerah *Illegal Drilling*.

Kata kunci: Kekurangan Energi Kronis, Ibu Hamil, Makronutrien, PHBS, *Illegal Drilling*.

ABSTRAK

**ANALISIS KANDUNGAN ALBUMIN DAN DAYA CERNA PROTEIN PADA
“HARUAN *CRUNCH*” : INOVASI PANGAN LOKAL KALIMANTAN TENGAH
PENCEGAH STUNTING**Novita Wulandari¹, Ni Nyoman Sri Yuliani²¹Program Studi Kedokteran Program Sarjana, Fakultas Kedokteran, Universitas Palangka Raya²Departemen Gizi, Fakultas Kedokteran, Universitas Palangka Raya

Kejadian stunting masih menjadi perhatian dengan tingkat kejadian pada tahun 2023 sebesar 21,5%. Provinsi Kalimantan Tengah menunjukkan kejadian stunting yang lebih tinggi yaitu 23,5% pada tahun 2023. Angka kejadian yang tinggi untuk target nasional sebesar 14,2% kejadain. Kurangnya asupan protein menjadi salah satu faktor penyebab terjadinya stunting di Indonesia. Kalimantan Tengah memiliki sumber daya lokal yaitu ikan haruan yang mengandung tinggi albumin untuk mendukung pertumbuhan balita. Pengolahan ikan haruan yang kurang bervariasi menyebabkan anak-anak tidak mau mengonsumsi ikan. Berdasarkan permasalahan tersebut, peneliti membuat sebuah inovasi olahan pangan lokal berbahan ikan haruan berupa “*Haruan crunch*” yang mengandung tinggi albumin sebagai alternatif pencegah stunting. Analisis albumin dan daya cerna protein menggunakan metode spektrofotometri UV-Vis. **Hasil** analisis, sampel C (60% tepung ikan haruan : 40% tepung tapioka) mengandung albumin lebih tinggi daripada sampel A (40% tepung ikan haruan : 60% tepung tapioka) dan B (50% tepung ikan haruan : 50% tepung tapioka). Daya cerna protein yang paling baik terkandung dalam sampel B daripada sampel A dan C. Pemberian haruan *crunch* yang direkomendasikan yaitu pada perbandingan tepung ikan dan tepung tapioka 50 : 50, karena memiliki daya cerna protein terbaik.

Kata kunciStunting, Haruan *crunch*, Ikan Haruan, Albumin, Daya Cerna Protein

Successful Nutritional Management Following Laparotomy, Adhesiolysis, and Ileostomy with High-Output Stoma in a Pediatric Patient with Perforated Appendix and Severe Malnutrition: A Case Report

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ABSTRACT

Introduction: Optimal nutritional management is essential for growth and recovery in pediatric patients undergoing gastrointestinal surgery, particularly in the presence of malnutrition and high-output stomas. Surgical interventions often disrupt gastrointestinal function, leading to malabsorption and increased nutritional vulnerability. Early and structured nutritional strategies are critical to minimizing complications and promoting recovery.

Case Presentation: We report the case of a 14-year-old boy with perforated appendicitis and severe malnutrition who underwent laparotomy, adhesiolysis, and ileostomy. Postoperatively, he developed septic shock, hypoalbuminemia, and high-output stoma with significant protein and fluid losses. Nutritional intervention included a high energy-protein diet, oligomeric enteral formula enriched with medium-chain triglycerides, and targeted micronutrients. Over three months, the patient demonstrated substantial weight gain, improved wound healing, decreased stoma output, and functional recovery, culminating in successful ileostomy reversal.

Discussion: High-output stomas necessitate aggressive nutritional support to counteract protein and fluid loss. The oligomeric formula was chosen for its low-residue content, rapid digestibility, and high absorptive efficiency, facilitating optimal nitrogen and energy uptake despite significant gastrointestinal losses. Adequate energy and protein intake prevented catabolism and supported collagen synthesis, while supplementation with vitamin C, vitamin A, zinc, and selenium enhanced tissue repair, modulated inflammation, and improved antioxidant defenses. The observed catch-up growth and functional improvements underscore the effectiveness of the tailored nutritional approach.

Conclusion: Intensive nutritional therapy is vital for pediatric patients with severe malnutrition undergoing gastrointestinal surgery with high-output stomas. Combining specialized enteral nutrition with high protein-energy intake and micronutrient support can enhance wound healing, nutritional rehabilitation, and overall recovery.

Keyword: Pediatric nutrition, high-output ileostomy, severe malnutrition, oligomeric formula, wound healing

Efikasi Suplementasi Vitamin D terhadap Densitas Mineral Tulang dan Massa Otot pada Osteosarkopenia: Sebuah Tinjauan Sistematis

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ABSTRAK

Latar Belakang dan Tujuan: Osteosarkopenia merupakan sindrom geriatri yang meningkatkan risiko jatuh, fraktur, dan mortalitas. Vitamin D berperan penting dalam kesehatan tulang dan otot, tetapi bukti klinis mengenai efektivitas suplementasinya masih beragam sehingga memerlukan sintesis komprehensif. Tinjauan sistematis ini bertujuan mengevaluasi efektivitas suplementasi vitamin D terhadap densitas tulang, massa otot, serta luaran klinis (jatuh dan fraktur) pada lansia dengan atau berisiko osteosarkopenia, sekaligus mengidentifikasi sumber heterogenitas antarstudi untuk mendukung praktik klinis dan penelitian selanjutnya.

Metode: Tinjauan sistematis ini dilakukan sesuai dengan pedoman PRISMA. Pencarian literatur sistematis dilakukan pada database PubMed, Google Scholar, Semanthalic Scholar, Springer, Wiley Online Library untuk mengidentifikasi uji klinis acak terkontrol (RCT) dan meta-analisis yang relevan.

Hasil: Analisis dari studi yang diinklusi menunjukkan bahwa efek positif yang signifikan pada densitas mineral tulang dan penurunan risiko fraktur terutama ketika suplementasi vitamin D dikombinasikan dengan kalsium. Suplementasi vitamin D menunjukkan dampak positif yang cukup bermakna terhadap peningkatan massa otot apendikular, dengan efek terbesar terlihat ketika dikombinasikan dengan intervensi nutrisi lain seperti protein dan leusin, serta latihan resistensi.

Kesimpulan: Suplementasi vitamin D merupakan komponen penting dalam manajemen osteosarkopenia. Namun, efikasi maksimalnya tercapai ketika diintegrasikan ke dalam pendekatan intervensi multikomponen yang juga mencakup asupan kalsium dan protein yang adekuat serta program latihan fisik yang terstruktur.

Kata kunci: Osteosarkopenia, Vitamin D, Densitas Mineral Tulang, Massa Otot

Pendekatan Nutrisi Terpadu pada Pasien *Papillary Thyroid Carcinoma*

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Abstrak

Latar Belakang. Kanker tiroid menunjukkan peningkatan global signifikan hingga 582% sejak 2002, dengan *Papillary Thyroid Carcinoma* (PTC) sebagai tipe tersering.¹ Nutrisi seimbang berperan penting dalam menjaga fungsi tiroid melalui mikronutrien seperti yodium, selenium, zat besi, vitamin D, dan zinc. Ketidakseimbangan asupan gizi dapat memperburuk fungsi tiroid serta meningkatkan risiko kanker.²

Ilustrasi Kasus. Seorang laki-laki 29 tahun datang dengan keluhan benjolan di leher kanan. Setelah evaluasi klinis dan pemeriksaan penunjang, pasien didiagnosis PTC varian klasik dan folikular. Pasien menjalani *thyroidectomy* komplet dua tahap dengan dukungan terapi nutrisi pascaoperasi berupa diet 2500 kkal/hari dengan protein 70 g/hari, lemak 56 g/hari, karbohidrat 400 g/hari, serta suplementasi zinc 20 mg/hari. Perbaikan fungsi tiroid dan kondisi klinis dicapai setelah intervensi nutrisi dan terapi levothyroxin.

Diskusi. Faktor nutrisi, obesitas, serta paparan lingkungan berperan dalam patogenesis kanker tiroid. Panduan ESPEN (2021) menekankan pentingnya skrining gizi dan intervensi nutrisi dini dengan kebutuhan energi 25–30 kkal/kg/hari dan protein 1,0–1,5 g/kg/hari.³ Mikronutrien seperti selenium dan zinc bersama vitamin antioksidan dapat mendukung metabolisme tiroid dan pemulihan pascaoperasi.⁴ Pendekatan nutrisi terpadu yang mencakup pengaturan diet dan suplementasi mikronutrien berpotensi meningkatkan **Hasil** klinis dan kualitas hidup pasien PTC.⁵

Kesimpulan. Pilihan terapi nutrisi pada pasien *papillary thyroid carcinoma* dapat berupa kombinasi pemberian nutrisi oral serta suplementasi vitamin dan mineral. Monitoring asupan nutrisi berkelanjutan penting dilakukan untuk memperbaiki kualitas hidup pasien.

Kata kunci. *Papillary thyroid carcinoma*, terapi nutrisi.

Suplementasi Nutrisi dan Latihan Intensitas Tinggi: Suatu Tinjauan Sistematis tentang Antioksidan, Respon Inflamasi, dan Toleransi Latihan

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Abstrak

Latar Belakang dan tujuan: Latihan interval intensitas tinggi (HIIT) dan latihan resistensi memberikan manfaat signifikan bagi kinerja fisik, namun dapat menyebabkan stres oksidatif dan peradangan. Strategi nutrisi telah diusulkan untuk meredakan efek-efek tersebut. Ulasan sistematis ini bertujuan untuk mengevaluasi efek suplementasi nutrisi dikombinasikan dengan HIIT dan latihan resistensi terhadap stres oksidatif, penanda inflamasi, pemulihan, dan **Hasil** kinerja pada dewasa sehat.

Metode: Pencarian sistematis dilakukan di PubMed, Scopus, dan Web of Science. Studi yang memenuhi syarat meliputi uji klinis acak pada manusia yang menyelidiki suplementasi bersama dengan HIIT atau latihan resistensi sesuai dengan pedoman PRISMA.

Hasil: Terdapat 6 studi yang memenuhi kriteria kelayakan. Polifenol dikombinasikan dengan latihan resistensi meningkatkan massa otot dan VO_{2max} tetapi memiliki efek anti-inflamasi yang terbatas. L-citrulline secara akut meningkatkan nitrat oksida dan enzim antioksidan setelah HIIT. Teh hijau dengan HIIT mengurangi IL-6, IL-1 β , dan galanin serta meningkatkan aktivitas antioksidan pada lansia obesitas. Suplementasi vitamin C dan E mengurangi kerusakan otot dan hemolisis pada atlet elit. Enam minggu suplementasi vitamin C tendensi untuk memodulasi ekspresi gen IL-6 dan IL-10 pada wanita lanjut usia. Probiotik meningkatkan pemulihan dan mengurangi peradangan pada atlet.

Kesimpulan: Suplemen nutrisi, terutama L-citrulline dan polifenol, menunjukkan potensi dalam meningkatkan pertahanan antioksidan, mengurangi peradangan, dan mendukung pemulihan saat dikombinasikan dengan HIIT atau latihan resistensi.

Kata kunci: Latihan interval intensitas tinggi, Suplementasi, Antioksidan, Respons Peradangan.

Efektivitas Pola Diet Anti-inflamasi terhadap Kendali Glikemik dan Penanda Inflamasi pada Pasien Diabetes Melitus Tipe 2: Suatu Tinjauan Sistematis

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Abstrak

Latar Belakang dan tujuan: Peradangan kronik derajat rendah berkontribusi pada patogenesis diabetes melitus tipe 2 (DMT2). Pola diet anti-inflamasi diperkirakan memperbaiki kendali glikemik dan menurunkan penanda inflamasi, namun bukti ilmiah masih beragam. Tinjauan sistematis ini mengevaluasi efektivitas pola diet anti-inflamasi terhadap kendali glikemik dan penanda inflamasi pada pasien DMT2.

Metode: Tinjauan sistematis ini dilakukan sesuai pedoman PRISMA. Penelusuran literatur dilakukan pada PubMed, Scopus, dan *Cochrane Library* hingga Juni 2025. Inklusi mencakup uji klinis terkontrol acak (RCT) dan studi kohort prospektif yang menilai intervensi diet anti-inflamasi, baik yang didefinisikan secara eksplisit maupun berbasis skor inflamasi diet. **Hasil** utama meliputi parameter kendali glikemik (HbA1c, glukosa darah puasa) dan penanda inflamasi (hs-CRP, IL-6, TNF- α). Risiko bias dinilai menggunakan *Cochrane RoB 2.0* dan *Newcastle-Ottawa Scale*.

Hasil: Enam studi terinklusi (5 RCT, 1 kohort) dengan durasi intervensi 5 minggu–12 bulan. Sebagian besar RCT menunjukkan penurunan signifikan HbA1c (0,5–1,2%) dan glukosa darah puasa, serta hs-CRP. Beberapa studi juga melaporkan penurunan TNF- α dan IL-6. Studi kohort mendukung peran hs-CRP sebagai mediator hubungan diet dan risiko DM2. Luaran sekunder seperti profil lipid dan berat badan bervariasi. Risiko bias umumnya rendah–sedang, kualitas kohort baik.

Kesimpulan: Pola diet anti-inflamasi efektif memperbaiki kendali glikemik dan menurunkan penanda inflamasi pada pasien DMT2. Intervensi ini berpotensi menjadi bagian dari terapi gizi medis. Uji klinis berskala besar dengan durasi lebih panjang diperlukan untuk memperkuat bukti.

Kata kunci: diet anti-inflamasi, diabetes melitus tipe 2, kendali glikemik, penanda inflamasi.

PENGARUH USIA TERHADAP LINGKAR LENGAN ATAS IBU HAMIL TRIMESTER 1 DI PUSKESMAS MERANTI

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ABSTRAK

Latar Belakang dan Tujuan

Status gizi ibu pada awal kehamilan berperan penting terhadap kesehatan ibu dan janin. Lingkaran Lengan Atas (LILA) merupakan indikator sederhana untuk menilai status gizi ibu hamil [1], dengan ambang batas LILA <23,5 cm dikategorikan sebagai KEK (Kekurangan Energi Kronis) [2]. Status nutrisi saat kehamilan diduga berkaitan dengan usia ibu karena adanya kebutuhan nutrisi ganda atau akumulasi risiko yang meningkatkan kerentanan terhadap malnutrisi [3]. Penelitian ini bertujuan menganalisis pengaruh usia terhadap LILA ibu hamil trimester 1 di Puskesmas Meranti.

Metode

Penelitian ini merupakan penelitian *cross sectional* yang bersumber dari catatan medis 133 pasien *Antenatal Care* (ANC) Terpadu di Puskesmas Meranti pada April-Mei 2025. Data dianalisis secara statistik menggunakan STATA MP versi 17.

Hasil

Hasil analisis regresi linear sederhana pada pengaruh usia terhadap LILA ibu hamil menghasilkan nilai $p = 0,048$, koefisien $\beta = 0,084$, dan $R^2 = 0,029$ yang berarti bahwa usia berpengaruh signifikan terhadap LILA ibu hamil trimester 1 di Puskesmas Meranti, setiap kenaikan 1 tahun umur berhubungan dengan meningkatnya LILA sebesar 0,084 cm, dan hanya 2,9% variasi LILA yang dapat dijelaskan oleh variabel usia.

Kesimpulan

Usia berpengaruh signifikan terhadap LILA ibu hamil trimester 1 di Puskesmas Meranti. Diperlukan penelitian lebih lanjut untuk menganalisis faktor-faktor lain yang berpengaruh terhadap status gizi ibu hamil, dengan sampel yang lebih besar.

Kata kunci

Usia, lingkaran lengan atas, status gizi, KEK, ibu hamil

Terapi Medik Gizi pada *Toxic Epidermal Necrolysis* dengan *Overweight*

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Latar Belakang:

Toxic Epidermal Necrolysis (TEN) merupakan bentuk paling berat dari reaksi hipersensitivitas terhadap obat, ditandai nekrosis epidermal masif dan keterlibatan mukosa multipel dengan mortalitas tinggi. Kondisi ini menimbulkan hipermetabolisme dan hiperkatabolisme berat yang meningkatkan kebutuhan energi, protein, dan mikronutrien untuk mendukung regenerasi jaringan. Mikronutrien berperan penting dalam imunomodulasi, aktivitas antioksidan, dan penyembuhan luka. Pada pasien *overweight*, penentuan kebutuhan energi menjadi tantangan karena risiko *overfeeding*, sehingga diperlukan pendekatan individual.

Kasus:

Laki-laki 34 tahun dengan *overweight* (IMT 24,5 kg/m²) dirawat dengan diagnosis TEN yang mencakup 93% total luas permukaan tubuh diduga akibat penggunaan ibuprofen, kotrimoksazol, dan azitromisin. Enam hari sebelum dikonsulkan, terjadi penurunan asupan akibat inflamasi dan keterlibatan mukosa. Saat dikonsulkan pasca debridemen, pasien menunjukkan peningkatan BUN, SGOT, SGPT, dan hiponatremia ringan yang menandakan stres metabolik berat.

Diskusi:

Kebutuhan energi dan protein ditentukan sesuai rekomendasi ESPEN (2021) yaitu 30–35 kkal/kg dan 1,5–2 g protein/kg berat badan ideal. Terapi gizi diberikan melalui formula enteral tinggi energi-protein yang mengandung glutamin secara bertahap. Suplementasi mikronutrien meliputi vitamin B kompleks, vitamin D, dan seng untuk mendukung antioksidan dan perbaikan jaringan.

Kesimpulan:

Individualisasi terapi medik gizi berbasis berat badan ideal dan kecukupan mikronutrien membantu meningkatkan toleransi, mempercepat pemulihan jaringan, serta mendukung perbaikan klinis hingga pasien pulang dalam kondisi stabil.

Kata kunci: TEN, *Toxic Epidermal Necrolysis*, *Overweight*

Terapi Medik Gizi pada Pasien Malnutrisi Berat, Risiko Tinggi *Refeeding Syndrome* dan Hipoalbuminemia dengan *Multiple perforation* Jejunum Ileum

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Latar Belakang:

Malnutrisi berat pascaoperasi abdomen dengan komplikasi multipel perforasi jejunum–ileum merupakan kondisi kompleks yang sering disertai *refeeding syndrome*, hipoalbuminemia, dan gangguan absorpsi akibat *short bowel syndrome* (SBS). Terapi medik gizi berperan penting dalam menstabilkan metabolisme, mempercepat penyembuhan, dan mencegah komplikasi.

Ilustrasi Kasus:

Perempuan 30 tahun dirawat pasca histerektomi komplikatif dengan kebocoran usus dan *burst abdomen*, kemudian menjalani reseksi jejunum 80 cm dan hemikolektomi kanan dengan anastomosis jejunokolika. Pasien didiagnosis dengan malnutrisi berat, hipoalbuminemia, hipokalemia, dan risiko tinggi *refeeding syndrome*. Pasien awalnya NPO dan mendapat nutrisi parenteral penuh.

Diskusi:

Terapi dimulai dengan *parenteral nutrition* (Bfluid 500 mL/24 jam, Futrolit 500 mL/24 jam, Dextrose 5% 1000 mL/24 jam) untuk memenuhi kebutuhan energi 25–35 kkal/kgBBE dan protein 1,5–2 g/kgBBI, disertai suplementasi albumin sachet 3×1 sachet/hari selama 6 hari. Berdasarkan pedoman ESPEN 2025, pasien dengan reseksi ileum terminal memerlukan suplementasi vitamin dan mineral rutin, termasuk vitamin A, D, E, K, Na, K, Mg, Ca, P, zink, selenium, tembaga, serta vitamin B12 intramuskular 1 mg tiap 2–3 bulan seumur hidup, untuk mencegah defisiensi akibat gangguan absorpsi. Setelah stabil, diberikan Formula Oligo 22 g × 6 kali/hari (100 mL/porsi) guna mendukung adaptasi usus.

Kesimpulan:

Terapi medik gizi komprehensif berbasis panduan ESPEN yang meliputi nutrisi parenteral bertahap dan suplementasi mikronutrien lengkap penting untuk mencegah komplikasi metabolik dan memperbaiki prognosis pasien pasca reseksi usus luas dengan SBS.

Kata kunci: malnutrisi berat, *short bowel syndrome*, *refeeding syndrome*, hipoalbuminemia, vitamin B12, terapi medik gizi

Terapi Medik Gizi Pada Pasien dengan Obesitas *grade 2*, *Edmontone Stage 3*, *Cronic Kidney Disease*, *Post Transplantasi Ginjal* dan Hipertensi

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Latar Belakang:

Cronic Kidney Disease (CKD) adalah suatu proses patofisiologis dengan etiologi yang beragam, mengakibatkan penurunan fungsi ginjal yang progresif, dan ireversibel, yang pada tahap lanjut diperlukan terapi pengganti ginjal seperti dialisis maupun transplantasi ginjal. Obesitas berperan dalam faktor risiko terjadinya CKD dan dikaitkan dengan luaran *post* transplantasi yang buruk. Intervensi gizi memegang peran penting dalam mencegah terjadinya rekurensi serta memperbaiki luaran *post* transplantasi.

Ilustrasi Kasus:

Seorang pria usia 31 tahun dengan CKD *stage 5 post* transplantasi ginjal, pasien sebelumnya sudah menjalani hemodialisa rutin sebanyak 3 kali perminggu sejak 2020. Pola makan yang tidak seimbang dan gaya hidup sedentari menjadi salah satu faktor resiko terjadinya obesitas dan CKD pada pasien. Menurut kriteria WHO asia pasifik pasien masuk ke obesitas 2 dengan IMT 34,49 kg/m², dan *edmontone stage 3* menurut kriteria EOSS (*Edmontone Obesity Staging System*). Pemberian nutrisi pada pasien diberikan bertahap sesuai kondisi dan toleransi pasien.

Diskusi:

Obesitas dikaitkan dengan luaran *post* transplantasi ginjal yang buruk melalui mekanisme perioperatif, metabolik dan hemodinamik, imunologis dan inflamasi dan kardiovaskuler. Penatalaksanaan nutrisi mengikuti rekomendasi ESPEN (2016) dengan target 30-35kcal/BBi, Protein $\geq 1,4$ gr/BBi pada fase akut dan 0,75-1,0 gr/BBi pada fase kronik, lemak <30% total kalori harian, serat 25-30gr/hari, natrium <2g/hari, pemberian vitamin d, vitamin b, kalium, kalsium, fosfor, besi, magnesium dan zink sesuai angka kecukupan gizi (AKG) kecuali ada ketidaknormalan kadar dalam tubuh.

Kesimpulan:

Pemantauan status nutrisi dan pemberian nutrisi yang adekuat dapat memperbaiki luaran dan mengurangi komplikasi *post* tranplantasi.

Kata kunci: Obesitas, CKD, Transplantasi Ginjal, Nutrisi

TERAPI MEDIK GIZI PADA HIPOALBUMINEMIA, *SYSTEMIC LUPUS ERYTHEMATOSUS* DERAJAT AKTIVITAS BERAT DAN EFUSI PLEURA BILATERAL DENGAN MALNUTRISI BERAT

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Latar Belakang:

Systemic Lupus Erythematosus SLE merupakan penyakit autoimun kronik yang banyak menyerang perempuan usia produktif dan menyebabkan komplikasi multiorgan serta gangguan status gizi. Intervensi nutrisi yang tepat sangat penting untuk mendukung perbaikan status gizi, fungsi imun, dan kondisi klinis pasien.

Ilustrasi Kasus:

Perempuan usia 22 tahun dengan keluhan demam hilang timbul dan batuk selama 3 bulan terakhir yang menyebabkan penurunan asupan makan. TB 158 cm BB 33 kg IMT 13,2 kg/m². Penurunan BB ada dalam 3 bulan terakhir (21%), dari 42 kg menjadi 33 kg. Ditemukan *muscle wasting* dan kehilangan lemak subkutan di seluruh tubuh, edema di kedua tungkai, dan kekuatan genggam tangan (HGS) 10,2 kg/f. Laboratorium Albumin 2,1 g/dL, proteinuria +1, ANA IF pola DFS (AC-2) titer 1:100. Terapi medik gizi dengan target energi 1658 kkal/hari dan protein 52 gram/hari (1 gram/kgBB) dimulai bertahap secara oral dalam bentuk diet lunak, ONS yang mengandung omega 3 dan probiotik, albumin oral, serta suplementasi vitamin D 2000 IU/hari, vitamin C 500 mg/hari, dan zinc 20 mg/hari. Asupan makan, HGS, dan status fungsional secara umum membaik selama perawatan hingga pasien pulang.

Diskusi:

SLE menyebabkan peningkatan kebutuhan nutrisi akibat proses inflamasi kronik yang bersifat katabolik. Kondisi ini diperburuk oleh penurunan asupan makan akibat gejala sistemik yang menyertai. Terapi medik gizi dapat mengoptimalkan status gizi pasien dan menurunkan inflamasi yang terjadi akibat SLE.

Kesimpulan:

Terapi medik gizi yang adekuat mendukung perbaikan status gizi, kapasitas fungsional, dan fungsi imun pada SLE.

Kata kunci: SLE, malnutrisi berat, hipoalbuminemia, terapi medik gizi

The Effect of Carbohydrate Loading on Exercise Performance in Amateur Sports Enthusiasts: A Systematic Review

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ABSTRACT

Background and Purpose: Carbohydrate loading (CL) is a nutritional strategy designed to maximize muscle glycogen stores before prolonged or high-intensity exercise. While its benefits are well established among elite athletes, evidence in amateur or recreational athletes remains inconsistent due to differences in metabolic capacity and exercise duration. This study aimed to systematically review the effects of carbohydrate loading on exercise performance in amateur athletes.

Method: This systematic review followed the PRISMA 2020 guidelines. A literature search was conducted through PubMed, ScienceDirect, ProQuest, and Google Scholar databases. Eligible studies included experimental or randomized controlled trials assessing high-carbohydrate dietary interventions in non-elite athletes. Extracted data included performance outcomes (VO₂max, time to exhaustion, race **Results**) and metabolic responses. Risk of bias and quality of the included studies was assessed using the Cochrane Risk of Bias 2.0 tool and NIH Quality Assessment Tool.

Results: Seven studies met the inclusion criteria. Five studies demonstrated significant improvements in endurance performance, glucose stability, and delayed fatigue following carbohydrate loading, particularly in prolonged events lasting more than 90 minutes. Two studies, however, reported no significant effects in short-duration or moderate-intensity activities. These discrepancies may relate to training status, glycogen storage capacity, and adherence to dietary protocols.

Conclusion: Carbohydrate loading improves endurance performance and metabolic efficiency in amateur athletes, especially during long-duration exercise. Nevertheless, individual variation highlights the importance of personalized carbohydrate strategies to optimize athletic performance.

Keywords: carbohydrate loading, amateur athletes, endurance, glycogen, performance

TERAPI MEDIK GIZI DENGAN KOMBINASI VITAMIN D DAN BCAA PADA PASIEN *SLE FLARE*: LAPORAN KASUS

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Latar Belakang: *Systemic Lupus Erythematosus (SLE)* merupakan penyakit autoimun kronik dengan inflamasi sistemik yang meningkatkan kebutuhan energi-protein, namun gejala dan efek terapi sering menurunkan asupan (1). Penatalaksanaan gizi yang tepat berperan penting dalam mencegah perburukan dan memperbaiki luaran klinis (2).

Ilustrasi Kasus: seorang Perempuan, 19 tahun dengan SLE (SLEDAI 14), lupus nefritis, dan pneumonia dirawat di ICU dengan penurunan berat badan bermakna (56kg menjadi 50.6kg; 9.6%/bulan) dan malnutrisi berat dengan asupan energi-protein <50% kebutuhan serta kadar 25(OH) vitamin D 12.4ng/ml (defisiensi) (3). Terapi nutrisi dimulai secara bertahap melalui jalur enteral dan parenteral dengan awal 12kkal/kgBb dan 0.6gr/kgBb protein, ditingkatkan menjadi 30kkal/kgBb dan 1.2gr/kgBb protein dengan ONS renal yang ditambahkan BCAA dan whey protein untuk mendukung anabolisme. Albumin meningkat dari 2.26gr/dl menjadi 2.67gr/dL dengan toleransi baik. Namun pasien mengalami gagal multi organ dan meninggal pada hari ke-20.

Diskusi: defisiensi vitamin D pada SLE berkorelasi dengan aktivitas penyakit yang lebih tinggi karena vitamin D berperan menekan respon autoimun dan sitokin pro- inflamasi. Suplementasi 5000 IU/hari berpotensi memperbaiki fungsi imun (4). Pemberian BCAA dan whey protein bermanfaat dalam menekan katabolisme otot serta meningkatkan sintesis protein hati pada fase hiperkatabolik (5). Dukungan nutrisi dini yang disesuaikan dengan kondisi pasien dapat memperbaiki status metabolik (6), meskipun luaran klinis sangat bergantung pada keparahan penyakit dan keterlibatan organ.

Kesimpulan: Terapi nutrisi individual yang mengintegrasikan vitamin D, BCAA dan whey protein dapat memperbaiki parameter gizi dan metabolik pada SLE berat dengan disfungsi ginjal mampu memperbaiki status gizi walau prognosis ditentukan keparahan penyakit (5). Pendekatan ini menegaskan pentingnya skrining dini, eskalasi bertahap, dan koordinasi multidisiplin.

Kata kunci: *Systemic Lupus Erythematosus*; Malnutrisi; Terapi Nutrisi; Laporan kasus; Penyakit Autoimun

Efektivitas Intervensi Diet terhadap Profil Metabolik dan Profil Hormon pada Wanita dengan Sindrom Ovarium Polikistik (PCOS): Studi *Systematic Review*

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ABSTRAK

Pendahuluan : Sindrom ovarium polikistik (PCOS) merupakan kelainan endokrin yang paling sering dijumpai pada perempuan usia reproduktif. Kondisi ini ditandai oleh adanya resistensi insulin, penumpukan lemak visceral, dislipidemia, serta peningkatan kadar androgen. Kombinasi gangguan metabolik dan hormonal tersebut dapat mengganggu fungsi reproduksi, meningkatkan risiko penyakit kardiometabolik, dan menurunkan kualitas hidup. Salah satu pendekatan non-farmakologis yang menjanjikan untuk memperbaiki regulasi metabolik maupun hormonal pada pasien PCOS adalah intervensi diet.

Metode: Tinjauan sistematis ini disusun mengikuti pedoman PRISMA 2020. Pencarian literatur dilakukan melalui PubMed, ScienceDirect, dan Cochrane Library hingga Agustus 2025. Kriteria inklusi mencakup *randomized controlled trial* (RCT) pada perempuan dengan PCOS dan indeks massa tubuh (IMT) $\geq 25 \text{ kg/m}^2$ yang mengevaluasi efek intervensi diet terhadap profil metabolik dan hormonal. Dari 437 artikel yang diidentifikasi, tujuh penelitian (n = 406 peserta) memenuhi kriteria kelayakan dan dievaluasi secara menyeluruh.

Hasil dan Diskusi: Tinjauan terhadap tujuh studi RCT menunjukkan bahwa berbagai intervensi diet memberikan dampak positif pada wanita dengan PCOS. Kombinasi licorice dengan LCD serta diet PMCD terbukti efektif menurunkan kadar LDL dan trigliserida (TG). Perbaikan hormonal ditandai oleh peningkatan SHBG ($p = 0,042$) dan penurunan LH ($p < 0,05$), terutama pada diet PMCD dan ketogenik. Diet rendah AGE (low-AGEs diet) juga berkontribusi dalam menurunkan kadar TNF- α ($p = 0,004$). Sementara itu, diet KEMEPHY dan L-AGEs menunjukkan pengaruh signifikan terhadap VAT dan VFL ($p < 0,005$), namun hanya dua studi yang melaporkan luaran ini secara rinci sehingga diperlukan penelitian lanjutan.

Kesimpulan: Intervensi diet efektif menurunkan memperbaiki profil metabolik, menyeimbangkan regulasi hormonal, dan memiliki dampak positif terhadap lemak visceral,

pada wanita dengan PCOS. KD dan VLCKD merupakan strategi paling menjanjikan, sementara PMCD dan low-AGEs diet bermanfaat untuk fenotipe metabolik tertentu. Prinsip nutrisi personal perlu diutamakan, meskipun uji klinis jangka panjang masih diperlukan untuk mengonfirmasi efek terhadap luaran reproduktif.

Kata kunci: *diet intervention, visceral adipose tissue, lipid profile, hormone profile, polycystic ovary syndrome.*

TERAPI MEDIK GIZI TERINTEGRASI DENGAN IMUNONUTRISI DAN VITAMIN D PADA PASIEN KRISIS *MYASTHENIA GRAVIS*: LAPORAN KASUS

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ABSTRAK

Latar Belakang: *Myasthenia gravis* (MG) merupakan penyakit autoimun pada sambungan neuromuskular yang ditandai kelemahan otot fluktuatif dan mengancam fungsi pernapasan. Keterlibatan otot orofaring menimbulkan disfagia, risiko aspirasi, dan malnutrisi.¹

Ilustrasi Kasus: Pasien laki-laki 61 tahun dengan MG berat mengalami gagal napas dan disfagia berat sehingga seluruh asupan diberikan melalui *nasogastric tube* (NGT). Pemeriksaan awal menunjukkan defisiensi vitamin D (17,8 ng/mL). Kebutuhan energi ditetapkan berdasarkan rekomendasi untuk sakit kritis.² Intervensi dimulai dalam 24 jam pertama dengan energi 22 kkal/kgBB dan protein 1,3 g/kgBB, kemudian dinaikkan bertahap hingga 30 kkal/kgBB dan protein 1,7 g/kgBB. Pasien mendapat kombinasi nutrisi enteral rumah sakit dan *oral nutritional supplement* yang mengandung imunonutrisi glutamin ±3,9-5,4 g/hari dan omega 3, serta suplementasi vitamin D 10.000 IU/hari sesuai pedoman koreksi defisiensi.³

Diskusi: Setelah satu bulan intervensi, MG *Composite Score* menurun dari 45 menjadi 22, menunjukkan perbaikan neuromuskular signifikan. Pemenuhan energi dan protein adekuat, disertai imunonutrisi dan vitamin D, mendukung pemulihan, menyeimbangkan respon imun, serta menurunkan risiko infeksi, dan memperbaiki luaran klinis pasien.^{4,5} Kombinasi intervensi ini mempercepat perbaikan kondisi sehingga pasien dipulangkan dalam keadaan stabil.

Kesimpulan: Terapi gizi terintegrasi dengan pemenuhan energi-protein adekuat, *early enteral feeding*, imunonutrisi (glutamin + omega-3), dan vitamin D efektif mempertahankan status gizi dan mempercepat pemulihan pasien MG berat.

Kata kunci: *Myasthenia Gravis*; disfagia; imunonutrisi; vitamin D; terapi medik gizi

Tempeh vs Antibiotic-Associated Diarrhea: Can a Traditional Food Beat a Modern Problem? – A Systematic Review

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Abstract

Background: Antibiotic-associated diarrhea (AAD) is a frequent adverse effect of antimicrobial therapy, affecting up to 35% patients due to intestinal microbiota disruption and overgrowth of *Escherichia coli* and *Clostridium difficile*¹. Tempeh contain probiotics, prebiotics, and bioactive peptides that may help gut microbial balance and mucosal integrity. This systematic review aimed to evaluate tempeh as a probiotic-based intervention for the prevention of AAD through microbiota modulation and immune enhancement.

Method: A systematic literature search was conducted using PubMed, Google Scholar, and ScienceDirect databases. A total of 3,524 records were identified. Four primary studies were included: two in vitro, one in vivo, and one human clinical study. Data were analyzed qualitatively to assess microbial, biochemical, and immunological outcomes related to AAD prevention.

Result: In vitro studies demonstrated that tempeh extract inhibited up to 90% of *Escherichia coli* adhesion to intestinal cells, and combination with *Lactobacillus plantarum* enhanced anti-adhesion effects². Animal studies showed fermented soybean meal reduced diarrhea incidence and inflammatory cytokines while increasing *Lactobacillus* and *Bifidobacterium*³. Human clinical trials indicated increased IgA and beneficial gut bacteria after tempeh consumption⁴.

Conclusion: Tempeh shows promising probiotic and immunomodulatory properties that can preventing AAD. It acts through pathogen inhibition, microbiota restoration, and immune enhancement. Further human studies are required to validate its clinical efficacy and define optimal dosage and preparation **Methods.**

Keywords: Tempeh; Probiotic; Gut Microbiota; Antibiotic-Associated Diarrhea; Synbiotic.

KAPASITAS ANTIOKSIDAN UMBI BAWANG SUNA
(*Allium schoenoprasum L.*)
PADA BERBAGAI CARA PENGOLAHAN

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ABSTRAK

Latar Belakang: Bawang suna (*Allium schoenoprasum L.*) mengandung antioksidan alami yang dapat digunakan untuk mencegah terjadinya stress oksidatif yang ditimbulkan oleh radikal bebas. Masyarakat Kalimantan Tengah menggunakan tanaman tersebut sebagai bumbu masakan dan obat tradisional. Pengolahan bawang suna dapat dengan berbagai cara, secara langsung atau mentah, digoreng ataupun direbus. Penelitian ini bertujuan untuk mengetahui kapasitas antioksidan umbi bawang Suna (*Allium schoenoprasum L.*) pada berbagai cara pengolahan yang umum digunakan masyarakat.

Metode: Jenis penelitian ini yaitu eksperimental laboratorium, menguji kapasitas antioksidan pada sampel umbi bawang suna segar, rebus, dan tumis dengan metode DPPH (2,2-diphenyl-1-picrylhydrazyl) menggunakan spektrofotometer UV-vis.

Hasil: Umbi bawang Suna mentah, rebus dan tumis memiliki kapasitas antioksidan terhadap radikal bebas DPPH dan berbeda bermakna antar kelompok ($p=0.001$).

Kesimpulan: Terdapat perbedaan kapasitas antioksidan umbi bawang suna (*Allium schoenoprasum L.*) dari cara pengolahan segar, rebus dan tumis. Pengolahan segar dan rebus merupakan pengolahan terbaik dalam mempertahankan nilai kapasitas antioksidan.

Kata kunci : Umbi bawang suna, Kapasitas Antioksidan, DPPH

Pemberian Glutamin dalam Terapi Medik Gizi pada Pasien Luka Bakar Mayor Derajat IIAB 21% TBSA dengan Hipoalbuminemia: Laporan Kasus

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Abstrak

Latar Belakang: Luka bakar memicu respons hipermetabolik, inflamasi sistemik, dan stres oksidatif yang secara signifikan meningkatkan kebutuhan energi dan protein. Ketidakcukupan asupan pada fase akut menyebabkan hipoalbuminemia, memperburuk katabolisme, menghambat regenerasi jaringan, meningkatkan risiko infeksi, dan memperpanjang lama rawat inap. Intervensi nutrisi yang tepat dan bertahap merupakan komponen penting dalam mengendalikan respons metabolik, mendukung penyembuhan luka, memperbaiki status gizi, dan meningkatkan luaran klinis.

Laporan Kasus: Seorang laki-laki 56 tahun dengan luka bakar *superficial–mid–deep dermal* derajat IIAB seluas 21% TBSA (*Total Body Surface Area*) akibat *flame injury*, menjalani debridement dan transplantasi kulit. Pasien mengalami hipoalbuminemia berat (2,2 g/dL) dan inflamasi sistemik (NLR awal 36,96) dengan asupan awal 10% kebutuhan energi. Terapi nutrisi bertahap diberikan berupa diet lunak tinggi protein, formula *oral nutrition supplement*, suplementasi albumin, multivitamin, serta glutamin parenteral, dengan target energi 2075 kkal dan protein 104 gram per hari.

Diskusi: Pendekatan bertahap meningkatkan toleransi gastrointestinal, mencegah sindrom refeeding, dan mendukung perbaikan metabolik. Glutamin berperan mempertahankan integritas mukosa usus, fungsi imun, dan regenerasi jaringan. Asupan meningkat dari 200 kkal menjadi 1800 kkal (88% kebutuhan) dalam enam belas hari perawatan, disertai perbaikan klinis, stabilisasi hemodinamik, dan tren peningkatan status protein.

Kesimpulan: Intervensi nutrisi oral dan parenteral yang bertahap, termasuk suplementasi glutamin, berperan penting dalam pemulihan pasien luka bakar mayor dengan hipoalbuminemia berat, meningkatkan kecukupan energi-protein, memperbaiki kondisi klinis, dan mempercepat penyembuhan luka.

Kata kunci: luka bakar, terapi medik gizi, glutamin, hipoalbuminemia, hipermetabolisme.

Laporan Kasus: Terapi Nutrisi Pada Pasien dengan Penyakit Glioblastoma Multiforme (GBM)

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Abstrak

Latar Belakang.

Glioblastoma multiforme (GBM) adalah tumor otak primer yang agresif dan seringkali mengganggu status nutrisi pasien melalui efek tumor, pengobatan (bedah, radioterapi, kemoterapi), dan perubahan neurologis yang menurunkan asupan makanan, dikaitkan dengan **Hasil** klinis yang lebih buruk, toleransi terapi menurun, dan kualitas hidup berkurang.

Ilustrasi Kasus.

Seorang perempuan inisial IAKW, berusia 45 tahun datang ke IGD RSUD Bali Mandara dengan keluhan wajah kiri terasa kebas dan mencong dengan riwayat operasi tumor otak 19 Agustus 2025.

Diskusi.

Rekomendasi umum untuk pasien kanker asupan energi 25–30 kkal/kg/hari dan protein 1,0–1,5 g/kg/hari, penilaian risiko malnutrisi secara rutin, serta intervensi dini (konseling gizi, suplemen oral) dan penggunaan nutrisi enteral bila asupan oral tidak mencukupi. Indikasi untuk nutrisi parenteral mengikuti prinsip onkologi bila enteral tidak memungkinkan dan pasien mengalami malnutrisi yang signifikan.

Kesimpulan.

Perawatan gizi sangat penting dalam mengelola pasien bedah saraf dengan neoplasma otak, mengurangi komplikasi, dan meningkatkan pemulihan pascaoperatif serta luaran klinis secara keseluruhan. Tim multidisiplin adalah kunci untuk luaran yang optimal. Penelitian di masa mendatang harus bertujuan untuk menstandarisasi protokol agar dapat diterapkan secara lebih luas.

Kata kunci. *Glioblastoma Multiforme*, terapi nutrisi.

LAPORAN KASUS TERAPI NUTRISI PADA PASIEN ANAK LUKA BAKAR 21% DERAJAT 2A DI RSUD WANGAYA

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Abstrak

Latar Belakang

Luka bakar adalah trauma berat yang menyebabkan hipermetabolisme berkepanjangan. Jika asupan nutrisi tidak adekuat, penurunan berat badan dapat terjadi, kemudian mempengaruhi pertumbuhan, penyembuhan luka, dan imunitas.^{1,2,3,4} Oleh karena itu, untuk mengatasi kebutuhan metabolik ini diperlukan intervensi nutrisi yang tepat untuk meningkatkan luaran klinis pasien.^{1,2,4,5}

Ilustrasi kasus

Anak laki-laki, usia 1 tahun 2 bulan mengalami luka bakar setelah terkena air panas. Luka bakar pada wajah, badan, lengan, paha dengan luas 21 % derajat 2A. Pada pasien ini ditetapkan target kalori 125 kkal/kgbb/hari dan target protein sebesar 1,5g/kg/hari. Suplementasi mikronutrien diberikan yaitu zinc 10 mg tiap 24 jam per oral. Terdapat penurunan albumin (2,2 g/dL) dan berat badan. Pasien dipulangkan setelah perawatan hari ke 5 dengan kondisi luka bakar mengalami penyembuhan dengan baik.

Diskusi

Pasien luka bakar dengan luas >20% mengalami respons seperti lipolisis, proteolisis, glikolisis, dan demam. Penurunan albumin terjadi karena peningkatan permeabilitas kapiler, pengenceran cairan, dan peningkatan katabolisme.^{2,3,4,5,6} Pada kondisi inflamasi, konsentrasi albumin plasma menurun meskipun sintesis meningkat.^{2,4} Pada pasien didapatkan penurunan albumin dan penurunan berat badan. Target kebutuhan kalori dan protein sesuai dengan rumus Sutherland. Target kalori $(60 \times \text{BB}) + (35 \times \% \text{LB})$ kkal/hari dan target protein 1-2g/kgBB/hari.^{6,7} Pada luka bakar terjadi kehilangan mikronutrien yang menyebabkan tertundanya pemulihan. Pada pasien ini diberikan suplementasi zinc 10 mg tiap 24 jam.

Kesimpulan

Pasien dengan luka bakar mayor memiliki kebutuhan nutrisi yang meningkat, karena respons hipermetabolisme dan keadaan katabolik yang berkepanjangan. Terapi nutrisi yang adekuat dapat menjaga status gizi pasien dan mendukung penyembuhan luka bakar dengan baik.

Kata kunci: Nutrisi, luka bakar, anak.

From Bench to Bedside: Can Nutritional Senolytics and Senomorphic Alleviate Frailty in Humans? A Systematic Review and Meta-Analyses

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Abstract

Introduction: Nutraceuticals with senolytic and senomorphic properties are an emerging anti-aging strategy. Frailty, a key marker of functional decline, is a critical clinical outcome for assessing such interventions. However, the translational effect of these dietary interventions on frailty in humans remains unclear.

Objective: This systematic review assessed the effect of senolytic and senomorphic nutritional interventions on frailty and physical function in humans.

Method: Adhering to PRISMA guidelines, we systematically searched for studies using core concepts of senolytic/senomorphics and frailty. Eligible studies were randomized controlled trials (RCTs), non-randomized interventional studies, and prospective cohorts in adults, where a nutritional intervention with purported senolytic/senomorphics properties was administered and a validated measure of frailty or physical function was reported.

Result & Discussion: From 285 identified records, 7 studies (5 RCTs, 2 non-randomized; total n=235) were included. Interventions included quercetin & dasatinib, curcumin derivatives, and other nutraceuticals over 4 weeks to 12 months. Six of seven studies demonstrated improvements in at least one measure of physical function, including handgrip strength, gait speed, and Short Physical Performance Battery (SPPB) scores. A meta-analysis of SPPB scores showed a significant mean difference favoring the intervention group (MD: 2.04, 95% CI: 0.22–3.85). Two studies reported inverse correlations between senescence-associated biomarkers and functional improvements.

Conclusion: Nutraceutical senolytic and senomorphic interventions show promise for improving physical function, a core component of frailty. The evidence remains limited by a small number of heterogeneous studies and a high risk of bias in some trials, underscoring the need for larger, more rigorous RCTs.

Keywords: frailty, nutritional interventions, physical function, senolytics, systematic review

Pankreatitis Akut pada Pasien Peritonitis *et causa* Perforasi Gaster disertai Pneumothorax yang Mendapat Terapi Paraenteral: Sebuah Laporan Kasus

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Latar Belakang: Pankreatitis akut (PA) merupakan kondisi inflamasi pankreas dengan risiko mortalitas tinggi pada kasus berat, terutama bila disertai komplikasi bedah. Pada pasien dengan perforasi gaster dan peritonitis, pemberian nutrisi menjadi tantangan karena keterbatasan jalur enteral. Nutrisi parenteral (PN) menjadi pilihan ketika enteral nutrition (EN) tidak memungkinkan, sesuai rekomendasi ESPEN dan ASPEN. Pasien yang menjalani nutrisi parenteral (PN) berisiko tinggi mengalami cedera hati dan pankreas.

Ilustrasi Kasus: Seorang laki-laki 18 tahun mengalami trauma abdomen dengan perforasi gaster ± 5 cm, perdarahan 1500 cc, dan hematoma luas pada usus. Pasien menjalani laparotomi eksplorasi, dipasang *nasogastric tube* (NGT) untuk dekompresi dan *nasoduodenal tube* (NDT) untuk nutrisi. Namun, karena risiko kebocoran, *rebleeding*, anastomosis dan ileus, pasien tidak dapat langsung menerima EN. PN berupa Aminolyte Peri® dan D5% diberikan sejak hari pertama perawatan selama 11 hari lamanya. Selama terapi, pasien mengalami peningkatan bilirubin, γ GT, SGPT, serta enzim pankreas yang konsisten dengan *Parenteral Nutrition–Associated Liver Dysfunction* (PNALD), namun membaik setelah PN dihentikan dan EN ditingkatkan. Pasien pulih dan dipulangkan pada hari ke-20 perawatan.

Diskusi: PN diperlukan pada kondisi fungsi gastrointestinal yang belum optimal. Meskipun mendukung status gizi, PN jangka panjang meningkatkan risiko PNALD. Kurangnya stimulasi enteral dapat mengganggu sirkulasi enterohepatik dan sekresi serta penyerapan asam empedu. Memberikan EN dan waktu istirahat dari PN terbukti menurunkan enzim hati serum dan konsentrasi bilirubin terkonjugasi, sehingga menurunkan risiko perkembangan PNALD.

Kesimpulan: Pemberian EN pada pankreatitis akut bukan merupakan suatu kontraindikasi melainkan berperan dalam perbaikan klinis pada pasien yang mendapat PN dengan komplikasi.

Kata kunci: pankreatitis akut, perforasi gaster, pneumothorax, nutrisi parenteral, PNALD

MEDICAL NUTRITION THERAPY IN FILARIASIS WITH SECONDARY NEPHROTIC SYNDROME

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Background:

Filariasis is a neglected tropical disease caused by filarial worms and transmitted through mosquito bites. In rare cases, it may cause secondary nephrotic syndrome. This study aimed to describe medical nutrition therapy (MNT) in a patient with chronic lymphatic filariasis complicated by secondary nephrotic syndrome.

Case Presentation:

We report a 23-year-old female with chronic lymphatic filariasis complicated by cellulitis, sepsis, anemia, and suspected secondary nephrotic syndrome characterized by hypoalbuminemia, hypercholesterolemia, and anasarca edema. The patient presented with significant reductions in dietary intake, gastrointestinal symptoms, and chronic hyponatremia. Nutritional diagnosis was imbalance of food intake and hypoalbuminemia. Medical nutrition therapy (MNT) focused on gradual refeeding using a high-energy, moderate-protein, low-sodium diet tailored to renal function. The patient received oral nutrition support with albumin supplementation and protein-enriched pudding to support fluid balance. Micronutrient support was also provided to address potential deficiencies in zinc, iron, calcium, and vitamin D. Nutritional intervention improved intake, stabilized fluid balance, and supported recovery.

Discussion:

Secondary nephrotic syndrome in filariasis arises from immune-mediated glomerular injury and chronic inflammation. Nutritional therapy plays a crucial role in managing protein loss, correcting electrolyte imbalance, and supporting recovery. Despite obesity, inflammatory catabolism and poor intake can cause functional protein deficiency, highlighting the importance of individualized assessment.

Conclusion:

This case underscores the importance of comprehensive nutritional assessment and individualized therapy in managing complex tropical infections with renal and metabolic complications. Early MNT can improve outcomes in patients with filariasis complicated by nephrotic syndrome and malnutrition.

Keywords:

Filariasis, secondary nephrotic syndrome, medical nutrition therapy, hypoalbuminemia, malnutrition.

The Role of Vitamin D in Pregnancy on the Risk of Preeclampsia and Low Birth Weight: A Meta-analysis of Randomised Controlled Trials

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Background: Preeclampsia (PE), low birth weight (LBW), and preterm birth are major causes of maternal and neonatal morbidity and mortality. Vitamin D supplementation during pregnancy is considered to affect these outcomes. This study evaluated the effect of vitamin D supplementation during pregnancy on the risk of PE, LBW, and preterm birth through a meta-analysis of randomised controlled trials (RCTs).

Methods: We conducted this review following PRISMA 2020 guidelines (PROSPERO ID: CRD420251143323). PubMed, Scopus, and Web of Science were searched to identify relevant RCTs. Risk ratios (RRs) with 95% confidence intervals (CIs) were pooled using fixed- or random-effects models, depending on the level of heterogeneity.

Results: Thirteen RCTs involving nearly 4,000 pregnant women were included. Vitamin D supplementation was associated with a significant reduction in the risk of PE (RR 0.53; 95% CI 0.41–0.70; $p < 0.00001$; $I^2 = 19\%$) and preterm birth (RR 0.62; 95% CI 0.50–0.77; $p < 0.0001$; $I^2 = 31\%$). No significant effect was observed on LBW (RR 0.65; 95% CI 0.34–1.27; $p = 0.21$; $I^2 = 65\%$).

Conclusions: Vitamin D supplementation during pregnancy significantly reduces the risk of PE and preterm birth. However, the effect on LBW is not statistically significant. These findings support that adequate maternal vitamin D status during pregnancy is essential and emphasise the need for further RCTs to clarify optimal supplementation strategies and the long-term effects on maternal and child health.

Keywords: Low birth weight, meta-analysis, preeclampsia, pregnancy, preterm birth, vitamin D

CALORIE RESTRICTION AS A NUTRITIONAL STRATEGY AGAINST INFLAMMAGING: MOLECULAR MECHANISMS AND CLINICAL PERSPECTIVES

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BACKGROUND

Inflammaging, a chronic low-grade inflammation associated with aging, accelerates biological decline and the onset of metabolic and degenerative diseases. Calorie restriction (CR) – a reduction in energy intake without malnutrition – have demonstrated robust anti-aging and anti-inflammatory effects in human studies. These effects are mediated by modulation of nutrient-sensing and inflammatory pathways, including SIRT-1, AMPK, mTOR, NF-κB, which regulate oxidative stress and cellular senescence.

OBJECTIVE

This systematic review examines the clininal and mechanistic evidence regarding the effects of calorie restriction on inflammaging, emphasizing molecular mechanism that mediate its anti-aging activity.

METHODS

Following PRISMA guidelines, a systematic search was conducted in PubMed, Scopus, ScienceDirect, and Cochrane Library using BOOLEAN operators. Eligible studies included randomized controlled trials (RCTs). The primary outcomes were inflammatory cytokines (IL-6, TNF-α, CRP), while secondary outcomes were molecular regulators (SIRT-1, AMPK, mTOR, NF-κB).

RESULTS

Twelve RCTs involving 743 participants (aged 40–75 years; 10–30% energy reduction; 4–24 weeks) met the inclusion criteria. Most trials reported that CR significantly decreased circulating inflammatory cytokines, including IL-6, TNF-α, and CRP. Mechanistic data indicated SIRT1/AMPK activation and NF-κB/mTOR suppression, leading to improved metabolic regulation, mitochondrial function, and autophagy.

CONCLUSION

Evidence supports CR as a feasible nutritional strategy against inflammaging, acting through coordinated metabolic and inflammatory modulation to promote healthy aging.

Keywords: Calorie restriction, inflammation, aging, cytokines, autophagy.

Manajemen Nutrisi dan Kolaborasi Multidisiplin pada Abses Mamae pada Ibu Menyusui

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Abstrak

Latar Belakang. Mastitis merupakan peradangan jaringan payudara yang umum dialami ibu menyusui, dengan insidensi mencapai 10–33% dalam enam bulan pertama menyusui.¹ Kondisi ini umumnya disebabkan oleh stasis ASI, retakan puting, dan infeksi *Staphylococcus aureus*.² Bila tidak ditangani dengan baik, dapat berkembang menjadi abses mamae yang memerlukan tindakan bedah. Intervensi nutrisi sejak awal diperlukan untuk mempercepat penyembuhan luka dan menurunkan risiko infeksi berulang.³

Ilustrasi Kasus. Seorang ibu berusia 29 tahun dengan berat badan 62 kg dan tinggi badan 150 cm (IMT 27,5 kg/m², overweight) dirawat akibat abses mamae pasca mastitis berulang. Pasien menjalani drainase dan mendapat terapi antibiotik cefazolin, serta diet 2500 kkal/hari dengan protein 80 g/hari.

Diskusi. Mastitis dan abses mamae merupakan kondisi inflamasi yang membutuhkan tata laksana menyeluruh, meliputi eradikasi infeksi, drainase yang adekuat, pengendalian nyeri, serta dukungan nutrisi. ESPEN merekomendasikan kebutuhan energi 25–30 kkal/kgBB/hari dan protein 1,2–1,5 g/kgBB/hari untuk mendukung regenerasi jaringan.³ Pada berat badan 62 kg, kebutuhan energi berkisar 1550–1860 kkal/hari dan protein 74–93 g/hari. Selain makronutrien, ESPEN Short Micronutrient Guideline (2024) menekankan pentingnya vitamin C 100–200 mg/hari, vitamin D 600–1000 IU/hari, zinc 15–25 mg/hari, dan selenium 60–100 µg/hari untuk penyembuhan luka dan fungsi imun.⁴ Kombinasi nutrisi ini mempercepat pemulihan dan mencegah kekambuhan mastitis.

Kesimpulan. Penatalaksanaan mastitis berulang hingga abses mamae memerlukan pendekatan multidisiplin. Kolaborasi dokter bedah, gizi klinis, dan konselor laktasi diperlukan untuk memastikan pengendalian infeksi, dukungan nutrisi optimal, dan keberlanjutan menyusui.

Kata kunci. Mastitis berulang, Abses mamae, Manajemen Nutrisi, Kolaborasi multidisiplin.

The Effect of Basil leaf Extract (*Ocimum basilicum*) on Blood Sugar Regulation in Hyperglycemic Rats: an Experimental Study

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Diabetes is one of the significant public health problems worldwide. The mortality rate has reached 2.2 million people globally. Herbal medicine is an alternative in the treatment and prevention of diabetes. Basil leaves are one of the anti-diabetic herbal plants rich in flavonoids, polyphenols and various essential oils. This study aim to determine the effect of giving basil leaf extract on blood sugar regulation in hyperglycemic rat.

Basil leaf extract effect proven through experimental animal study with a post- test only control group design. Maceration **Method** with 96% ethanol were used in the making of basil leaf extract. A total of 25 male *Rattus norvegicus* wistar aged 2-3 months were divided into 5 groups: control group (K0), treatment group (K1), and 3 basil leaf extract treatment groups: P1 (dose 250mg/kgBW), P2 (dose 500mg/kgBW), and P3 (dose 750mg/kgBW). Hyperglycemic conditions were carried out by administering streptozotocin (STZ) as much as 40mg/kgBW intraperitoneally.

Based on the **Results** of the analysis of different test data between all groups with a confidence level of 95%, there were significant differences between all groups in fasting blood sugar ($p = 0.0001$), insulin levels ($p = 0.0001$) and insulin resistance values ($p = 0.0001$). The **Results** of the analysis between the two groups found significant differences in groups P1, P2 and P3 when compared to group K1 in fasting blood sugar data, insulin levels and HOMA-IR values.

In **Conclusion**, this study found that administering basil leaf extract significantly affected blood sugar regulation in rat with hyperglycemia.

Keywords: animal study, basil leaf, blood glucose, insulin level

TERAPI MEDIK GIZI PADA PASIEN MALNUTRISI BERAT DENGAN *PARTIAL ILEUS OBSTRUKSI* ec DIVERTIKEL, PASCA ADHESIOLISIS, RESEKSI DIVERTIKEL, ANASTOMOSIS *SIDE TO SIDE ILEOILEAL*

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Latar Belakang: Malnutrisi berat pada pasien pasca pembedahan mayor merupakan tantangan dalam manajemen nutrisi klinis karena berhubungan dengan peningkatan morbiditas, komplikasi pasca operasi, dan mortalitas. Reseksi ileum memiliki konsekuensi nutrisi jangka panjang yang memerlukan penatalaksanaan komprehensif dan *monitoring* berkelanjutan.

Ilustrasi Kasus: Dilaporkan kasus seorang perempuan berusia 54 tahun dengan malnutrisi berat pasca *laparotomy* eksplorasi, *adhesiolisis*, reseksi divertikel ileum, dan anastomosis *side to side ileoileal*. Pasien mengalami penurunan berat badan 21% dalam 3 bulan (dari 53 kg menjadi 42 kg) dengan IMT 17,5 kg/m². Diagnosis malnutrisi berat ditegakkan berdasarkan kriteria GLIM dengan fenotipik berupa penurunan berat badan signifikan dan *muscle wasting*, serta etiologi berupa penurunan asupan dan inflamasi (NLR 22,4). Pasien memiliki komorbid *Systemic Lupus Erythematosus* (SLE) *on treatment*, hidronefrosis ringan bilateral, dan nefrolitiasis dekstra.

Diskusi: Terapi medik gizi dimulai dengan nutrisi parenteral total selama 3 hari, dilanjutkan kombinasi parenteral-enteral menggunakan formula oligopeptida, kemudian transisi ke oral-enteral pada hari ke-6. Target energi 1786 kkal/hari dengan protein 1,5 g/kgBB tercapai dalam 6 hari tanpa komplikasi *refeeding syndrome*. Suplementasi mikronutrien spesifik diberikan mencakup vitamin B kompleks, vitamin D 1000 IU, dan zinc 20 mg. *Hand grip strength* meningkat dari 4,4 kg/f menjadi 7,2 kg/f dalam 7 hari perawatan.

Kesimpulan: Pendekatan nutrisi bertahap dari parenteral ke enteral hingga oral ber**Hasil** mengatasi malnutrisi berat. *Monitoring* jangka panjang diperlukan untuk vitamin B12 mengingat risiko defisiensi pasca reseksi ileum.

Kata kunci: malnutrisi berat, reseksi ileum, nutrisi parenteral, formula oligopeptida, kriteria GLIM

Malnutrition and Immunocompromised Conditions in Children in Papua, Indonesia: A Systematic Review of Prevalence, Determinants, and Health Impacts

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Background: Malnutrition and immunocompromised conditions in children represent a dual burden of health in Papua, Indonesia—a region marked by geographic isolation, limited healthcare infrastructure, and high rates of poverty. These conditions interact synergistically, increasing vulnerability to infections, impairing growth and development, and exacerbating child mortality.

Objective: This systematic review aims to assess the current evidence on the prevalence, risk factors, and health outcomes of malnutrition in immunocompromised children under five years of age in Papua, and to evaluate the effectiveness of relevant public health interventions.

Methods: A systematic search was conducted using PubMed, Scopus, and Google Scholar for studies published between 2010 and 2025. Inclusion criteria encompassed peer-reviewed studies reporting data on children aged 0–59 months in Papua with documented malnutrition and immunocompromised conditions, including HIV, tuberculosis, or congenital immune deficiencies. The review adhered to PRISMA guidelines, and **Methodological** quality was assessed using the Joanna Briggs Institute (JBI) critical appraisal tools.

Results: Fifteen studies met the inclusion criteria. Stunting was the most prevalent form of malnutrition, affecting 40–55% of immunocompromised children, followed by underweight (25–40%) and wasting (15–30%). HIV and TB co-infections were the most commonly reported immunocompromising conditions. Malnutrition was strongly associated with delayed diagnosis, low maternal education, inadequate breastfeeding, and lack of access to antiretroviral or tuberculosis treatment. Mortality rates were significantly higher among children with both malnutrition and compromised immune function. Current intervention programs remain fragmented and limited in reach, particularly in remote areas.

Conclusion: Children in Papua facing both malnutrition and immunocompromised conditions are at exceptionally high risk of adverse health outcomes. Comprehensive, integrated health strategies are urgently needed—combining nutritional rehabilitation, infectious disease management, and culturally appropriate community-based interventions—to reduce morbidity and mortality in this vulnerable population.

Keywords: Malnutrition, Immunocompromised children, Tuberculosis, Papua, Systematic review.

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ABSTRAK

Nutrigenomik merupakan bidang ilmu yang menelaah interaksi antara faktor genetik dan nutrisi dalam memengaruhi kesehatan. Pada ibu hamil, pendekatan ini semakin penting karena variasi genetik dapat memengaruhi metabolisme zat gizi esensial, yang berdampak pada kesehatan ibu maupun perkembangan janin. Artikel ini bertujuan untuk meninjau peran variasi genetik dan interaksi nutrisi terhadap risiko komplikasi kehamilan serta peluang penerapan *personalized nutrition* berbasis profil genetik pada ibu hamil. Penulisan dilakukan melalui tinjauan literatur dari berbagai publikasi internasional dan nasional yang relevan dalam sepuluh tahun terakhir, dengan menekankan pada gen yang berhubungan dengan metabolisme glukosa, asam lemak, folat, dan vitamin B12 pada ibu hamil. Sejumlah variasi gen, seperti FTO, ADRB2, dan VDR, terbukti berhubungan dengan peningkatan risiko obesitas, resistensi insulin, diabetes gestasional, hipertensi kehamilan, serta anemia. Mekanisme yang mendasari melibatkan jalur molekuler dan epigenetik yang memengaruhi ekspresi gen dan fungsi protein. Pemahaman ini membuka peluang pengembangan intervensi gizi yang lebih personal, mulai dari suplementasi mikronutrien hingga modifikasi pola makan dan gaya hidup. Penerapan *personalized nutrition* berbasis profil genetik selama kehamilan berpotensi meningkatkan kesehatan ibu sekaligus menurunkan risiko penyakit metabolik pada keturunan. Namun, penelitian lebih lanjut dan uji klinis berskala besar masih diperlukan untuk memastikan efektivitas serta kelayakan implementasinya dalam praktik klinis maupun kebijakan kesehatan.

Kata kunci: genetic, kehamilan, komplikasi metabolic, dan nutrigenomik

PENGARUH RADIOTERAPI PADA STATUS GIZI PASIEN KANKER DI RSUP R. D KANDOU MANADO.

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Abstrak

Latar Belakang & Tujuan

Indeks massa tubuh (IMT) sering digunakan untuk menilai status gizi, namun tidak selalu mampu mendeteksi malnutrisi, terutama pada pasien yang menjalani radioterapi. *Patient Generated – Subjective Global Assessment* (PG-SGA) memberikan penilaian lebih komprehensif. Penelitian ini bertujuan untuk menilai pengaruh radioterapi terhadap perubahan status gizi pasien kanker dewasa yang dirawat di RSUP R. D. Kandou Manado.

Metode

Penelitian ini menggunakan desain observasional analitik kohort retrospektif dengan membandingkan status gizi berdasarkan PG-SGA antara pasien kanker yang menerima radioterapi dan pasien kontrol yang tidak menerima radioterapi.

Hasil

Sebanyak 40 pasien diteliti (20 radioterapi, 20 non-radioterapi). Pada kelompok radioterapi, 12 pasien (60%) mengalami malnutrisi berat, dibandingkan 4 pasien (20%) pada kelompok non-radioterapi. Uji Chi-square menunjukkan perbedaan signifikan ($\chi^2 = 6,667$; $p = 0,010$) dengan odds ratio 6,0 (95% CI: 1,46–24,69), menunjukkan bahwa pasien radioterapi memiliki risiko 6 kali lebih tinggi mengalami malnutrisi dibanding pasien non-radioterapi. Uji T independen menunjukkan perbedaan signifikan skor PG-SGA antara kedua kelompok ($p = 0,001$), sedangkan IMT tidak berbeda signifikan ($p = 0,984$), menegaskan keterbatasan IMT dalam mendeteksi malnutrisi.

Kesimpulan

Radioterapi berpengaruh terhadap status gizi pasien kanker di RSUP R. D. Kandou Manado. Hal ini ditunjukkan oleh adanya hubungan bermakna antara radioterapi dan status gizi berdasarkan PG-SGA. Sebaliknya, **Hasil** analisis IMT tidak terdapat perbedaan signifikan antara kelompok dengan dan tanpa radioterapi, sehingga IMT kurang sensitif dalam mendeteksi perubahan status gizi akibat terapi.

Kata kunci: Malnutrisi, Pasien kanker, PGSGA, Radioterapi, Skrining gizi

**TERAPI NUTRISI PADA PASIEN DENGAN ABSES PARU DISERTAI
TUBERCULOSIS PARU, EMPIEMA, ACUTE KIDNEY INJURY,
CHOLELITHIASIS, HIPOALBUMINEMIA, ANEMIA DAN LEUKOSITOSIS**

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ABSTRAK

Abses paru merupakan suatu infeksi pada jaringan paru yang ditandai dengan terbentuknya kavitas berisi material purulen akibat nekrosis parenkim paru. Kondisi ini dapat menimbulkan komplikasi serius, yang berisiko menyebabkan malnutrisi yang dapat meningkatkan morbiditas pasien. Studi kasus ini membahas seorang pasien dengan abses paru kanan disertai *Tuberculosi*s paru aktif, empiema, *acute kidney injury* (AKI), kolelitiasis, hipoalbuminemia, anemia, dan leukositosis yang menjalani perawatan multidisiplin di rumah sakit. Diagnosis ditegakkan melalui pemeriksaan klinis, radiologis, laboratorium, serta kultur mikrobiologi. Penatalaksanaan pasien meliputi terapi medikamentosa, terapi suportif, serta terapi nutrisi. Intervensi gizi diberikan secara bertahap melalui kombinasi oral dan parenteral dengan target kebutuhan energi 1350–1450 kkal/hari, protein 1,5–2 g/kgBB/hari, karbohidrat 45–50%, dan lemak 25–30%. Suplementasi tambahan berupa zinc, vitamin A, C, D, B kompleks, serta ekstrak ikan gabus diberikan untuk mendukung perbaikan status gizi, hipoalbuminemia, anemia, dan imunitas pasien. Selama 14 hari perawatan gizi di rumah sakit, tampak perbaikan fungsi ginjal, kadar bilirubin, kadar albumin, penurunan marker inflamasi. Kemudian dilakukan pemantauan gizi selama 6 bulan setelah keluar dari rumah sakit, menunjukkan adanya perbaikan klinis dan status gizi, seperti peningkatan berat badan, perbaikan kapasitas fungsional dan kadar albumin normal. Studi ini menunjukkan pentingnya pendekatan multidisiplin, khususnya peran terapi nutrisi jangka panjang, dalam memperbaiki status metabolik, menurunkan risiko mortalitas, serta meningkatkan kualitas hidup pasien dengan abses paru dan penyakit penyerta yang kompleks.

Kata kunci: abses paru, TB paru, hipoalbuminemia, terapi nutrisi.

**The Effect Of Vitamin D On Incidence and Severity Of Insomnia
in Chronic Kidney Disease Patients on Dialysis:
A Systematic Literature Review**

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Background: Insomnia is a common issue among patients with chronic kidney disease (CKD) undergoing dialysis, that significantly affecting their quality of life. Recent studies have suggested a potential link between vitamin D deficiency and various sleep disorders like insomnia.

Objective: This systematic literature review aims to assess the relationship of vitamin D level and supplementation on the incidence and severity of insomnia in patients with CKD undergoing dialysis.

Methods: A systematic search was conducted across PubMed, Google Scholar, and Scopus databases for studies published up to 2025. Eligible studies included randomized controlled trials, case-control, and cross-sectional analysis assessing the association between serum 25(OH)D levels or vitamin D supplementation and insomnia or sleep quality among adult CKD patients on hemodialysis or peritoneal dialysis.

Results: We found five articles that examined the correlation between vitamin D levels and sleep disturbances among patients with CKD undergoing dialysis. Preliminary findings from the included studies indicates that vitamin D deficiency is associated with a higher prevalence of insomnia and poor sleep quality in dialysis patients.

Conclusion: Current evidence suggests that adequate vitamin D levels may play a beneficial role in improving sleep quality and reducing insomnia symptoms among CKD patients undergoing dialysis therapy.

Keywords: Vitamin D, insomnia, chronic kidney disease, dialysis

Efektivitas Balon Intragastrik Allurion dalam Penanganan Obesitas: Sebuah Studi Retrospektif pada 7 Pasien Obesitas

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Latar Belakang dan Tujuan: Obesitas merupakan masalah kesehatan global yang meningkatkan risiko penyakit metabolik dan memerlukan intervensi efektif. Balon intragastrik Allurion (BIA) merupakan terapi minimal invasif non-bedah untuk manajemen obesitas. Data efektivitas metode ini pada populasi lokal masih terbatas. Penelitian ini bertujuan mengevaluasi efektivitas BIA dalam manajemen obesitas.

Metode: Studi retrospektif ini menganalisis data 7 kasus (3 laki-laki, 4 perempuan) yang menjalani program BIA selama 2-43 minggu (rata-rata 15,3 minggu) periode 2024–2025. Data awal dan akhir program dari berat badan (BB), Indeks Mass Tubuh (IMT), massa lemak (ML), massa tubuh bebas lemak (MTBL), dan *bassal metabolic rate* (BMR) diuji normalitasnya (Shapiro-Wilk) dan dibandingkan menggunakan *paired samples t-test*.

Hasil: Rata-rata BB awal 105.1, akhir 90.8 kg, IMT awal 39.1, akhir 33.5 kg/m², ML awal 37.3, akhir 28.8 kg, MTBL awal 77.4, akhir 73.7 kg, BMR awal 2033.2, akhir 1897 kkal. Terdapat penurunan signifikan pada BB (rata-rata penurunan 14.8 kg, $p=0.004$), IMT (rata-rata penurunan 5.6 kg/m², $p=0.007$), ML (rata-rata penurunan 8.4 kg, $p=0.007$), MTBL (rata-rata penurunan 3.7 kg, $p=0.002$) dan BMR (rata-rata penurunan 136.2 kkal, $p=0.004$).

Kesimpulan: Intervensi balon intragastrik Allurion efektif dalam manajemen obesitas, terbukti dengan penurunan signifikan pada berat badan, IMT, dan lemak tubuh. Pengawasan nutrisi dan olahraga diperlukan untuk memitigasi kehilangan massa tubuh bebas lemak yang signifikan.

Kata Kunci

Balon Intragastrik Allurion, Komposisi Tubuh, Obesitas, Penurunan Berat Badan,

ABSTRAK

Deskripsi Status Gizi, Massa Lemak Total, Massa Otot, Massa Lemak Visceral, dan Skrining Malnutrisi pada Pasien Diabetes Melitus Tipe 2 di Rumah Sakit Universitas Airlangga Surabaya 2024

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Latar Belakang: Pasien DM sering mengalami peningkatan massa lemak terutama lemak visceral, penurunan massa otot yang dapat mengakibatkan resistensi insulin dan meningkatkan risiko komplikasi kardiometabolik. Penelitian ini bertujuan menggambarkan status gizi, massa lemak total, otot, lemak visceral, dan skrining malnutrisi pada pasien DM di Rumah Sakit Universitas Airlangga berdasarkan jenis kelamin.

Metode: Desain penelitian deskriptif dengan melibatkan 27 pasien DM tipe 2 (10 laki-laki dan 17 perempuan) yang baru masuk di rawat inap. Data dikumpulkan pada Juni–Juli 2024. Massa lemak total, otot, dan lemak visceral diukur menggunakan *Bioelectrical Impedance Analysis* (BIA), status gizi dinilai dengan mengukur Indeks Massa Tubuh (IMT), dan skrining malnutrisi menggunakan *Patient-Generated Subjective Global Assessment* (PG-SGA).

Hasil: Rerata kelompok pasien perempuan, 76% memiliki status gizi lebih, dengan kategori *overweight*, *obese* I dan II. Massa lemak total kategori tinggi yaitu sebesar 39%, massa otot dan skala massa lemak visceral kategori normal yaitu sebesar 37,05 kg dan 8,65. Pada skor PG-SGA sebesar 4,24 yang mengindikasikan risiko malnutrisi sedang. Pada kelompok pasien laki-laki mayoritas berstatus gizi lebih yaitu 80% kategori *overweight* dan *obese* I. Massa lemak total dan massa otot kategori normal yaitu sebesar 24% dan 48,44 kg serta skala massa lemak visceral sebesar 13,3 sehingga kategori risiko rendah. **Hasil** skor PG-SGA sebesar 3,6 menunjukkan risiko malnutrisi rendah.

Kesimpulan: Pada kelompok perempuan memiliki status gizi lebih, masa lemak total tinggi dan berisiko malnutrisi sedang. Sedangkan pada laki-laki berstatus gizi lebih, berisiko rendah terhadap penyakit kardiometabolik, dan berisiko malnutrisi rendah saat skrining.

Kata kunci: diabetes melitus, jenis kelamin, status gizi, massa lemak total, massa otot, lemak visceral

SAFETY OF SEMAGLUTIDE (GLP-1RA) FOR PATIENTS WITH OBESITY, IS IT ACTUALLY SAFE? A SYSTEMATIC REVIEW AND META-REGRESSION ANALYSIS OF RANDOMIZED CONTROLLED TRIAL

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ABSTRACT

Introduction: Semaglutide (GLP-1RA) is a drug that was originally intended for patients with T2DM, but is now being used by patients with both T2DM and non-T2DM to lose weight. Several side effects have been reported, but data is still limited.

Objective: Assessing the side effects of semaglutide use in obese patients and the relationship to dosage and duration of use.

Methods: Pubmed and Sciencedirect were utilized for literature search. Eligibility criteria were based on PICOS, such as Obesity (Patient), Semaglutide (Intervention), Control or Placebo (Control), reported adverse event (Outcome), and Randomized Controlled Trial (Study). “Semaglutide” and “Obesity” are used as **Keywords**. Meta-analysis until regression were performed with R Studio (R.4.4.3) (library(meta)) with Odds Ratio (OR) and Random Effect Model (REM) for generalized **Conclusion**. Cochrane RoB2 used for risk of bias for included studies.

Result: A review of 23 studies (47,130 patients) found semaglutide increased gastrointestinal (OR 2.7), acute pancreatitis (OR 1.81), nervous system (1.09), malignancy (OR 1.06), and musculoskeletal (OR 1.01) adverse effects. It showed protective effects against acute kidney injury (OR 0.81), cardiac disorder (OR 0.77), hypoglycemia (0.36), and infection (OR 0.97). Meta-regression showed increased dosage reduced protective effects, while decreased duration increased them. Some publication bias was noted, but heterogeneity was low ($I^2 < 50\%$).

Conclusion: Semaglutide increases gastrointestinal, acute pancreatitis, nervous system, malignancy, and musculoskeletal adverse effects, while protecting against kidney injury, cardiac disorder, hypoglycemia, and infection.

Keywords: Adverse Effect, GLP-1RA, Obesity, Semaglutide

LITERATURE REVIEW : THE EFFECTS OF A VEGAN DIET DURING PREGNANCY ON MATERNAL AND FETAL HEALTH

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Background Vegetarian and vegan diets have gained increasing popularity in recent years, primarily due to their potential to reduce the risk of chronic diseases such as cardiovascular disease, type 2 diabetes, and certain types of cancer. However, their impact on maternal and fetal health remains a subject of ongoing debate, particularly because of the risk of nutritional deficiencies during pregnancy.

Objective This literature review aims to examine the effects of a vegan diet during pregnancy on maternal and fetal health.

Methods A total of seven scientific articles published between 2014 and 2024 were analyzed, sourced from databases including PubMed and Google Scholar.

Result The findings highlight both the potential protective effects and the nutritional risks associated with plant-based diets during pregnancy. Specifically, deficiencies in key nutrients such as protein, iron, vitamin D, calcium, iodine, omega-3 fatty acids, and vitamin B12 may negatively impact maternal health and fetal development if not properly addressed. However, current evidence also suggests that a well-planned vegan diet can be safely followed during pregnancy and lactation, provided that essential nutrients are carefully managed through dietary planning and appropriate supplementation.

Conclusion Appropriate nutritional interventions and close monitoring for pregnant women following a vegan diet are essential to ensure maternal health and to support optimal growth and development in infants and children.

Keywords Maternal health, Fetal development, Vegan diet, Nutritional deficiencies, Micronutrient status.

Hubungan antara Status Nutrisi dengan Kejadian Anemia pada Remaja Putri Usia 12-17 Tahun di Kintamani, Bangli, Bali

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Latar Belakang. Anemia masih menjadi permasalahan utama bagi remaja putri khususnya di Kintamani. Status nutrisi sendiri telah dilaporkan sebagai salah satu faktor penting dalam kejadian anemia. Penelitian ini bertujuan untuk melihat hubungan antara status nutrisi dengan kejadian anemia pada remaja putri di Kintamani.

Metode. Penelitian potong lintang dilakukan serangkaian program skrining kesehatan di sekolah menengah yang berada dalam wilayah kerja Puskesmas Kintamani VI. Penilaian status nutrisi remaja menggunakan aplikasi WHO Anthro-plus dengan kategori sesuai WHO *Reference* 2007. Kadar hemoglobin ditentukan melalui pemeriksaan darah *point of care testing* (POCT) dengan alat yang sudah terkalibrasi. Hubungan antar variabel selanjutnya dinilai dengan analisis Chi Square.

Hasil. Sampel total sebanyak 232 remaja putri dengan rentang usia 12-17 tahun diikutsertakan dalam penelitian ini. Pada analisis deskriptif didapatkan status nutrisi berupa gizi buruk 1 orang (0,4%), gizi kurang 5 (2,1%), gizi baik 185 (79,7%), gizi lebih 26 (11,2%), dan obesitas 15 (6,5%). Anemia juga ditemukan pada 64 (27,5%) remaja putri, yang mana 31% ditemukan pada kelompok malnutrisi dan 26% pada kelompok gizi normal. Analisis statistik tidak menemukan korelasi yang signifikan antara status nutrisi dan anemia ($p = 0,524$). Meskipun tidak ditemukan korelasi, hasil menunjukkan kecenderungan kejadian anemia lebih tinggi pada remaja putri yang mengalami masalah nutrisi (*over* dan *undernutrition*).

Kesimpulan. Pada populasi remaja putri di Kintamani, mayoritas memiliki status nutrisi yang baik. Pada kelompok malnutrisi terdapat lebih banyak remaja dengan gizi lebih/obesitas. Kejadian anemia ditemukan lebih banyak pada remaja dengan masalah nutrisi dibandingkan gizi normal, meskipun hubungannya belum terbukti bermakna secara statistik.

Kata kunci: *indeks massa tubuh, status anemia, remaja putri*

Status Gizi Remaja pada Pondok Pesantren *Ianatut Tholibin* Pungging-Mojokerto: Penelitian Deskriptif

Rizki Mega Aprilia

YR Medika

ABSTRAK

Latar Belakang: Status gizi memiliki peranan krusial dalam perkembangan kognitif, fisik, dan kesehatan reproduksi. Kelompok usia yang rentan mengalami masalah gizi salah satunya adalah usia remaja yang ditandai dengan kebutuhan nutrisi yang meningkat seiring dengan percepatan pertumbuhan dan perkembangan. Lingkungan pondok pesantren, dengan sistem asrama yang menuntut kemandirian serta keterbatasan pilihan makanan, berpotensi memberikan tantangan tersendiri dalam pemenuhan gizi santri. Penelitian ini bertujuan untuk mengetahui gambaran status gizi remaja di Pondok Pesantren *Ianatut Tholibin*.

Metode: Desain penelitian yang digunakan adalah *cross sectional* dengan jumlah partisipan sebanyak 80 siswa kelas 7–9 berusia 13–15 tahun. Data dikumpulkan melalui pengukuran berat badan dan tinggi badan kemudian diklasifikasikan menggunakan angka *Z-score* IMT/U.

Hasil: Sebagian besar partisipan memiliki status gizi normal (63,75%). Namun, terdapat 6,25% remaja yang tergolong gizi kurang, bahkan 1,25% termasuk gizi buruk. Sebaliknya, 22,5% remaja mengalami gizi lebih dan 6,25% obesitas.

Kesimpulan: Temuan ini menggambarkan bahwa meskipun mayoritas remaja berada pada kategori gizi normal, masih terdapat tantangan baik dalam mengatasi masalah kekurangan maupun kelebihan gizi. Upaya edukasi gizi dan perbaikan pola makan di lingkungan pesantren menjadi penting untuk mendukung tumbuh kembang optimal serta kesehatan jangka panjang santri.

Kata kunci: status gizi, remaja, pondok pesantren

LIFESTYLE MODIFICATION AND SUPPLEMENTATION IN A WOMAN WITH VITAMIN D DEFICIENCY AND NON SPECIFIC CHRONIC LOW BACK PAIN: A CASE REPORT

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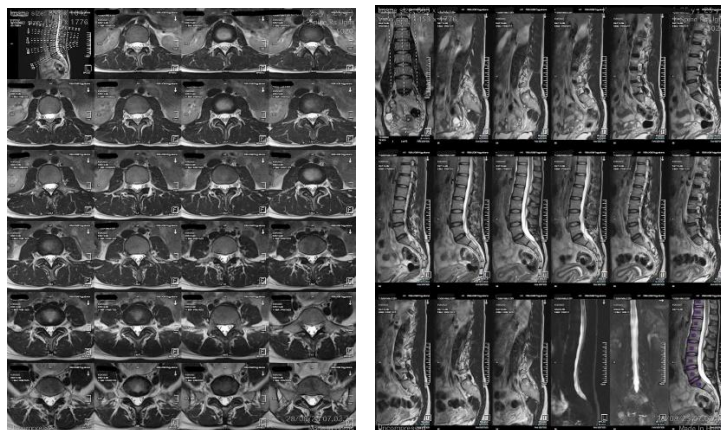
2. Spine Assistant Gadjah Mada Academic Hospital, Yogyakarta

Background:

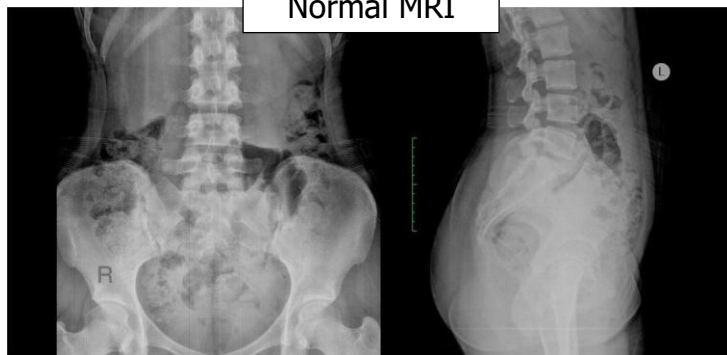
Chronic low back pain (CLBP) is defined as a pain presented between the costal margins and the inferior gluteal fold for ≥ 3 months with or without neurological deficits¹. Vitamin D Deficiency was associated with increased peripheral and central pain sensitivity during mechanical stimulation in patients with CLBP². This could be explained by the beneficial effect of vitamin D on neurite and astrocyte outgrowth and its effect on opioid signaling modulation that relieves neuropathic pain². We present a case of a 26-year-old female patient with vitamin D deficiency and severe chronic low back pain. After 3 months of vitamin D supplementation and lifestyle modification, pain relieves was achieved as the vitamin D level improved.

Case Illustration:

A 26-year-old woman, initial “K,” presented to the Orthopedic Spine Clinic at Gadjah Mada University Academic Hospital with a three-month history of low back pain rated as 8 on the Visual Analog Scale (VAS), which had worsened by her first visit in February 2025. Her vital signs were within normal limits. Physical examination revealed a body weight of 45 kg, height of 158 cm (BMI 18.0 kg/m²), waist circumference of 72 cm, and upper arm circumference of 23 cm. Provocative tests, including Lasegue’s and Patrick’s (FABER) tests, were negative, and there was no lumbar tenderness. Lumbosacral X-ray and non-contrast MRI findings were unremarkable. Laboratory **Results** showed a serum vitamin D level of 11.6 ng/mL, confirming vitamin D deficiency. She was diagnosed with vitamin D deficiency-related low back pain and was started on calcitriol 0.5 µg every 12 hours, calcium lactate 500 mg daily, and vitamin D₃ 5000 IU daily. Nutritional targets were set at 1125 kcal/day (25 kcal/kg/day) and 45 g of protein/day (1 g/kg/day). She was also advised to have daily sun exposure for 30 minutes and to exercise for at least 30 minutes per day, with monthly reassessment of serum vitamin D levels.



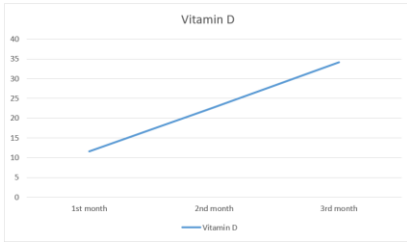
Normal MRI



Normal Lumbosacral Ap/Lat

At the two-month follow-up, her vitamin D level had increased to 22.7 ng/mL, and her low back pain improved to VAS 5. Physical examination showed a weight of 46 kg (BMI 18.4 kg/m²), waist circumference of 72.5 cm, and upper arm circumference of 23.2 cm. The same supplementation regimen was continued, and a repeat vitamin D test was scheduled for the following month.

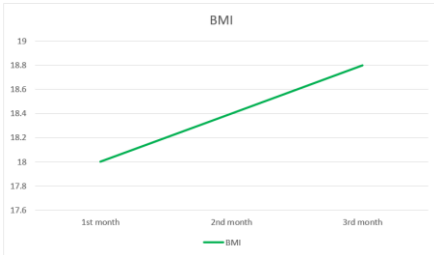
By the third month, the patient reported complete resolution of low back pain, and her vitamin D level had normalized to 34.1 ng/mL. At that time, she weighed 47 kg (BMI 18.8 kg/m²), with a waist circumference of 73 cm and upper arm circumference of 23.5 cm. The patient was declared to have achieved normal vitamin D levels, and no further follow-up was required. She was counseled to maintain a healthy lifestyle and balanced diet to preserve optimal musculoskeletal health and prevent recurrence of vitamin D deficiency.



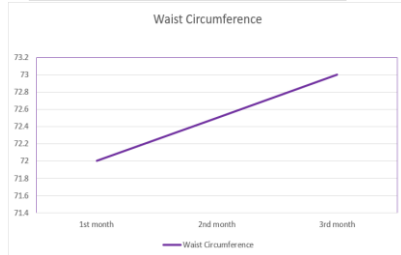
Monitoring graph vitamin



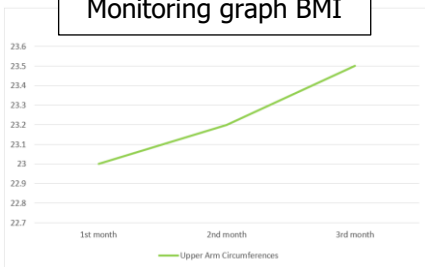
Monitoring graph



Monitoring graph BMI



Monitoring graph
waist circumference



Monitoring graph upper arm
circumference

Discussion:

Vitamin D deficiency is known to contribute to the development of low back pain³. Vitamin D functions as a hormone that regulates the homeostasis of minerals such as calcium and phosphorus, thereby maintaining bone strength and integrity¹. In conditions of vitamin D deficiency, disturbances in calcium and phosphorus metabolism occur, leading the skeletal system to serve as a major source for maintaining serum calcium levels. This compensatory process may result in osteomalacia and exacerbate pre-existing osteopenia or osteoporosis¹. Moreover, vitamin D exerts anti-inflammatory effects by downregulating pro-inflammatory cytokines and upregulating anti-inflammatory cytokines¹. Additionally, vitamin D deficiency increases parathyroid hormone (PTH) secretion, which enhances bone turnover

and may lead to microfractures within the vertebral structures, ultimately contributing to low back pain¹. Lifestyle modification, dietary intake and supplementation also help optimize absorption and reduce pain^{1,2}.

Conclusion:

Supplementation with lifestyle modification and adequate dietary intake can increase vitamin D levels, thereby reducing low back pain.

Key Words:

Vitamin D deficiency, chronic low back pain, supplementation, lifestyle modification.

VITAMIN D AND TELOMERE LENGTH, THE UNSEEN PATHWAY TO LONGEVITY : A SYSTEMATIC REVIEW AND META ANALYSIS

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Introduction: Telomere length is a key biomarker of aging, with longer telomeres associated with longevity and lower disease risk. Vitamin D has been proposed to exert anti-aging effects via its anti-inflammatory and antioxidative mechanisms which preserve telomere integrity. However, current evidence on this association remains inconsistent.

Objective: To systematically evaluate the effect of vitamin D on telomere length.

Methods: A systematic search following PRISMA guidelines was conducted across PubMed, ScienceDirect, Scopus, and ProQuest up to September 2025. Observational studies were synthesized qualitatively. Data from RCTs were pooled using a random-effects model in RevMan 5.4.

Results: Four RCTs and 18 observational studies were included, comprising >180,000 participants. Meta-analysis of RCTs demonstrated a significant positive effect of vitamin D supplementation on telomere length compared with placebo (SMD=0.29; 95% CI=0.03-0.54; p=0.03). Among observational studies, the majority showed positive associations between optimal vitamin D levels and longer telomeres. Some showed partial association influenced by age, sex, race, or genetics. Others found null **Results**, confounded by lifestyle factors or age, such as young participants with inherently long telomeres or very old participants whose telomeres already shortened. These findings support a U-shaped relationship between vitamin D and telomere length. Both deficiency and excess may accelerate telomere attrition, as vitamin D could shift its antioxidant capacity toward a pro-oxidant state.

Conclusion: Vitamin D may have a significant protective effect on telomere length. Optimal vitamin D status could contribute to anti-aging. Further longitudinal RCTs are warranted to elucidate the optimal vitamin D range and doses for telomere preservation.

Keywords: vitamin D, telomere length, anti-aging, longevity

SINBIOTIK DAN PROBIOTIK SEBAGAI STRATEGI ANTI- PENUAAN PADA DEWASA ASIA: SUATU TINJAUAN SISTEMATIS

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ABSTRAK

Latar Belakang: Penuaan ditandai penurunan fungsi fisiologis, stres oksidatif, dan inflamasi kronis yang meningkatkan risiko penyakit degeneratif. Probiotik dan sinbiotik berpotensi mendukung penuaan sehat dengan memulihkan keseimbangan mikrobiota, meningkatkan *short-chain fatty acid* anti-inflamasi, memperkuat *barrier* usus, dan memperbaiki biomarker penuaan. Namun, bukti efektivitas sinbiotik pada populasi Asia masih terbatas akibat perbedaan pola makan, mikrobiota, dan faktor genetik.

Objektif: Menilai efektivitas sinbiotik dan probiotik sebagai strategi anti-penuaan pada dewasa Asia melalui tinjauan sistematis literatur yang tersedia.

Metode: Tinjauan sistematis ini dilakukan dengan menelusuri *database* PubMed dan Scopus dalam periode 2010-2025. Kriteria inklusi meliputi uji klinis atau studi observasional 2010-2015 pada dewasa Asia yang menilai efek sinbiotik atau probiotik terhadap biomarker penuaan atau parameter kesehatan terkait penuaan. Studi dianalisis berdasarkan panduan PRISMA.

Hasil: Beberapa studi menunjukkan bahwa konsumsi *Bifidobacterium animalis* subsp. *lactis* dan arginin selama 12 minggu dapat memperbaiki fungsi endotel (peningkatan RHI) serta meningkatkan kadar putresin dan spermidin, yang dapat menurunkan risiko aterosklerosis¹. Pemberian diet seimbang disertai probiotik memperbaiki biomarker gizi dan inflamasi (glukosa puasa, HbA1c, albumin, γ -GT, kolesterol total, HDL-C, IgE) serta meningkatkan proporsi mikrobiota usus seperti *Bacteroidaceae*, *Prevotella*, dan *Faecalibacterium*². Konsumsi minuman sinbiotik selama 3 minggu dapat memodulasi mikrobiota usus, meningkatkan metabolisme glukosa, serta memberikan efek anti-inflamasi yang berpotensi bertahan meskipun intervensi telah dihentikan³.

Kesimpulan: Sinbiotik dan probiotik memperbaiki mikrobiota usus, biomarker darah, dan fungsi vaskular pada dewasa Asia sehingga berpotensi mendukung penuaan sehat

Kata kunci: “synbiotic,” “probiotic,” “anti-aging,” “Asian.

SERIAL KASUS: TERAPI MEDIK GIZI PADA IBU HAMIL TRIMESTER III DENGAN ANEMIA, PLASENTA PREVIA, PERDARAHAN ANTEPARTUM HINGGA PERIOPERATIF SC

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3 Dokter Spesialis Obstetri Ginekologi RSIA Bunda Semarang

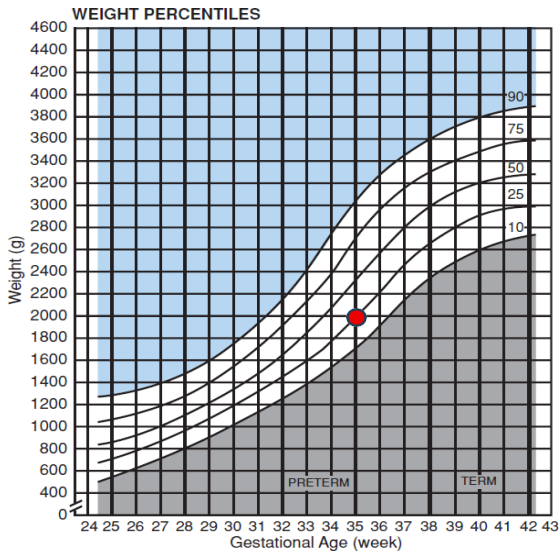
Latar Belakang

Anemia pada ibu hamil memiliki dampak kesehatan terhadap ibu dan janin, antara lain keguguran, kelahiran prematur, gangguan pertumbuhan dan perkembangan janin atau berat badan lahir rendah (BBLR <2500 gr), perdarahan antepartum, dan ketuban pecah dini. Anemia pada kehamilan menurut WHO adalah kondisi ibu dengan kadar Hb < 11gr/dl. Asupan gizi ibu yang tidak adekuat dapat berdampak buruk pada pertumbuhan dan perkembangan janin. Pola makan ibu selama kehamilan mendukung kesehatan janin, berat badan lahir cukup, dan kelangsungan hidup ibu dan bayi. Memperbaiki pola makan ibu sebelum dan selama kehamilan dapat mengoptimalkan kehamilan sehingga mengurangi risiko masalah kesehatan bagi ibu dan bayinya.

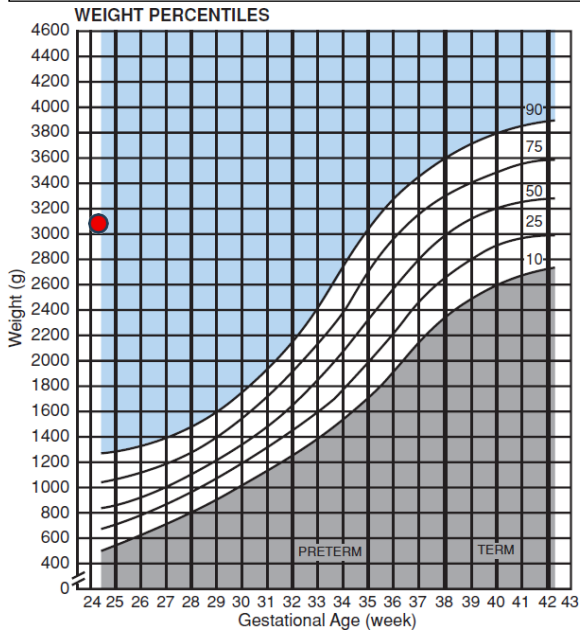
Ilustrasi kasus

Perempuan 29 tahun G2P1A0 hamil 35 minggu dikonsultasikan dari bagian Obsgin dengan anemia, perdarahan antepartum dan plasenta previa. Pasien dengan BB sebelum hamil 53 kg, TB 155 cm (IMT 22,06 normoweight), BB selama kehamilan 63kg (IMT 26,22), dari USG didapatkan TBJ 2000 gr. Pasien diberikan terapi medik gizi yaitu diet tinggi energi tinggi protein dengan target energi 25 kkal/kgBB/hari = 1500 kkal + 400 kkal (trimester 3) = 1900 kkal. Target protein 1 g/kgBB/hari = 63 gr + 25 gr (trimester 3) = 90 gr protein. Lemak: 53 g (25% energi), total lemak 20–30% energy, SFA (lemak jenuh) <10%, MUFA (monounsaturated fatty acid) 10– 15% energi. PUFA (omega-3 & omega-6) 5–10% energi. Karbohidrat: 276 g (58% energi). Serat 25–30 g/hari. Cairan: ±2200 mL/hari. Suplementasi Vitamin B kompleks 1 tab/8 jam, suplementasi Fe.

2 minggu kemudian pasien kembali rawat inap untuk persalinan SC. Setelah perbaikan asupan, TBJ menjadi 2830 gr. Diberikan terapi medik gizi perioperatif, sebelum operasi SC ERACS pasien diberikan Carbohydrate loading maltodex 200 ml. Pasca operasi diberikan kalori 2100 kkal, protein 99 gr, karbohidrat 315 gr, lemak 49 gr lemak (21 %). Kebutuhan cairan 2100 - 2800 cc/hari. Diet diberikan diet biasa tinggi kalori, tinggi protein 2100 kkal/99 gram protein. Suplementasi Vitamin C 100 mg/8 jam (3 hari), Zink 20 mg (3 hari). Lahir bayi dengan BBL 3300 gr.



Kurva Lubchenco Usia Kehamilan 35 minggu



Kurva Lubchenco Usia Kehamilan 37 minggu

Diskusi

Masalah yang sering dialami ibu hamil adalah kekurangan energi kronis dan anemia, yang dapat menghambat pertumbuhan janin, sehingga menyebabkan risiko berat badan lahir rendah. Pada kasus ini, setelah diberikan terapi medik gizi berupa diet tinggi kalori tinggi protein dan suplementasi Fe, tampak adanya peningkatan kadar hemoglobin ibu dan peningkatan TBJ. Tampak pergeseran Kurva Lubchenco yang sebelumnya di bawah percentil 50 menjadi di percentil 50, *outcome* berupa lahir bayi dengan BBL 3300 gr, PB 48 cm, LK 34 cm, LD 30.5 cm, LL 10 cm. Pemenuhan target energi dan protein untuk mendukung fase *recovery* dan *wound healing*.

Kesimpulan

Diet lengkap gizi seimbang dan pemberian tablet Fe diperlukan untuk mencegah anemia dan menurunkan risiko BBLR.

Kata kunci

Terapi medik gizi, anemia, TBJ, BBL

ABSTRAK

Peran Kecukupan Energi Dan Protein Terhadap *Handgrip Strength* Pada Pasien Malnutrisi Sedang Secara Klinis Dan Karsinoma Serviks Yang Sedang Menjalani Terapi Radiasi : Laporan Kasus

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Departemen Ilmu Gizi, Fakultas Kedokteran Universitas Indonesia-Rumah Sakit Dr.
Cipto Mangunkusumo

Latar Belakang: Kanker serviks merupakan salah satu keganasan ginekologi dengan angka kejadian tinggi dan sering diikuti oleh masalah malnutrisi yang dapat memperburuk luaran terapi. Kondisi malnutrisi sedang secara klinis tidak hanya memengaruhi status gizi, tetapi juga berdampak pada fungsi otot, ditandai dengan penurunan *handgrip strength* sebagai indikator kapasitas fungsional. Intervensi nutrisi dengan kecukupan energi dan protein berperan penting dalam mendukung sintesis protein otot sekaligus mencegah proteolisis.

Ilustrasi Kasus: Laporan kasus seorang wanita 48 tahun dengan karsinoma serviks stadium IVA dan penyakit ginjal kronik stadium 3A yang menjalani 28 fraksi radioterapi. Pasien mengalami penurunan berat badan 8% dalam enam bulan terakhir, disertai anoreksia, mual, serta asupan energi dan protein rendah dengan diagnosis malnutrisi sedang dan kaheksia kanker. Pemeriksaan laboratorium awal menunjukkan Hb 6,8 g/dL yang meningkat menjadi 12,2 g/dL. *Handgrip strength* awal 12,8/12,4 kg menurun 10/8,4 kg saat asupan terbatas, kemudian menunjukkan perbaikan bertahap setelah intervensi nutrisi lebih optimal menjadi 10,2/9,9 kg. Asupan awal 12 kkal/kgBB dan protein 0,4 g/kgBB yang naik bertahap hingga 27 kkal/kgBB dan protein 1 g/kgBB.

Diskusi: Victoria-Montesinos et al., menyatakan bahwa pemenuhan energi dan protein yang memadai, berpotensi membantu mempertahankan fungsi otot pada pasien kanker dengan malnutrisi. Pada kasus ini, peningkatan bertahap asupan energi dan protein diikuti perbaikan *handgrip strength*, menunjukkan hubungan positif antara kecukupan nutrisi dan kapasitas fungsional otot.

Kesimpulan: Kecukupan energi dan protein berpotensi mempertahankan kekuatan otot pada pasien kanker serviks malnutrisi sedang selama terapi radiasi.

Kata kunci: *handgrip strength*, intervensi nutrisi, kanker serviks, malnutrisi

Appetite Stimulant Use in Cancer: Systematic Review on Randomized Clinical Trials

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Cancer-related cachexia (CRC) is often in individuals with advanced cancer. Appetite stimulants serve as a critical adjunctive therapy, but comprehensive synthesis of their efficacy is needed. This investigation aims to systematically review the evidence from Randomized Clinical Trials (RCTs) on the clinical impact of these agents in cancer patients. This systematic review included RCTs comparing appetite stimulant versus placebo in cancer patients with cachexia and anorexia. Databases (PubMed, Scopus, Sciencedirect and Wiley Online Library) were searched following PRISMA 2020 guidelines. Risk of bias was assessed using Cochrane RoB 2.0 tool. Qualitative synthesis was performed to summarize the findings. A total of 4 RCTs (N = 1041 patients) were included, focused on Anamorelin (N=835) and Mirtazapine (N=206). Anamorelin, consistently demonstrated efficacy in improving body weight, Lean Body Mass (LBM) and Fat Mass in patients with cachexia ($p<0.001$). Mirtazapine yielded mixed **Results**: while two studies found no significant improvement in subjective appetite scores, one reported a significant increase in total energy intake and a decrease in sarcopenia proportion ($p=0.03$). Included RCTs were have a low to some concerns risk of bias. Anamorelin provides strong evidence for improving some objective nutritional parameters in CRC. Mirtazapine offers potential benefits related to increased energy consumption and mood management, but its role as an appetite stimulant remains unclear. Therapeutic selection should be tailored to individual patient goals, prioritizing body composition (Anamorelin) or energy intake/mood (Mirtazapine).

Keywords: appetite stimulant, cancer, randomized clinical trial, anamorelin, mirtazapine

Unlocking the Potential of Green Tea: A Systematic Review of the Efficacy of EGCG for Primary and Secondary Prevention of Breast Cancer

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Background and Objective

Green tea is one of the world's most popular beverages and has been associated with a number of health benefits, including prevention of obesity, cardiovascular disease, neurodegenerative disease, and several site-specific cancers, including breast cancer. These beneficial effects are primarily attributed to the chemical properties of tea catechins, of which epigallocatechin-3-gallate (EGCG) is the most abundant (50-75% of total catechin content) and biologically active form.¹

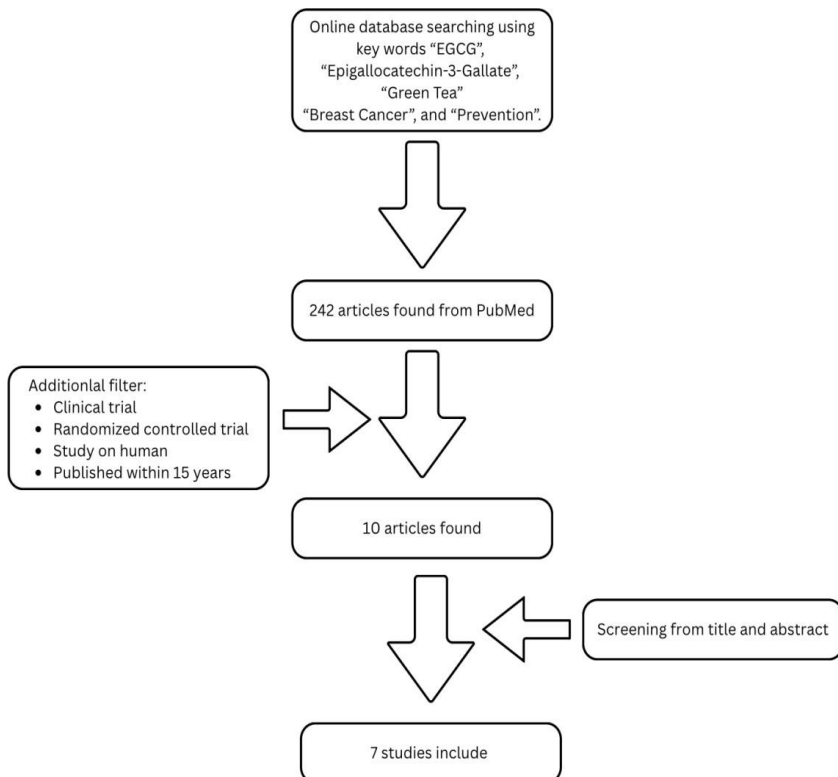
Breast cancer is the most commonly diagnosed invasive malignancy, the leading cause of death in women worldwide and remains a major public health challenge with incidence rates rising particularly in Asian populations.^{2,5} Epigallocatechin-3-gallate (EGCG), the principal catechin in green tea, has been widely investigated for its potential anti-carcinogenic and chemopreventive properties.^{3,6} This systematic review aimed to evaluate the efficacy of EGCG supplementation for both primary and secondary prevention of breast cancer.

Methods

A systematic search of PubMed was conducted to identify randomized controlled trial (RCTs) and clinical studies published between 2010–2025 that evaluated EGCG or standardized green tea extracts in women at risk for breast cancer or breast cancer survivors. Study selection was guided by the PICO framework, and data were synthesized on population, intervention, comparison, and outcomes.

Results

Seven eligible studies were included. A presurgical pilot trial demonstrated that oral supplementation with Greenselect® Phytosome® resulted in detectable EGCG accumulation in breast tumor tissue and was correlated with a reduction in Ki-



67 proliferation index, supporting its potential antiproliferative effect.⁴ In the Minnesota Green Tea Trial, daily supplementation with 843 mg EGCG was generally well tolerated in postmenopausal women, although liver enzyme elevations occurred more often in the green tea extract group, highlighting hepatotoxicity as the primary safety concern.¹ A hospital-based case-control study in Hong Kong found no overall association between tea consumption and breast cancer risk, but tea drinking was linked to a reduced risk in premenopausal women, while postmenopausal ER-negative women who consumed green tea showed an increased risk of breast cancer.² A large randomized controlled trial among

postmenopausal women showed no overall effect on mammographic density, but a significant reduction was observed in younger women aged 50–55 years, suggesting an age-dependent effect.⁷ Short-term intervention with Polyphenon E in healthy postmenopausal women improved metabolic markers including LDL cholesterol, glucose, and insulin sensitivity, but did not consistently affect sex hormones.⁸ Among survivors of hormone receptor–negative breast cancer, Polyphenon E was associated with decreased angiogenic growth factors such as VEGF and HGF, indicating potential effects on growth factor signaling.⁹ The Minnesota Green Tea Trial design paper further highlighted its role as a rationale for biomarker-driven prevention trials.¹⁰

Conclusion

EGCG demonstrates bioavailability in breast tissue and potential antiproliferative and metabolic benefits, with age- and population-dependent effects. Although findings support EGCG as a promising adjunct for breast cancer prevention, heterogeneity across trials highlights the need for larger, long-term studies to define optimal dosage, safety, and clinical applicability.

Keywords

EGCG; green tea; breast cancer; prevention; systematic review

Does Omega-3 Supplementation Added to Exercise Attenuates Inflammaging? Effects on Circulating IL-6 in Older Adults: A Meta-Analysis of Randomized Controlled Trials

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Abstract

Background and Aim: Low-grade systemic inflammation (inflammaging) characterizes older adults, with circulating interleukin-6 (IL-6) as a key biomarker linked to frailty, physical decline, and cardiometabolic risk. Exercise repeatedly elicits anti-inflammatory myokine responses, while long-chain omega-3 (EPA/DHA) promotes resolution of inflammation via membrane remodelling and specialized pro-resolving mediators. This study aims to determine whether adding omega-3 supplementation to structured exercise reduces resting IL-6 more than exercise alone in older adults.

Methods: A systematic search was undertaken in PubMed using a pre-specified Medical Subject Headings (MeSH) strategy that combined terms for long-chain omega-3 fatty acids, structured exercise/physical activity, Interleukin-6, the aged population, and randomized/clinical trial filters; animal-only studies were excluded. This search yielded 22 records. Complementary searches in Scopus (14 records) and ResearchGate (18 records) were pooled with PubMed **Results** and deduplicated prior to screening. Four RCTs (duration 8–18 weeks) met all criteria. Pooled effects were estimated with a random-effects model using restricted maximum likelihood (REML). Between-study heterogeneity was summarized by Q, I², and τ^2 summarized between-study heterogeneity. Potential small-study effects were explored visually using a funnel plot.

Results: Pooled analysis using a REML model shows that post-intervention IL-6 was lower by 0.77 pg/mL when omega-3 supplementation was added to exercise versus exercise alone (MD = -0.77 pg/mL; 95% CI -1.46 to -0.08; p = 0.03; k = 4), indicating a statistically significant, directionally consistent attenuation of resting inflammation. Between-study

heterogeneity was moderate ($Q = 7.04$, $df = 3$, $p = 0.07$; $I^2 = 55\%$; $\tau^2 = 0.26$), suggesting that differences in trial characteristics (e.g., duration 8–18 weeks, exercise mode, and omega-3 dose/form) contributed to variability in effect sizes. Funnel-plot analysis did not reveal marked asymmetry.

Conclusion: Across randomized trials in older adults, omega-3 supplementation added to exercise achieves a modest but statistically significant reduction in resting IL-6 versus exercise alone, consistent with attenuation of inflammaging.

Keywords: Omega-3, Exercise, Interleukin-6, Inflammaging, Older Adults

Hubungan antara Indeks Massa Tubuh dan Kadar Asam Urat pada Pegawai Rumah Sakit Umum Universitas Muhammadiyah Malang: Analisis Data Pemeriksaan Kesehatan Umum Tahun 2023–2024.

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Abstract

Background: Hyperuricemia is increasingly recognized as a cardiometabolic risk factor, yet data among Indonesian healthcare workers remain limited. Healthcare workers, particularly those engaged in shift work, are prone to obesity and metabolic disorders that may predispose to hyperuricemia.

Objective: To examine the association between body mass index (BMI) and hyperuricemia among hospital employees.

Methods: This analytical observational study with a cross-sectional design utilized general check-up data from University of Muhammadiyah Malang (UMM) Hospital (2023–2024). Of 467 employees screened, 67 met the inclusion criteria of complete BMI and serum uric acid data. Hyperuricemia was defined as >7 mg/dL in men and >6 mg/dL in women. Associations between BMI and hyperuricemia were assessed using Chi-square or Fisher's exact test as an alternative.

Results: Among 67 employees (34 males, 33 females), hyperuricemia prevalence was 16.4%. It was more common in males (23.5% vs. 9.1% in females) and in employees aged 40–49 years (18.7%). Hyperuricemia prevalence was higher in obese employees (27.8%) compared with non-obese (12.2%), although this association was not statistically significant ($p = 0.127$).

Conclusion: No significant association was found between BMI-defined obesity and hyperuricemia among hospital employees, although higher prevalence was observed in males, middle-aged groups, and obese individuals. Future occupational health screening should consider integrating central adiposity indices such as waist circumference or waist-to-height ratio to improve hyperuricemia risk identification.

Keywords: Hyperuricemia, Body Mass Index, Obesity, Hospital Employee

***Fasting-Mimicking Diet* pada Pasien Kanker yang Menjalani Terapi Aktif: Tinjauan Sistematis tentang Keamanan dan Efek terhadap IGF-1**

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Latar Belakang dan tujuan: *Fasting-Mimicking Diet* (FMD) merupakan diet yang dirancang untuk meniru respon seluler dan metabolik yang bermanfaat dari puasa tradisional sambil tetap memungkinkan asupan makanan. FMD telah muncul sebagai intervensi metabolik yang berpotensi meningkatkan toleransi pengobatan dan memodulasi metabolisme tumor pada pasien kanker. Tinjauan sistematis ini bertujuan untuk mengevaluasi profil keamanan FMD dan menilai efeknya terhadap kadar IGF-1 serum pada pasien kanker dewasa yang sedang menjalani pengobatan aktif.

Metode: Pencarian literatur secara komprehensif dilakukan pada basis data PubMed/MEDLINE, Scopus, ProQuest, Google Scholar, Cochrane CENTRAL, dan ClinicalTrials.gov hingga 3 Oktober 2025. Penyaringan studi menggunakan metode PRISMA. Penilaian risiko bias dilakukan menggunakan JBI Critical Appraisal Checklist for Quasi-Experimental Studies dan CEBM RCT Appraisal Tool.

Hasil: Dari 301 studi yang teridentifikasi, sebanyak lima studi diinklusi, terdiri dari dua RCT dan tiga *single-arm trial*. Efek samping berdasarkan CTCAE menunjukkan secara keseluruhan FMD dapat ditoleransi dengan baik dan aman. RCT menunjukkan tidak ada perbedaan efek samping yang signifikan antara kelompok FMD dan kontrol, bahkan kejadian muntah dan neutropenia derajat tiga di kelompok kontrol secara signifikan lebih tinggi dari kelompok FMD. Semua studi melaporkan penurunan kadar IGF-1 pasca FMD, meskipun signifikansi statistik bervariasi.

Kesimpulan: FMD aman dan berpotensi menurunkan kadar IGF-1 pada pasien kanker yang menjalani terapi aktif.

Kata kunci: *Fasting-mimicking diet*, kanker, keamanan, terapi kanker, Insulin-like Growth Factor-1 (IGF-1)

Hubungan Indeks Massa Tubuh (IMT) dengan respon Kemoterapi Neoadjuvan rejimen berbasis *Taxane* pada penderita Kanker Payudara lanjut lokal dinilai dari Skoring *Residual Cancer Burden (RCB)*

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Abstrak

Latar Belakang: Populasi obesitas berdasarkan IMT di Indonesia menunjukkan peningkatan. IMT diteliti sebagai faktor yang memengaruhi efektivitas kemoterapi dan prognosis kanker. *Overweight* dan obesitas berkaitan dengan terbentuknya lingkungan mikro pro-resistensi, sedangkan *underweight* berkaitan dengan toksisitas obat. Namun penelitian yang secara spesifik menilai hubungan IMT dengan respon kemoterapi berdasarkan skor *RCB* masih terbatas.

Tujuan: Penelitian bertujuan untuk Mengetahui hubungan antara IMT dengan respon Kemoterapi Neoadjuvan rejimen berbasis *taxane* pada penderita Kanker Payudara lanjut lokal dinilai dari Skoring *RCB*.

Metode: Studi observasi analitik dengan pendekatan *cross-sectional*. Dengan Teknik *total sampling* didapatkan 36 data rekam medis penderita kanker payudara lanjut lokal yang mendapat kemoterapi neoadjuvant rejimen berbasis *Taxane* di Rumah Sakit Onkologi Surabaya periode 1 Januari 2023 – 31 Desember 2024 yang telah memenuhi kriteria inklusi dan kriteria eksklusi. Data dianalisis dengan analisis multivariat regresi logistik ordinal.

Hasil: Hasil analisis didapatkan nilai $p = 0,029$ ($p < 0,05$). Hal ini menunjukkan bahwa terdapat hubungan yang signifikan antara IMT dengan skor *RCB*. Kekuatan hubungan didapat dari nilai korelasi $r = 0,365$ yang menunjukkan bahwa IMT dan skor *RCB* memiliki korelasi positif.

Kesimpulan: Terdapat hubungan antara IMT dengan respon Kemoterapi Neoadjuvan rejimen berbasis *taxane* pada penderita Kanker Payudara lanjut lokal dinilai dari Skoring *RCB*.

Kata kunci: IMT, Kanker payudara, neoadjuvan, respon kemoterapi, *RCB*

Peran Probiotik dalam Optimalisasi Mikrobiota Usus untuk Pencegahan Kanker Kolorektal: *Systematic Review*

Otin Rynda Simanjuntak
RSU Bunda Mulia

ABSTRAK

Latar Belakang: Kanker kolorektal (KKR) merupakan salah satu penyebab utama kematian akibat kanker di dunia. Disbiosis mikrobiota usus diketahui berperan penting dalam patogenesis KKR melalui peningkatan inflamasi kronik dan produksi metabolit prokarsinogenik. Pendekatan pencegahan berbasis probiotik kini menjadi fokus penelitian, mengingat kemampuannya memodulasi ekosistem mikroba intestinal, memperbaiki integritas mukosa, serta menstimulasi imunitas antitumor.

Tujuan: Tinjauan sistematis ini bertujuan untuk menilai bukti empiris terbaru (2020–2025) terkait peran probiotik dalam pencegahan KKR, meliputi jenis strain yang digunakan, mekanisme kerja biologis, dan signifikansi luaran klinis maupun preklinis.

Metode: Penelusuran literatur dilakukan pada PubMed, Scopus, ProQuest, dan Web of Science dengan **Kata kunci** “*probiotics*”, “*colorectal cancer*”, dan “*prevention*”. Hanya artikel orisinal dengan desain uji klinis, kohort, kasus-kontrol, atau penelitian eksperimental yang dipublikasikan tahun 2020–2025 dan mengevaluasi efek probiotik terhadap risiko atau perkembangan KKR yang dimasukkan. Studi tinjauan sistematis, meta-analisis, dan penelitian hewan tanpa data biologis relevan dikeluarkan dari analisis.

Hasil: Lima artikel memenuhi kriteria: tiga studi klinis (Iran, AS, Taiwan) dan dua penelitian preklinis (Tiongkok). Strain utama yang diteliti meliputi *Bifidobacterium spp.*, *Lactobacillus spp.*, dan *Clostridium butyricum* MIYAIRI 588. **Hasil** menunjukkan peningkatan dominasi bakteri protektif, penurunan polip adenomatosa, serta penghambatan pertumbuhan tumor secara signifikan pada model hewan. Sebagian uji klinis menunjukkan efek protektif yang bermakna, meski heterogenitas metodologi masih tinggi.

Kesimpulan: Probiotik berpotensi sebagai agen pencegahan adjuvan terhadap KKR melalui rekonstruksi mikrobiota, peningkatan produksi SCFA, modulasi imun mukosa, dan perbaikan integritas barrier usus. Diperlukan uji klinis terstandar jangka panjang untuk menentukan strain, dosis, dan durasi optimal guna penerapan klinis berbasis bukti yang lebih kuat.

Kata kunci: bakteri, kanker kolorektal, probiotik

Challenges in Nutritional Management of a Severely Malnourished Post-Craniotomy Patient with Intracerebral and Intraventricular Hemorrhage: A Case Report

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Introduction: Intracerebral hemorrhage (ICH) is a life-threatening neurological emergency. In neurocritical care, nutrition is a crucial yet often neglected component influencing recovery. Malnutrition and feeding intolerance frequently complicate management, particularly in patients requiring prolonged ventilation.

Objective: To describe the clinical and nutritional management of a postoperative ICH and intraventricular hemorrhage (IVH) patient with severe protein–energy malnutrition and feeding intolerance.

Case Presentation: A 62-year-old Balinese male presented with sudden loss of consciousness and was diagnosed with hypertensive ICH and IVH. He underwent craniotomy and external ventricular drainage. Nutritional assessment revealed severe protein–energy malnutrition. Enteral nutrition was initiated but was complicated by feeding intolerance, necessitating temporary total parenteral nutrition (TPN). Despite multidisciplinary management and feeding adjustments, the patient developed respiratory failure and bradycardia on day 26, resulting in death.

Discussion: This case illustrates how acute neurological insult and pre-existing malnutrition can complicate postoperative recovery. The alternating tolerance to enteral feeding reflected the gastrointestinal dysmotility commonly seen in neurocritical patients. Transitioning between enteral and parenteral nutrition was necessary yet challenging. Evidence supports early individualized feeding and cautious caloric escalation to prevent underfeeding and refeeding syndrome. Malnutrition remains a strong predictor of poor outcomes in ICH, as demonstrated in this case.

Conclusion: This case underscores that nutritional management is a critical determinant of survival and recovery in postoperative hemorrhagic stroke. Personalized, closely monitored nutrition strategies are essential, especially for severely malnourished neurocritical patients.

Keywords: Intracerebral hemorrhage; neurocritical care; malnutrition; postoperative management; case report.

Hubungan Karakteristik Ibu Hamil dengan Kejadian Kekurangan Energi Kronis (KEK) di Puskesmas Nusa Penida II Tahun 2024

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Abstrak

Latar Belakang dan Tujuan:

Kekurangan Energi Kronis (KEK) pada ibu hamil meningkatkan risiko komplikasi baik bagi ibu maupun janin, terutama di wilayah kepulauan seperti Nusa Penida, yang memiliki keterbatasan akses layanan kesehatan dan pangan. Prevalensi nasional mencapai 17,3% pada tahun 2023.^{1,2} Tujuan penelitian ini untuk mengetahui hubungan antara karakteristik ibu hamil (usia, gravida, tingkat pendidikan, pekerjaan, status ekonomi, dan status tempat tinggal) dengan kejadian KEK di Puskesmas Nusa Penida II tahun 2024.

Metode:

Penelitian ini menggunakan desain analitik *cross-sectional* dengan *total sampling* yaitu 156 responden ibu hamil yang melakukan kunjungan ANC pertama di Puskesmas Nusa Penida II tahun 2024. Status KEK ditentukan melalui pengukuran Lingkar Lengan Atas (LILA) dengan batas <23,5 cm.³ Data dianalisis menggunakan uji Chi-square dengan nilai $p < 0,05$ dianggap bermakna.

Hasil:

Prevalensi KEK ditemukan sebesar 19,9% (31 dari 156 responden). Karakteristik ibu hamil yang berhubungan signifikan dengan KEK adalah jumlah kehamilan/gravida ($p=0,000$), pendidikan ($p=0,03$), status ekonomi ($p=0,03$), dan status tempat tinggal ($p=0,000$). Usia dan pekerjaan tidak menunjukkan hubungan bermakna ($p=0,271$ dan $p=0,513$). Faktor sosial ekonomi dan reproduktif lebih dominan mempengaruhi kejadian KEK dibandingkan faktor usia atau pekerjaan.^{3,5}

Kesimpulan:

Prevalensi KEK di Puskesmas Nusa Penida II tahun 2024 lebih tinggi dari target nasional. Karakteristik ibu hamil yang berhubungan dengan kejadian KEK adalah multigravida, pendidikan rendah, ekonomi rendah, dan status perantau.

Kata kunci: Ibu hamil, Kekurangan Energi Kronis, LILA, status ekonomi, Nusa Penida

TERAPI MEDIK GIZI PADA MALNUTRISI SEDANG, *WOUND DEHISCENCE* PASCA OPERASI LAPAROTOMI, INFEKSI LUKA OPERASI DAN ANEMIA RINGAN NORMOSITIK NORMOKROM

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Latar Belakang: Malnutrisi pasca bedah merupakan kondisi serius yang dapat menghambat penyembuhan luka, meningkatkan risiko infeksi, dan memperpanjang masa rawat. Dalam kasus ini, fokus membahas pendekatan terapi gizi pada pasien dengan komplikasi pasca operasi.

Ilustrasi kasus: Seorang wanita usia 30 tahun, dengan riwayat operasi laparotomi dan relaparotomi, dengan keluhan luka operasi terbuka, nyeri, dan keluarnya cairan purulen. BB badan pasien 39 kg dengan tinggi badan 145 cm. Diagnosa gizi didapatkan malnutrisi sedang dengan ditandai penurunan berat badan signifikan karena asupan makanan pasien menurun, yakni 13,3% dalam 6 bulan (dari 45 kg menjadi 39 kg) dan IMT 18,55 kg/m² (underweight). Pemeriksaan laboratorium menunjukkan anemia normositik normokrom (Hb 9,3 g/dl) dan albumin 3,5 g/dL.

Diskusi: Terapi medik gizi diberikan untuk memenuhi kebutuhan hipermetabolik dan mendukung perbaikan jaringan. Terapi medik gizi diberikan berupa diet TKTP dengan ekstra putih telur, dengan kebutuhan energi 2.025 kkal/hari dan protein tinggi 101,25 gram/hari (2,6 g/kgBB), diformulasikan dari makanan biasa dan suplementasi oral. Monitoring dilakukan terhadap toleransi gastrointestinal, asupan makanan (>80%), dan progres penyembuhan luka.

Kesimpulan: Intervensi gizi yang agresif, berfokus pada pemenuhan energi dan protein, merupakan komponen krusial dalam tata laksana pasien malnutrisi pasca bedah dengan komplikasi luka. Pendekatan ini penting untuk memperbaiki status gizi, mendukung penyembuhan luka, dan memperbaiki prognosis pasien.

Kata kunci: Malnutrisi sedang, *wound dehiscence*, terapi medik gizi, anemia normositik, penyembuhan luka.

Laporan Kasus: Pendekatan Gizi Klinik pada Ibu Hamil dengan Anemia Defisiensi Besi Berulang

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Latar Belakang: Anemia defisiensi besi (ADB) merupakan masalah gizi tersering pada kehamilan dan berkontribusi terhadap 40% kasus anemia global pada ibu hamil¹. Multiparitas dan cadangan besi yang belum pulih dari kehamilan sebelumnya meningkatkan risiko ADB berulang². Pendekatan gizi klinik berperan penting untuk menilai etiologi, status besi, dan menentukan intervensi nutrisi maupun farmakologis yang tepat menjelang persalinan³.

Ilustrasi Kasus: Seorang ibu hamil 23 tahun, G2P1A0 usia kehamilan 36 minggu, dengan riwayat anemia pada kehamilan pertama, datang dengan keluhan lemas dan pucat. IMT pra-hamil 21,6 kg/m² dengan kenaikan berat badan 13 kg selama kehamilan, LILA 24,5 cm. Pasien rutin mengonsumsi tablet tambah darah sejak trimester I, namun mengalami mual, muntah, dan memiliki kebiasaan minum teh. Pemeriksaan menunjukkan Hb 8,7 g/dL, Ht 27%, ferritin 5,3 ng/mL. Pasien dirawat inap dan mendapat transfusi PRC 1 kolf serta infus feritin. Setelah terapi, Hb meningkat menjadi 9,6 g/dL, kondisi klinis membaik, dan pasien melahirkan bayi aterm awal dalam kondisi stabil.

Diskusi: ADB pada kasus ini disebabkan oleh kombinasi defisiensi cadangan besi akibat kehamilan sebelumnya dan gangguan absorpsi karena konsumsi teh (tanin) serta mual dan muntah. Pemberian Fe parenteral terbukti efektif mempercepat peningkatan Hb pada ibu hamil dengan intoleransi Fe oral^{4,5}. Serta dioptimalisasi dengan edukasi yang memfokuskan untuk memperbaiki status besi.

Kesimpulan: Pendekatan gizi klinik komprehensif melalui identifikasi faktor risiko, terapi, serta edukasi efektif memperbaiki status besi ibu hamil dengan anemia berulang.

Kata kunci: Anemia defisiensi besi; kehamilan; ferritin; terapi Fe parenteral; gizi klinik.

Association Between Malnutrition and Adverse Cardiovascular Events in Coronary Artery Disease: A Systematic Review and Meta-Analysis

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Background: Malnutrition is a prevalent and critical condition in patients with coronary artery disease (CAD), often leading to poor clinical outcomes. It is associated with altered immune function, increased inflammation, and impaired endothelial function, all of which contribute to the progression of cardiovascular diseases. Despite its potential impact, the relationship between malnutrition and adverse cardiovascular events (CVEs) in CAD patients remains inadequately understood. Existing studies have reported varying **Results**, but a comprehensive synthesis of the evidence is lacking. This systematic review and meta-analysis aims to assess the association between malnutrition and the incidence of CVEs in CAD patients. By aggregating data from multiple studies, this analysis seeks to clarify the role of malnutrition in exacerbating cardiovascular risk and inform clinical strategies to improve patient management and outcomes in CAD

Method: This study conducted a systematic review and meta-analysis of observational studies to examine the association between malnutrition and adverse cardiovascular events in patients with coronary artery disease (CAD). A total of 25 studies, comprising over 180,000 CAD patients, were included in the analysis. Nutritional status was assessed using three commonly utilized indices: the Controlling Nutritional Status (CONUT) score, the Geriatric Nutritional Risk Index (GNRI), and the Prognostic Nutritional Index (PNI). The primary outcomes were major adverse cardiovascular events (MACE) and all-cause mortality. Pooled hazard ratios (HRs) with 95% confidence intervals (CIs) were calculated to determine the strength of the association. Subgroup analyses were performed to evaluate

the consistency of the **Results** across different CAD phenotypes and nutritional indices. Heterogeneity was assessed using the I^2 statistic, and publication bias was examined with Egger's regression test.

Results: A total of 25 studies involving over 180,000 patients with coronary artery disease were included in the quantitative synthesis. Across studies, nutritional status was evaluated using the Controlling Nutritional Status (CONUT) score, Geriatric Nutritional Risk Index (GNRI), and Prognostic Nutritional Index (PNI). The pooled analysis demonstrated that malnutrition was significantly associated with an increased risk of major adverse cardiovascular events (MACE) (pooled hazard ratio [HR] = 1.68; 95% confidence interval [CI] 1.43–1.97; $P < 0.001$) and all-cause mortality (HR = 1.82; 95% CI 1.55–2.13; $P < 0.001$). Subgroup analyses showed consistent associations across different CAD phenotypes—acute coronary syndrome and stable CAD—as well as across various nutritional indices, with no significant interaction effects ($P > 0.05$). Moderate heterogeneity was observed among studies ($I^2 = 47\%$), but leave-one-out sensitivity analyses confirmed the robustness of the **Results**. Publication bias was not significant as assessed by Egger's regression test ($P > 0.10$). Overall, malnutrition remained an independent predictor of adverse cardiovascular outcomes after multivariable adjustment for age, comorbidities, and left ventricular ejection fraction.

Conclusion: Malnutrition is significantly associated with an increased risk of major adverse cardiovascular events and all-cause mortality in patients with coronary artery disease. The findings suggest that poor nutritional status serves as an independent predictor of adverse cardiovascular outcomes, regardless of CAD phenotype or nutritional assessment tool used. These **Results** highlight the importance of monitoring and addressing malnutrition in CAD patients to improve clinical outcomes. Further studies are needed to explore the mechanisms underlying this association and evaluate the effectiveness of nutritional interventions in reducing cardiovascular risk.

Keyword: Malnutrition, Coronary Artery Disease, Adverse Cardiovascular Events, Cardiovascular Risk, Nutritional Status

The Effectiveness of Local Supplementary Feeding in Increasing Body Weight and Mid-Upper Arm Circumference of Pregnant Women with Chronic Energy Deficiency (CED) at Sonraen Primary Health Center

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Abstract

Background and Objectives : Maternal Chronic Energy Deficiency (CED) remains a persistent nutritional challenge that significantly contributes to adverse pregnancy outcomes, including Low Birth Weight (LBW), and accounts for approximately 40% of national childhood stunting cases. This study aimed to the effectiveness of a locally sourced supplementary feeding program in improving the nutritional status of pregnant women diagnosed with CED, as measured by changes in Body Weight (BW) and Mid-Upper Arm Circumference (MUAC).^{(1) (2)} **Methods** : This quantitative, one-group pre–post quasi-experimental study involved 23 pregnant women with CED (MUAC < 23.5 cm). Participants received locally prepared supplementary food daily for 45 consecutive days, providing approximately 500–700 kcal and 18–19% protein per day.⁽³⁾ Anthropometric data (BW and MUAC) were analyzed using the Paired Sample T-test and Wilcoxon Signed-Rank Test.⁽⁴⁾

Results: The 45-day intervention resulted in statistically significant improvements in both anthropometric indicators ($p < 0.001$ for both). Mean body weight increased from 48.06 ± 5.25 kg to 51.89 ± 4.35 kg, reflecting an average gain of 3.83 kg. Mean MUAC increased from 22.46 ± 0.94 cm to 23.91 ± 0.96 cm, exceeding the clinical CED threshold of 23.5 cm.

Conclusion: Local supplementary feeding effectively improved the nutritional status of pregnant women with CED, as reflected by significant increases in body weight and MUAC.⁽⁵⁾⁽⁶⁾

Keywords :

Local supplementary food, CED, pregnant women, MUAC

PENGARUH KONSUMSI MINYAK IKAN OMEGA-3 TERHADAP PROSES *ANTI-AGING* : SEBUAH *SYSTEMATIC REVIEW*

Syahrana Naura Shedysni

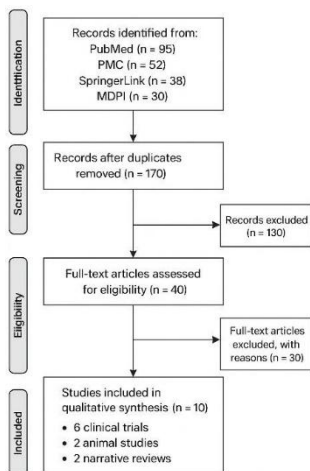
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Latar Belakang dan Tujuan

Penuaan ditandai dengan pemendekan telomer, inflamasi kronis, dan stres oksidatif. Asam lemak omega-3 memiliki potensi efek protektif terhadap proses penuaan melalui mekanisme anti-inflamasi dan antioksidan. Tujuan *systematic review* ini adalah mengevaluasi pengaruh konsumsi minyak ikan omega-3 terhadap biomarker *anti-aging*, terutama panjang telomer dan aktivitas telomerase.

Metode

Systematic review ini dilakukan berdasarkan prinsip PRISMA. Penelusuran literatur dilakukan melalui database PubMed, PMC, SpringerLink, dan MDPI untuk jurnal tahun 2020-2025 menggunakan **Kata kunci** : "*omega-3*", "*telomere*", "*telomerase*", "*anti-aging*". Kriteria inklusi : artikel dalam bahasa Indonesia/Inggris, studi manusia/hewan, serta melaporkan hubungan omega-3 dengan biomarker *aging*. Sebanyak 10 studi (6 uji klinis, 2 hewan, 2 ulasan) dianalisis.



Gambar 1. PRISMA

No	Penulis (Tahun)	Desain Studi	Populasi / Sampel	Intervensi Omega-3	Durasi	Biomarker Penuaan	Hasil Utama	Kesimpulan	Kualitas Studi*
1	Ali A, et al. (2022)	Uji klinis acak	120 dewasa sehat	2 g/hari EPA + DHA	6 bulan	Panjang telomer, telomerase	Panjang telomer meningkat signifikan	Omega-3 memperpanjang telomer	Tinggi (Cochrane: risiko bias rendah)
2	Sawan N, et al. (2022)	Meta-analisis	8 studi klinis	1–3 g/hari	3–12 bulan	Panjang telomer	Efek positif konsisten antar studi	Efek protektif signifikan	Tinggi (PRISMA & AMSTAR: baik)
3	Seo J, et al. (2022)	Cross-sectional	1.200 pria dewasa	Asupan diet omega-3 alami	-	Panjang telomer leukosit	Asupan tinggi → telomer lebih panjang	Korelasi positif antara asupan dan panjang telomer	Sedang (NOS: 7/9)
4	Farzaneh F, et al. (2024)	Studi hewan	Tikus fat-1 transgenik	Omega-3 endogen tinggi	12 minggu	Panjang telomer jaringan	Kadar omega-3 tinggi → telomer lebih panjang	Efek protektif oksidatif	Sedang (validasi hewan terbatas)
5	Epel E, et al. (2021)	Uji klinis	90 dewasa stres tinggi	1.25–2.5 g/hari	4 bulan	Telomer, IL-6, CRP	IL-6 & CRP turun, telomer stabil	Efek anti-inflamasi & anti-aging	Tinggi (Cochrane: risiko bias rendah)
6	Chang Y, et al. (2025)	Kohort longitudinal	1.050 responden	Serum omega-3 alami	-	IL-6, CRP, aging rate	Omega-3 tinggi → inflamasi rendah	Efek dimediasi inflamasi	Sedang–Tinggi (NOS: 8/9)
7	Frontiers Editorial (2024)	Review naratif	-	-	-	Telomer, intervensi nutrisi	Telomer sebagai target nutrisi	Omega-3 kandidat potensial	Sedang (naratif, tanpa meta-analisis)
8	Tilekli A & Acar Tek N (2023)	Review singkat	-	-	-	Panjang telomer	Ringkasan efek omega-3	Perlu uji klinis lanjutan	Sedang (literatur terbatas)
9	MDPI (2022)	Uji klinis	80 lansia sehat	EPA dari mikroalga	3 bulan	ROS, telomerase	ROS ↓, telomerase ↑	Potensi sumber nabati omega-3	Tinggi (Cochrane: risiko bias rendah)
10	Verywell Health (Nature Aging, 2025)	Uji klinis (Do HEALTH Trial)	1.500 lansia >60 tahun	Omega-3 + vitamin D	3 tahun	Panjang telomer, fungsi fisik	Aging biologis melambat	Efek sinergis	Tinggi (multicenter, double-blind)

Tabel 1. Ringkasan Penelitian

Hasil

Mayoritas studi menunjukkan bahwa suplementasi omega-3 (EPA dan DHA) berhubungan positif dengan panjang telomer dan/atau aktivitas telomerase. Efek protektif diduga diperantarai oleh penurunan inflamasi sistemik (IL-6, CRP) dan stres oksidatif. Kombinasi omega-3 dan vitamin D dan olahraga menunjukkan **Hasil** sinergis dalam memperlambat *aging*.

Kesimpulan

Konsumsi omega-3, terutama dalam dosis klinis, berpotensi memperlambat penuaan biologis melalui perlindungan telomer dan pengurangan inflamasi. Diperlukan uji klinik lebih lanjut dalam kurun waktu yang lama untuk konfirmasi pengaruh tersebut.

Kata kunci

Omega-3, Telomer, Telomerase, *Anti-aging*, Inflamasi

Vitamin D Supplementation and Spinal Fusion Success: A Meta- Analysis

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Background Poor bone mineralization and various musculoskeletal disorder has been linked to Vitamin D deficiency, especially osteoporosis and fractures.(1,2) Recently, there has been growing an interest towards the potential impacts of vitamin D on the outcomes of spinal fusion surgery ; however, clinical evidence supporting its benefit in spinal fusion remains inconclusive.

Objective This meta-analysis aims to evaluate the effect of vitamin D supplementation on spinal fusion success rates in patients undergoing spinal fusion surgery.

Methods A systematic literature search was performed using PubMed in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Eligible studies included randomized controlled trials, prospective, and retrospective cohorts reporting spinal fusion outcomes in patients receiving vitamin D supplementation. Data were analyzed using a random-effects model with the Mantel-Haenszel **Method**, and heterogeneity was assessed using the I^2 statistic.(3)

Results Three studies met the inclusion criteria, comprising one randomized controlled trial and two prospective cohort studies, involving a total of 270 patients (170 in the vitamin D group and 100 in the control group). Pooled analysis demonstrated no statistically significant difference in fusion success between groups (risk ratio = 1.01; 95% CI = 0.72–1.41; $p > 0.05$). High heterogeneity was observed ($I^2 = 89\%$), and risk of bias ranged from low to moderate across studies.

Conclusion:

Vitamin D supplementation did not significantly improve spinal fusion success rates. Further large-scale randomized controlled trials with standardized supplementation protocols and controlled preoperative vitamin D levels are needed to clarify its potential role in enhancing spinal fusion outcomes.

Keywords: Preoperative Vitamin D, Spinal Fusion.

PERANAN IMUNONUTRIEN PADA PATOFISIOLOGI KANKER GASTER DENGAN PENYULIT *MODERATE PROTEIN ENERGY MALNUTRITION*: LAPORAN KASUS

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Latar Belakang

Tumor ganas gaster adalah pertumbuhan sel-sel abnormal pada lapisan gaster yang membentuk massa.¹ Pengobatan utama meliputi pengangkatan tumor kanker melalui operasi gastrektomi. untuk mengurangi infeksi dan komplikasi, dan penting untuk meningkatkan kekebalan tubuh pasien.² Peran imunonutrien melibatkan zat-zat esensial atas fungsi sistem kekebalan tubuh, pengendalian peradangan pada keganasan dengan cara mengurangi sitokin pro-inflamasi, yang meningkat pada pasien kanker, sehingga mengurangi respons inflamasi yang dapat menghambat fungsi kekebalan tubuh.^{3,4} Nutrien seperti arginin, asam lemak omega-3, dan glutamin dapat meningkatkan respons imun.⁵

Ilustrasi kasus

Seorang perempuan, 49 tahun dengan kanker Gaster Borrmann, BB 51.6 kg. Pemeriksaan laboratorium awal menunjukkan, deplesi imun berat (TLC 414 sel/ μ L), hipoalbuminemia 3.1 (g/dL)

Diskusi

Terapi medik gizi diberikan dengan *transitional feeding* dengan kebutuhan energi 1.900 kkal/hari, protein 1,5 g/kgBB/hari, suplementasi zinc, vitamin B kompleks, vitamin A, vitamin C, vitamin D, dan imunonutrien terdiri dari glutamin, arginin, omega 3.

Setelah 29 hari perawatan, kondisi klinis pasien menunjukkan perbaikan terutama dalam hal toleransi nutrisi bahkan pasca operasi.

Evaluasi dua minggu kemudian memperlihatkan perbaikan parameter laboratorium peningkatan TLC (414 menjadi 1.078.8 sel/ μ L) dan kenaikan albumin (3,1 menjadi 3,8 g/dL). **Hasil** ini menunjukkan efek imunonutrien sebagai terapi tambahan dalam mengurangi peradangan, memperbaiki status gizi, dan meningkatkan **Hasil** klinis pada pasien Kanker Gaster Borrmann yang menjalani operasi gastrektomi.^{5,6}

Kesimpulan

Terapi medik gizi pada pasien kanker Gaster Borrmann dengan penyulit moderate PEM diberikan energi dan protein yang adekuat serta pemberian imunonutrien berupa arginin, glutamin, omega 3 memiliki efek anti-inflamasi dan imunomodulator.

Kata kunci: kanker gaster, imunonutrien, arginin, glutamin, Omega-3

Terapi Gizi Medik Komprehensif pada Pasien Kanker Serviks Stadium Lanjut dengan Malnutrisi Berat, Ileus Obstruktif Parsial, dan Cedera Ginjal Akut: Sebuah Laporan Kasus

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Latar Belakang:

Kanker serviks merupakan keganasan dengan insiden dan mortalitas tinggi. Kondisi ini seringkali diperumit oleh malnutrisi berat dan kakeksia, sindrom metabolik kompleks yang secara signifikan memperburuk prognosis, menurunkan toleransi terhadap terapi, dan menurunkan kualitas hidup pasien.

Kasus:

Seorang wanita berusia 51 tahun dengan diagnosis kanker serviks stadium IIB progresif yang datang dengan keluhan penurunan asupan berat, mual, dan muntah. Pemeriksaan menunjukkan kondisi klinis yang kompleks, meliputi penurunan berat badan sebesar 20%, ileus obstruktif parsial, dan cedera ginjal akut (AKI) stadium II dengan hiperkalemia yang mengancam jiwa. Diagnosis malnutrisi berat (stadium 2) ditegakkan berdasarkan kriteria dari *Global Leadership Initiative on Malnutrition* (GLIM).

Diskusi:

Laporan ini menganalisis secara mendalam patofisiologi kakeksia kanker yang dimediasi oleh inflamasi sistemik sebagai pendorong utama proses katabolisme pada pasien. Dibahas pula dilema terapeutik dalam manajemen nutrisi, khususnya dalam menyeimbangkan kebutuhan protein yang tinggi pada kondisi kakeksia kanker dengan rekomendasi restriksi protein pada AKI non-dialisis. Rasionalisasi penggunaan nutrisi parenteral (PN) sebagai intervensi penyelamat jiwa pada kondisi kegagalan fungsi usus didasarkan pada pedoman *European Society for Clinical Nutrition and Metabolism* (ESPEN).

Kesimpulan:

Kasus ini menyoroti pentingnya pendekatan terapi gizi medik yang individual, dinamis, dan berbasis pedoman dalam menstabilkan pasien onkologi kritis dengan kegagalan multiorgan. Kolaborasi tim multidisiplin dan pemantauan metabolik yang ketat merupakan prasyarat untuk keberhasilan terapi.

Kata kunci: Kanker Serviks, Malnutrisi, Kakeksia, Terapi Gizi Medik, Nutrisi Parenteral, Cedera Ginjal Akut, Ileus Obstruktif.

The Effect of Tea in Healthy Aging in Asia: A Systematic Review

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Introduction: Life expectancy has increased globally, highlighting the importance of promoting healthy aging. The key factor lies in nutrition, like tea which has healthy aging property. The aim of this study is to evaluate how various kind of tea can affect healthy aging in Asian population.

Methods: This systematic review followed PRISMA 2020 guidelines and searched in PubMed, SpringerLink, and Cochrane databases for articles published between 2020 and 2025 with PICO framework. The problem include longevity in Asian Population with the intervention of tea consumption and non-tea consumption, with the outcomes assessing healthy aging in mental and physical health.

Results and Discussion: Five studies were included in which two studies analyzed mental health; with green tea associated with higher cognition ($p<0.05$), while matcha supplementation enhanced cognition in women ($p<0.05$). Three other studies related to physical health; in which study on Japanese herbal tea significantly reduce BMI, blood pressure, cholesterol, triglycerides, and uric acid ($p<0.05$). Tea also correlated with healthy dietary pattern, which linked to reduced frailty risk ($p<0.05$). Though, green tea was found connected with higher serum uric acid ($p<0.01$). This findings indicate that tea consumption may contribute to healthy aging in both mental and physical health through protection against oxidative stress which contribute more benefit both in mental and physical health.

Conclusion: True tea and herbal tea appear to support aspects of healthy aging in Asian populations, particularly in cognitive, frailty, and metabolic domains.

Keyword: healthy aging, tea, longevity, antioxidant.

PERAN ASAM LEMAK OMEGA-3 DALAM PENANGANAN PASIEN *SISTEMIK LUPUS ERITEMATOSUS* (SLE) DENGAN PENYULIT OBESITAS : LAPORAN KASUS

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Latar Belakang

Systemic Lupus Erythematosus (SLE) merupakan penyakit autoimun kronis multisistem yang lebih sering dialami oleh wanita usia reproduksi.¹ Proses inflamasi yang berlangsung pada SLE dapat diperberat oleh obesitas, yang ditandai oleh kondisi peradangan kronis tingkat rendah. Kombinasi keduanya dapat meningkatkan produksi sitokin proinflamasi, memperberat aktivitas penyakit, serta menurunkan respons terhadap terapi.^{2,3} Asam lemak omega-3 (EPA dan DHA) diketahui menekan aktivasi NF- κ B dan produksi sitokin proinflamasi seperti IL-6 dan TNF- α , sehingga berpotensi memperbaiki status imun pasien SLE. Laporan kasus ini bertujuan menggambarkan efek suplementasi omega-3 terhadap status inflamasi dan imun pada pasien SLE dengan obesitas.

Ilustrasi kasus

Seorang perempuan 21 tahun dengan SLE disertai obesitas (indeks massa tubuh (IMT) 36,8 kg/m²; *fat mass index* (FMI) 20,9 kg/m²) menunjukkan deplesi imun berat (TLC 477,4 sel/ μ L), peningkatan rasio neutrofil-limfosit (NLR) (3,37), serta hipoalbuminemia (3,1 g/dL).

Diskusi

Terapi medik gizi diberikan secara oral dengan kebutuhan energi 1.900 kkal/hari, protein 1,2–1,3 g/kgBB adjust, serta suplementasi imunonutrisi berupa omega-3 (3 g/hari), zinc, vitamin B kompleks, vitamin C, vitamin D, ekstrak *Curcuma longa*, dan ekstrak *Channa striata*. Setelah 14 hari, pasien menunjukkan perbaikan kondisi klinis, terutama dalam hal toleransi nutrisi. Evaluasi dua bulan kemudian memperlihatkan peningkatan TLC menjadi 1.038,5 sel/ μ L, penurunan NLR menjadi 1,5, serta kenaikan albumin menjadi 3,4 g/dL.

Kesimpulan

Hasil ini menunjukan bahwa suplementasi omega-3 berpotensi sebagai terapi pendukung dalam memberikan efek antiinflamasi dan imunomodulator sebagai bagian dari terapi medik gizi pada pasien SLE dengan penyulit obesitas.⁴

Kata kunci: *Systemic Lupus Erythematosus*, Obesitas, Omega-3, imunonutrisi, Rasio Neutrofil-Limfosit

**Peran *Oral Nutritional Supplements (Whey Protein)*,
Omega-3 dan Mikronutrien pada Kaheksia Kanker Payudara:
Laporan Kasus**

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Latar Belakang

Kaheksia pada pasien kanker menyebabkan kehilangan massa otot dan lemak, penurunan fungsi, dan menurunkan toleransi terhadap terapi onkologik.^{1,2} Pendekatan nutrisi multimodal yang mengombinasikan *Oral Nutrition Supplement (ONS)* berbasis *whey protein*, suplementasi omega-3, dan mikronutrien dapat mendukung anabolisme, menekan inflamasi, dan meningkatkan luaran klinis.²⁻⁴

Ilustrasi kasus

Perempuan, 43 tahun dengan karsinoma mammae sinistra pasca-kemoterapi direncanakan menjalani mastektomi. Pasien mengalami penurunan berat badan 25 kg (~42%) dalam 5 bulan, indeks massa tubuh (IMT) 17,2 kg/m², *fat-free mass index* (FFMI) 13,72 kg/m², dan *handgrip* 7 kg. Pemeriksaan laboratorium menunjukkan hipoalbuminemia (2,7 g/dL), hipokalemia ringan, anemia, serta defisiensi vitamin D (7 ng/mL).

Diskusi

Terapi medik gizi diberikan dengan target energi 1.700 kkal/hari dan protein 1,5 g/kgBB/hari melalui ONS berbasis *whey protein*, suplementasi omega-3, vitamin D 5.000 IU/hari, vitamin C, zinc, kurkumin, dan multivitamin, disertai koreksi elektrolit dan dukungan cairan parenteral. Setelah intervensi, berat badan meningkat (38,3 → 41,7 kg), FFM (30,87 → 33,57 kg), FFMI (13,72 → 14,92 kg/m²), *handgrip* (7 → 11 kg), serta albumin menjadi ±3,1 g/dL. Peningkatan vitamin D marginal (7 → 10 ng/mL) menunjukkan perlunya suplementasi jangka panjang. **Hasil** ini menunjukkan efek anabolik dan antiinflamasi dari kombinasi ONS *whey protein*, omega-3, dan mikronutrien.

Kesimpulan

Terapi nutrisi multimodal berbasis ONS *whey protein*; omega-3; serta mikronutrien dapat memperbaiki komposisi tubuh dan fungsi pada pasien kaheksia akibat kanker payudara, meningkatkan kesiapan perioperatif, dan menurunkan risiko komplikasi.

Kata kunci

kaheksia; kanker payudara; *whey protein*; omega-3; mikronutrien

Peran Probiotik, Omega-3 dan Mikronutrien pada *Myasthenia Gravis* dengan komplikasi *Community-Acquired Pneumonia*: Laporan Kasus

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Latar Belakang

Myasthenia gravis (MG) adalah penyakit autoimun yang menyebabkan kelemahan otot dan meningkatkan risiko aspirasi serta *Community-Acquired Pneumonia* (CAP).¹ Kondisi ini sering disertai malnutrisi akibat gangguan menelan dan peningkatan kebutuhan metabolik.² Terapi medik gizi yang tepat diperlukan untuk memperbaiki status gizi, imunitas, dan luaran klinis pasien MG dengan komplikasi CAP dan malnutrisi.³

Ilustrasi Kasus

Laki-laki, 41 tahun dengan *Myasthenia Gravis* dan *Community Aquired Pneumonia*. Pasien mengalami penurunan berat badan sebesar 7 kg (~13,4%) dalam 3 bulan, indeks massa tubuh (IMT) 16,5 kg/m², dan *handgrip* 7,3 kg. Pemeriksaan laboratorium menunjukkan leukositosis (13.210/uL), peningkatan *Neutrophil-to-Lymphocyte Ratio* (NLR) (4,1%), dan hipoalbuminemia ringan (3,1 g/dL).

Diskusi

Terapi medik gizi diberikan dengan target energi 1.900 kkal/hari dan protein 1,5 g/kgBB/hari, berupa *Oral Nutrition Supplement* (ONS), Probiotik 1 sachet/12 jam, suplementasi omega-3 1000 mg/hari, vitamin D 5.000 IU/hari, vitamin C, zinc, kurkumin dan multivitamin. Setelah intervensi, berat badan meningkat (44,1 → 46,3 kg), *handgrip* (7,3 → 8,1 kg), serta albumin menjadi 3,3 g/dL. **Hasil** ini menunjukkan efek imunomodulator dan antiinflamasi dari kombinasi Probiotik, omega-3, dan mikronutrien.

Kesimpulan

Terapi medik gizi berupa ONS, Probiotik, Omega-3 serta mikronutrien dapat memperbaiki status gizi, imunitas dan inflamasi pada pasien MG dengan komplikasi kompleks seperti CAP dan malnutrisi.

Kata kunci: *Myasthenia Gravis*, *Community Aquired Pneumonia*, Probiotik, Omega-3, Malnutrisi

Terapi Medik Gizi pada Pasien Weil's Disease dengan AKI AKIN III dan Malnutrisi Sedang: Laporan Kasus

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Latar Belakang

Weil's disease (leptospirosis berat) sering bermanifestasi dengan **sepsis dan AKI** yang dapat berlanjut menjadi **ensefalopati uremik**, sehingga membutuhkan tatalaksana intensif termasuk terapi pengganti ginjal dan dukungan nutrisi yang terpadu.^{1,2} Penentuan rute pemberian nutrisi, serta komposisi makronutrien dan pengawasan ketat terhadap keseimbangan cairan dan elektrolit menjadi kunci keberhasilan terapi.³

Ilustrasi kasus : Laki-laki, **76 tahun**, dirawat di ICU dengan **penurunan kesadaran e.c. encefalopati uremik, AKI AKIN tahap III** (post inisiasi HD) dan **Weil's disease**.

Pasien mengalami penurunan berat badan 5 kg (6,9%) dalam 2 bulan. Pemeriksaan fisik didapatkan konjungtiva anemis, sklera ikterik, *shifting dullness*, *muscle wasting*, edema pada kedua dorsum pedis. Pemeriksaan laboratorium menunjukkan hipoalbuminemia berat 2,4, Leukositosis 11220, Anemia 8.8, Trombositopenia 12.000, Peningkatan NLR 27.7, Deplesi berat sistem imun TLC 381, Penurunan fungsi ginjal UR/CR 218/4.87 eGFR 12, hiponatremia 129, Hiperbilirubinemia Direk/Total 7.56/10.04, Prokalsitonin 379.29, Infeksi ; Leptospira Positif.

Diskusi Penatalaksanaan nutrisi diberikan energi 1700 kkal dan dinaikkan 2000 kkal setelah kondisi stabil. Protein yang diberikan 0,8g dinaikkan secara bertahap hingga 1,2 g/kgBB/hari sesuai dengan PNPK dan ESPEN.^{4,5}

Pasien diberikan nutrisi secara bertahap melalui enteral dan parenteral kemudian oral disesuaikan dengan kondisi klinis pasien. Rencana nutrisi dipantau melalui metode 24-jam *recall*. Selama perawatan terjadi **perbaikan klinis** yaitu encefalopati uremik dan kesadaran membaik, perbaikan status metabolik. Diagnosis keluar mencerminkan perbaikan multi-sistem dengan Malnutrisi yang tertangani.

Kesimpulan: Pada pasien **Weil's disease** dengan **AKI AKIN III** dan malnutrisi, target energi-protein serta **monitoring metabolik-fungsional** dapat diimplementasikan secara aman dan berasosiasi dengan perbaikan klinis yang terukur di ICU.

Kata kunci

Weil's disease, AKI, Encefalopati uremik, Nutrisi ICU

TERAPI MEDIK GIZI PADA ANAK LAKI LAKI 13 TH DENGAN DIABETES KETOASIDOSIS BERULANG

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Rumah Sakit Umum Ari Canti

ABSTRAK

Latar Belakang

Diabetes Ketoasidosis (DKA) merupakan salah satu komplikasi yang mengancam nyawa pada pasien anak dengan DM Tipe 1. Pemberian rehidrasi intravena dan terapi insulin yang tepat dapat memperbaiki DKA lebih cepat dan lebih baik mengurangi kejadian edema serebral dan disfungsi organ. Waktu asupan makanan adalah salah satu faktor yang diabaikan. Setiap keterlambatan satu jam dalam memulai makan bisa memperpanjang waktu perbaikan DKA selama 30 menit, dan meningkatkan kemungkinan DKA berlangsung lebih dari 48 jam sebesar 8%.

Ilustrasi Kasus

Pasien laki-laki berusia 13 tahun dengan kondisi Ketoacidosis Diabetik pada DM Tipe 1 dengan dehidrasi sedang serta riwayat DKA berulang. Status Antropometri pasien adalah *Stunted*. Pasien telah diinisiasi pemberian asupan makanan <36 jam.

Kesimpulan

perluunya pemantauan intensif dan kolaborasi terapi medik gizi serta dosis terapi insulin pada pasien agar kadar gula darah pasien stabil sehingga bisa segera pulih tidak ketergantungan terhadap terapi intravena.

Kata kunci

DKA, berulang, waktu asupan makanan, fluktuasi gula darah

TERAPI MEDIK GIZI PASIEN *DEEP VEIN THROMBOSIS REGIO LOWER EKSTREMITY* + SELULITIS REGIO FEMUR ET DORSUM PEDIS BILATERAL DENGAN HIPOALBUMINEMIA DAN *SEVERE PROTEIN ENERGY MALNUTRITION* : LAPORAN KASUS

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Latar Belakang

Deep Vein Thrombosis (DVT) adalah kondisi yang ditandai dengan pembentukan trombus pada vena dalam, terutama pada ekstremitas bawah, yang disertai inflamasi. DVT dapat menyebabkan komplikasi serius seperti post-thrombotic syndrome dan emboli paru (PE) hingga kematian. Pasien dengan DVT seringkali mengalami malnutrisi dan gangguan metabolik lainnya yang memperburuk kondisi klinis mereka. terapi nutrisi medik yang tepat dapat memperbaiki status gizi dan mendukung pemulihan pasien.

Ilustrasi kasus

Seorang perempuan berusia 45 tahun yang didiagnosis dengan DVT pada ekstremitas bawah disertai selulitis bilateral. Penurunan berat badan sebesar 20% dalam 6 bulan. Pemeriksaan laboratorium menunjukkan hipoalbuminemia (2,2 g/dL), anemia (9.4 gr/dl) dan defisiensi vitamin D (20 ng/mL).

Diskusi

Kebutuhan energi diberikan dengan menggunakan rumus Harris Benedict sebesar 1700 kkal per hari, dengan komposisi makronutrien terdiri dari protein 1,5 g/kgBBI, karbohidrat 50%, dan lemak 31,9%. Nutrisi oral dan parenteral diberikan, termasuk suplementasi zinc, vitamin B kompleks, dan curcuma. Setelah intervensi gizi. status metabolik menunjukkan perbaikan signifikan pada kadar albumin (2.2 → 2.5 mg/dl), dan hemoglobin (9.4 → 10.5 mg/dl) disertai peningkatan kapasitas fungsional pasien yang tercermin pada peningkatan handgrip strength (6.7→ 8.5 kg). **Hasil** ini menunjukkan bahwa intervensi gizi yang sesuai dapat memperbaiki status gizi dan metabolik, serta mendukung pemulihan pasien DVT yang kompleks.

Kesimpulan

Pemberian nutrisi yang tepat dapat memperbaiki status gizi dan mendukung proses

pemulihan pada pasien dengan DVT dan malnutrisi. Terapi gizi yang disesuaikan dengan kondisi klinis pasien berperan penting dalam mengurangi komplikasi, mempercepat pemulihan, dan meningkatkan kualitas hidup pasien.

Kata kunci

Deep Vein Thrombosis (DVT), Malnutrisi, Hipoalbuminemia, anemia, Terapi gizi.

DEFISIENSI VITAMIN D PADA IBU DAN DAMPAKNYA TERHADAP LINGKAR KEPALA NEONATUS: SEBUAH TINJAUAN SISTEMATIS

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ABSTRAK

Tujuan: Mengevaluasi efek defisiensi vitamin D maternal terhadap lingkaran kepala neonatus berdasarkan bukti terkini dari studi observasional dan randomized controlled trials yang dipublikasikan dalam 5 tahun terakhir.

Metode: Pencarian sistematis dilakukan di database PubMed, Cochrane Library, dan ScienceDirect untuk studi yang dipublikasikan antara Januari 2020 hingga September 2025. Kriteria inklusi mencakup studi observasional dan RCT yang melibatkan ibu hamil dengan berbagai status vitamin D dan melaporkan pengukuran lingkaran kepala neonatal dalam 72 jam pertama setelah lahir. Seleksi studi menggunakan aplikasi Rayyan.ai dan penilaian risiko bias menggunakan Newcastle-Ottawa Scale, JBI Critical Appraisal Tool, dan Review Manager 5.4.1.

Hasil: Enam studi melibatkan 1.300 pasangan ibu-bayi dianalisis, terdiri dari satu RCT, dua studi kohort prospektif, dan tiga studi potong lintang. Temuan menunjukkan hubungan konsisten antara defisiensi vitamin D maternal dan lingkaran kepala neonatus yang lebih kecil. Ibu dengan status vitamin D normal memiliki 93,3% peluang melahirkan neonatus dengan lingkaran kepala normal, sementara ibu dengan defisiensi dan insufisiensi vitamin D mayoritas (91,7-96,8%) melahirkan neonatus dengan lingkaran kepala kecil. Kadar vitamin D maternal pada kelompok dengan neonatus berlingkaran kepala normal secara signifikan lebih tinggi ($16,07 \pm 8,21$ ng/mL) dibandingkan kelompok dengan lingkaran kepala kecil ($9,87 \pm 7,57$ ng/mL). Suplementasi vitamin D dosis tinggi (20 µg/hari) menunjukkan lingkaran kepala rata-rata $35,8 \pm 2,7$ cm dibanding dosis rendah 10 µg/hari ($34,7 \pm 2,4$ cm).

Kesimpulan: Defisiensi vitamin D maternal secara konsisten berkaitan dengan lingkaran kepala neonatus yang lebih kecil, mengindikasikan dampak negatif terhadap perkembangan neurologis fetal. Monitoring dan optimalisasi status vitamin D selama kehamilan penting sebagai strategi preventif. Diperlukan standarisasi metode pengukuran dan konsensus nilai cutoff untuk memperkuat rekomendasi klinis berbasis bukti.

Kata kunci: defisiensi vitamin D, lingkaran kepala neonatal, kehamilan, perkembangan neurologis, ibu, bayi.

The Potential of Omega-3 Fatty Acids in Preserving Cognitive Health in Older Adults : A Systematic Review

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Abstract

Background and Purpose: Global population aging has increased the prevalence of cognitive decline and dementia among older adults. Long-chain omega-3 fatty acids—docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA)—play key roles in maintaining neuronal membrane integrity and modulating neuroinflammation and oxidative stress. However, findings on their cognitive benefits remain inconsistent due to differences in study design, dosage, and participant characteristics. This systematic review aims to evaluate the potential of omega-3 fatty acids in preserving cognitive health among older adults through evidence from randomized controlled trials (RCTs).

Method: Following PRISMA 2020 guidelines, a literature search was conducted in PubMed, ScienceDirect, EBSCOhost, ProQuest, SpringerLink, and Cochrane databases. Eligible studies were RCTs published within the last ten years involving adults aged ≥ 50 years, with or without mild cognitive impairment (MCI). Interventions included omega-3 supplementation (DHA, EPA, or both) compared with placebo. Ten RCTs met the inclusion criteria and were analyzed descriptively; risk of bias was assessed using the Cochrane Risk of Bias Tool 2.

Results: Ten RCTs encompassing 7,325 participants aged 55–90 years were included. Supplementation regimens varied widely, with DHA doses ranging from 480 mg to 1,550 mg per day and EPA doses ranging from 351 mg to 2,000 mg per day, administered either separately or in combined formulations. Large-scale trials (MAPT, AREDS2) showed no global cognitive benefit, while smaller studies reported improvements in episodic memory, perceptual speed, and mood especially among MCI or APOE- $\epsilon 4$ carriers. No serious adverse events were reported.

Conclusion: Omega-3 supplementation appears safe and may preserve cognitive function, mood, and neurostructural integrity in older adults, warranting standardized long-term clinical evaluation.

Keyword Omega-3 fatty acids; docosahexaenoic acid (DHA); eicosapentaenoic acid (EPA); aging; cognitive

Peran Suplementasi Probiotik pada Pasien dengan Sindrom Ovarium Polikistik (PCOS): Suatu Tinjauan Sistematis

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ABSTRAK

Latar Belakang: Sindrom ovarium polikistik (PCOS) merupakan gangguan endokrin yang umum terjadi pada wanita usia reproduktif, ditandai dengan hiperandrogenisme, resistensi insulin, dan peradangan tingkat rendah kronis. Suplementasi probiotik dan sinbiotik telah diajukan sebagai terapi tambahan baru untuk meningkatkan hasil metabolik, hormonal, dan psikososial pada PCOS, namun bukti yang ada masih beragam.

Metode: Sebuah tinjauan sistematis dilakukan pada RCT yang meneliti penggunaan probiotik pada wanita dengan PCOS. Sepuluh RCT yang diterbitkan antara tahun 2016 hingga 2025 dimasukkan dalam analisis. Kualitas metodologis setiap penelitian dinilai menggunakan Skala Jadad. Data mengenai hasil hormonal, metabolik, inflamasi, stres oksidatif, dan hasil yang dilaporkan oleh pasien disintesis secara naratif.

Hasil: Semua penelitian yang disertakan memiliki kualitas metodologis yang tinggi, masing-masing memperoleh skor 5/5 pada Skala Jadad. Suplementasi probiotik dan sinbiotik secara konsisten meningkatkan parameter hormonal, termasuk penurunan kadar testosteron total dan peningkatan globulin pengikat hormon seks. Beberapa studi melaporkan peningkatan sensitivitas insulin, indeks massa tubuh (IMT), dan profil lipid, sementara studi lain menunjukkan penurunan penanda inflamasi dan stres oksidatif seperti hs-CRP, IL-6, dan *malondialdehyde* dengan peningkatan kapasitas antioksidan secara bersamaan. Selain itu, suplementasi meningkatkan kualitas hidup dan hasil kesehatan mental, terutama dalam aspek kesejahteraan emosional, citra tubuh, dan stres. Efeknya lebih menonjol pada penelitian yang menggunakan formulasi sinbiotik atau strategi ko-suplementasi.

Kesimpulan: Suplementasi probiotik dan sinbiotik merupakan terapi tambahan yang menjanjikan bagi wanita dengan PCOS, karena memberikan manfaat multidimensi pada aspek hormonal, metabolik, dan psikososial. Namun, variasi dalam strain, dosis, dan populasi menekankan perlunya uji klinis yang lebih besar, jangka panjang, dan terstandarisasi.

Kata kunci: sindrom ovarium polikistik, PCOS, probiotik, suplementasi.

Medium Chain Triglycerides sebagai energi alternatif pada Traumatic Brain Injury: Laporan Kasus

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Latar Belakang

Traumatic Brain Injury (TBI) merupakan penyebab utama morbiditas yang memicu keadaan hipermetabolik dan katabolik, meningkatkan risiko malnutrisi. Intervensi nutrisi dini memainkan peran kritis dalam mengoptimalkan pemulihan dan mencegah komplikasi lebih lanjut.

Ilustrasi Kasus

Laki-laki, berusia 76 tahun dengan TBI ringan pasca kraniektomi untuk evakuasi hematoma. Pasien menunjukkan penurunan asupan oral, atrofi otot, dan hipoalbuminemia (2,5 g/dL). Manajemen nutrisi dimulai melalui pemberian melalui enteral, diikuti dengan transisi bertahap ke asupan oral. Medium Chain (MCT) dan makanan kaya antioksidan ditambahkan untuk mendukung metabolisme serebral dan memodulasi neuroinflamasi. Mikronutrien pendukung, termasuk Zink, vitamin B kompleks, curcuma juga diberikan.

Diskusi

Terapi medik gizi diberikan dengan target 1.900 kkal/hari dan protein 1,5 g/kgBB/hari. Setelah intervensi selama 14 hari melalui pemberian asupan makronutrien dan suplemen MCT, perbaikan yang signifikan diamati pada biomarker inflamasi dan nutrisi: NLR menurun dari 24,8 menjadi 1,15, albumin meningkat menjadi 3,0 g/dL, dan TLC membaik dari 709 menjadi 2955. Kapasitas fungsional pasien juga membaik, ditandai dengan peningkatan handgrip dari 1,2 menjadi 16,3 kg dan toleransi asupan oral yang lebih baik.

Kesimpulan

Terapi nutrisi memiliki peran penting secara individual pada pasien dengan *Traumatic Brain Injury* (TBI). Integrasi makronutrien yang adekuat, suplemen Medium Chain Trygliserides (MCT), dan dukungan mikronutrien berkontribusi pada perbaikan regulasi inflamasi, status nutrisi, dan pemulihan fungsional.

Kata kunci

Traumatic Brain Injury, terapi medik gizi, malnutrisi, *Medium Chain Trygliserides*, mikronutrien,

Correlation Between Skeletal Muscle Mass, Body Fat, and Body Water Composition with Waist Circumference in Adults

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ABSTRACT

Introduction: Abdominal obesity, commonly measured through waist circumference, represents a central marker of metabolic risk. While body fat accumulation plays a key role, alterations in skeletal muscle mass (SMM) and body water distribution may also contribute to abdominal adiposity and metabolic dysregulation. This study aimed to analyze the correlation between body composition components, including skeletal muscle mass (SMM), percent body fat (BF%), total body water (TBW), with waist circumference (WC) among adults.

Methods: This cross-sectional study utilized secondary data from body composition analyses performed using bioelectrical impedance **Methods.** Variables included SMM, BF%, TBW, and WC. Spearman correlation and quantile regression analyses were applied to determine relationships between body composition components and WC, adjusting for potential confounders such as age.

Results: Subjects were predominantly obese population with central obesity. Spearman's correlation showed a strong correlation between BF% and WC ($r = 0.663$, $p < 0.001$), while SMM ($r = 0.753$, $p < 0.001$) and TBW ($r = 0.759$, $p < 0.001$) showed significant negative correlations. Quantile regression confirmed that BF% ($\beta = 1.341$, $p < 0.001$) and SMM ($\beta = 4.967$, $p = 0.007$) were independent predictors of WC, while TBW and age were not significant. The model explained 76% of the WC variance (Pseudo $R^2 = 0.760$), indicating that approximately 76% of the variation in WC was explained by the included variables.

Conclusion: Higher body fat percentage and skeletal muscle mass were independently associated with waist circumference, whereas body water and age showed no significant effects. Body fat accumulation remains the key determinant of abdominal obesity, emphasizing the importance of fat reduction and muscle maintenance strategies in obesity prevention.

Keywords: Body fat, obesity, skeletal muscle mass, total body water, waist circumference

Terapi Medik Gizi Pasien *Cerebral Infarction* dengan Efusi Pleura Dextra, Ulkus Dekubitus, disertai *Severe Protein Energy Malnutrition* dan Penyulit Anemia, Hipoalbuminemia dan Imbalance Elektrolit

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Latar Belakang :

Pasien dengan cerebral infarction berisiko tinggi mengalami komplikasi gizi dan metabolik akibat imobilisasi, inflamasi sistemik, dan gangguan intake oral. Kondisi ini dapat menimbulkan severe protein energy malnutrition (PEM) yang memperburuk penyembuhan luka dan memperpanjang masa rawat, terutama bila disertai efusi pleura, ulkus dekubitus, anemia, hipoalbuminemia, dan ketidakseimbangan elektrolit. Pendekatan terapi medik gizi komprehensif menjadi kunci pemulihan kondisi klinis dan metabolik pasien.

Ilustrasi Pasien :

Seorang pasien laki-laki usia lanjut dirawat dengan diagnosis cerebral infarction, disertai efusi pleura dextra, ulkus dekubitus grade II–III, serta severe PEM. Pemeriksaan laboratorium menunjukkan albumin 2,2 g/dL, Hb 8,5 g/dL, Na⁺ 128 mmol/L, dan K⁺ 3,0 mmol/L. Intervensi gizi dimulai dengan koreksi elektrolit dan rehidrasi, diikuti terapi nutrisi enteral bertahap menggunakan formula oligomerik menuju polimerik. Kebutuhan energi dinaikkan secara progresif dari 20 menjadi 30–35 kkal/kgBB/hari, dan protein hingga 1,2–1,5 g/kgBB/hari. Suplementasi zat besi, vitamin C, dan zink diberikan untuk mendukung penyembuhan luka dan koreksi anemia.

Hasil:

Setelah terapi medik gizi selama masa perawatan, terjadi perbaikan status nutrisi dan stabilisasi biokimia: albumin meningkat menjadi 3,3 g/dL, hemoglobin menjadi 10,8 g/dL, natrium dan kalium mencapai nilai normal (Na⁺ 137 mmol/L, K⁺ 4,1 mmol/L). Luka dekubitus menunjukkan granulasi baik, berat badan meningkat ± 2 –3 kg, dan asupan energi-protein mencapai >90% kebutuhan harian. Kondisi klinis pasien membaik dengan peningkatan kesadaran, nafsu makan, dan stabilitas tanda vital.

Kesimpulan:

Penatalaksanaan terapi medik gizi yang terstruktur dan bertahap berperan penting dalam memperbaiki status nutrisi, menormalkan keseimbangan elektrolit, mempercepat penyembuhan luka, serta meningkatkan **Hasil** klinis pasien dengan cerebral infarction dan komplikasi gizi berat. Kolaborasi multidisiplin menjadi faktor utama keber**Hasilan** tatalaksana kasus ini.

Kata kunci: Cerebral infarction, efusi pleura, hipoalbuminemia, anemia, ketidakseimbangan elektrolit,

Asosiasi Obesitas dan Skor Kalsium Arteri Koroner di Rumah Sakit Sekunder di Indonesia

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Latar Belakang dan tujuan: Di Indonesia, prevalensi obesitas pada penduduk usia >18 tahun adalah 35,4%. Obesitas meningkatkan risiko penyakit kardiovaskular dan kalsium arteri koroner (KAK), penanda beban aterosklerotik dan prediktor kuat dari penyakit jantung koroner (PJK), penyakit kardiovaskular, dan mortalitas. Namun, hubungan antara obesitas dan atherosclerosis subklinis sering dinilai kompleks dan paradoksikal. Studi ini bertujuan untuk mengevaluasi hubungan IMT dengan skor KAK pada populasi umum.

Metode: Kami menganalisa IMT dan KAK dari populasi umum berdasarkan data sekunder salah satu rumah sakit swasta di Jakarta tahun 2025. Pasien dikategorisasikan obesitas jika $IMT \geq 23 \text{ kg/m}^2$ sesuai kriteria Asia Pasifik dan lansia jika usia ≥ 60 tahun. Computed tomography (CT) scan jantung tanpa kontras dilakukan untuk mendapatkan nilai KAK dengan kategorisasi skor KAK 0 sebagai tidak PJK dan skor KAK >0 sebagai PJK. Uji *Chi-Square* dilakukan untuk menilai hubungan bivariat, sementara uji regresi logistik biner digunakan untuk menilai hubungan multivariat.

Hasil: Penelitian ini merekrut 659 pasien. Dari semua pasien, terdapat 444 (67,4%) laki – laki, 223 (33,8%) lansia, dan 530 (80,4%) obesitas. Berdasarkan analisis bivariat, laki – laki (OR 3,43; 95%CI 2,43-4,84; $p < 0,001$), lansia (OR 9,1; 95%CI 5,48-15,1; $p < 0,001$), dan obesitas (OR 2,03; 95%CI 1,37-3; $p < 0,001$) berpengaruh signifikan terhadap PJK. Berdasarkan analisis multivariat, ketiganya tetap berpengaruh signifikan, baik secara simultan maupun parsial [laki – laki (OR 4,3; 95%CI 2,85-6,49; $p < 0,001$), lansia (OR 12,55; 95%CI 7,27-21,68; $p < 0,001$), dan obesitas (OR 1,87; 95%CI 1,16-3,04; $p = 0,01$).

Kesimpulan: Obesitas, lansia, dan laki-laki merupakan faktor risiko signifikan terhadap kejadian PJK, yang dinilai dari KAK pada pemeriksaan CT scan jantung, pada populasi umum di Indonesia.

Kata kunci: obesitas, penyakit jantung koroner, skor kalsium arteri koroner

TERAPI MEDIK GIZI PADA PASIEN DENGAN ANGINA LUDWIG DAN FISTULA ESOPHAGEAL YANG MENGALAMI KOMPLIKASI MALNUTRISI PROTEIN-ENERGI SEDANG: LAPORAN KASUS

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ABSTRAK

Latar Belakang

Ludwig's Angina adalah selulitis difus langka pada jaringan lunak dasar mulut dan leher. Ada banyak etiologi dan faktor risiko yang terkait dengan *Ludwig's Angina*, infeksi odontogenik menyumbang 70% kasus. Fistula yang berasal dari daerah lain pada saluran pencernaan (GI) (misalnya lambung dan esofagus) dapat termasuk dalam Fistula Enterokutan (ECF).^{1,2} Diperkirakan 50-90% pasien ECF mengalami masalah gizi, termasuk malnutrisi, dehidrasi, gangguan elektrolit, atau sepsis.³

Ilustrasi Kasus

Kami melaporkan kasus seorang wanita berusia 61 tahun dengan *Ludwig's Angina* dan Fistula Esofagus dengan Malnutrisi Protein Energi Sedang. Pemeriksaan fisik menunjukkan luka bedah terbuka di daerah submandibular dan leher, penurunan berat badan, dan kekuatan genggaman tangan yang berkurang (2,3 kg). Pemeriksaan darah menunjukkan hipoalbuminemia berat (2,3 g/dl), hiponatremia ringan (131 mmol/L), hipokalemia sedang (2,6 mmol/L), deplesi sistem imun berat (jumlah limfosit total/TLC $546 \times 10^3/\text{mm}^3$), dan peningkatan rasio neutrofil-limfosit (NLR) (7,01%).

Diskusi

Pengelolaan nutrisi diberikan melalui rute enteral, dengan pemberian 1750 kkal dan 1,7 gram protein per kilogram berat badan per hari. Hiponatremia dan hipokalemia diperbaiki dengan KAEN 3B 500 ml/24 jam. Setelah 10 hari pengobatan nutrisi, kapasitas fungsional yang membaik (2,3 menjadi 8,4 kg). **Hasil** laboratorium membaik albumin (2,3 menjadi 3,1 g/dl), kalium (2,6 menjadi 3,5 mmol/L), TLC (546 menjadi $1316 \times 10^3/\text{mm}^3$), dan NLR (7,01 menjadi 4,12%).

Kesimpulan

Pengelolaan nutrisi enteral dengan pemberian kalori dan protein yang adekuat terbukti efektif dalam memperbaiki status gizi pasien, keseimbangan elektrolit, serta kapasitas fungsional. Penanganan nutrisi yang tepat sangat penting dalam mendukung pemulihan pasien Angina Ludwigs dengan Fistula Enterokutaneus yang kompleks seperti ini.

Kata kunci: Ludwigs Angina, Fistula Enterokutan, terapi nutrisi

Unveiling the Invisible: *Escherichia coli* as a Food Safety Challenge in a Hospital in the Absence of a Nutrition Support Team (NST)

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ABSTRACT

Background and aims: Hospital-acquired foodborne infections undermine WHO's Global Patient Safety Action Plan 2021-2030, disproportionately affecting older adults and oncology patients. This study examined how the absence of NST oversight contributes to environmental failures leading to *Escherichia coli* contamination in hospital food systems.

Methods: A Cross-sectional mixed-methods study (January-August 2025) was conducted at a referral hospital in the absence of NST. Six Critical Control Points (CCPs) were evaluated against standards. Food samples were collected three times at different holding times (10, 120, 180 minutes) and cultured for *E. coli* using SNI 16649-2:2023. Fisher's exact test, risk difference, and Spearman's correlation were applied.

Results: The Environmental Risk Score (ERS) index was 5.80 (High Risk), with all CCP non-compliance. Cold storage ($Z = +10.13$) and freezer ($Z = +9.83$) demonstrated extreme deviations. *E. coli* contamination occurred exclusively during prolonged holding time: 28.6% (4/14) at ≥ 120 minutes versus 0% (0/7) at 10 minutes, representing a Risk Difference of +28.6% (95% CI: +6.3% to +50.9%, $p=0.048$, Fisher's Exact Test). Number Needed to Harm (NNH) was 3.5 meals, indicating one additional contamination event per 3-4 meals held beyond 120 minutes.

Conclusions: The absence of NST oversight was associated with systematic HACCP failures and significantly elevated *E. coli* contamination risk, strongly linked to prolonged holding time. Establishing NST with explicit food safety mandates is essential to prevent foodborne infections in hospitalized patients, in accordance with WHO, ESPEN, and CDC recommendations.

Keywords: Hospital Food Safety; Nutrition Support Team (NST); *Escherichia coli*; HACCP; Oncology Patient

Prognostic Nutritional Index (PNI) to Predict the Overall Survival and Disease Free Survival of the Patient with Gastric Cancer: A Prognostic Systematic Review and Meta-Analysis

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ABSTRACT

Introduction: Gastric cancer remains a leading cause of cancer death worldwide. Identification of simple prognostic biomarkers is needed to more accurately predict patient outcomes, including the Prognostic Nutritional Index (PNI), calculated based on serum albumin levels and peripheral lymphocyte counts, which has been reported to have predictive value for survival in gastric cancer patients. This review aims to evaluate the association between PNI and overall survival (OS) and disease-free survival (DFS) in gastric cancer patients.

Methods: A literature search was conducted in PubMed and ScienceDirect from 2015 to September 2025. Prospective and retrospective cohort studies reporting hazard ratios (HRs) for OS or DFS based on PNI categories were included. Data were extracted independently, study quality was assessed using the Newcastle–Ottawa Scale, and analyses were performed using Review Manager 5.4 software.

Results: Sixteen cohort studies with a total of 13,357 patients with gastric cancer were included. The analysis showed that low PNI was associated with decreased OS (HR 1.71; 95%CI: 1.43–2.04; $I^2 = 84\%$; $p < 0.001$) and DFS (HR 1.64; 95%CI: 1.02–2.63; $I^2 = 60\%$; $p = 0.04$). Subgroup analysis of overall survival demonstrated a consistent role of PNI in predicting the prognosis of patients with gastric cancer in both Asian (HR 1.67; 95%CI: 1.38–2.03; $I^2 = 85\%$) and non-Asian (HR 1.74; 95%CI: 1.38–2.21; $I^2 = 0\%$), all significant ($p < 0.001$).

Conclusion: Low PNI is a predictor of poor prognosis in gastric cancer patients, both for OS, in Asian and non-Asian populations, and DFS.

Keywords: Prognostic biomarkers, Disease-free survival, Gastric cancer, Overall survival, Prognostic Nutritional Index

The Effect of Parenteral Omega-3 Fish Oil Supplementation on Length of Stay in Critically Ill Patients: A Meta-Analysis Study

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ABSTRACT

Background and Objective: Omega-3 fatty acids derived from fish oil in parenteral nutrition are known to exert anti-inflammatory and immunomodulatory effects that can improve clinical outcomes in critically ill patients. However, findings on their impact on length of stay (LOS) and mortality remain inconsistent. This study aimed to evaluate the effects of parenteral omega-3 supplementation on ICU LOS, hospital LOS, and mortality among intensive care patients.

Methods: Literature searches were conducted in PubMed, Scopus, Web of Science, and ClinicalTrials.gov up to October 2025. Inclusion criteria consisted of randomized controlled trials (RCTs) involving adult ICU patients receiving parenteral nutrition containing fish oil compared with standard lipid emulsions. Extracted data included ICU and hospital LOS as well as mortality rates. Analyses were performed using a random-effects model to calculate standardized mean differences (SMD) and p-values.

Results: A total of five RCTs (n = 635) met the inclusion criteria. Parenteral omega-3 fish oil supplementation was found to reduce hospital LOS by approximately 8–9 days (SMD - 8.82; 95% CI -14.50 to -3.13; p=0.002) and ICU LOS by about 2–3 days (SMD -0.75; 95% CI -4.21 to -2.71; p=0.67), although the latter was not statistically significant. Moreover, it reduced mortality by 34% compared to controls (OR 0.66; 95% CI 0.44–0.98; p=0.04).

Conclusion: Parenteral omega-3 fish oil supplementation in critically ill patients significantly shortens hospital LOS and shows a trend toward reduced ICU LOS and mortality.

Keywords: omega-3, fish oil, parenteral nutrition, ICU, length of stay.

Oral Supplementation of *Lactobacillus* sp. and Its Effect on Plaque Psoriasis: A Systematic Review

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ABSTRACT

Introduction : Plaque psoriasis is a chronic inflammatory disease. And one of its contributing factors is gut microbiota dysbiosis. Probiotic supplementation, particularly *Lactobacillus* species, has been proposed to modulate systemic inflammation through the gut–skin axis. This review aimed to evaluate the effectiveness of oral *Lactobacillus* sp. supplementation in patients with plaque psoriasis

Methods: A systematic review was conducted according to the PRISMA 2020 guidelines. Literature searches were performed in PubMed, Google Scholar, and Cochrane for studies published between 2021 and 2025 with PICO framework. The PICO framework was applied, focusing on plaque psoriasis patients receiving oral *Lactobacillus* supplementation compared with placebo, with outcomes psoriasis area and severity index (PASI), dermatology life quality index (DLQI), inflammatory markers and serum trace elements.

Results and Discussion: Four studies showed significant improvements in inflammatory biomarkers, antioxidant activity, and serum mineral balance following *Lactobacillus* supplementation. Oral *Lactobacillus* sp. Supplementation demonstrated significant reductions in PASI and DLQI scores ($p < 0.05$), increased total antioxidant activity ($p = 0.030$), and decreased hs-CRP, IL-6, and MDA levels ($p < 0.05$). Improvements in serum Zn, Ca, Mg, and Fe were also observed post-intervention. Probiotics help to restore the balance of gut microbiota and reduce systemic inflammation. Overall, probiotics demonstrated potential in modulating oxidative stress and restoring gut–skin homeostasis.

Conclusion: Oral *Lactobacillus* sp. supplementation shows potential to improve inflammatory markers, oxidative status, and mineral homeostasis in plaque psoriasis.

Keywords: *lactobacillus* sp.; probiotics; plaque psoriasis; oral supplementation

Suplementasi Mikronutrien dan Luaran Penyembuhan Luka Setelah Pembedahan Abdominal pada Pasien Tuberkulosis: Sebuah Tinjauan Sistematis

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ABSTRAK

Malnutrisi, termasuk defisiensi mikronutrien tertentu, merupakan kondisi yang sering ditemukan pada pasien dengan tuberkulosis (TB) abdominal dan dapat menghambat proses penyembuhan luka pascaoperasi. Status gizi yang buruk tidak hanya menurunkan daya tahan tubuh, tetapi juga mengganggu pembentukan jaringan baru dan respons inflamasi normal. Penelitian ini bertujuan untuk menilai bukti ilmiah mengenai efektivitas suplementasi mikronutrien perioperatif terhadap luaran penyembuhan luka pada pasien dewasa yang menjalani pembedahan abdominal akibat TB. Tinjauan ini dilakukan berdasarkan pedoman PRISMA 2020, dengan penelusuran literatur dari basis data PubMed, EMBASE, dan Scopus sejak awal publikasi hingga 22 September 2025 tanpa batasan bahasa maupun tahun. Studi yang memenuhi kriteria inklusi melibatkan pasien dewasa dengan TB abdominal yang menerima suplementasi mikronutrien tunggal atau kombinasi selama periode perioperatif serta melaporkan sedikitnya satu luaran penyembuhan luka (infeksi daerah operasi [SSI], dehiscence, volume drainase, atau waktu penutupan luka). Desain penelitian yang disertakan mencakup uji acak terkontrol, quasi-eksperimental, kohort, dan seri kasus. Risiko bias dinilai menggunakan Cochrane RoB 2.0 untuk RCT dan Newcastle–Ottawa Scale untuk studi observasional. Sebanyak lima penelitian dengan total 207 pasien memenuhi kriteria inklusi. Dua studi yang melibatkan prosedur TB spinal ($n = 175$) menunjukkan bahwa formula perioperatif yang diperkaya vitamin dan unsur jejak dapat menurunkan volume drainase luka sebesar 120–150 mL, mempertahankan kadar albumin serum, dan mempercepat resolusi penanda inflamasi dibandingkan perawatan standar. Pada kasus TB abdominal, malnutrisi berat praoperatif berhubungan erat dengan peningkatan kejadian SSI (21–23%) dan mortalitas. Dukungan nutrisi tinggi protein yang diperkaya zinc dan vitamin pada tiga kasus TB abdominal terbukti mempercepat penutupan luka laparotomi yang mengalami dehiscence maupun fistula enterokutaneus. Suplementasi vitamin dan unsur jejak berperan penting dalam mempertahankan status gizi, mengurangi eksudat luka, serta menurunkan komplikasi infeksi pascaoperasi. Sebaliknya, malnutrisi yang tidak ditangani secara adekuat meningkatkan risiko keterlambatan penyembuhan dan komplikasi luka. Diperlukan uji klinis berskala besar dengan desain terkontrol yang ketat

untuk menegaskan manfaat suplementasi mikronutrien spesifik pada pasien TB abdominal pascaoperasi.

Kata kunci: Pembedahan abdominal; Suplementasi mikronutrien; Tuberkulosis; Penyembuhan luka

Efektivitas Intervensi Multimodal dalam Tatalaksana Sarkopenia pada Pasien Kanker dengan Kemoterapi: Tinjauan Sistematis

Otin Rynda Simanjuntak
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ABSTRAK

Pendahuluan: Sarkopenia merupakan komplikasi serius pada pasien kanker yang menjalani kemoterapi, ditandai dengan penurunan massa dan kekuatan otot yang berdampak negatif terhadap toleransi terapi, status fungsional, dan kualitas hidup. Upaya pencegahan dan penanganan sarkopenia membutuhkan pendekatan multimodal, melibatkan intervensi nutrisi protein dan latihan fisik untuk menekan efek katabolik akibat terapi antikanker.

Tujuan: Tinjauan sistematis ini bertujuan mengevaluasi efektivitas intervensi multimodal berupa kombinasi nutrisi protein dan latihan fisik dalam mencegah serta mengatasi sarkopenia pada pasien kanker selama menjalani kemoterapi.

Metode: Pencarian literatur dilakukan pada basis data PubMed, Scopus, Embase, Web of Science, Cochrane Library, ProQuest, serta Garuda dan Neliti untuk publikasi Januari 2020–September 2025. Artikel yang diinklusi adalah penelitian asli (uji klinis acak, quasi-eksperimental, atau kohort) yang menilai efek kombinasi nutrisi protein dan latihan fisik terhadap massa otot, kekuatan, dan luaran klinis pasien kanker. Dari 1.372 artikel yang teridentifikasi, lima studi memenuhi kriteria inklusi dan dianalisis secara kualitatif.

Hasil: Lima RCT (Uji Klinis Acak) dianalisis. Intervensi multimodal (suplementasi protein 1,2–1,5 g/kg/hari dikombinasikan dengan latihan resistensi/aerobik selama 8–12 minggu) secara konsisten meningkatkan kekuatan otot (*handgrip*) dan performa fisik, serta memperbaiki kualitas hidup dan menurunkan toksisitas kemoterapi. Bukti untuk peningkatan massa otot struktural yang signifikan selama durasi intervensi singkat tersebut cenderung heterogen, namun intervensi terbukti menstabilkan massa otot.

Kesimpulan: Intervensi multimodal terbukti efektif dalam mencegah serta memperbaiki sarkopenia selama kemoterapi, terutama melalui peningkatan kekuatan fungsional dan optimalisasi sintesis protein otot (MPS). Strategi ini perlu diintegrasikan ke dalam perawatan onkologi komprehensif dengan standar dosis protein tinggi dan latihan resistensi terstruktur sebagai tatalaksana berbasis bukti.

Kata kunci: sarkopenia, kanker, latihan fisik, nutrisi protein

Nutritional Interventions for Improving Quality of Life in Cancer Survivors: A Systematic Review

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ABSTRACT

Introduction: As cancer survivor numbers grow, maintaining their quality of life (QoL) is crucial. This group often faces reduced QoL due to treatment sequelae like malnutrition and fatigue. This review synthesizes evidence from randomized controlled trials (RCTs) on the efficacy of nutritional interventions for improving QoL in adult cancer survivors.

Methods: This review was conducted in accordance with the PRISMA guidelines.

Results: Sixteen RCTs were included, assessing diverse interventions such as dietary counseling, oral nutritional supplements (ONS), and multi-component lifestyle programs. Significant global QoL improvements were seen with individualized counseling for colorectal cancer survivors and with comprehensive lifestyle programs for breast cancer survivors. Fatigue was notably reduced by lifestyle interventions. Targeted ONS improved physical outcomes like body weight, with some translating into better QoL.

Discussion: Nutritional interventions can effectively improve QoL, especially when they are individualized, multi-modal (e.g., combining diet and exercise), and started early in survivorship. Benefits likely operate through direct physiological improvements and indirect psychosocial pathways from education and support.

Conclusion: Targeted nutritional strategies, particularly individualized counseling and comprehensive programs, are valuable for enhancing survivor QoL and should be integrated into standard care. Further high-quality, large-scale RCTs are needed to define optimal strategies for different survivor populations.

Keywords: Cancer Survivorship, Nutritional Intervention, Quality of Life , Dietary Counseling, Lifestyle Intervention.

Homemade Versus Fortified Complementary Feeding in Childhood Iron Status: A Systematic Review

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Background

Iron deficiency anemia (IDA) remains a major childhood health issue in developing countries, including Indonesia, where nearly half of children under five are affected. While homemade complementary foods are culturally preferred, fortified options have demonstrated superior effects on reducing anemia, hemoglobin and ferritin levels. This systematic review synthesizes current evidence on the impact of fortified compared to homemade feeding on hemoglobin concentration, ferritin level, and anemia prevalence among infants and young children, with particular relevance to the Indonesian setting.

Methods

A systematic search was conducted in PubMed, Scopus, Cochrane, ScienceDirect, and SpringerLink databases following PRISMA guidelines. The search focused on studies comparing fortified and homemade complementary feeding in children and their effects on iron status and anemia prevalence. Eligible studies included systematic reviews, randomized controlled trials, and observational studies.

Results

Eleven of 744 identified studies met the inclusion criteria. Across diverse settings, fortified complementary foods consistently improved hemoglobin and ferritin concentration and reduced anemia prevalence compared with homemade or non-fortified diets among children receiving complementary feedings. Multiple RCTs demonstrated benefit from fortified cereals, micronutrient powders, and nutrient supplements without increasing adverse events. The evidence showed strong high public health relevance for low-middle income countries, with several community-based interventions resembling Indonesia's feeding context. However, heterogeneity in intervention types and duration was noted.

Conclusion

Fortified complementary feeding effectively improves iron status and reduces anemia risk in infants. In Indonesia, integrating fortified products within community programs while maintaining culturally accepted homemade feeding represents a feasible and sustainable strategy to close micronutrient gaps.

Low Phase Angle as a Predictor of Mortality in Elderly With Sarcopenia : Systematic Review and Meta-Analytic Study

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ABSTRAK

Latar Belakang: Sarcopenia adalah sindrom geriatrik yang umum pada lansia dan terkait dengan peningkatan risiko kematian. Phase angle (PhA), parameter yang diperoleh dari bioelectrical impedance analysis (BIA), telah diusulkan sebagai indikator status seluler dan nutrisi. Namun, hubungan antara PhA rendah dan risiko kematian pada populasi lansia dengan sarcopenia belum banyak dikaji secara sistematis.

Tujuan: Menilai secara kuantitatif hubungan antara nilai PhA yang rendah dan risiko mortalitas pada individu sangat lanjut usia dengan sarcopenia melalui meta-analisis studi observasional.

Metode: Pencarian literatur dilakukan secara sistematis pada PubMed, Embase, Web of Science, dan Cochrane Library hingga Juni 2025. Studi observasional (kohort atau cross-sectional) yang melibatkan individu ≥ 65 tahun dengan diagnosis sarcopenia dan melaporkan estimasi mortalitas berdasarkan kategori PhA dimasukkan. Analisis dilakukan menggunakan model efek acak. Penilaian heterogenitas dilakukan dengan statistik I^2 dan potensi bias publikasi dievaluasi menggunakan funnel plot.

Hasil: Lima studi ($n=1350$) dimasukkan. PhA rendah secara signifikan meningkatkan risiko mortalitas (Pooled OR: 2.20; 95% CI: 1.70–3.00; $I^2 = 48\%$). Funnel plot menunjukkan potensi bias publikasi minimal.

Kesimpulan: PhA rendah merupakan prediktor kuat mortalitas pada lansia dengan sarcopenia. PhA dapat digunakan dalam skrining risiko klinis populasi ini. Studi prospektif lebih lanjut diperlukan untuk menetapkan nilai ambang yang optimal dan mengevaluasi nilai prognostik PhA lintas populasi yang lebih beragam.

Kata kunci: Phase angle, sarcopenia, lansia, mortalitas, bioimpedance

Perbaikan *Functional Capacity* melalui Terapi Medik Gizi pada Pasien dengan *Severe Malnutrition* dan *Hypoalbuminemia* Pasca *Tracheostomy* dan *Gastrostomy Feeding*

karena Tumor Lidah: Sebuah Laporan Kasus

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Latar Belakang

Malnutrition merupakan komplikasi utama pada pasien kanker kepala-leher akibat disfagia, obstruksi, dan efek terapi. Kondisi ini meningkatkan morbiditas, mortalitas, serta menurunkan kualitas hidup. ESPEN 2021 menekankan pentingnya *early enteral nutrition* untuk mencegah deteriorasi status gizi dan fungsi tubuh.

Kasus

Pasien laki-laki 64 tahun dirawat pasca *tracheostomy* dan *gastrostomy feeding* karena Tumor Lidah. Berdasarkan kriteria GLIM, didapatkan *severe malnutrition* dengan fenotipik (penurunan BB signifikan 38%/1 bulan, IMT 17,1 kg/m², *muscle wasting* generalisata) dan etiologi (asupan <30% kebutuhan, *systemic inflammation* NLR 13,04, albumin 2,80 g/dL). Pasien dikategorikan SGA C dengan kapasitas fungsional *bedridden*.

Diskusi

Tatalaksana awal berupa diet cair formula oligomerik 22 gram 6 kali 100 ml disertai albumin 6 kali ½ sachet/hari, ditambah suplementasi vitamin B kompleks dan zinc 20 mg/hari. Asupan ditingkatkan bertahap menjadi *blenderized diet* sesuai toleransi. Pencapaian intake harian meningkat dari 600 kkal (45% TEE) menjadi 1200 kkal (90% TEE). *Functional capacity* membaik dari *bedridden* menjadi mampu duduk dengan bantuan. Sesuai ESPEN 2021, target energi 25–30 kkal/kgBB/hari dan protein 1,2–1,5 g/kgBB/hari dianjurkan untuk pasien *major surgery* dengan risiko *malnutrition*.

Kesimpulan

Kasus ini menegaskan pentingnya intervensi gizi *enteral* dini dan bertahap berbasis panduan ESPEN pada pasien kanker kepala-leher dengan *severe malnutrition*. Pendekatan ini terbukti meningkatkan asupan energi-protein, memperbaiki status gizi, dan menunjang kualitas hidup.

Kata kunci: *Head and neck cancer; Gastrostomy feeding, Severe Malnutrition, Hypoalbuminemia.*

Terapi Medik Gizi pada Pasien CKD Stadium V dengan Protein–Energy Wasting, Sepsis, dan Obstruksi Usus

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Latar Belakang:

Protein–Energy Wasting (PEW) merupakan komplikasi gizi yang sering ditemukan pada pasien penyakit ginjal kronik (PGK) stadium V dengan hemodialisis (HD). Kondisi ini dapat diperberat oleh infeksi, sepsis, dan obstruksi gastrointestinal yang menurunkan asupan serta meningkatkan inflamasi.

Ilustrasi Kasus:

Laki-laki, 56 tahun, dengan PGK stadium V on HD sejak 2019, CAD, dan ileus obstruksi dirawat dengan penurunan asupan yang disebabkan oleh nyeri perut dan diare. Pasien mengalami penurunan berat badan 19% dalam 6 bulan (IMT 19,05 kg/m², muscle wasting). Pemeriksaan menunjukkan hipoalbuminemia (2,6 g/dL), hiponatremia (134 mmol/L), dan peningkatan marker inflamasi (NLR 17,3). Pasien dipuasakan selama 8 hari sebelum tindakan laparotomi dan 4 hari post laparotomi dengan HD regular 3 kali seminggu. Pasien mendapat total nutrisi parenteral dimulai dari 15% kebutuhan energi (Target Energi 1.800 kkal/hari; protein 1,2 g/kgBBI)

Diskusi:

Pada PGK dengan PEW, stres pembedahan dan sepsis memicu lonjakan sitokin proinflamasi yang mempercepat katabolisme dan degradasi protein. Puasa (NPO) berkepanjangan menyebabkan defisit energi–nitrogen dan meningkatkan risiko *refeeding*. Jika rute enteral tidak memadai, **nutrisi parenteral (PN)** dapat diberikan **bertahap** untuk membatasi kelebihan cairan, azotemia, gangguan fosfat/kalium, dan disglukemia. Bukti mengenai **Intradialytic Parenteral Nutrition (IDPN)** terhadap kelangsungan hidup masih tidak konsisten. Pada fase puasa lama, **PN penuh di luar sesi HD**, kemudian **ditransisikan ke enteral**/ oral segera setelah ileus membaik, merupakan strategi terapi medik gizi yang direkomendasikan.

Kesimpulan:

Terapi medik gizi yang terindividualisasi dan monitoring intensif sangat penting pada pasien PGK dengan PEW untuk menstabilkan metabolisme, mendukung pemulihan, dan meningkatkan kualitas hidup.

Kata kunci: penyakit ginjal kronik, PEW, hemodialisis, nutrisi parenteral, sepsis.

Terapi Medik Gizi pada *Squamous Cell Carcinoma Regio Parietal-Occipital* dengan Malnutrisi Berat : Sebuah Laporan Kasus

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Latar Belakang :

Karsinoma sel skuamosa (SCC) kulit kepala merupakan keganasan epitel dengan potensi invasi ke tulang dan jaringan intrakranial. Penanganan stadium lanjut memerlukan pendekatan multidisiplin meliputi reseksi luas, kraniektomi, dan rekonstruksi flap. Malnutrisi perioperatif meningkatkan risiko komplikasi metabolik, infeksi, serta kegagalan penyembuhan luka. Dukungan nutrisi yang tepat berperan penting dalam optimisasi **Hasil** bedah.

Kasus:

Pasien laki-laki 59 tahun dengan **SCC regio parietal oksipital**, keluhan benjolan kepala kiri sejak 1 bulan. Berdasarkan kriteria **GLIM**, ditemukan fenotipik malnutrisi berat (penurunan berat badan signifikan, IMT 11,9 kg/m², muscle wasting generalisata) dan etiologik (asupan <50% selama 1 minggu, inflamasi sistemik dengan NLR 8,57 dan albumin 2,70 g/dL). **PNI 36** menunjukkan risiko tinggi komplikasi perioperatif.

Diskusi:

Terapi medik gizi diberikan dengan target **energi 1.700 kkal/hari** dan **protein 1,2 g/kgBB (75 g/hari)** melalui kombinasi **ONS tinggi protein** dan **nutrisi parenteral**, disertai **vitamin D 1000 IU/hari** dan **vitamin B kompleks**. Sesuai **ESPEN 2021**, kebutuhan energi 25–30 kkal/kgBB/hari dan protein 1,2–1,5 g/kgBB/hari dianjurkan untuk pasien bedah mayor dengan risiko malnutrisi. Kombinasi asupan rendah dan inflamasi menyebabkan kondisi hiperkatabolik yang menurunkan imunitas dan memperlambat penyembuhan.

Kesimpulan:

Optimalisasi status gizi perioperatif melalui kombinasi nutrisi oral dan parenteral dapat meningkatkan kesiapan operasi, mempertahankan imunitas, dan memperbaiki outcome bedah pada pasien SCC kepala stadium lanjut dengan malnutrisi berat.

Kata kunci: *Squamous Cell Carcinoma, Parietal–Occipital*, Perioperatif, Malnutrisi berat

Efek Suplementasi Vitamin D terhadap Risiko Jatuh dan Fraktur pada Lansia dengan Osteosarkopenia: Suatu Tinjauan Sistematis

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ABSTRAK

Latar Belakang dan Tujuan:

Osteosarkopenia, adalah kombinasi penyakit osteoporosis dan sarkopenia yang merupakan masalah kesehatan yang umum pada lansia dan menyebabkan peningkatan risiko jatuh, fraktur, serta penurunan kualitas hidup. Vitamin D berperan penting dalam metabolisme kalsium-fosfat dan fungsi otot melalui aktivasi reseptor vitamin D (VDR). Defisiensi vitamin D sering ditemukan pada lansia dan dikaitkan dengan melemahnya otot serta penurunan kepadatan tulang. Namun, efektivitas suplementasi vitamin D dalam menurunkan risiko jatuh dan fraktur pada populasi dengan osteosarkopenia masih belum konsisten. Penelitian ini bertujuan meninjau bukti ilmiah terkini mengenai pengaruh suplementasi vitamin D terhadap risiko jatuh dan fraktur pada lansia dengan osteosarkopenia.

Metode:

Tinjauan sistematis ini mengikuti pedoman PRISMA 2020 dengan pencarian literatur pada PubMed, Cochrane, dan ClinicalTrials.gov hingga Agustus 2025. Studi yang disertakan merupakan Randomized Controlled Trials (RCTs) yang meneliti suplementasi vitamin D tunggal atau kombinasi dengan kalsium dan/atau latihan ketahanan pada lansia usia ≥ 50 tahun. Risiko bias dinilai menggunakan alat Cochrane Risk of Bias versi 2.0.

Hasil:

Sebanyak lima studi memenuhi kriteria inklusi. Mayoritas menunjukkan bahwa suplementasi vitamin D dosis 800–2000 IU/hari meningkatkan kekuatan otot, performa fungsional, dan kepadatan mineral tulang. Namun, studi berskala besar pada populasi tanpa defisiensi vitamin D tidak menunjukkan penurunan signifikan pada kejadian fraktur.

Kesimpulan:

Suplementasi vitamin D dapat meningkatkan fungsi otot dan kepadatan tulang serta menurunkan risiko jatuh pada lansia dengan osteosarkopenia, terutama pada mereka yang mengalami defisiensi. Pendekatan kombinasi dengan latihan fisik dan nutrisi optimal tetap diperlukan untuk **Hasil** yang maksimal.

Kata kunci: vitamin D, osteosarkopenia, jatuh, fraktur, lansia, suplementasi

Personalized Nutrition Strategies Based on Gut Microbiome and Host Genomic Interplay: A Systematic Review

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INTRODUCTION

Introduction: The traditional “one-size-fits-all” dietary approach has limited success in reducing metabolic diseases. Growing evidence shows that individuals respond differently to the same diet due to complex interactions between nutrition, the gut microbiome, and host genetics. This systematic review evaluates personalized nutrition strategies that integrate both microbiome characteristics and genomic factors to predict and improve health outcomes.

Methods: A systematic search was performed in PubMed, Google Scholar, Semantic Scholar, Springer, and Wiley Online Library for human intervention and observational studies. Eligible studies evaluated interactions between dietary exposure, host genetics, and at least one gut microbiome feature on a health-related outcome. **Methodological** quality was assessed using RoB 2 for randomized trials and the Newcastle-Ottawa Scale for observational studies. **Results** were narratively synthesized by outcome.

Results: Seventeen studies met inclusion criteria. Baseline microbiome composition—such as Prevotella-to-Bacteroides ratio and microbial gene richness—strongly predicted dietary responses related to weight, glucose, and lipid metabolism. Host genetic variants (e.g., FTO, APOE) influenced baseline risk and magnitude of response. Individuals with high-risk FTO alleles showed better improvements after personalized diets, while APOE4 was linked to distinct microbiome- metabolic patterns. The PREDICT 1 study reported the microbiome explained more variance in postprandial lipemia (7.1%) than meal nutrients (3.6%) or genetics (0.8%).

Discussion: Host genetics “prime” metabolic predisposition, while the microbiome acts as a dynamic “predictor” and mediator of dietary effects via bioactive metabolites (e.g., SCFAs,

TMAO). This interaction can promote health or drive dysbiosis and disease.

Conclusion: Combining microbiome and genomic data yields a more effective personalized nutrition model. Microbiome profiling identifies likely responders, while genetics highlights high- risk individuals. Future long-term multi-omic RCTs in diverse populations are needed to guide clinical application.

Keywords: Personalized Nutrition, Gut Microbiome, Nutrigenomics, Gene-Diet Interaction, FTO, APOE.



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