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Alma Ata

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Date: 1st April 2025

Dr. Veriani Aprilia,
Head,
Department of Nutrition,
Faculty of Health Sciences,
Alma Ata University, Indonesia

Dear Dr.,

IWINDS 1.0 2025: INVITATION AS KEYNOTE SPEAKER

On behalf of the Organizing Committee, I am honored to invite you as our **KEYNOTE SPEAKER** at our First **International Webinar on Nutrition and Dietetics Series 1.0 (IWINDS) 2025** organized by Department of Nutrition, Faculty of Health Scineces, Alma Ata University, Indonesia. The webinar is scheduled on **25th April 2025**, with the following theme, "**Nutritional Biochemistry and Intervention: Addressing Anemia for Global Health**". The topic that being proposed by the committee member for you to deliver is ***"Nutritional Intervention of Anemia: Indonesia's Perspective".***

I believe that your participation would significantly contribute to knowledge enhancement for the participants. Please note that each speaker is given 45-minutes presentation slot, which is inclusive of 10-minutes Q&A session. Please submit your presentation abstract latest by **15th of April 2025** that will be included in the program book. Your slot will be at 11.15 - 12.00 pm (Indonesia Time).

I would appreciate it if you could indicate your acceptance of this invitation by **7th April 2025**. Thank you in advance for your consideration and I look forward to receiving a positive response from you soon.

Thank You.

Yours sincerely,

Ryan Salfarino
Chairman,
International Webinar on Nutrition and Dietetics Series (IWINDS) 1.0 2025
Department of Nutrition,
Faculty of Health Sciences,
Alma Ata University, Indonesia

INTERNATIONAL WEBINAR ON NUTRITION & DIETETICS SERIES (IWINDS 1.0) 2025

الجامعة الإسلامية العالمية ماليزيا
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA
يونيۡرسِيتِي إِسۡلَام أَنتَارَا بَغسَا مَليسِيَا
Garden of Knowledge and Virtue

NUTRITIONAL BIOCHEMISTRY AND INTERVENTION: ADDRESSING ANEMIA FOR GLOBAL HEALTH

25 April 2025 (Fri)

9.00 am - 12.00pm (Indonesia Time)

10.00 am - 1.00pm (Malaysia Time)

Online Streaming

SCAN HERE TO REGISTER

Keynote Speakers:

NUTRITIONAL BIOCHEMISTRY OF ANEMIA

Assoc Prof Dr Muhammad bin Ibrahim
Department of Nutrition Sciences
Kuliyyah of Allied Health Sciences
International Islamic University Malaysia (IIUM)

ANEMIA FROM INDONESIA'S PERSPECTIVE

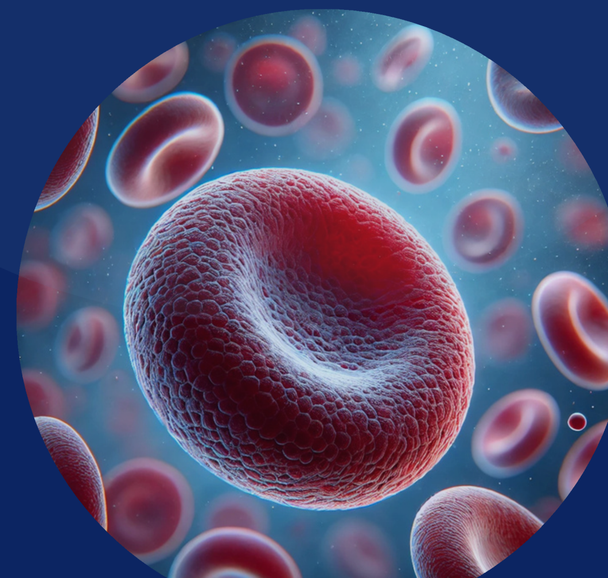
Dr Yhona Paratmanitya
Department of Nutrition
Faculty of Health Sciences
Alma Ata University (AAU)

NUTRITIONAL INTERVENTION OF ANEMIA: INDONESIA'S PERSPECTIVE

Dr Veriani Aprilia
Department of Nutrition
Faculty of Health Sciences
Alma Ata University (AAU)

Moderator:

Syed M Amirfaiz
Postgraduate Students Society
Kuliyyah of Allied Health Sciences
IIUM Kuantan



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INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA
Garden of Knowledge and Virtue

CERTIFICATE OF APPRECIATION

This certificate is awarded to

Dr. Veriani Aprilia, S.TP, M.Sc

for participation as

Keynote Speaker

in the International Webinar of Nutrition and Dietetics (IWINDS) 1.0
"Nutritionist Biochemistry and Intervention Adressing Anemia for Global Health"

Friday, April 25th 2025

Dr. Yhona Paratmanitya, S.Gz.,Dietisien.,MPH
Dean of Faculty of Health Sciences
Alma Ata University

Ryan Salfarino, S.TP, M.Sc.
Chairman
IWINDS 1.0 2025

DOKUMENTASI

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INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

Dr. Veriani Aprilia, M.Sc.

Head of Nutrition Departement
Alma Ata University

EDUCATION :

- Bachelor of Food Technology, Gadjah Mada University
- Master of Science, Gadjah Mada University
- Doctorate, Gadjah Mada University

25 April 2025

IWINDS 1.0
INTERNATIONAL WEBINAR ON NUTRITION AND DIETETICS
Nutritionist Biochemistry and Intervention Adressing Anemia for Global Health

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NUTRITIONAL INTERVENTION OF ANEMIA: INDONESIA'S PERSPECTIVE

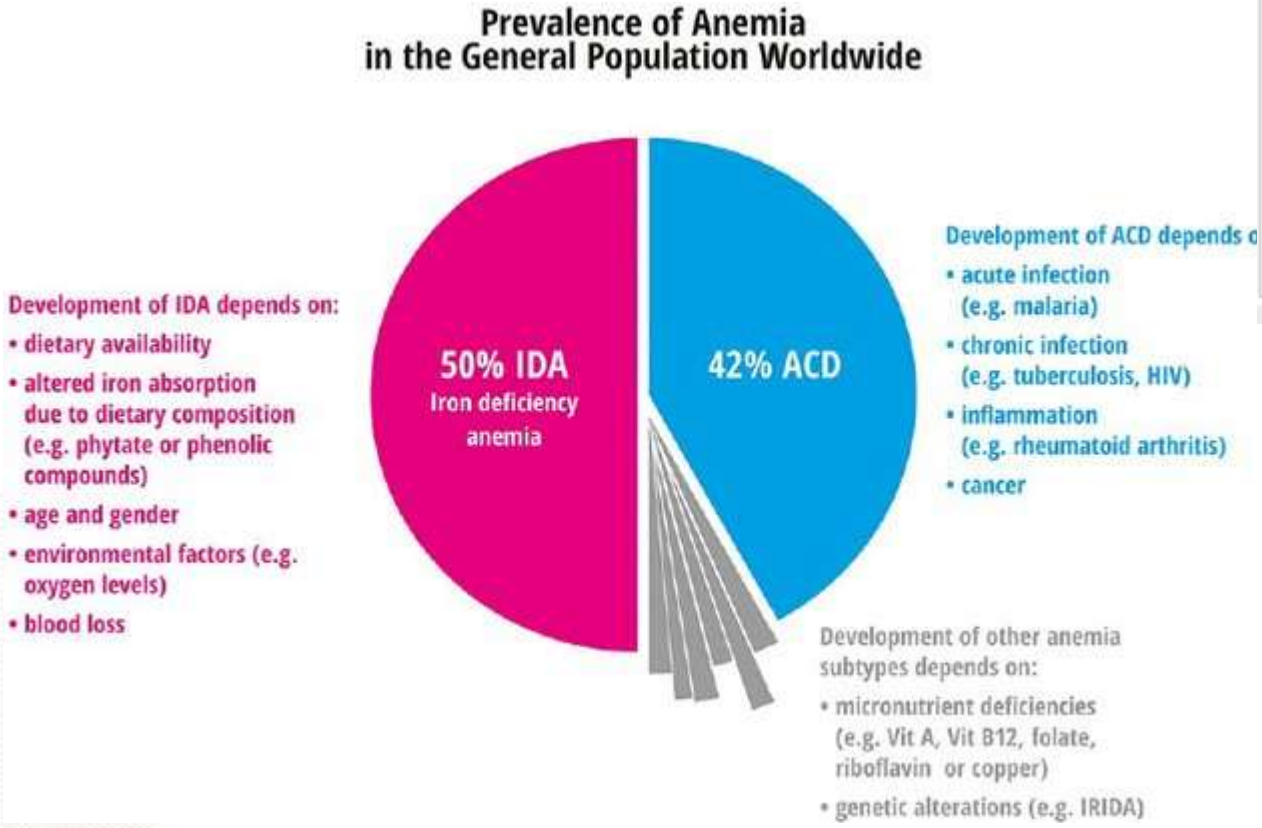
Veriani Aprilia

Department of Nutrition, Faculty of Health Sciences, Universitas Alma Ata

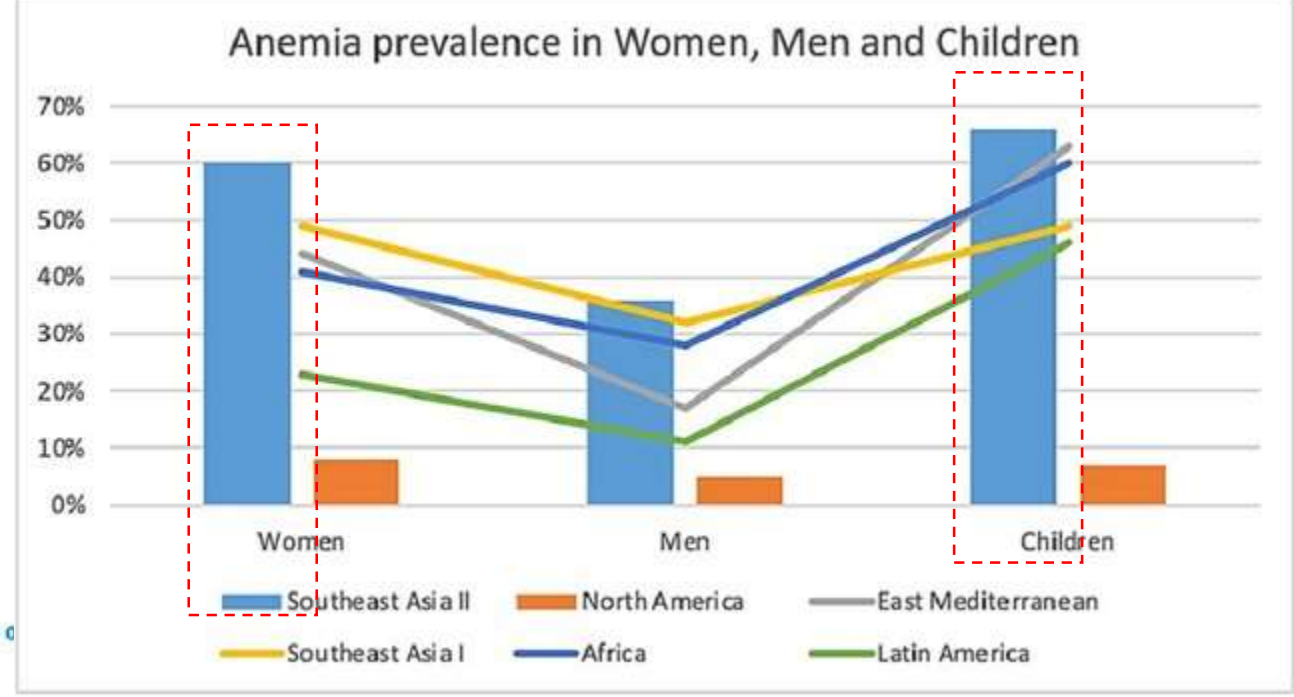
International Webinar on Nutrition and Dietetics Series (IWINDS 1.0)

25 April 2024

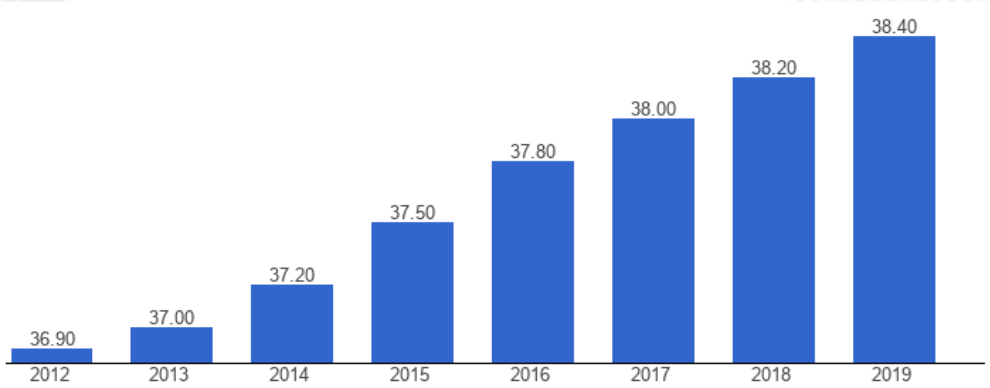
Anemia



Steinbicker and Muckenthaler, 2013



Padda et al., 2021



Underfive children in Indonesia

Program to Overcome Anemia in Indonesia

- Iron and folic acid (IFA) supplementation, including mandatory provision of 90 IFA tablets for pregnant women to prevent maternal anemia and low birth weight, and weekly supplementation for adolescent girls (10-19 years) through school-based programs and community health centers (Posyandu).
- Food fortification, enriching wheat flour, cooking oil, and rice with iron, zinc, folic acid, and vitamins B1 and B2.
- balanced nutrition guidelines promoting diversified food consumption, healthy living behaviors, physical activity, adequate water intake, and limited sugar, salt, and fat consumption.
- The fourth strategy addresses comorbidities through BMI screening, deworming, and control of malaria, HIV, and TB.
- The fifth strategy emphasizes maternal and child health programs including exclusive breastfeeding promotion, delayed umbilical cord clamping, and complementary feeding education.
- Finally, collaborations with NGOs and international agencies (UNICEF, WHO, GAIN) support these efforts. Despite these comprehensive interventions, challenges persist including low IFA supplement compliance, cultural dietary preferences (low meat consumption, rice-dependent diets), economic barriers to iron-rich foods, and weak fortification policy monitoring.

1. Iron and folic acid (IFA) supplementation

primarily targeting pregnant women, adolescent girls, and young children

History of Iron and folic acid (IFA) supplementation

- 1970: Begin to applicate in Indonesia
- 1990: For women of productive age → self supplementation. Following program: Gerakan Pekerja Perempuan Sehat dan Produktif (GP2SP) (Healthy and Productive Women Workers Movement)
- 1996: anemia prevention and control program in the regions for adolescent girls and prospective brides

- Recommended daily allowance of iron in Indonesia

Group	Age	Iron Requirement (mg/day)
Infants/Children	0–6 months	0.3 mg (AI*)
	7–12 months	7 mg
	1–3 years	7 mg
	4–6 years	10 mg
	7–9 years	10 mg

Adolescents	10–12 years	8 mg (boys), 18 mg (girls)
	13–15 years	11 mg (boys), 26 mg (girls)
	16–18 years	11 mg (boys), 26 mg (girls)
Adult Men	19–29 years	9 mg
	30–49 years	9 mg
	50+ years	9 mg
Adult Women	19–29 years	18 mg
	30–49 years	18 mg
	50+ years	8 mg
Pregnant Women	All trimesters	27 mg
Breastfeeding Women	First 6 months	9 mg
	After 6 months	9 mg

- Dosage of iron supplementation (Indonesian Ministry of Health)

Age	Dosage of iron	Forms	Notes
6-12 months	10 mg elemental iron/d	Liquid drops/syrup	preventive
1–5 years	10 mg/day	syrup/chewable tablets	preventive
6–12 years	30 mg once weekly	tablets	school-based programs (preventive)
1–5 years	3 mg/kg/day for 3 months	tablets	
6–12 years	60 mg/day for 3 months	tablets	
13-18 years (girls)	60 mg once weekly + 400 mcg folic acid	tablets	preventive
	60–120 mg/day for 3 months	tablets	treatments
Pregnant women	60 mg/day + 400 mcg folic acid for 90 days during pregnancy	tablets	Standard prophylaxis
	120 mg/day until Hb normalizes (often with 5 mg folic acid)	tablets	treatments
Women of Reproductive Age (including postpartum)	60 mg weekly	tablets	preventive
	60–120 mg/day for 3 months.	tablets	Postpartum anemia:
Adults	100–200 mg/day (divided into 2–3 doses) for 3–6 months		

- Elemental iron content varies by salt type

  Ferrous sulfate: ~20% elemental iron.

  Ferrous fumarate: ~33% elemental iron.

  Ferrous gluconate: ~12% elemental iron.

Key Challenges of Iron Supplementation Programs in Indonesia

Low Adherence & Compliance

- **Side Effects**: Nausea, constipation, and stomach pain lead to discontinuation (only **30–50% of pregnant women** complete the recommended 90-day TTD regimen).
- **Misconceptions**: Myths like "*Iron tablets cause big babies*" or "*Only weak people need supplements*" discourage use.
- **Forgetfulness**: Especially among adolescents and busy mothers

Uneven Distribution & Supply Chain Issues

- **Stockouts**: Rural and remote areas (e.g., Papua, East Nusa Tenggara) often face shortages due to logistical challenges.
- **Weak Last-Mile Delivery**: Not all Posyandu (community health posts) receive consistent TTD supplies.

Weak Monitoring & Evaluation

- **Incomplete Data**: Many health facilities fail to track actual supplement consumption vs. distribution.
- **No Real-Time Reporting**: Manual record-keeping delays problem identification.

Limited Awareness & Education

- **Low Knowledge**: Many beneficiaries don't understand anemia risks or the importance of iron.
- **Cultural Beliefs**: Some communities prefer traditional remedies over supplements.

Formulation & Palatability Issues

- **Unpleasant Taste**: Chewable tablets/syrups for children are often rejected.
- **Suboptimal Dosing**: Daily regimens (vs. weekly) reduce compliance.

2. Food fortification

- to correct a demonstrated micronutrient deficiency in the general population (mass or large-scale fortification) or in specific population groups (targeted fortification)

Wheat flours

- Permenkes No. 33/2012 (mandatory since 2013)
- Iron Compound: Ferrous sulfate ($FeSO_4$) or ferrous fumarate.
- Fortification Level: 60–90 ppm (mg/kg) of iron.
- Coverage: Used in noodles, bread, and biscuits (e.g., Indomie, Sari Roti).
- Studies show ~10–15% reduction in anemia in populations consuming fortified noodles/bread.

Rice (Fortified with Iron & Other Micronutrients)

- the government's national medium term strategic plan (RPJMN) and the target in the 2020-2024 RPJMN is that 100% of social safety net (SSN) beneficiaries receive fortified rice
- Pilot Program: "Berforte" (Fortified Rice) distributed in social protection schemes (e.g., Rastra/BPNT)→ beras rastra 10 kg/family
- Iron Compound: Micronutrient powder (MNP) or iron-coated rice kernels.
- Target: Poor households, school feeding programs
- Pilot in East Java (2020) reduced anemia in children by ~12%

Cooking oil

- Not yet iron-fortified, but some contain vitamin A (Permenkes No. 23/2021).

Infant complementary foods

- Example: "Bubur Bayi Fortifikasi" (fortified porridge) with iron, zinc, and vitamins.

Challenges of food fortification in Indonesia

- **Low public awareness** of fortified foods.
- **Uneven enforcement**, especially in small-scale mills.

3. Balanced nutrition guidelines/Pedoman Gizi Seimbang

- promoting diversified food consumption → Including iron-rich sources (animal and plant-based).
  - adequate water intake
  - limited sugar, salt, and fat consumption.
- Clean and healthy living behaviors → Reducing parasitic infections (a major cause of anemia)
- physical activity → Enhances iron absorption and metabolism
- Monitoring of body weight → Preventing undernutrition, which exacerbates anemia

Promoting Iron-Rich Foods

Food Group	Iron Sources	Bioavailability
Animal-Based (Heme Iron)	Liver, red meat, chicken, fish, eggs	High absorption (15–35%)
Plant-Based (Non-Heme Iron)	Spinach, tempeh, tofu, beans, fortified cereals	Low absorption (2–20%), but enhanced with vitamin C
Fortified Foods	Iron-fortified wheat flour, rice, infant cereals	Moderate absorption

Enhancing Iron Absorption

- **Vitamin C Pairing**: Encouraging fruits (oranges, guava) with meals to boost non-heme iron absorption.
- **Avoiding Inhibitors**: Educating on reducing tea/coffee during meals (tannins block iron absorption).

Study of Iron-Rich Foods at Universitas Alma Ata

- Red spinach stick (Wilandri et al, 2022) → **improved hemoglobin and hematocrit levels of girl adolescents in Riau Archipelago**

Study of Iron-Rich Foods at Universitas Alma Ata

- On going: noodle fortified with red spinach and lele (in collaboration with IIUM)
- Red spinach yogurt

Challenges in balanced nutrition guidelines

Barrier	Impact on Anemia
Poverty & Food Access	Low-income families rely on cheap, low-iron staples (rice, instant noodles).
Cultural Preferences	Some avoid organ meats (liver) due to taste or beliefs.
Misinformation	Myths like "spinach alone prevents anemia" persist.
Limited Monitoring	Weak enforcement of dietary guidelines in rural areas.

4. BMI screening, deworming, and control of malaria, HIV, and TB

BMI Screening (Nutritional Assessment)

- Low BMI (underweight) is linked to iron deficiency and poor dietary intake.
- Obesity can cause chronic inflammation, reducing iron absorption.

Current Programs in Indonesia:

- Posyandu (Community Health Posts): Monthly weight/height monitoring for children and pregnant women.
- Integrated ANC Services: BMI screening for pregnant women to identify malnutrition risks.
- School Health Units (UKS): BMI checks for adolescents

Deworming (Helminthiasis Control)

- Soil-transmitted helminths (hookworms, roundworms) cause blood loss and iron deficiency.
- ~24% of Indonesian children have worm infections (WHO, 2022).

Current Programs:

- Biannual Mass Deworming (Ministry of Health):
  - Targets school-age children (6–12 years).
  - Uses albendazole/mebendazole.
- Pregnant Women: Deworming in 2nd/3rd trimester (if endemic area).

Challenges:

- Low coverage in **remote regions** (Papua, NTT).
- Reinfection due to poor sanitation

Malaria Control

- Malaria causes hemolytic anemia (destruction of red blood cells).
- Endemic in Eastern Indonesia (Papua, Maluku, NTT)

Current Programs:

- Insecticide-Treated Nets (ITNs) and indoor residual spraying (IRS).
- Malaria Chemoprevention for pregnant women in high-risk zones.
- Rapid Diagnostic Tests (RDTs) and artemisinin-based therapy.

Challenges:

- Drug resistance in Papua.
- Low healthcare access in endemic areas.

HIV and TB Control

- HIV causes anemia of chronic disease (inflammatory cytokine effects).
- TB leads to malnutrition and blood loss (e.g., pulmonary TB).

Current Programs:

- HIV: Free ARV therapy (including zidovudine, which can cause anemia).
- TB: Iron/folic acid supplements for patients (MoH guideline).

Challenges:

- Stigma limits testing/treatment adherence.
- Drug interactions (e.g., ARVs affecting iron metabolism).

Case Study: Success in East Nusa Tenggara (NTT) Integrated approach:
Deworming + iron supplements + malaria nets → **15% drop in child anemia (2019–2023)**.

5. Emphasizes maternal and child health programs

Exclusive breastfeeding promotion

Breast Milk's Protective Effects

•Highly bioavailable iron: Although breast milk contains low iron (0.2–0.5 mg/L), its iron is 50–70% absorbable (vs. 4–10% in fortified formula).

•Delays iron depletion: Full-term babies have enough iron stores for 6 months if exclusively breastfed.

•Reduces infection risk: Breast milk's lactoferrin and immunoglobulins prevent diarrhea/respiratory infections, which can worsen anemia.

Case Study: Success in Surabaya

•Intervention: "Kangaroo Mother Care + EBF Education" in hospitals.

•Result: EBF rates increased from 45% to 68% (2019–2023), with lower infant anemia rates

Program	Target Group	Anemia Link
"ASI Eksklusif 6 Bulan" Campaign	Pregnant women/mothers	Ensures infants rely on breast milk's iron
Baby-Friendly Hospital Initiative (BFHI)	Health facilities	Promotes immediate breastfeeding (colostrum is iron-rich)
Posyandu Counseling	Mothers of <2-year-olds	Teaches **avoidance of prelacteal feeds** (e.g., honey, water)
Workplace Lactation Support	Working mothers	Prevents early formula use

delayed umbilical cord clamping

waiting **1–3 minutes** after birth before cutting the cord

Increased Iron Reserves

• Extra blood transfer: Delaying clamping allows 20–30% more blood (up to 100 mL) to flow from the placenta to the baby.

• Additional iron: This provides 40–50 mg more iron, enough to prevent deficiency for 6–8 months.

• Reduces early anemia risk: Babies with DCC have higher hemoglobin levels at 2–6 months (WHO, 2020).

spect	Details
Policy	**Recommended by WHO & Kemenkes RI**, but not yet mandatory.
Hospital Practice	**~50% of hospitals** practice DCC, mostly in urban areas.
Traditional Birth Attendants (TBAs)	Often clamp early due to lack of training.
Awareness	Low among mothers; many prefer immediate cutting for cultural reasons.

delayed umbilical cord clamping

critical intervention to prevent and reduce anemia among Indonesian children aged **6–24 months**, a period when iron needs are high but dietary intake is often inadequate. Proper education for caregivers on **what, when, and how to feed** can significantly improve iron intake and absorption, breaking the cycle of anemia.

complementary feeding education

critical intervention to prevent and reduce anemia among Indonesian children aged **6–24 months**, a period when iron needs are high but dietary intake is often inadequate. Proper education for caregivers on **what, when, and how to feed** can significantly improve iron intake and absorption, breaking the cycle of anemia.

Common Mistake	Impact on Anemia
Late introduction of solids (after 9 months)	Delays iron intake
Over-reliance on rice porridge (low iron)	Inadequate iron supply
Lack of iron-rich foods (meat, fish, beans)	Poor iron stores
No vitamin C pairing (blocks absorption)	Non-heme iron not absorbed

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Thank you

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INTERNATIONAL WEBINAR ON NUTRITION & DIETETICS SERIES (IWINDS 1.0) 2025

Nutritional Biochemistry and Intervention: Addressing Anemia for Global Health

25 APRIL 2025

PROGRAM BOOK

INTERNATIONAL WEBINAR ON NUTRITION & DIETETICS SERIES (IWINDS 1.0) 2025

"Nutritional Biochemistry and Intervention: Addressing Anemia for Global Health"

BACKGROUND

The **International Webinar on Nutrition and Dietetics Series (IWINDS) 1.0** is a pioneering initiative jointly organized by the **Department of Nutrition, Faculty of Health Sciences, Alma Ata University (Indonesia)** and the **Postgraduate Student Society, Kulliyyah of Allied Health Sciences, International Islamic University Malaysia (IIUM)**. This annual webinar series aims to serve as a collaborative platform for discussing pressing nutrition-related health challenges across Asia, particularly in Indonesia and Malaysia.

The theme for IWINDS 1.0, *"Nutritional Biochemistry and Intervention: Addressing Anemia for Global Health,"* reflects the urgency of addressing anemia—a condition that continues to affect millions globally, especially in vulnerable populations such as women, children, and underprivileged communities. The webinar will explore the biochemical underpinnings of anemia and showcase evidence-based nutritional interventions designed to prevent and manage this condition.

With anemia rates remaining alarmingly high in both Indonesia and Malaysia, despite public health initiatives, IWINDS 1.0 emphasizes region-specific challenges, dietary patterns, and socioeconomic barriers. It aims to foster knowledge exchange and multidisciplinary collaboration among researchers, practitioners, policymakers, and students from across the region and beyond.

By spotlighting innovations in nutritional biochemistry and interventions, IWINDS 1.0 aspires to contribute to global health goals, align with the visions of both host universities, and advance public health outcomes through sustainable, nutrition-focused strategies.

Welcome Messages

Message from the Advisor

Assalamualaikum warahmatullahi wabarakatuh.

It is with great pleasure and deep appreciation that I welcome all distinguished speakers, guests, and participants to the **International Webinar on Nutrition & Dietetics Series (IWINDS) 1.0**, hosted under the theme *"Nutritional Biochemistry and Intervention: Addressing Anemia for Global Health."*

This webinar marks a significant step in our ongoing collaboration with the International Islamic University Malaysia and reflects our shared commitment to advancing public health through education, research, and engagement. Anemia, as a persistent global health issue, particularly affects communities in Southeast Asia. Through this scholarly platform, we aim to highlight the intersection of nutritional biochemistry with public health policy and practice.

May this webinar foster meaningful dialogue, spark innovative research, and catalyze strategic actions to combat anemia at both regional and global levels. We look forward to insightful exchanges and enduring collaborations that extend well beyond today's program.

Thank you for your participation and contribution.
Wassalamualaikum warahmatullahi wabarakatuh.

Dr. Yhona Paratmanitya
Advisor, IWINDS 1.0
Faculty of Health Sciences, Alma Ata University

Message from the Chairman

Warm greetings to all attendees of the **International Webinar on Nutrition & Dietetics Series (IWINDS) 1.0**. It is an honor to welcome each of you to this meaningful and timely gathering focused on the critical issue of anemia.

This event represents more than just academic dialogue; it embodies a concerted effort to bring together expertise from different regions, with a strong emphasis on cooperation between Indonesia and Malaysia. The goal is to address pressing nutritional health challenges through science-based approaches, particularly from a biochemical perspective.

I wish to thank our esteemed keynote speakers and collaborators from IIUM and Alma Ata University, and extend my gratitude to the organizing committee for their tireless efforts. May this webinar inspire further research and interventions that advance our shared mission of global health equity.

Thank you.

Mr. Ryan Salfarino
Chairman, IWINDS 1.0
Faculty of Health Sciences, Alma Ata University

Message from the Deputy Chairman

Assalamualaikum and warm greetings.

It is a privilege to serve as Deputy Chairman for the **IWINDS 1.0 Webinar**, a cross-national academic endeavor that emphasizes the vital role of nutritional science in addressing anemia—a condition that continues to impair health and development worldwide.

Our theme for this series underscores the importance of biochemical understanding in developing sustainable interventions. I believe that by promoting regional insights and global perspectives, we can collectively contribute to practical, evidence-based solutions.

I commend the dedication of all organizing members, speakers, and participants. Your presence here signifies a commitment to research-driven progress, and I hope this event fosters long-lasting networks of collaboration.

Thank you and may the discussions be fruitful and impactful.
Wassalamualaikum warahmatullahi wabarakatuh.

Dr. Nuraniza Azahari
Deputy Chairman, IWINDS 1.0
Kulliyyah of Allied Health Sciences, International Islamic University Malaysia

Organizing Committee

The success of this international webinar is made possible through the dedication and collaboration of the following organizing committee members:

Position	Name	Affiliation
Advisor	Dr. Yhona Paratmanitya	Alma Ata University, Indonesia
Chairman	Mr. Ryan Salfarino	Alma Ata University, Indonesia
Deputy Chairman	Dr. Nuraniza Azahari	International Islamic University Malaysia (IIUM)
Secretary	Ms. Rindi Nuryani	Alma Ata University, Indonesia
Technical & IT	Mr. Fitsyal Febriyadin	Alma Ata University, Indonesia
Event Coordinator	Ms. Pramitha Sari	Alma Ata University, Indonesia
Promotion & Registration	Mr. Syed M Amirfaiz Syed Ali	International Islamic University Malaysia (IIUM)
Special Task	Mr. Badr Eddin Kharsa	International Islamic University Malaysia (IIUM)

Program Schedule

Indonesia Time (WIB)	Malaysia Time (MYT)	Activity
8.45 – 9.00 am	9.45 – 10.00 am	Participants joining the platform
9.00 – 9.10 am	10.00 – 10.10 am	Opening by MC (Alma Ata) + National Anthems of Indonesia & Malaysia
9.10 – 9.15 am	10.10 – 10.15 am	Welcoming Remark by IWINDS 1.0 Chairman
9.15 – 10.00 am	10.15 – 11.00 am	**Keynote Speech 1**: "*Nutritional Biochemistry of Anemia*" Speaker: Assoc. Prof. Dr. Muhammad bin Ibrahim (IIUM)
10.00 – 10.15 am	11.00 – 11.15 am	Short break (**Quiz**)
10.15 – 11.00 am	11.15 – 12.00 pm	**Keynote Speech 2**: "*Anemia from Indonesia's Perspective*" Speaker: Dr. Yhona Paratmanitya (AAU)
11.00 – 11.45 am	12.00 – 12.45 pm	**Keynote Speech 3**: "*Nutritional Intervention of Anemia: Indonesia's Perspective*" Speaker: Dr. Veriani Aprilia (AAU)
11.45 am	12.45 pm	Photography session & disperse

Keynote Speech Abstracts

Keynote 1: The Nutritional Biochemistry of Anemia

Speaker: Muhammad Bin Ibrahim[123], Syed Muhammad Amirfaiz Bin Syed Ali[1]
1 Department of Nutrition Sciences, Kulliyyah of Allied Health Sciences, International Islamic University Malaysia, Malaysia
2 Institute of Planetary Survival for Sustainable Well-being (PLANETIIUM), International Islamic University Malaysia, Pahang, Malaysia
3 Food Security and Public Health Nutrition Research Group (FOSTER), Kulliyyah of Allied Health Sciences, International Islamic University Malaysia, Pahang, Malaysia

Corresponding author: abumaisarah@iium.edu.my

ABSTRACT

Introduction: Anemia is a condition in which the number of red blood cells, coupled consequently with their oxygen-carrying capacity is insufficient to meet the body's physiologic needs. Many studies show that specific physiological needs vary with a person's age, gender, residential elevation above sea level (altitude), smoking behaviors, and different stages of pregnancy. The objective: This paper will focus the discuss on the status and trends of anemia in Malaysia together with the nutritional biochemistry aspects of anemia. The trends: Globally, it is estimated that 40% of all children aged 6–59 months are affected by anemia. Data from the National Health & Morbidity Survey (NHMS) 2023, the overall prevalence of anemia in children aged 6-59 months was 46.5%. Nutritional biochemistry of anemia: Iron metabolism is strongly regulated by hepcidin, a liver-derived peptide that controls dietary iron absorption and deployment from storage sites. Higher levels of hepcidin, normally observed in chronic inflammation and obesity, promote to functional iron deficiency by limiting iron availability for erythropoiesis. Beyond iron, absences in folate and vitamin B12 impair nucleotide biosynthesis, leading to megaloblastic anemia characterized by ineffective erythropoiesis and macrocytic red blood cells. Promising evidence suggests that homocysteine accumulation, due to inadequate folate or vitamin B12 levels, may further worsen oxidative stress and endothelial dysfunction, compounding anemia-related complications. Furthermore, vitamin A deficiency has been implicated in impaired iron mobilization and altered erythropoietin production, underscoring the multifactorial nature of anemia. Studies showed that bioavailability of dietary iron is a crucial determinant of anemia risk, with non-heme iron from plant-based diets exhibiting poor absorption compared to heme iron from animal sources. Polyphenols, phytates and calcium further inhibit iron uptake, while ascorbic acid and certain amino acids enhance their bioavailability. Presented Malaysia's dietary patterns, optimizing iron absorption through

strategic food combinations and fortification programs is essential. A deeper understanding of the biochemical mechanisms governing anemia is critical for formulating targeted, evidence-based nutritional interventions that address both deficiency and functional anemia at the molecular level. Conclusion: The prevalence of anemia among children aged 6-59 months in this survey was considered a severe public health problem (≥ 40%). Understanding the nutritional biochemistry of anemia will facilitate the health care related industries to come with effective recommendations by incorporate anemia prevention strategies into complementary feeding and preschoolers' education for mothers and caregivers.

Keywords: Anemia, Prevalence, Nutritional Biochemistry, Iron Deficiency, Polyphenols, Biochemical Mechanism

Keynote 2: Anemia from Indonesia's Perspective

Speaker: Yhona Paratmanitya[1,2]
1 Department of Nutrition, Faculty of Health Sciences, Universitas Alma Ata, Indonesia
2 Graduate School of Public Health, Faculty of Health Sciences, Universitas Alma Ata, Indonesia

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ABSTRACT

Introduction: The prevalence of anemia in Indonesia is still high and tends to increase in the last two decades. The prevalence in toddlers, the elderly, and pregnant women is higher than in other age groups. Some of the determining factors of anemia include food intake, compliance with consumption of iron supplements, and the presence of infection. The objective: This paper will present the prevalence of anemia in Indonesia together with the determinants of anemia, especially in children and pregnant women. Discussion: World Health Organization (WHO) estimate that globally, 40% of all children aged 6–59 months, 37% of pregnant women and 30% of women 15–49 years of age are affected by anemia. In Indonesia, the recent National Health Survey (2023), shows that the prevalence of anemia among children aged 0-4 years is 23,8%; children aged 5-14 years is 16,3%; women of reproductive age (WRA) who ever been pregnant is 24,3%; and pregnant women is 27,7%. Based on Indonesian Basic Health Survey 2018 data analysis, several risk factors for anemia were found. Determinants of anemia in toddlers include the child's age and the family's economic status. Young age groups have a higher risk of experiencing anemia than older age groups, and families with better economic levels can prevent anemia in toddlers. Meanwhile, in the WRA group, the determining factors for anemia include age, level of education, chronic energy deficiency (CED) status, and compliance with iron supplement consumption. The age group <20 years has a higher risk of experiencing anemia compared to the older age group. WRA who experience CED and are not compliant in consuming iron supplement also have a higher risk of experiencing anemia. In pregnancy, the risk factors of anemia include maternal age, gestational age, ANC visits, and CED status. Pregnant women aged 20-35 years have the lowest risk of experiencing anemia compared to younger and older age groups. Pregnant women with KEK, in the third trimester of pregnancy, and ANC visits <4x have a higher risk of experiencing anemia. Conclusion: The prevalence of anemia among children, WRA, and pregnant women in Indonesia still above 20%. By knowing the determinants of anemia, appropriate prevention strategies can be developed to overcome the problem of anemia in Indonesia.

Keywords: Anemia, Prevalence, Determinant, Iron Deficiency, Indonesia

Keynote 3: Nutritional Intervention of Anemia – Indonesia's Perspective

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ABSTRACT

Introduction: Anemia remains a significant public health challenge in Indonesia, particularly affecting pregnant women, children under five, and adolescent girls. This condition is primarily driven by iron deficiency along with other nutritional deficiencies (vitamin B12, folate), infectious diseases (malaria, helminthiasis), and genetic factors (thalassemia). Given Indonesia's diverse dietary patterns, socioeconomic disparities, and varying levels of healthcare access, nutritional interventions play a crucial role in combating this prevalent health issue. Objectives: This paper examines nutritional interventions for anemia in Indonesia through both preventive and curative strategies. Discussion: The first strategy involves iron and folic acid (IFA) supplementation, including mandatory provision of 90 IFA tablets for pregnant women to prevent maternal anemia and low birth weight, and weekly supplementation for adolescent girls (10-19 years) through school-based programs and community health centers (Posyandu). The second strategy focuses on food fortification, enriching wheat flour, cooking oil, and rice with iron, zinc, folic acid, and vitamins B1 and B2. The third strategy implements balanced nutrition guidelines promoting diversified food consumption, healthy living behaviors, physical activity, adequate water intake, and limited sugar, salt, and fat consumption. The fourth strategy addresses comorbidities through BMI screening, deworming, and control of malaria, HIV, and TB. The fifth strategy emphasizes maternal and child health programs including exclusive breastfeeding promotion, delayed umbilical cord clamping, and complementary feeding education. Finally, collaborations with NGOs and international agencies (UNICEF, WHO, GAIN) support these efforts. Despite these comprehensive interventions, challenges persist including low IFA supplement compliance, cultural dietary preferences (low meat consumption, rice-dependent diets), economic barriers to iron-rich foods, and weak fortification policy monitoring. Conclusions: Strengthening program implementation, enhancing community engagement, and enforcing policies more effectively are crucial for reducing anemia prevalence and improving public health outcomes in Indonesia.

Keywords: anemia; nutritional intervention; iron supplementation; food fortification; public health

Keynote Speaker Profile

Assoc. Prof. Dr. Muhammad Bin Ibrahim

Assoc. Prof. Dr. Muhammad Bin Ibrahim is an esteemed academic and researcher specializing in Nutritional Biochemistry, currently serving as the Deputy Dean of Postgraduate and Responsible Research & Innovation at the Kulliyyah of Allied Health Sciences, International Islamic University Malaysia. He holds a Ph.D. in Nutritional Biochemistry from Universiti Putra Malaysia and a Master of Science (Food) as well as a B.Tech (Food) from Universiti Sains Malaysia.

With over 18 years of academic experience, Dr. Muhammad has taught an extensive array of undergraduate and postgraduate courses, including Nutritional Biochemistry, Genes and Nutrition, Nutrition Policy & Food Security, and Islamic Practices in Food and Nutrition. He is also an active supervisor of doctoral and master's research in health sciences, particularly in antioxidant research and metabolic health.

Dr. Muhammad's research is widely recognized, especially his work on underutilized fruits such as *Baccaurea angulata* (Belimbing Dayak) and their functional food potential. He has led and collaborated on numerous government-funded projects under schemes such as FRGS, PRGS, and KTP, focusing on cardiovascular health, antioxidant nutrition, and honey-based functional foods (e.g., Trihoney™).

He has authored over 60 scientific publications indexed in WoS and Scopus and frequently presents at international conferences. His scholarly contributions span the domains of food biochemistry, functional foods, public health nutrition, and Islamic perspectives in dietary sciences.

Assoc. Prof. Dr. Muhammad continues to champion translational research that bridges scientific knowledge and community health improvement, making him a distinguished contributor to the field of nutritional biochemistry.

Dr. Yhona Paratmanitya

Dr. Yhona Paratmanitya is a senior academician and public health expert serving as the Dean of the Faculty of Health Sciences at **Universitas Alma Ata**, Yogyakarta, Indonesia. She is also affiliated with the university’s **Graduate School of Public Health**, where she contributes to the academic development of future health professionals with a focus on nutrition and preventive healthcare.

Dr. Yhona's research interests center around maternal and child health, nutritional epidemiology, and community-based interventions aimed at addressing anemia and related deficiencies. Her work explores the determinants of anemia among vulnerable populations, including toddlers, women of reproductive age, and pregnant women in Indonesia. She emphasizes data-driven approaches for health planning and policy development, often using large-scale survey data like the Indonesian Basic Health Survey and National Health Survey.

As a keynote speaker at IWINDS 1.0, she brings invaluable insights into the Indonesian perspective on anemia—highlighting region-specific risk factors, socioeconomic influences, and public health implications. Her contribution underscores the necessity of context-specific, equitable, and evidence-informed strategies to reduce anemia prevalence and improve health outcomes.

Dr. Veriani Aprilia

Dr. Veriani Aprilia is a distinguished academic and expert in food science and nutrition, currently serving as the **Head of the Department of Nutrition Science** at the Faculty of Health Sciences, Universitas Alma Ata, Yogyakarta, Indonesia. She holds a **Ph.D. in Food Science** (2018), **M.Sc. in Food Science and Technology** (2012), and **Bachelor of Food and Agricultural Product Technology** (2005)—all from Universitas Gadjah Mada.

With a comprehensive academic and research portfolio, Dr. Veriani has been active in both educational leadership and scholarly work. Her research centers on **glucomannan-based prebiotics**, **synbiotics**, **functional food product development**, and **micronutrient interventions**, particularly for maternal and child health. She has published in international journals such as *Carbohydrate Polymers*, *Scientific World Journal*, and *Walailak Journal of Science and Technology*.

In addition to her academic pursuits, Dr. Veriani has held numerous leadership roles, including **Head of the Research Institute** and **Head of Alma Ata University Press**. She is also a reviewer for high-impact journals such as *LWT - Food Science and Technology* and *Carbohydrate Polymers*.

Her work integrates laboratory innovation with public health implementation, often addressing anemia and nutrition-related disorders. As a keynote speaker at IWINDS 1.0, she contributes insights drawn from Indonesia's landscape of nutritional interventions and her extensive expertise in product innovation, prebiotic formulation, and public health advocacy.

Acknowledgements

The Organizing Committee of the **International Webinar on Nutrition & Dietetics Series (IWINDS) 1.0**, themed *"Nutritional Biochemistry and Intervention: Addressing Anemia for Global Health"*, would like to express our deepest appreciation to all individuals and institutions whose contributions have made this event a success.

First and foremost, we thank **Universitas Alma Ata, Indonesia** and the **International Islamic University Malaysia (IIUM)** for their continued support, commitment, and collaboration in jointly organizing this international academic platform.

Special thanks are extended to our distinguished keynote speakers—**Assoc. Prof. Dr. Muhammad Bin Ibrahim**, **Dr. Yhona Paratmanitya**, and **Dr. Veriani Aprilia**—for their insightful presentations, scholarly contributions, and dedication to addressing global nutritional challenges.

We also acknowledge the efforts of the **Postgraduate Student Society, Kulliyyah of Allied Health Sciences (IIUM)** and the **Department of Nutrition, Faculty of Health Sciences (Alma Ata University)** for their organizational leadership, promotional outreach, and coordination across borders.

Our sincere gratitude goes to all committee members, moderators, volunteers, and technical teams for their invaluable support and commitment throughout the preparation and execution of this event.

Finally, we extend heartfelt appreciation to all participants, both local and international, whose active engagement has enriched the discourse and strengthened the academic and professional networks within the global nutrition community.

May the outcomes of this webinar serve as a steppingstone for future collaborations, impactful research, and meaningful actions toward the eradication of anemia and the advancement of global health.

Closing Note

As we conclude the **International Webinar on Nutrition & Dietetics Series (IWINDS) 1.0**, we reflect on a day marked by rich academic exchange, insightful presentations, and meaningful discussions centered on the critical theme of *"Nutritional Biochemistry and Intervention: Addressing Anemia for Global Health."*

This event has successfully brought together scholars, practitioners, and students from various institutions and countries to share knowledge and perspectives on one of the most pressing nutritional issues affecting populations worldwide. The integration of biochemical understanding, cultural context, and public health strategy has highlighted the multifaceted nature of anemia and the importance of multidisciplinary solutions.

We are especially proud of the collaborative effort between **Universitas Alma Ata** and **International Islamic University Malaysia**, which exemplifies the spirit of cross-border academic solidarity and shared commitment to advancing global health.

To our keynote speakers, organizing committee, and all participants—thank you for your contributions, engagement, and enthusiasm. We hope the ideas shared today will spark future research, inform policy directions, and inspire actionable interventions in your respective communities.

We look forward to welcoming you again in the upcoming series of IWINDS and to building a stronger, healthier, and more equitable world—through the power of nutrition science.

Thank you. Terima kasih. Syukran.