



Supplement

Nutri Symposium 2023 Micronutrient Deficiency and It's relation with Health & Disease

This supplement is a selection of paper presented at the Nutri Symposium 2023 on 29 – 30 July 2023.

Supplementary Paper:

Speaker presentation :

- **Enhancing patient care: Ethical considerations for micronutrient management in hospital nutrition settings**
 - Chyme reinfusion therapy using new technology
 - Vitamin D supplementation in critically ill patients: pros and cons
- **Iron deficiency and its impact to children's cognitive and development**
- **Safety drinking water and risk of stunting in children: Is it related ?**
 - Nutrition in paediatric intestinal failure
Many More

Oral presentation :

- **A corellation between adult body mass index and waist circumference and blood pressure at the primary health care of Gribig**
 - Relationship between spacing of pregnancy and incidence of anemia in Multipara
 - The role of folate in the management of insulin resistance in adults : a systematic review
- **Knowledge, attitude, and behavior regarding hydration of fluid intake of a university's students in Jakarta**
 - Fluid intake among university students in Jakarta
- **The role of symbiotic to treat diarrhea in a critically ill Guillain-barre syndrome patient with morbid and type 2 diabetes mellitus : A case report**
 - The effects of probiotics supplementation on children with ADHD : A systematic review
- **Impact of an oral nutritional supplement on improving body composition in older adults with malnutrition : A randomized controlled trial**
- **Association between minimum dietary diversity practice in children aged 6-23 months with nutritional status in east Jakarta 2020**

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Cover design by. Harryarts / Freepik

Aim and Scope

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Publication Frequency

This journal is published bi-annually

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Editorial Office	World Nutrition Journal Wisma Nugraha, Suite 501, 5th Floor JI Raden Saleh No. 6 Jakarta Pusat Phone: +622131905330 Email: worldnutritionjournal@gmail.com	
Publisher	Indonesian Nutrition Association Wisma Nugraha, Suite 501, 5th Floor JI Raden Saleh No. 6 Jakarta Pusat Phone: +622131905330 Email: ina.nutri@yahoo.co.id	

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ABSTRACT

Enhancing patient care: Ethical considerations for micronutrient management in hospital nutrition settings

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Received: 14 September 2023

Accepted: 18 September 2023

Published: 30 September 2023

Abstract : *Nutri Symposium 2023 - Speaker*

Link to DOI:

[10.25220/WNJ.V07.S1.0001](https://doi.org/10.25220/WNJ.V07.S1.0001)

Citation: Permatasari, D. Enhancing patient care: ethical considerations for micronutrient management in hospital nutrition settings. World Nutrition Journal.2023 September 30, 7(S1): 1.



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Website :

<http://www.worldnutrijournal.org/>

Micronutrients are represented by vitamins and minerals and are present in a wide variety of foods. Each of these nutrients performs specific functions that are essential for the health of our cells and their harmonious functioning. Data suggest that many people have an inadequate daily intake of micronutrients, even when nutritious food is more easily available. It has since been established that the complex, integrated immune system needs multiple specific micronutrients, including vitamins A, D, C, E, B6, and B12, folate, zinc, iron, copper, and selenium, which play vital, often synergistic roles at every stage of the immune response. Adequate amounts are essential to ensure the proper function of physical barriers and immune cells; however, daily micronutrient intakes necessary to support immune function may be higher than current recommended dietary allowances. Even in Covid-19 patients, micronutrients are used as one of the recommendations for the therapy, both with mild symptoms to severe symptoms who require treatment in the ICU.

Critical micronutrients were identified with deficiencies being present in numerous acute and chronic diseases. The ESPEN Micronutrient Recommendations explained that the adequate amounts of all essential trace elements and vitamins shall be supplied to all patients receiving medical nutrition from the beginning of the period of nutritional support. In many clinical situations, for safety and practical reasons micronutrients can be provided orally or enterally to correct depletion or deficiency. The parenteral route, intravenous (IV) or intramuscular (IM), may be indicated where absorption is poor, or for rapid correction of a deficiency.

The ethical principles “autonomy, beneficence, non-maleficence and justice” are internationally recognized. They are interrelated and must be applied in the act of medical decision making, including the nutrition support (macro and micronutrient treatment). The crucial difference between nutritional support as a medical treatment and force feeding is the patient’s consent to treatment. If the patient is unable to give this, any treatment given must be in their best interests. Those involved in providing nutritional support should have a clear understanding of the ethical and legal principles that underpin such decisions and knowledge of the benefits and burdens of the proposed treatments. Decision making must consider knowledge of the underlying disease process and its prognosis, and the evidence relating the likely benefits and burdens of nutritional support in this situation. These issues must be fully discussed with the patient to enable them to make an informed decision.

Keywords: micronutrients, deficiencies, recommendations, ethical principles

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ABSTRACT

Chyme reinfusion therapy using new technology

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Abstract : *Nutri Symposium 2023 - Speaker*

Received: 14 September 2023
Accepted: 18 September 2023
Published: 30 September 2023

Link to DOI:

[10.25220/WNJ.V07.S1.0002](https://doi.org/10.25220/WNJ.V07.S1.0002)

Citation: Hardy, G. Chyme reinfusion therapy using new technology. World Nutrition Journal. 2023 September 30, 7(S1): 2.



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Website :
<http://www.worldnutrijournal.org/>

High output double enterostomies (DES) and disease-related malnutrition (DRM) are features of intestinal failure (IF) that require parenteral nutrition (PN) until surgical re-establishment of intestinal continuity. PN risks include gut and hepatobiliary dysfunction and Intestinal failure associated liver disease (IFALD), defined as hepatobiliary dysfunction with elevated liver function tests (LFT). Chyme reinfusion therapy (CRT) is a distal feeding technique recommended for restoration of digestive function. International CRT studies in 370+ patients with DES or enteroatmospheric fistula (EAF) demonstrate enhanced intestinal absorption and decreased fluid losses. Improved nutritional status, early weaning from PN, with improved LFT, reduced postoperative complications and length of stay (LOS) result in appreciable cost savings. In our Australian/New Zealand experiences with CRT using the closed Insides System™, nutritional status was monitored by a dietitian in the nutrition support team (NST) and in 80% patients PN was stopped or adjusted according to oral intakes when energy targets were achieved. Likewise, opiates and Loperamide, that retard gastric emptying and prolong transit time, were monitored by pharmacy and the medications and PN reduced as CRT progressed. Patients experienced rapid GI recovery (85%), decreased net stoma losses with at least one bowel movement (79%). Normalisation of electrolytes and LFT with weight gains of 2-6 kg (60%) and stoma reversal for 14/19 (74%) facilitated accelerated hospital discharge for home management supported by stoma nurses and NST.

Based on these clinical experiences CRT has the potential to improve nutrition status and normalise LFT with reduced use of drugs and PN, fewer infections, and reduced LOS. If these data with savings, compared to current standards of care, estimated at IDR1000m per patient, are verified in larger studies, CRT could make a significant contribution to the efficacy and cost effectiveness of nutrition support for intestinal failure.

Keywords: chyme reinfusion, intestinal failure

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ABSTRACT

Vitamin D supplementation in critically ill patients: pros and cons

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Received: 14 September 2023

Accepted: 18 September 2023

Published: 30 September 2023

Link to DOI:

[10.25220/WNJ.V07.S1.0003](https://doi.org/10.25220/WNJ.V07.S1.0003)

Citation: Norouzy, A. Vitamin D supplementation in critically ill patients: pros and cons. World Nutrition Journal.2023 September 30, 7(S1): 3.



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Website

: <http://www.worldnutrijournal.org/>

Abstract : Nutri Symposium 2023 - Speaker

Traumatic Brain Injury (TBI) is a leading cause of death in patients admitted to the intensive care unit. Vitamin D or calciferol is a steroidal compound made of cholesterol with healing properties due to its specific receptors (vitamin D receptors) in the nucleus of brain cells and its protective properties against nervous tissue in addition to its anti-inflammatory effects.

This study is a double-blind randomized clinical trial that was performed on 72 patients with severe brain injury with a mean age of 34-50 years. They were randomly assigned to the study, thus intervention and control groups received vitamin D with a dose of 100,000 units and a dose of 1000 units for 5 days, respectively. Clinical assessments measured the levels of several biomarkers such as interleukin 6, monocyte aggregating protein type 1, the ratio of C-reactive protein to albumin, mortality rates of 28 and 120 days. Also, the scores of APACHE II, SOFA and NUTRIC questioner, serum levels of parathyroid hormones, calcium, phosphorus, calorie, and macronutrient intakes were measured before and after the intervention. Statistical analysis of the data was performed using SPSS software version 21 and $P < 0.05$ was considered statistically significant.

High-dose of vitamin D reduced 260.16 pg/ml levels of IL-6 ($P = 0.10$), 47.33 pg/ml MCP1 ($P = 0.13$) levels and 22.98 units in the ratio of CRP to albumin ($P = 0.84$) in the intervention group. The mean survival during 28 and 120 days of follow-up was 24.86 and 93.74 days in the control group and 25.72 and 99.15 days in the intervention group, respectively ($P = 0.629$, $P = 0.530$). Subsequently by the end, in the intervention group, the GCS score increased by 1.76 units ($P = 0.56$) and the SOFA and NUTRIC score decreased by 2.77 and 1.5 units respectively ($P = 0.01$, $P = 0.1$). The mean serum levels of PTH in the group with a high dose of vitamin D (500000 IU) decreased by 55 pg/ml ($P = 0.005$). However, changes in the other markers were not significantly different between the two groups ($P < 0.05$).

Oral supplementations with high dose of vitamin D in patients with severe TBI could improve their clinical status by lowering PTH levels and may increase the long-term survival rate in these patients. Although further studies are required to conclusively prove these effects.

Keywords: vitamin D supplementation, traumatic brain injury, inflammation, mortality

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ABSTRACT

Iron deficiency and its impact to children's cognitive and development

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Received: 14 September 2023

Accepted: 18 September 2023

Published: 30 September 2023

Link to DOI:

[10.25220/WNJ.V07.S1.0004](https://doi.org/10.25220/WNJ.V07.S1.0004)

Citation: Sekartini R, Iron deficiency and its impact to children's cognitive and development, World Nutrition Journal.2023 September 30, 7(S1): 4.



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Website

: <http://www.worldnutrijournal.org/>

Abstract : Nutri Symposium 2023 - Speaker

Children are born to learn, and they develop and learn very quickly in their early years. Brain development milestones in children aged 0-5 years and Iron plays an important role in many neurodevelopmental processes, and animal studies have shown that adequate iron requirements in pregnancy and childhood are critical for a child's brain and neurodevelopment. Early childhood has been associated with permanent cognitive deficits related to CNS structure, metabolic disturbances, growth retardation, impaired immune response, psychological abnormalities, and behavioral delays, including learning skill, performance at school. Iron is necessary for various cellular processes in the growing brain especially in terms of memory and learning. Children in early life show enduring cognitive deficits. Iron plays an important role in encouraging the growth and development of children. Physical health and nutrition are important in the first five years of life. Children who are unable to achieve adequate substance intake are likely to show permanent cognitive decline and impaired motor development. The *Dietary Reference Intakes* (DRI) recommendations include the *Recommended Dietary Allowance* (RDA) for iron, iron requirements are based on iron amounts in the average amount of breastmilk consumed and their mix diet. This refers to the average daily iron intake level that is sufficient to meet the requirements of nearly all healthy individuals at a given life stage. Iron deficiency occurs on a continuum with symptoms including focus, lack of appetite and anger; Unstable growth and delayed development are often not apparent until the deficiency becomes severe. Therefore, it needs professional help.

Keywords: iron deficiency, brain and neurodevelopment, children's cognitive

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ABSTRACT

Safety drinking water and risk of stunting in children: Is it related ?

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Abstract : *Nutri Symposium 2023 - Speaker*

Received: 14 September 2023
Accepted: 18 September 2023
Published: 30 September 2023

Link to DOI:
[10.25220/WNJ.V07.S1.0005](https://doi.org/10.25220/WNJ.V07.S1.0005)

Citation: Ratnayani, Safety drinking water and risk of stunting in children: is it related?, World Nutrition Journal.2023 September 30, 7(S1): 5.



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Background and objectives: Slum areas are identical with nutritional problems in children including stunted children. Incidence of stunted can be caused by various factors, one of which is dysbiosis. This study aims to analyze the microbiota composition of stunted and non-stunted children in Jakarta slum areas and related contributing factors.

Methods: This study is a comparative cross-sectional study to analyze association between gut microbiota and stunted incidence among children in Jakarta slum area and related contributing factors, included WASH (Water, Sanitation and Hygiene) such as sources of drinking water. The study has been conducted in the Hamlet No 9 and No 11 of the Kebon Bawang Urban Village, North Jakarta. The research was conducted in November 2021 – June 2022. Gut microbiota analysis was carried out at the Human Cancer Research Center-Indonesia Medical Education and Research Institute (HCRC-IMERI) and PT. Genetica Science.

Results: There was an association between the composition of the gut microbiota and the incidence of stunting in children in Jakarta slum area. In general, the abundance of pathogenic microbiota in stunted children was higher than in the non-stunted children. These are influenced by many factors including the source of drinking water. In this study it was found that in the stunted group more of the sources of drinking water were refilled water. Differences in the composition of microbiota are influenced by sources of drinking water.

Keywords: drinking water, safety, stunted children

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ABSTRACT

Nutrition in paediatric intestinal failure

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Abstract : *Nutri Symposium 2023 - Speaker*

Received: 14 September 2023
Accepted: 18 September 2023
Published: 30 September 2023

Link to DOI:
[10.25220/WNJ.V07.S1.0006](https://doi.org/10.25220/WNJ.V07.S1.0006)

Citation: Wong, T, Nutrition in paediatric intestinal failure, World Nutrition Journal.2023 September 30, 7(S1): 6.

Children with irreversible intestinal failure can survive and lead good quality of life in the recent 20-30 years. A lot of this advance is due to better understanding of what and how to deliver nutrition (both enterally and parenterally) effectively. This talk aims to provide not only an overview but some practical considerations on how to manage paediatric intestinal failure.

Keywords: nutrition, paediatrics, intestinal failure, management



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Website :
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ABSTRACT

Micronutrient forgotten or missed in critically ill patients

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Received: 14 September 2023

Accepted: 18 September 2023

Published: 30 September 2023

Link to DOI:

[10.25220/WNJ.V07.S1.0007](https://doi.org/10.25220/WNJ.V07.S1.0007)

Citation: Herrero, SM, Micronutrient forgotten or missed in critically ill patients, World Nutrition Journal.2023 September 30, 7(S1): 7.



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Website : <http://www.worldnutrijournal.org/>

Abstract : Nutri Symposium 2023 - Speaker

There is growing interest in the role of micronutrients (essential trace elements and vitamins) in optimizing health and in the prevention or treatment of some diseases. But we must not forget that micronutrients must also be considered in critically ill patients. There is a big difference.

When we care for a critically ill patient, there are different factors that determine the current severity, especially those underlying diseases or in the absence of previous disease at the time of admission.

Regardless of the cause (patient admitted for distributive or hyperdynamic shock (septic shock, acute pancreatitis, anaphylaxis, spinal cord trauma, etc.) or for hypodynamic shock (cardiogenic, obstructive, hemorrhagic, hypovolemic shock, etc.), initial therapy should not be They only give mechanical or pharmacological support with the idea of keeping the patient alive. They all share similar supports from the nutritional point of view, but many times we forget about those small needs that are often vital.

Most of our readers think that in order to nourish these patients it is necessary to provide carbohydrates, fats, and proteins in adequate doses for the adjusted weight and cause of the shock. We also know that we must provide certain vitamins and other trace elements such as minerals (including selenium, iron and copper or zinc). But there are more micronutrients and also nano nutraceutical structures that we sometimes forget or missed when prescribing nutritional support.

We will review the generally accepted essential inorganic micronutrients (trace elements), as well as the organic ones (fat-soluble and water-soluble vitamins) for which there is some scientific evidence of their deficiency, but also those for which they have not been clearly reported or because we lack information, but which its supplementation (v-3 fatty acids or coenzyme Q) can provide significant benefit without added harm.

Keywords: micronutrients, trace elements, omega 3 fatty acid, coenzyme Q10

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ABSTRACT

Extreme obesity in the intensive care unit

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Received: 14 September 2023
Accepted: 18 September 2023
Published: 30 September 2023

Link to DOI:
[10.25220/WNJ.V07.S1.0008](https://doi.org/10.25220/WNJ.V07.S1.0008)

Citation: Varon J, Hussaini N, Extreme obesity in the intensive care unit, World Nutrition Journal. 2023 September 30, 7(S1): 8-9.



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Website: <http://www.worldnutrijournal.org/>

Abstract : *Nutri Symposium 2023 - Speaker*

Morbid obesity is a highly serious condition that significantly impairs health worldwide. This is especially prominent during the COVID-19 pandemic, as lockdowns and reduced physical activity contributed to the problem. Overweight and obese adults are at a higher risk of various acute and chronic medical conditions, including hypertension, heart disease, diabetes, respiratory problems, certain cancers, gout, and arthritis. While some individuals may have higher muscle or bone mass accounting for excess weight, the majority of those exceeding 20% of their ideal body weight have excessive fat. Disturbingly, obesity rates in the USA have been progressively increasing since the first survey conducted in 1960. Recent data shows that obesity prevalence in the USA is three times higher than in France and one-and-a-half times higher than in England. Given the widespread nature of obesity and its association with numerous diseases, it is not surprising that many obese patients require treatment in the intensive care unit (ICU).

Morbid obesity, defined as having a body mass index (BMI) above 40 Kg/m², is associated with an increased risk of mortality. Critically ill morbidly obese patients pose unique challenges to the critical care team, and tend to experience more complications during ICU admission, leading to longer hospital stays and poorer outcomes.

Managing critically ill patients who are morbidly obese is a difficult and formidable task. Understanding the physiological changes and complications specific to this group may help improve their outcomes. A systemic approach is usually necessary when caring for these individuals in the ICU.

In terms of pulmonary function, increasing BMI leads to significant abnormalities, such as reduced lung capacity, functional residual capacity, and vital capacity by up to 30%. Lung function tests reveal a restrictive pattern. Breathing becomes more laborious due to abnormal chest elasticity, increased chest wall resistance, airway resistance, abnormal diaphragmatic position, upper airway resistance, and the need to eliminate higher levels of carbon dioxide. Severe obesity often causes low blood oxygen levels, resulting from ventilation-perfusion mismatching caused by alveolar collapse and airway closure at the bases of the lungs.

When obese patients require mechanical ventilation, their small lung volumes and increased airway resistance necessitate the use of relatively small tidal volumes, which should be determined by airway pressures and blood gas levels rather than the patient's weight. Positive end-expiratory pressure (PEEP) can help prevent airway closure and lung collapse. Weaning obese patients from mechanical ventilation is frequently challenging, and a 45-degree reverse Trendelenburg position may facilitate the process. Obese patients also have a higher incidence of pulmonary complications following surgery.

Morbid obesity significantly increases the risk of pulmonary embolism and postoperative thromboembolic disease, likely due to decreased mobility, venous stasis, and increased thrombotic potential. Endotracheal intubation can be particularly challenging in morbidly obese patients due to limited neck mobility and mouth opening, requiring experienced clinicians for airway management.

Total blood volume and resting cardiac output increase in proportion to the excess weight of morbidly obese individuals. The rise in cardiac output is mainly due to an increase in stroke volume, resulting in normal cardiac and stroke indexes. Although obese patients have increased baseline oxygen consumption, their ejection fraction is depressed at rest and after exercise. Blood pressure measurements using cuff sphygmomanometry may be inaccurate in obese patients, and continuous monitoring with an arterial cannula is advisable. The pharmacokinetics of drugs are altered in obesity, depending on their properties and mode of metabolism. Dosing should take these factors into account to avoid toxic drug levels based on the patient's actual body weight.

Despite having excess body fat and lean mass, obese individuals are prone to developing protein energy malnutrition during metabolic stress, especially if their nutritional status was already poor before injury. Nutrition should not be withheld from obese patients under the misconception that weight reduction.

Keywords: morbid obesity, critically ill, ICU

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ABSTRACT

Lactate – from villain to guardian

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Abstract : *Nutri Symposium 2023 - Speaker*

Received: 14 September 2023
Accepted: 18 September 2023
Published: 30 September 2023

Link to DOI:
[10.25220/WNJ.V07.S1.0009](https://doi.org/10.25220/WNJ.V07.S1.0009)

Citation: Nallos M, Lactate – from villain to guardian, World Nutrition Journal.2023 September 30, 7(S1): 10.



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<http://www.worldnutrijournal.org/>

Elevated plasma lactate level is a useful warning sign in patients presenting with a variety of critical illnesses. Our understanding of hyperlactatemia, however, has improved and we can no longer associate lactate itself with any harmful effects. Lactate is a crucial intracellular buffer, and a central molecule in the interorgan exchange of carbon and redox potential. While lactate levels correlate with severity of acidaemia in shock there is little evidence to support the commonly held view that its origin is mainly secondary to anaerobic metabolism because of reduced tissue oxygen delivery. More commonly, lactate production is increased due to accelerated aerobic glycolysis caused by adrenergic stimulation and inflammation. Concurrently, splanchnic vasoconstriction in shock leads to reduced delivery of lactate to two major lactate consuming organs (liver, kidney) disturbing the normally operating interorgan lactate shuttle. The construct of tissue hypoxia and insufficient aerobic ATP production as a cause of “lactic acidosis” is commonly attributed to tissue hypoperfusion. While tissue perfusion e.g. assessed by capillary refill time, is crucial in treating shocked patients, targeting lactate clearance may lead to over-resuscitation and potentially harmful use of inotropes, intravenous fluids and supplemental oxygen. While it is crucial to restore perfusion to ischaemic tissues the goal should be the correction of blood flow and underlying pathology rather than treatment of the “lactic acidosis” per se.

Keywords: lactate, shock, acidosis, glycolysis

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ABSTRACT

A study of breakfast pattern in Indonesia, Malaysia, and Philippines

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Abstract : Nutri Symposium 2023 - Speaker

Received: 14 September 2023
Accepted: 18 September 2023
Published: 30 September 2023

Link to DOI
[10.25220/WNJ.V07.S1.0010](https://doi.org/10.25220/WNJ.V07.S1.0010)

Citation: Agdeppa I A, Custodio M R S, Toledo M B, A study of breakfast pattern in Indonesia, Malaysia, and Philippines, World Nutrition Journal.2023 September 30, 7(S1): 11.



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Website
<http://www.worldnutrijournal.org/>

Background : The quality of foods taken during breakfast could contribute in shaping diet quality. The International Breakfast Research Initiative (IBRI) conducted a standardized analysis of national nutrition surveys from Indonesia, Malaysia, and the Philippines to derive nutritional recommendations for a balanced breakfast.

Methods : Data from the 2018 Indonesian Food Barometer (IFB), 2018 Malaysian Food Barometer (MFB), and the 2018 Expanded National Nutrition Survey (ENNS) were utilized to analyse breakfast patterns, nutritional profiles, and their association with overall diet quality, measuring the nutrient density of the total diet.

Results: The findings indicate that breakfast is regularly consumed in the three countries among adults: approximately 95% in Indonesia, 89 % in Malaysia, and 96% across different age groups in Philippines. However, despite high regularity of consumption, nutritional inadequacies were evident. Malaysian breakfast meals were found to have high levels of fats, saturated fats, total sugars, and sodium, while lacking nutrients such as fiber, potassium, calcium, vitamins C and D, folate, iron, zinc, and magnesium. Similarly, breakfast in Indonesia and Philippines were found to be sufficient in micronutrient intake. These inadequacies were reflected in the reasonably low NRF Index 9.3 scores in Indonesia (384), Malaysia (364), and the Philippines (330), which indicated poor overall diet quality. Based on the principles similarly applied in European, North American, and Latin American studies, breakfast recommendations specifically concerning these countries were developed in order to address these nutrient imbalances.

Conclusions and recommendations: The analysis reveals the need to improve breakfast quality in these three countries. Regular breakfast consumption presents an opportunity to bridge nutritional gaps in essential nutrients. The evidence-based recommendations proposed in this study can inform national educational campaigns and interventions promoting healthier breakfast choices. Implementation of these recommendations will enhance breakfast's nutritional quality and contribute to overall dietary improvements in Indonesia, Malaysia, and the Philippines.

Keywords: breakfast pattern, Indonesia, Malaysia, Philippines

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ABSTRACT

The science and practice of micronutrient in clinical nutrition : the importance of micronutrient evaluation

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Received: 14 September 2023
Accepted: 18 September 2023
Published: 30 September 2023

Link to DOI
[10.25220/WNJ.V07.S1.0011](https://doi.org/10.25220/WNJ.V07.S1.0011)

Citation: Darmayanti S, The science and practice of micronutrient in clinical nutrition : the importance of micronutrient evaluation, World Nutrition Journal.2023 September 30, 7(S1): 12.

Abstract : *Nutri Symposium 2023 - Speaker*

Micronutrients play a crucial role in maintaining good health as they are required for various processes within the body. Every individual has different micronutrient needs depending on their metabolic condition. To achieve optimal health, these needs must be met adequately. However, symptoms of micronutrient deficiency often appear late when deficiency is already severe. Accurate measurement is necessary to provide a good understanding of an individual's needs. Currently, advanced technology using ICP-MS methods is available to measure trace elements in the blood. Monitoring nutritional status by examining micronutrients is a practical and cost-effective approach for proper management.

Keywords: micronutrient, micronutrient assessment



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Website
<http://www.worldnutrijournal.org/>

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ABSTRACT

Thiamine Pharmaconutrition in Sepsis: current evidence on safety and efficacy

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Received: 14 September 2023
Accepted: 18 September 2023
Published: 30 September 2023

Link to DOI
[10.25220/WNJ.V07.S1.0012](https://doi.org/10.25220/WNJ.V07.S1.0012)

Citation: Hardy G, Manzanares W, Thiamine Pharmaconutrition in Sepsis: current evidence on safety and efficacy, World Nutrition Journal.2023 September 30, 7(S1): 13.



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Website
<http://www.worldnutrijournal.org/>

Abstract : Nutri Symposium 2023 - Speaker

Sepsis is a life-threatening condition characterized by multiorgan dysfunction due to an exaggerated host response to infection associated with a homeostatic failure. Sepsis is also characterized by low thiamine levels, which are associated with illness severity, hyperlactatemia, and poor clinical outcomes. However, caution is needed with interpretation of thiamine blood concentration in critically ill patients. C-reactive protein (CRP) should always be measured to determine the patient's inflammatory status. Recent strategies to improve clinical outcomes in sepsis include high-dose intravenous micronutrients.

This presentation will summarize the biological properties of thiamine and the effects of pharmaconutrition with high-dose thiamine in critically ill adult patients with sepsis or septic shock. Examination of the most up-to-date evidence confirms that Recommended Daily Allowance (RDA) supplementation is relatively safe for thiamine-deficient patients. However, pharmaconutrition with high-dose thiamine as monotherapy or as combination therapy (with vitamin C or corticosteroids) has failed to show improvements in clinical outcomes.

A better understanding of the pharmacokinetic (PK) and pharmacodynamic (PD) profiles of thiamine is needed. In the future, well designed and better powered clinical trials are urgently warranted before any specific recommendations can be made regarding pharmaconutrition with high-dose micronutrients in the critical care setting.

Keywords: micronutrients, pharmaconutrition , sepsis, thiamine

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ABSTRACT

Nutrition and inflammaging : unveiling the impact of diet on healthy aging

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Abstract : Nutri Symposium 2023 - Speaker

Received: 14 September 2023
Accepted: 18 September 2023
Published: 30 September 2023

Link to DOI
[10.25220/WNJ.V07.S1.0013](https://doi.org/10.25220/WNJ.V07.S1.0013)

Citation: Puruhita N, Nutrition and inflammaging : unveiling the impact of diet on healthy aging, World Nutrition Journal.2023 September 30, 7(S1): 14.



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Website
<http://www.worldnutrijournal.org/>

Aging is a declining process which leads to a poorer state of human health. The process involved immune system, known as immunosenescence, which is a multifactorial and dynamic process, involving both innate and acquired immunity. It is characterized by a progressive reduction in the ability to trigger immune responses against infections and vaccinations and lead to inflammaging. Immunosenescence plays a critical role in most chronic diseases in older people, therefore, attempts are made to slow down or reverse the process.

Inflammaging is defined as a chronic, sterile-low-grade inflammation with concurrently develop with age. It is macrophage centered, involves several tissues and organs, including the gut microbiota. It is characterized by a complex balance between pro- and anti-inflammatory responses and predicts susceptibility to age-related pathologies such as cancer, cardiovascular disease and neurodegenerative diseases. Recent theory considered inflammaging as an adaptation/remodeling as a result of lifelong immunological response to environmental exposure. It may be an adaptive process because it can trigger an anti-inflammatory response to counteract the age-related pro-inflammatory environment.

Chronic nutrients excess, especially a high-fat diet causes a stress for several tissues, which leads to chronic activation of specific inflammatory paths. These responses are higher in adipocytes and hepatocytes. Several nutrition-related interventions were proposed to modulate inflammation in ageing process, ranging from calorie restriction, timing food restriction, food-based treatments, gut microbiota modification and vitamin-based therapies. However, most of the intervention have not reached to conclusions as modalities to balance inflammaging and anti-inflammaging. Future clinical studies are required to confirm the effective therapy, both as single or multimodalities therapy, to modulate inflammaging and concomitant health outcomes.

Keywords: nutrition, aging, inflammation

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ABSTRACT

Home not alone : transition from hospital to home nutrition care, what to consider?

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Received: 18 September 2023
Accepted: 19 September 2023
Published: 30 September 2023

Link to DOI
[10.25220/WNJ.V07.S1.0014](https://doi.org/10.25220/WNJ.V07.S1.0014)

Citation: Francisco E M P, Home not alone : transition from hospital to home nutrition care, what to consider?, World Nutrition Journal.2023 September 30, 7(S1): 15.



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Website
<http://www.worldnutrijournal.org/>

Abstract : *Nutri Symposium 2023 - Speaker*

Malnutrition is said to be the “skeleton in the hospital closet”, mainly because it is overlooked undiagnosed, and untreated. This applies to the “home closet” as well, often being forgotten in the discharge planning and transition from hospital to home.

Family physicians are well-qualified to provide home health care since this requires continuing and comprehensive management in a family context. It is the family physician that can initiate the decision to transition to home care, and is directly involved in the planning and coordination of the services.

Various assessments may be done in the home care setting, namely: Functional, Cognitive, Psychosocial, Nutritional, Medicine use and compliance, and even Caregiver Assessment. The Homecare Nutrition Pathway involves assessment prior to discharge, provision of a nutrition care plan by the team, and subsequent monitoring and reassessment at home. After the home visit, the plans should be summarized and documented on the chart, with follow up plans discussed with the family and referring doctor or attending team.

The home care set up is unique and ideally, should be patient focused, family inclusive, and community oriented. Thus, a family physician may play various roles in the hospital setting, home care, and community setting. A family physician may be Health Care Provider and Healer, Educator, Coordinator, Navigator, Leader, and Researcher. One needs to facilitate efficient and effective access to health-related programs and resources, from both the private and government sectors. It is also important to identify health agencies and community resources that can help address challenges and barriers in the home care pathway. Having multi-disciplinary and inter-professional team of clinicians, such as dietitians, nurses, pharmacists, physical and occupational therapist, is also key to providing holistic care at home. With this concerted effort, we hope that our patients will truly feel Home Not Alone!

Keywords: discharge planning, family physician, home care, home nutrition therapy

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ABSTRACT

Human milk oligosaccharides (HMOS) for infant health and microbiome development

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Received: 14 September 2023
Accepted: 18 September 2023
Published: 30 September 2023

Link to DOI
[10.25220/WNJ.V07.S1.0015](https://doi.org/10.25220/WNJ.V07.S1.0015)

Citation: Karim R, Human milk oligosaccharides (HMOS) for infant health and microbiome development, World Nutrition Journal.2023 September 30, 7(S1): 16.



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Website
<http://www.worldnutrijournal.org/>

Abstract : Nutri Symposium 2023 - Speaker

HMO stands HUMAN MILK OLIGOSACCHARIDES, which act as a prebiotic found naturally in breastmilk. They are the third largest solid component in breast milk after lactose and fat. HMOs feed only beneficial bacteria in the gut of infants and children. Through scientific innovation, structurally identical HMOs to that found in breastmilk can now be created and supplemented in infant formula and supplement for infants and children. Recent research has highlighted the various functional roles of HMOs in infant development, including as prebiotics by promoting growth of beneficial intestinal bacteria thereby generating short-chain fatty acids which are very important for gut health. HMOs also play a central role in the development of the neonatal immune system by promoting healthy microbial diversity, preventing pathogen attachment, stimulating maturation of intestinal epithelial surface and by modulating the immune cells.

Keywords: breast milk, human oligosaccharides, immunity, prebiotics

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ABSTRACT

Perioperative nutrition : ERAS special group discussion

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Received: 14 September 2023
Accepted: 18 September 2023
Published: 30 September 2023

Abstract : *Nutri Symposium 2023 - Speaker*

Link to DOI
[10.25220/WNJ.V07.S1.0016](https://doi.org/10.25220/WNJ.V07.S1.0016)

Citation: Sutanto L, Manikam N R M, Nugroho A, Perioperative nutrition : ERAS special group discussion, World Nutrition Journal.2023 September 30, 7(S1): 17.



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Website
<http://www.worldnutrijournal.org/>

Nutrition is one of the vital role in improving the healing and recovery after surgery, either preoperative (before surgery), intraoperative (during surgery), or postoperative (after surgery). The Enhanced Recovery After Surgery (ERAS) Society has published a multidisciplinary approach to perioperative care aimed at achieved early recovery for patients undergoing major surgery.

There are various elements considered in the ERAS guidelines, which then simplified into 3 groups, namely preoperative, intraoperative and postoperative. Elements related to nutrition are preadmission counselling, preoperative fluids and carbohydrates loading, limited prolonged preoperative fasting, no/selective bowel preparation, type of anaesthesia, limiting of infusion fluids and NaCl, selective of enteral tubes using, preventing of nausea and vomiting after surgery, providing nutrition oral administration as early as possible, and stimulation of gut mobility.

Prolong preoperative fasting has unfavourable effects on patients including causing discomfort, increasing inflammation, postoperative nausea-vomitting, and blood sugar levels. The recommendation for preoperative fasting from ERAS is that 6 hours before surgery patients can still consume food and 2 hours can drink clear fluid. For such preoperative nutritional guidelines to be implemented, a multidisciplinary approach is required, as well as explanation to the patient during preadmission counselling.

Postoperative oral nutrition can be started as early as possible, even the use of an enteral tube is not recommended. If there is no indication for enteral tube using, it is recommended to remove it before the patient wakes up from anaesthesia. Intravenous fluids is recommended to discontinue on postoperative day 1. Implementation of postoperative nutrition could be started with drinking clear fluid after the patient in conscious from anaesthesia in the recovery room and eating can be given after the patient is in ward.

In conclusion, perioperative nutrition is a crucial component of the ERAS protocol. Providing adequate nutrition before, during, and after surgery is essential to support the healing process, minimize complications, and promote faster recovery. By optimizing perioperative nutrition, healthcare providers can improve patient outcomes and increase the overall success of surgical interventions.

Keywords: ERAS, early oral nutrition, perioperative nutrition, perioperative fasting

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ABSTRACT

A correlation between adult body mass index and waist circumference and blood pressure at the primary health care of Gribig

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Received: 15 September 2023
Accepted: 18 September 2023
Published: 30 September 2023

Link to DOI:
[10.25220/WNJ.V07.S1.0017](https://doi.org/10.25220/WNJ.V07.S1.0017)

Citation: Anughrayasa E A, Sutanto E B, Christanti J S, Kartika M T. Correlation between adult body mass index and waist circumference and blood pressure at the primary health care of Gribig. World Nutrition Journal. 2023 September 30, 7(S1): 18.



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Website
<http://www.worldnutrijournal.org/>

Abstract : Nutri Symposium 2023 – Oral Presentation

Background : Over 17 million deaths are caused by cardiovascular disease due to high blood pressure. It is estimated that nearly 1.3 billion adults have high blood pressure in 2021, according to the World Health Organization (WHO). A significant factor affecting blood pressure is obesity. Body Mass Index (BMI) and Waist Circumference measurements can detect obesity in anthropometric examinations.

Objective : This study aimed to analyze the correlation between BMI, waist circumference, and blood pressure in adults at the Primary Health Care of Gribig, Kudus Regency.

Methods : The method of this study is a cross-sectional approach. The study measured BMI, waist circumference, and blood pressure and questionnaire. Inclusion criteria included men and women (healthcare staff, patient caregivers, and patients), aged 18-59 who agreed to become study subjects. Exclusion criteria included patients with a history of diseases, current conditions, medication intake that affects blood pressure, and being pregnant. Sampling was done with a purposive sampling and statistical analysis using the Pearson test.

Results : There was a significant correlation between BMI with systolic blood pressure ($p=0.000$) and diastolic blood pressure ($p=0.000$). The relationship between BMI with systolic blood pressure ($r=0.473$) and diastolic blood pressure ($r=0.439$) is moderate. There was a significant correlation between waist circumference with systolic blood pressure ($p=0.000$) and diastolic blood pressure ($p=0.000$).

Conclusion : perioperative nutrition is a crucial component of the ERAS protocol. Providing adequate nutrition before, during, and after surgery is essential to support the healing process, minimize complications, and promote faster recovery. By optimizing perioperative nutrition, healthcare providers can improve patient outcomes and increase the overall success of surgical interventions.

Keywords: Body mass index, waist circumference, blood pressure

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ABSTRACT

Relationship between spacing of pregnancy and incidence of anemia in Multipara

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Received: 15 September 2023
Accepted: 18 September 2023
Published: 30 September 2023

Link to DOI:
[10.25220/WNJ.V07.S1.0018](https://doi.org/10.25220/WNJ.V07.S1.0018)

Citation: Widyantara K, Sudarma V. Relationship between spacing of pregnancy and incidence of anemia in Multipara. World Nutrition Journal.2023 September 30, 7(S1): 19.



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Website :
<http://www.worldnutrijournal.org/>

Abstract : Nutrition Symposium 2023 – Oral Presentation

Background : Indonesia has a high prevalence of anemia in pregnant women, generally caused by iron deficiency. Pregnancy spacing <2 years, especially in multiparas, can affect the incidence of anemia which can cause miscarriage, premature birth, prolonged labor due to uterine muscle fatigue during contractions, postpartum bleeding due to the absence of uterine muscle contractions (uterine atony) and shock.

Method : This study used an observational analytical research design with a cross-sectional study approach. This research was conducted in May 2021 using the medical records of multiparous pregnant women who visited the Toili III Health Center, Sindang Sari Village, West Toili District, Banggai Regency, Central Sulawesi Province, Indonesia for the period January - December 2020. The data analyzed were age, distance pregnancy, frequency of antenatal care (ANC) and incidence of anemia. Data were analyzed using SPSS Version 28 with a significance level ($p < 0.05$).

Result : The age of the most subjects was in the range of 20-35 years, namely 82.6% with a gestational distance of <2 years, namely 67.9%. ANC visits 4 times as many as 56 people (51.4%) and the prevalence of anemia as many as 69 people (63.3%). here was a significant relationship between gestational interval ($p=0.028$) and ANC frequency ($p=0.000$) with the incidence of anemia in multiparous mothers. However, the relationship between age and the incidence of anemia in multiparous mothers was not statistically significant with p value = 0.988

Conclusion : There is a significant relationship between gestational distance and frequency of ANC with the incidence of anemia in multiparous mothers. There is no significant relationship between age and the incidence of anemia in multiparous mothers.

Keywords: multiparous anemia, frequency of ANC, gestational interval, age

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ABSTRACT

The role of folate in the management of insulin resistance in adults : a systematic review

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Received: 15 September 2023

Accepted: 18 September 2023

Published: 30 September 2023

Abstract : Nutrition Symposium 2023 – Oral Presentation

Link to DOI:

[10.25220/WNJ.V07.S1.0019](https://doi.org/10.25220/WNJ.V07.S1.0019)

Citation: Adareth T. The role of folate in the management of insulin resistance in adults : a systematic review. World Nutrition Journal.2023 September 30, 7(S1): 20.



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Background and objective : Insulin resistance (IR) is one of the main risk factors for type 2 diabetes. IR employs a heavy economic burden, and the prevalence rate of IR in Indonesia is high. Homeostasis model of assessment-insulin resistance (HOMA-IR) is proven to be a great clinical tool to assess IR. Nutrition intervention should be the primary focus in treating IR. Folate is proven to be effective in lowering homocysteine concentrations, which is one of the risk factors for IR. This study aimed to summarize the role of folate in the management of IR in adults.

Methods : Literature searches were conducted in PubMed, Science Direct, and Cochrane from January 2013 to June 2023. The format of this systematic review and study relevance analysis refers to the PRISMA statement. Articles were adjusted according to the inclusion and exclusion criteria from the study. Eligibility assessment of titles and abstracts was performed based on PICO criteria.

Results : Twelve studies were included in this review (n=1376 subjects). Eight randomized control trials measured the effect of folate supplementation (1-15 mg/d), duration of intervention (3-24 weeks), to HOMA-IR. In four cross-sectional studies, the correlation between folate consumption and folate status to HOMA-IR was evaluated. Eight studies showed a significant decrease in HOMA-IR from folate administration (p <0.05, CI 95%).

Conclusion : Folate can play a pivotal role as an alternative nutrition therapy for lowering insulin resistance in adults.

Keywords: folate, insulin resistance, HOMA-IR

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ABSTRACT

Knowledge, attitude, and behavior regarding hydration of fluid intake of a university's students in Jakarta

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Received: 15 September 2023
Accepted: 18 September 2023
Published: 30 September 2023

Link to DOI:
[10.25220/WNJ.V07.S1.0020](https://doi.org/10.25220/WNJ.V07.S1.0020)

Citation: Sutanto L B, Putri T C, Fabiani H, Winaktu G J M T. Knowledge, attitude, and behavior regarding hydration of fluid intake of a university's students in Jakarta. World Nutrition Journal.2023 September 30, 7(S1): 21.



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Website :
<http://www.worldnutrijournal.org/>

Abstract : Nutrition Symposium 2023 – Oral Presentation

Background : Adequate body fluid is beneficial for maintaining physiology, cognitive function, and concentration, which are important for students. The purpose of this study was to determine knowledge, attitude, and behavior regarding hydration and fluid consumption and fluids intake of university students in Jakarta.

Methods : The design of this study uses descriptive, cross sectional and consecutive sampling. Data collection was carried out online in October 2021 among 97 subjects who met the inclusion and exclusion criteria. The inclusion criteria were students of the Faculty of Medicine and Health Sciences, Krida Wacana Christian, University year 2019, who claimed to be healthy. Exclusion criteria were fasting, dieting, taking medication, vitamins, or foods that can affect urine color. Data were collected after obtaining approval from the university's ethics committee. Data of knowledge, attitude and behavior were taken using questioners, then they were scored and categorized as good, sufficient and lack/bad. Questioners have been validated before used.

Result :

Result:

Table. Knowledge, attitude and behavior of students regarding fluid consumption.

	Knowledge n (%)	Attitude n (%)	Behavior n (%)
Good	79 (81,4%)	27 (27,8%)	89 (91,8%)
Sufficient	18 (18,6%)	69 (71,1%)	8 (8,2%)
Lack/bad	-	1 (1%)	-

Conclusion : Knowledge, attitude and behavior regarding fluid consumption of students of a university's students in Jakarta are almost entirely good and sufficient.

Keywords: fluid consumption, knowledge-attitude-behavior

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ABSTRACT

Fluid intake among university students in Jakarta

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Abstract : Nutrition Symposium 2023 – Oral Presentation

Received: 15 September 2023
Accepted: 18 September 2023
Published: 30 September 2023

Link to DOI:
[10.25220/WNJ.V07.S1.0021](https://doi.org/10.25220/WNJ.V07.S1.0021)

Citation: Sutanto L B, Sutanto P G, Winaktu G J M T, Fabiani H. Fluid intake among university students in Jakarta. World Nutrition Journal.2023 September 30, 7(S1): 22.



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Website :
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Background : The significance of fluid intake cannot be underestimated, as it plays a vital role in regulating body temperature and enhancing cognitive function, especially in individuals experiencing thirst, while maintaining concentration. Fluid intake can be derived from various sources such as food, beverages, and metabolic processes. The objective of this study was to investigate the fluid intake among university students in Jakarta.

Methods: The design of this study was descriptive, cross-sectional, and consecutive sampling. Online data collection was conducted in November 2021. We analyzed 97 subjects after selection with inclusion and exclusion criteria. The inclusion criteria included male or female, aged 19-22 years, who were students from the Faculty of Medicine and Health Sciences, Krida Wacana Christian University class of 2019. The exclusion criteria included individuals who were fasting, on a weight loss program, or suffering from an illness that affected body fluid status. Data was collected for 3 consecutive days, with measurements taken 3 times a day, at 12:00 am, 18:00 pm, and 21:00 pm. Fluid intake, including water and other beverages, was categorized as adequate if it +10% of the Indonesian Recommended Daily Allowance (RDA), insufficient if it was <10% RDA, and excessive if it >10% RDA.

Result :

Result:

Table 1. Fluid intake of university students based on Indonesian Recommended Daily Allowance

Fluid intake	Male n (%)	Female n (%)	Total (n)
Insufficient	13 (50%)	24 (33,8%)	37 (37,5%)
Fluid intake, mean (SD)	1116 (267)	1013 (263)	
Adequate	9 (34,6%)	40 (56,3%)	49 (51%)
Fluid intake, mean (SD)	2135 (211)	1763 (279)	
Excessive	4 (15,3%)	7 (9,9%)	11 (11,5%)
Fluid intake, mean (SD)	3040 (375)	2953 (461)	
Total	26 (26,8%)	71 (73,2%)	97 (100%)

Conclusion : Several students have not met the recommended fluid intake requirements.

Keywords: fluid intake, fluid requirements, university students

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ABSTRACT

The role of synbiotic to treat diarrhea in a critically ill Guillain-Barre syndrome patient with morbid and type 2 diabetes mellitus : A case report

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Received: 15 September 2023
Accepted: 18 September 2023
Published: 30 September 2023

Link to DOI:
[10.25220/WNJ.V07.S1.0022](https://doi.org/10.25220/WNJ.V07.S1.0022)

Citation: Walter B C, Sonia S, Sinaga W, Octovia L I. The role of synbiotic to treat diarrhea in a critically ill Guillain-Barre syndrome patient with morbid and type 2 diabetes mellitus : A case report. World Nutrition Journal. 2023 September 30, 7(S1): 23.



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Website :
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Abstract : Nutrition Symposium 2023 – Oral Presentation

Background : Guillain-Barre Syndrome (GBS) is a serious post-infectious immune-mediated neuropathy, and the case is increasing every year, approximately 6 in 100.000 cases yearly. Several cases depend on mechanical ventilation (MV) and have diarrhea during treatment in the intensive care unit (ICU). This case report aims to describe the role of synbiotic supplementation in treating diarrhea in a GBS patient in intensive care unit (ICU).

Methods : We present a case report of a 50-years-old woman with GBS and breathing difficulty, being treated in ICU, depended on MV, and had diarrhea since day-15 on ICU. Her nutritional status was morbid obesity with initial body mass index (BMI) of 39.84 kg/m², she also had type 2 diabetes mellitus (T2DM) with uncontrolled blood glucose and dyslipidemia. Her diarrhea symptoms did not improve with anti-diarrhea drugs, antibiotic replacement, and administering non-lactose enteral nutrition formula. She was then given synbiotic supplementation consisting of *Bifidobacterium longum*, *Lactobacillus acidophilus*, and fructooligosaccharides (FOS) for 21 days.

Results : During 40 days of ICU care, energy intake was 13-30 kcal/kg BW/day and protein intake was 0.5-1.1 g/kg BW/day. Synbiotic supplementation began on day-21 of ICU care. There were significant improvements in diarrhea symptoms and clinical condition on day-28 of ICU care. She was discharged from ICU on day-41.

Conclusion : Provision of synbiotic supplementation may improve diarrhea symptoms in a critically ill GBS patient with morbid obesity and T2DM.

Keywords: synbiotic, Guillain-Barre syndrome, critically ill, diarrhea

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ABSTRACT

The effects of probiotics supplementation on children with ADHD : A systematic review

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Received: 15 September 2023
Accepted: 18 September 2023
Published: 30 September 2023

Link to DOI:

[10.25220/WNJ.V07.S1.0023](https://doi.org/10.25220/WNJ.V07.S1.0023)

Citation: Sunaryo J, Alyani S, Nabila F J. The effects of probiotics supplementation on children with ADHD : A systematic review. World Nutrition Journal.2023 September 30, 7(S1): 24.



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Abstract : Nutrition Symposium 2023 – Oral Presentation

Background : ADHD (Attention deficit hyperactivity disorder) is a common neurodevelopmental disorder characterised by inattention, impulsivity and hyperactivity. Studies suggest that gut microbiota is an important player in neurological disorders including ADHD through the microbiome-gut-brain axis. The gut inflammation can negatively impact brain structures, and these inflammatory markers could influence pathogenesis of ADHD. Probiotics may be able to help the inflammation associated with increased intestinal permeability. However, clinical implementation of probiotics with ADHD is still unclear. This review examined available clinical trials related to probiotics supplementation on children with ADHD.

Methods : PubMed, Scopus, and Google Scholar were researched for trials on children diagnosed with ADHD and probiotics supplementation as an intervention, and published papers from January 2015 to June 2023.

Results : We identify 6 studies that meet the inclusion criteria, including randomised control trials and single-arm trials. These studies examined the effect of various probiotics supplementation on children with ADHD. The effects being examined include clinical symptoms, quality of life, comorbid symptoms, Body Mass Index, metabolites, inflammatory cytokines. Majority of the studies reported improvement of ADHD clinical symptoms, which is suggested to be caused by improvement of anti-inflammatory cytokines and specific metabolites as reported in several of the studies. However, one study of Synbiotic 2000 supplementation found no significant effect on ADHD clinical symptoms.

Conclusion : Probiotics supplementation might help improve symptoms and metabolites in children with ADHD, which suggests that probiotics might be beneficial as an adjuvant therapy. Further research is clearly warranted due to limited high-quality of existing research.

Keywords: Probiotic, ADHD, Children

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ABSTRACT

Impact of an oral nutritional supplement on improving body composition in older adults with malnutrition : A randomized controlled trial

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Received: 18 September 2023
Accepted: 19 September 2023
Published: 30 September 2023

Link to DOI:
[10.25220/WNJ.V07.S1.0024](https://doi.org/10.25220/WNJ.V07.S1.0024)

Citation: Wickramawardhane P, Dalpatadu C, Hills A P, Ranasinghe P, Jayawardena R. Impact of an oral nutritional supplement on improving body composition in older adults with malnutrition : A randomized controlled trial. World Nutrition Journal. 2023 September 30, 7(S1): 25.



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Abstract : Nutrition Symposium 2023 – Oral Presentation

Background and objectives : The consequences of malnutrition in the elderly often manifest as weight loss and altered body composition. The aim of this study was to assess the efficacy of an oral nutritional supplement (ONS) on body composition in malnourished older adults.

Methods : This was an open-label, randomized-controlled, parallel-group study. Inclusion criteria were age ≥ 60 years, and mini nutrition assessment (MNA) score ≤ 11 . Participants with oral feeding difficulties, lactose intolerance and being bedridden were excluded. A total of 50 participants were randomly assigned to the intervention (IG) and control (CG) groups (1:1 ratio). The IG received the ONS [57 g/day (247 kcal/serving, 12 g protein)] before bedtime for 12 weeks, while the CG received a glass of water. Anthropometric measurement and body composition analysis were performed at the beginning and end of the study.

Results : A sample of 42 older adults (IG: n=20, and CG: n=22) completed the study. The mean age of the IG was 75.38 ± 6.05 years, and the CG was 74.84 ± 5.22 years ($p=0.732$). IG participants exhibited a significant weight gain ($+1.68 \pm 1.16$ vs. -0.46 ± 0.95 kg; $p < 0.001$) and a significant increase in lean mass ($+1.23 \pm 0.93$ vs. -0.45 ± 0.90 kg; $p < 0.001$) and fat mass ($+0.54 \pm 0.82$ vs. -0.06 ± 0.82 kg; $p=0.021$). One-quarter of the intervention group (n=5) achieved a weight gain $\geq 5\%$ of body weight, whereas none in the control group did ($p=0.012$). No significant changes observed in bone mineral content in the IG ($p=0.771$).

Conclusion : Supplementing with ONS was found to be effective in improving body composition in malnourished older adults.

Keywords: Body composition, Malnutrition, Older adults, Oral nutritional supplement

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ABSTRACT

Association between minimum dietary diversity practice in children aged 6-23 months with nutritional status in east Jakarta 2020

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Received: 18 September 2023
Accepted: 19 September 2023
Published: 30 September 2023

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Link to DOI:
[10.25220/WNJ.V07.S1.0025](https://doi.org/10.25220/WNJ.V07.S1.0025)

Citation: Waladhiyaputri V, Chandra D N. Association between minimum dietary diversity practice in children aged 6-23 months with nutritional status in east Jakarta 2020. World Nutrition Journal. 2023 September 30, 7(S1): 26.



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Website :
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Abstract : Nutrition Symposium 2023 – Oral Presentation

Introduction : The effects of malnutrition such as stunting, wasting, and underweight in the 1000 first days of life are irreversible, but is preventable by giving high quality complementary feeding practice. This study aims to examine the relationship between achievement of minimum dietary diversity (MDD) with nutritional status among children aged 6-23 months in East Jakarta during COVID-19 pandemic in 2020.

Methods : This cross-sectional study used secondary data from a research in Kampung Melayu Village, East Jakarta, with a total sampling of 102 subjects aged 6-23 months. MDD data was obtained through a 24-hour food recall, and then entered into the MDD achievement questionnaire. Data related to age, gender, mother's education level, and household income were also analyzed. Chi square test and logistic regression using SPSS Statistics version 25 was conducted.

Results : Majority of subjects in the study were 12-17 months (39.2%) and with an equal proportion between male and female. A total of 52% of subjects achieved MDD on the previous day's food intake. Stunting is the most prevalent nutritional status (20.6%, similar to data in Jakarta 2019) compared to wasting (15.7%) and underweight (12.7%), which are respectively higher and lower than the prevalence in Jakarta during 2019. No significant relationship was found between MDD and nutritional status, but gender was considered to be related to stunting ($p=0.003$; 95% CI=1.81-19.03) and underweight ($p=0.012$; 95% CI=1.54-36.73).

Conclusion : In analyzing the relationship between the quality of intake and nutritional status, other aspects such as the amount of intake also need to be taken into account.

Keywords: minimum dietary diversity, dietary diversity, 6–23 months, nutritional status, stunting, wasting, underweight, COVID-19

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