THE NUTRITION SOCIETY OF SRI LANKA

Annual Scientific Sessions 2025

Proceedings

"Empowering Communities through Advanced Nutrition and Health Literacy"

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"Empowering Communities through Advanced Nutrition and Health Literacy"

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● The Chief Guest, Hon. Minister of Health and Mass Media, Dr. Nalinda Jayatissa

● The Keynote Speaker, Dr. Abner Elkan Daniel, Health and Nutrition Manager - UNICEF Sri Lanka Country Office

● All the symposium Chairs, speakers, judges of presentation sessions, presenters, life members, other distinguished guests and all the participants for their participation in making this a fruitful event

● Sponsors and all others who supported the event in numerous ways

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Message from the Chief Guest

Hon. Minister of Health and Mass Media, Dr. Nalinda Jayatissa

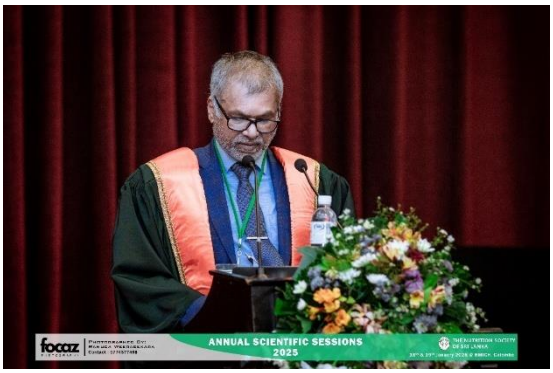
It is both an honor and a privilege to address you at the Annual Scientific Sessions of the Nutrition Society of Sri Lanka. The theme for this year, "Empowering Communities through Evidence-Based Nutrition and Health Literacy," is particularly timely and significant as we confront the growing health challenges faced by our nation. Sri Lanka is grappling with a rising tide of non-communicable diseases (NCDs), including diabetes, cardiovascular diseases, hypertension and obesity. These conditions, largely driven by lifestyle factors, not only diminish the quality of life for countless individuals but also place an overwhelming burden on our healthcare system. The adage "prevention is better than cure" holds especially true in the fight against NCDs. By focusing on prevention through healthier nutrition, increased physical activity and improved mental well-being, we can reduce the prevalence of these diseases significantly. This proactive approach not only improves individual health outcomes but also reduces the economic burden on our healthcare system, allowing for reinvestment in better infrastructure, access and care for all Sri Lankans. The foundation of prevention lies in lifestyle modification. Promoting evidence-based nutrition and health literacy empowers individuals to make informed choices about their diets and daily habits. This must be complemented by efforts to encourage regular physical activity and address mental health—essential components of a holistic approach to wellness. Together, these elements form a robust defense against the onset of NCDs. Achieving this goal requires a collaborative, multidisciplinary effort. It is imperative to engage medical professionals, dentists, allied health practitioners, nurses, dietitians, nutritionists, educators, policymakers, psychologists, and community leaders in a united front. Only through such coordinated efforts can we develop comprehensive strategies to tackle the root causes of NCDs, promote wellness, and support sustainable behavior change in our communities. Educating our citizens about the long-term benefits of healthier lifestyles is equally crucial. They must understand that these changes not only improve personal health but also contribute to a healthier, more productive society. Reducing the burden of NCDs will result in fewer hospitalizations, lower treatment costs, and the creation of resilient communities that thrive socially and economically. I commend the Nutrition Society of Sri Lanka for championing this cause and creating a platform for scientific exchange, advocacy, and public engagement. Initiatives like this drive awareness and inspire meaningful action. Let us commit ourselves to empowering Sri Lankans with the knowledge and tools they need to make healthier choices. Together, we can build a nation where prevention takes precedence, where health and well-being are paramount, and where our healthcare system focuses on sustainability and resilience.

Thank you, and let us move forward, united in our vision for a healthier Sri Lanka.

Message from the President - Nutrition Society of Sri Lanka

Holistic Strategies for Effective Management of Non-Communicable Diseases in Sri Lanka's Healthcare System

– Prof. Ananda Chandrasekara, Department of Nutrition and Dietetics, Wayamba University of Sri Lanka, Makandura, Gonawila 60170



This esteemed gathering of academics, scientists, and professionals presents a valuable opportunity to seek evidence-based solutions to Sri Lanka's pressing health challenges. Through the exchange of knowledge, innovative research, and collaborative efforts, we can pave the way for impactful strategies that empower communities and improve the health and well-being of our nation. As we unite under the theme "Empowering Communities through Evidence-Based Nutrition and Health Literacy," this platform encourages us to inspire change, foster collaboration, and drive innovation in holistic approaches to Non-Communicable Disease (NCD) prevention and management. NCDs remain a significant health and economic burden in Sri Lanka, accounting for nearly 75% of all deaths. Traditional management strategies, primarily focused on curative care, often fall short in addressing the complex and multifaceted nature of these diseases. This reality highlights the urgent need for a holistic, patient-centered approach to managing NCDs, particularly within hospital settings. Insulin resistance and metabolic syndrome are central contributors to the rising prevalence of NCDs, increasing the risk of type 2 diabetes, cardiovascular diseases, and other metabolic disorders. Conventional pharmaceutical treatments largely focus on symptom management rather than tackling root causes. Effective management of lifestyle-related diseases requires comprehensive interventions. Integrating medical treatments with personalized nutrition plans, structured physical activity, mental health support, and patient education can significantly enhance health outcomes, reduce hospital re-admissions, and lower healthcare costs. Addressing modifiable lifestyle factors—such as unhealthy diets, physical inactivity, stress, and poor sleep—is essential in reversing or managing insulin resistance and metabolic syndrome. A multidisciplinary approach involving diverse healthcare professionals is critical in delivering comprehensive care. Evidence-based lifestyle interventions, mental health integration, community involvement, and digital health tools are all vital components of effective NCD management. Cross-sector collaboration and policy-level changes that prioritize preventive care and holistic approaches will further improve public health outcomes in Sri Lanka.

Message from the Joint Secretaries - Nutrition Society of Sri Lanka

- **Dr. Thushanthi Perera**, Senior Lecturer, Department of Nutrition and Dietetics, Wayamba University of Sri Lanka
- **Ms. Hasanga Rathnayake**, Senior Lecturer, Department of Biochemistry, Faculty of Medicine, University of Ruhuna

It is our great pleasure to warmly welcome you all to the annual session 2025 of the Nutrition Society of Sri Lanka (NSSL). This event serves as a dynamic platform for researchers, professionals, and young scientists to share, discuss, and validate their research findings in the field of nutrition and health.

As a leading professional organization, the NSSL is dedicated to enhancing health and nutrition across the country by increasing nutritional literacy. We are committed to conducting educational programs and sharing evidence-based knowledge to empower communities and improve public health outcomes. Our society brings together a diverse group of healthcare professionals, reflecting a strong example of holistic approaches to nutrition and health.

Over the next two days, we are excited to present a rich lineup of presentations by distinguished scientists and experts from various institutions nationwide. We extend our heartfelt gratitude to our Chief Guest, Hon. Dr. Nalinda Jayatissa, Minister of Health and Mass Media, for his inspiring presence, and to our keynote speaker, Dr. Abner Daniel, Health and Nutrition Manager at UNICEF Sri Lanka, for his valuable insights.

We sincerely thank all symposium speakers, judges, abstract reviewers, evaluators, awardees, and presenters for their contributions. We are also deeply grateful to our sponsors for their generous support in making this event possible.

Special appreciation goes to the hosting, visual, and compering teams for their dedication. We warmly welcome all delegates, distinguished guests, and NSSL members—your active participation is crucial to the success of this event.

Lastly, we acknowledge the unwavering support of the NSSL council members. Please forgive any oversights, and we wish you all a happy, healthy, and prosperous New Year as we continue working together to advance our mission.

Keynote Address

Nourishing Futures: Evidence-Based Nutrition Actions across Sectors for Transforming Childhood Wellbeing

-

Dr. Abner Elkan Daniel, Health and Nutrition Manager, UNICEF - Sri Lanka Country Office

This keynote aims to highlight the critical role of evidence-based strategies in addressing childhood nutrition and wellbeing through multi-sectoral collaboration. It emphasizes how Health, Food, Education, WASH, and Social Protection sectors intersect to build a holistic support system for addressing all forms of malnutrition in children. Drawing on real-world examples and data-driven insights, the keynote showcases how integrated approaches yield measurable improvements in nutritional outcomes. The importance of governance – including leadership, accountability, and strategic investments is underscored as key drivers of sustainable change. With a clear call to action, the speech urges stakeholders to break down silos and work collaboratively to ensure every child has access to the resources needed to thrive, positioning childhood wellbeing as a collective priority and a foundation for a brighter future.

C.C. De Silva Orator Address

Bridging Knowledge and Action: Transforming Communities through Nutrition and Health Literacy

- Ms. Visakha Tillekeratne, International Consultant/Project Director/National Project Coordinator, Multi Sector Development Solutions (Pvt) Ltd

The oration will briefly explore the definitions of food, nutrition and health literacy extracted from various texts and publications and cite the process of inculcating food and nutrition literacy to result in nutrition related positive behaviour changes as portrayed in research and experiential processes.

A few of the latest research articles will be cited on what works to improve nutrition literacy and how to move toward proven behaviour change. An attempt will be made to explore the means to inculcate knowledge aspects in particular stages of the lifecycle.

The oration will next move to where Sri Lankans are, in the knowledge aspects of the definition and explore the degree to which behaviour changes have happened.

Contributions on the part of the orator towards some creative programs implemented over the past 15 years in Sri Lanka will be discussed together with program models of various other agencies. Best practices and lessons learnt will be extracted and a way forward for positive food and nutrition-related behaviors will be outline.

Healthy Lifestyle and Non- Communicable Diseases

Reversing Behavioral Changes on Prevention and Management of NCD

- Dr. Manilka Sumanathilake, Consultant Endocrinologist, National Hospital of Sri Lanka

NCD Burden in 21st Century - Dr. Lakshmi Somatunga, The Additional Secretary (Public Health Services) of Ministry of Health, Sri Lanka

Non-communicable diseases (NCDs), including cardiovascular diseases, diabetes, cancer and chronic respiratory conditions, have emerged as the leading cause of morbidity and mortality worldwide in the 21st century. Driven by urbanization, sedentary lifestyles, unhealthy diets and aging populations, NCDs account for over 70% of global deaths, disproportionately affecting low- and middle-income countries. The increasing prevalence of obesity, insulin resistance and metabolic syndrome further amplifies the risk of developing NCDs. Economic growth and globalization have also contributed to widespread consumption of processed foods, tobacco and alcohol, exacerbating health risks.

In Sri Lanka, NCDs are a significant public health concern, accounting for nearly 80% of all deaths. Also, 72% of the disease burden in Sri Lanka is attributed to NCDs. The rise in diabetes, hypertension, cardiovascular diseases and cancers has been linked to changing dietary patterns, reduced physical activity, and increased tobacco and alcohol use. The growing urban population and socio-economic transitions have led to a shift from traditional diets rich in fruits, vegetables, and whole grains to energy-dense, processed foods. Additionally, limited access to preventive healthcare services in rural areas exacerbates the NCD burden.

The economic impact of NCDs in Sri Lanka is substantial, straining the healthcare system and affecting national productivity. Addressing this requires multi-sectoral strategies focusing on prevention, early detection, and effective management. National policies, such as the National Strategic Plan for Prevention and Control of NCDs, emphasize health promotion, community-based interventions, and regulation of unhealthy food marketing. Efforts to promote healthy eating, increase physical activity, and reduce tobacco and alcohol consumption are crucial in curbing the rising NCD burden. Collaborative actions between government agencies, healthcare providers, and community organizations are vital for implementing sustainable health interventions. A proactive, holistic approach is essential to mitigate the NCD crisis and improve health outcomes for Sri Lanka's population.

Enhancing Patient Outcomes: The Integral Role of Dietitians in Managing Advanced Non-Communicable Diseases in Hospital Settings - Ms. Amal Firouse, Senior Dietitian, Asiri Surgical Hospital, Colombo, Sri Lanka

Non-communicable diseases (NCDs) are increasingly prevalent worldwide, including in Sri Lanka. When the progression of NCDs is not managed at the primary stage, patients often require hospitalization to address complications and control disease progression. Dietitians play an essential role in the nutritional management of hospitalized patients with NCDs through the administration of Medical Nutrition Therapy (MNT). MNT involves the systematic application of the Nutrition Care Process (NCP) to assess, diagnose, intervene, and regularly monitor and evaluation, thereby managing or delaying disease progression effectively.

Studies emphasize the importance of nutrition screening for all hospitalized patients to identify those at high risk of malnutrition. Patients requiring further dietary interventions should be referred to registered dietitians for specialized care. Major NCDs, such as diabetes, cardiovascular disease, and cancer, can be managed more effectively by integrating MNT alongside pharmacotherapy. This multidisciplinary approach has been shown to reduce polypharmacy, lower healthcare costs by shortening hospital stays and decrease readmission rates.

Even at the advanced stages of NCDs, where patients may require palliative care, dietitians contribute significantly to enhancing the quality of life. By addressing nutritional needs and improving symptom management, they play a critical role in patient comfort and well-being. The incorporation of dietitians into multidisciplinary healthcare teams ensures the provision of quality healthcare services. By addressing the nutritional needs of patients across all stages of care, dietitians contribute to better disease outcomes, enhanced recovery and cost-effective healthcare delivery in Sri Lanka.

Nutrition for All: Reducing Nutrition and Health Disparities through Education

Educational Strategies to Enhance Nutritional Knowledge across Diverse Populations - Prof. Renuka Silva, Professor of Applied Nutrition, Department of Nutrition and Dietetics, Wayamba University of Sri Lanka, Makandura, Gonawila 60170

Many parts of the world are grappling with a double burden of obesity and persistent malnutrition. In 2022, 2.5 billion adults were overweight, including 890 million who were living with obesity, while 390 million were underweight. Globally in 2022, 149 million children under 5 were estimated to be stunted, 45 million were estimated to be wasted, and 37 million were overweight or living with obesity. Iodine, vitamin A, and iron deficiency represents a major threat to the health and development of populations worldwide, particularly children and pregnant women in low-income countries. Nutrition education is emerging as a central strategy in promoting lasting improvements in population health. Nutrition education goes beyond merely providing information; it encompasses a comprehensive set of tools aimed at influencing specific behaviours that can be adjusted to promote positive health outcomes. Effective interventions involve multi-level approaches, including individual, institutional, community, and policy-level actions.

At the individual level, strategies may involve managing energy intake and expenditure to achieve recommended weight gain during pregnancy, promoting breastfeeding, and introducing nutritious complementary foods at appropriate stages. It is necessary to address women's health throughout the life cycle, from infancy through the school years, into adolescence and beyond. Research indicates that health and nutritional behaviours established during adolescence tend to persist into adulthood, potentially exerting a lasting influence on health in later life. Case studies and programs in Egypt and India successfully reduced anaemia among adolescent girls by combining nutrition education and counselling (NEC) with iron-folate supplementation. Similarly, school-based NEC programs in Mexico and the US effectively addressed overweight and obesity while promoting healthy lifestyles. Intervention studies that have been successful in helping women gain weight within the target require frequent, high intensity diet counselling.

Early childhood is a critical period for intervention; therefore, schools and day-care centers play a crucial role in shaping early dietary habits. Advancing healthy eating, dietary quality, and maintaining a healthy weight necessitates multi-level, multi-sectoral strategies that integrate direct nutrition education with broader policy, systems, and environmental (PSE) initiatives. Food and nutrition education should be mandatory in all schools, with teachers receiving continuous professional support throughout their careers. To improve the food environment and make healthy food accessible to all, several community-based strategies are promising, such as food and beverage taxes, better food programs for low-income populations, and interventions in the food retail environment. These approaches aim to reduce access to unhealthy foods while enhancing the availability and quality of nutritious options through targeted policies, programs, and retail practices. Another strategy involves integrating nutrition education into clinical practice. A team approach in clinical setting can enhance success in promoting healthier eating of patients. Additionally, digital technologies, including mobile applications and AI tools, are increasingly vital for improving diet management, supporting behavioral changes, and promoting healthy lifestyles across diverse populations.

Empowering Communities: The Role of Education in Health Promotion and Nutritional Equity - Dr. Supun Wijesinghe, Consultant Community Physician, Programme Manager - Ministry of Health, Sri Lanka

Education is a transformative tool in health promotion, bridging gaps in health literacy and addressing nutritional inequities. By equipping individuals with the knowledge and skills to make informed health decisions, education plays a pivotal role in improving health outcomes and fostering community well-being.

The link between education and health literacy

Health literacy, the ability to access, understand, and apply health information—is critical for promoting health. Education builds this capacity by fostering awareness, critical thinking, and decision-making skills. In Sri Lanka, studies reveal gaps in health literacy:

- School Teachers: About 32.5% of schoolteachers in Colombo exhibit limited health literacy due to factors like income and teaching experience.
- University Students: Over 50% of students struggle with reading and appraising health information, highlighting the need for targeted education.
- eHealth Literacy: The reliance on digital tools underscores the importance of training individuals to navigate electronic health resources effectively.

Education as a catalyst for health promotion

Education fosters behavior change by providing communities with tools to adopt healthier practices. Programs like Sri Lanka's School Health Promotion Programme (SHPP) integrate health topics into the curriculum, shaping lifelong habits among students and their families. Additionally, workplace health initiatives in the Galle district improved dietary habits and productivity through educational workshops on meal planning and nutrition.

Education also addresses nutritional equity by enhancing awareness of balanced diets and sustainable practices. By reducing misinformation and overcoming cultural taboos, education empowers underserved communities to improve their dietary diversity and health outcomes.

Empowering communities through local initiatives

Community engagement amplifies the impact of education. The Mothers' Support Group Initiative in Sri Lanka demonstrates how peer-led approaches can address health challenges:

- Cultural Sensitivity: Trusted community members lead initiatives, ensuring relevance and acceptance.
- Accessibility: Meetings are held in convenient locations with flexible schedules.
- Sustained Engagement: Activities like cooking demonstrations and group discussions maintain participation.

Nurturing Health Literacy in Schools: Bridging the Gap in Nutrition and Wellness

- Dr. Janandani Nanayakkara, Lecturer in Public Health Nutrition, School of Exercise and Nutrition Sciences, Deakin University, Victoria, Australia

Globally, there is an increasing prevalence of diet-related diseases and associated poor dietary habits, along with other broader food-related issues such as food insecurity. This has created an increased interest in improving the young generation's food and nutrition knowledge, skills, and behaviours through school food literacy education.

This presentation focuses on discussing the definitions of food literacy and exploring its dimensions. Next, the presentation will delve into research evidence on the importance of food literacy education in improving the health and well-being of children and identifying key features of effective food literacy interventions in schools. The presentation will also address the challenges related to school food literacy education.

School food environment also plays an important role in children's food choices and behaviours and has been used as a platform to promote healthy dietary behaviours among children. School food literacy education and a supportive food environment work together to help children develop healthy food behaviours. In the final section of this presentation, recent efforts in exploring ways of improving the school food environment are discussed.

Keywords: Food literacy education, Food environment, School

Nutrition in the Digital Age: Leveraging Technology to Enhance Health and Wellness

Harnessing AI and Machine Learning for Personalized Healthcare Solutions

- Dr. M.T.D. Lakshan, Consultant ENT, Head and Neck Surgeon, Senior Lecturer, Director, Nawaloka Hospitals, Sri Lanka

This scientific abstract explores the transformative potential of Artificial Intelligence (AI) and Machine Learning (ML) in reshaping healthcare solutions, particularly in the field of nutrition. It delves into the evolving landscape of personalized healthcare, emphasizing the integration of AI and ML technologies to optimize nutrition and health outcomes. Traditional "one-for-all" approaches to healthcare often yield suboptimal results due to individual variations in genetics, lifestyle, and environmental factors. AI and ML offer a data-driven solution, tailoring interventions to individual needs and preferences. By analyzing vast datasets, encompassing genetic profiles, lifestyle patterns, and real-time monitoring data, AI algorithms can generate precise and personalized recommendations.

In the realm of nutrition, AI-powered tools hold the promise of revolutionizing dietary guidance, enabling individuals to achieve optimal health and manage chronic diseases. AI algorithms can analyze genetic profiles to identify specific nutritional needs, predict glucose spikes in individuals with diabetes, and provide personalized meal planning strategies. Furthermore, the integration of AI with wearable technology allows for real-time monitoring of health and nutrition data, empowering individuals to make informed decisions about their dietary choices. The integration of AI and ML in healthcare presents both opportunities and challenges. Data privacy, security, and the potential for bias in AI models must be addressed to ensure equitable access and transparency. A multidisciplinary approach involving technologists, healthcare providers, and policymakers is crucial to harnessing the full potential of AI in healthcare.

The abstract advocates for fostering the development and implementation of AI-driven solutions to improve the health and well-being of individuals. Through collaborative efforts and public awareness campaigns, the transformative power of AI can be embraced to achieve a healthier future for all.

Bytes and Bites: Transforming Education through Digital Innovation - Dr. Ananda Kulasooriya, Director General at National Institute of Business Management (NIBM), Sri Lanka

In the rapidly evolving landscape of the 21st century, digital innovation is reshaping educational paradigms, fostering a more inclusive and personalized learning experience. Educational technology has emerged as a critical tool, enhancing pedagogical practices and enabling educators to engage students effectively. Central to this transformation is the concept of knowledge ownership in the digital age, where learners are empowered to curate, share, and collaborate on knowledge, thus fostering a culture of lifelong learning. The Technological Pedagogical Content Knowledge (TPACK) framework is instrumental in guiding educators to integrate technology thoughtfully into their teaching methodologies, ensuring that content delivery is both relevant and impactful. As we look towards the future of higher education, it is evident that digital innovation will play a pivotal role in redefining curricula, assessment, and student engagement strategies. The integration of artificial intelligence and wearable technologies is set to revolutionize the educational experience, providing real-time feedback and personalized learning pathways. This session explores these interconnected themes, highlighting the transformative potential of digital innovation in education and its implications for learners, educators, and institutions alike in navigating the complexities of the digital age.

AI-Assisted Personalized Dietary Assessment: A Nudging-Based Application for Tracking and Recording Diets - Dr. Thushanthi Perera, Senior Lecturer, Department of Nutrition and Dietetics, Wayamba University of Sri Lanka, Makandura, Gonawila 60170

Technology-assisted dietary assessment tools are becoming popular now due to their cost-effectiveness and ease of use. Hence, we aimed to develop an AI-assisted (Artificial Intelligence) smartphone app functionality called FRANI (Food Recognition Assistance & Nudging Insights) for dietary assessment in adolescent girls aged between 12-18 years in urban communities in Sri Lanka. The development of FRANI consisted of two main steps, where (i) to create an image database to train the FRANI AI model and (ii) to create a food database to feed the FRANI App. In the first step, a food inventory of the most commonly consumed food (n=238) by Sri Lankan adolescent girls was developed by conducting a dietary survey among adolescent girls. More than 8000 food images were collected to represent 238 priority food items by using a smartphone with a 13-mega pixel camera. Images were collected using different photo backgrounds, plating methods, portion sizes, and angles to maximize the variation of collected images. All the collected images were annotated to train a semantic segmentation AI model for recognizing food and estimating portion sizes. In the second step, all 238 food items were cooked and prepared in a dietetic lab setting. Recipes were collected for mixed dishes. A food database was developed on recipes, ingredients and food composition data of each raw ingredient The functionalities of the newly developed FRANI app include; the ability to 1) recognize different dishes, foods, and portion sizes when the phone is held over the dish; 2) help users accurately record meal intake and 3) nudge users to improve diets by providing tailored feedback based on dietary guidelines. The app tracks food group consumption and provides Dietary Diversity Scores (DDSs) based on the food groups and provides macro and macronutrient intake data. FRANI could potentially offer significant improvements in the methods used to collect dietary data, such as obtaining high-quality, frequent data while promoting healthy dietary habits.

Keywords: Adolescents, Dietary assessment, Nudges, Smartphone application, Sri Lanka

Beyond Energy: Exploring the Multifaceted Roles of Edible Fats and Oils in Health and Nutrition

Edible Oils in Modern Nutrition: Balancing Tradition and Innovation for Health - Prof. Terrance Madhujith, Professor and Department Chair, Department of Food Science and Technology, Faculty of Agriculture, University of Peradeniya, Sri Lanka

Navigating the Nutritional Landscape of Edible Fats and Oils: Benefits, Risks and Practical Insights - Dr. Renuka Jayatissa, Consultant in Community Medicine and Nutrition Specialist, Vice Chancellor, International Institute of Health Sciences Multiversity, Sri Lanka

The use of edible fats and oils is integral to human nutrition, with various oils offering distinct health benefits and culinary properties. Among the most widely debated oils are coconut oil and palm oil, both of which are plant-based and prevalent in cooking and food production. Coconut oil, known for its high saturated fat content (around 90%), contains a significant proportion of medium-chain triglycerides (MCTs), which are metabolized differently from long-chain fatty acids, potentially offering benefits like enhanced metabolism and weight management. However, due to its saturated fat content, its effect on heart health remains controversial, necessitating moderation in consumption. Palm oil, on the other hand, has a more balanced fat profile, containing 50% saturated fat, 40% monounsaturated fat, and 10% polyunsaturated fat. It is also a good source of antioxidants like tocotrienols, which may provide cardiovascular benefits. For low-heat cooking, oils like olive oil and sesame oil, both available in Sri Lanka, are often recommended due to their higher monounsaturated fat content and moderate smoke points, making them ideal for tempering, dressing and light cooking. Despite their differences, both coconut oil and palm oil can be part of a healthy diet when consumed in moderation. Rice and wheat bran oils, which are by products of milling, presents a healthier alternative for those seeking to improve their diet and overall health.

Unpacking the Connection between Dietary Fats and Cardiovascular Disease

- Dr. Kumari M. Ratnayake, Senior Lecturer, Department of Nutrition and Dietetics, Wayamba University of Sri Lanka

The relationship between dietary fats and cardio-metabolic risk, including conditions such as cardiovascular disease (CVD), diabetes, and metabolic syndrome, remains a subject of ongoing debate and research. While it is widely acknowledged that diet plays a critical role in shaping health outcomes, the precise role of fats particularly their types and sources has generated conflicting recommendations over the years. This dietary dilemma stems from differences in scientific findings, evolving health guidelines, and individual variability in response to fats. This summary unpacks the current complexities of fat intake and their impact on cardio-metabolic health. Cardio-metabolic risk factors include conditions and markers that increase the likelihood of developing cardiovascular disease and metabolic disorders. These factors include **Obesity**: Often characterized by an excess of body fat, particularly abdominal fat. **Insulin resistance**: Impaired insulin response, leading to higher blood sugar levels. **Dyslipidemia**: Abnormal lipid profiles, such as elevated LDL ("bad" cholesterol) or triglycerides, and low HDL ("good" cholesterol). **Hypertension**: Elevated blood pressure, contributing to arterial damage and heart disease risk.

Saturated fats, primarily found in animal products (meat, butter, cheese) and certain plant oils (coconut oil, palm oil), have long been associated with increased LDL cholesterol levels and higher cardiovascular risk. This led to the formulation of dietary guidelines recommending a reduction in saturated fat intake. However, newer studies have challenged this simplistic view, suggesting that not all saturated fats may have the same impact on health, and their effect may depend on the overall dietary pattern and context. Recent meta-analyses and systematic reviews have questioned the strength of the association between saturated fat intake and cardiovascular events. **Unsaturated fats**, particularly monounsaturated (e.g., olive oil, avocado) and polyunsaturated fats (e.g., omega-3 fatty acids found in fatty fish), have generally been considered heart-healthy, largely due to their ability to reduce LDL cholesterol and improve lipid profiles. Numerous studies, including large, randomized trials, suggest that replacing saturated fats

with unsaturated fats can lower the risk of cardiovascular disease. However, there are nuances to consider. While omega-3 fatty acids have been shown to have anti-inflammatory and heart-protective effects, the benefits of other polyunsaturated fats, such as omega-6 fatty acids (found in vegetable oils), are still debated. Excessive omega-6 intake, particularly when not balanced with omega-3s, may promote inflammation and increase the risk of chronic disease in some populations. **Trans fats**, particularly industrial trans fats found in processed foods, baked foods, and margarine, are unequivocally harmful to health. Trans fats not only raise LDL cholesterol but also lower HDL cholesterol, making them a significant risk factor for cardiovascular disease.

The challenge lies in understanding the right balance and sources of unsaturated fats in the diet to optimize health outcomes. There is also an ongoing debate on the total amount of fat in the diet. While the focus has traditionally been on fat quality, some studies suggest that the total quantity of fat consumed may also play a role in shaping cardio-metabolic risk. Diets that are too high in fat, regardless of type, may contribute to obesity and insulin resistance, both of which are key risk factors for cardiovascular disease and diabetes. One of the key challenges in understanding the impact of dietary fats on cardio-metabolic risk is the variation in individual responses. Genetic factors, lifestyle habits (e.g., physical activity), and underlying health conditions (e.g., type 2 diabetes, hypertension) can all influence how fats are metabolized and how they affect lipid profiles and insulin sensitivity. For example, some individuals may be more susceptible to the negative effects of saturated fats due to genetic factors such as specific variations in lipid metabolism genes, while others may be more responsive to the benefits of polyunsaturated fats. This highlights the need for personalized nutrition, which considers an individual's genetics, health status, and other factors when making dietary recommendations.

In conclusion, the dietary dilemmas surrounding fats and cardio-metabolic risk are multifaceted and complex. While the dangers of trans fats are clear, the relationship between saturated fats and health is still debated, with some arguing for a nuanced approach that considers the overall diet and individual variability. Unsaturated fats, particularly omega-3s, continue to be supported for their heart-healthy effects, but excessive omega-6 intake may pose risks if not balanced appropriately. To address the dilemma, it is critical to prioritize whole, minimally processed foods, limit trans fats, and focus on personalized dietary approaches that account for genetic and lifestyle differences.

Abstracts of Oral Presentations

2502 - Optimizing Metabolic Health during Sedentary Periods through Soleus Push-Ups

H.M.C.N. Herath[1], S. Thilakarathna[2], Y. Umapathy[1], M.W.F. Sahla[1], K. Thevarajah[1], K.D.P. Madhushika[1] and A. Chandrasekara[1]

Sedentary behavior has recently been identified as a major risk factor for non-communicable diseases, with few effective strategies to reduce these risks during sitting. Based on previous studies that emphasized the soleus muscle's unique capacity for prolonged oxidative metabolism without fatigue, this study aims to investigate the effectiveness of soleus push-ups in enhancing energy expenditure and improving metabolic health during sedentary periods by maintaining blood glucose levels in real-world settings. Overweight or obese ten individuals (Overweight BMI cutoff value for South Asians $\geq$23 kg/m^2) with sedentary lifestyle, went through a two-hour and thirty-minute intervention with and without soleus push-ups, with the oral glucose tolerance test (OGTT) while minimizing their stress levels (ERC approval No: 2023HI14). Blood glucose levels were monitored at 0, 15, 30, 45, 60, 90, 120 and 150 minutes of time periods to identify early-phase response and fluctuations of blood glucose levels more accurately. According to the area under the curves based on oral glucose tolerance tests revealed, a significant (22.2%) reduction of post-prandial blood glucose levels in the treatment group compared to the control group by performing 80-100 repetitions per minute of soleus push-ups. This study provides beneficial insights into novel techniques to enhance metabolic health, emphasizing the important role of tailored exercise strategies in sedentary populations. Soleus push-ups demonstrate significant potential as a simple intervention to reduce post-prandial blood glucose levels, offering a promising strategy for improving metabolic health in sedentary populations. Further studies should explore the impact of soleus push-ups on insulin sensitivity and the modulation of stress-related hormones, providing a comprehensive understanding of their role in metabolic health.

Keywords: Blood glucose concentration, Insulin sensitivity, Non-communicable diseases, OGTT, Sedentary behavior

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2508 - Effect of Intensifed Nutrition Education Programme on Lifestyle Modifcation and Glycaemic Control of Individuals with Type 2 Diabets Mellitus

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Glycaemic control is the central focus of diabetes management. Lifestyle modification is a feasible and sustainable strategy of achieving the good glycaemic control. Nutrition education is an integral part of lifestyle modification in empowering individuals with type 2 diabetes mellitus (T2DM) towards achieving the better clinical outcomes. Therefore, current study was conducted with the objective of assessing the effect of intensified nutrition education programme on lifestyle modification and glycaemic control of individuals with T2DM. Forty four (n=44) individuals with T2DM were assigned either to receive intensified nutrition education programme (NEP, n=22) or standard care (control, n=22). NEP consisted of two group nutrition education sessions of dietary management, foot care and motivational session on improving the physical activities; two counselling sessions and two cooking sessions. Dietary educational materials and a recipe book were provided to individuals in the NEP group. All study participants were provided with blood glucose monitoring charts with sufficient guidance on plotting the their monthly fasting plasma glucose levels (FPG). Information on general lifestyle, disease, and medication history was obtained using a general lifestyle questionnaire at the baseline (t=0). Body weight, waist circumference, body composition, FPG level, dietary intake, physical activity level and knowledge and practice of T2DM on self-management of diabetes were assessed at the baseline (t=0 weeks) and at the end (t=12 weeks) of each study phase. The mean age of study participants was 59 years (SD,6) and diabetic duration was 8 (SD,6) years. Individuals, those who followed the NEP, showed significant ($P<0.05$) reductions in their total energy intake, energy from carbohydrates and added sugar compared to their baseline. FPG of the individuals with T2DM of the NEP arm was significantly lower ($P<0.05$) at the end compared to their baseline values. Therefore, it can be concluded that the intensified NEP was effective in reducing the FPG through improvements of their dietary intake.

Keywords: Glycaemic control, Lifestyle modification, Nutrition education, Type 2 diabetes mellitus

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2513 - Improvements in Sports Performance Through Personalized Nutrition Intervention for Track and Field Athletes: A Mixed Methods Approach

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Personalized sports nutrition interventions (SNIs) tailored to athletes' needs are essential for fueling training, enhancing performance, and promoting well-being. However, limited research has examined the effectiveness of SNIs in improving sports performance in Sri Lanka. This study aimed to assess the impact of an evidence-based, culturally appropriate personalized SNI on the performance and experiences of track and field athletes using both quantitative and qualitative methods. Fourteen national-level athletes who successfully completed a 16-week personalized SNI, delivered by the principal investigator through one-on-one consultations at three-time points (0, 4th, and 8th weeks), participated in this study. Performance data were gathered quantitatively, and qualitative insights were obtained through in-depth interviews focusing on the athletes' experiences with the intervention. The study population (mean age: 23.0 ± 3.9 years, 57.1% male) included six sprinters, two middle-distance runners, three long-distance runners, one jumper, and one thrower. Following the intervention, six athletes achieved personal bests, one set a national record, and four recorded seasonal bests. All participants reported reduced fatigue, enhanced performance and improved well-being. They perceived the importance of multivitamins and supplements in boosting performance. Almost all athletes reported performance gains with respective ergogenic supplements, including caffeine (13/14), bicarbonate (3/4), beta-alanine (5/6), and beetroot juice (3/3). Additionally, athletes prescribed with creatine (n=3) demonstrated notable improvements in explosive power compared to earlier performances. Five athletes reported fewer injuries and illnesses after following the prescribed dietary advice and supplementation compared to their usual practices. Furthermore, two marathoners stated that the hydration advice enhanced their performance. Despite the positive outcomes, side effects were reported from the prescribed vitamins and supplements, including constipation, sleeplessness, and abdominal discomfort. This mixed-methods study highlights the importance of personalized, culturally appropriate SNIs in enhancing sports performance and well-being among track and field athletes, while recommending future research to assess their sustained effects.

Keywords: Mixed methods, Personalized nutrition, Sports nutrition, Sports performance, Track and field

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2515 - Evaluation of the Glycemic Index of String Hoppers Made from Selected Rice Varieties for Diabetic Dietary Management

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Low-glycemic index (GI) foods are crucial in managing chronic diseases like type 2 diabetes. This study assessed the feasibility of producing low-GI food products using long-grain rice varieties with inherently low GI. Three long-grain varieties; CIC Red Fragrance (CIC-RF), CIC White Basmati (CIC-WB), CIC Sticky Basmati (CIC-SB) and one medium-grain variety; BG 352 were included in the study, with amylose content assessed. String hoppers were prepared from these rice varieties to determine GI and 50 g of glucose was used as the standard food. Thirteen healthy, non-diabetic individuals aged 18-25 years with a normal BMI participated in the study. The GI of string hoppers made from each rice variety was determined following the standard method reported by FAO/WHO which involves measuring the blood glucose response to the string hoppers compared to the standard reference, glucose, over a two-hour period. According to the amylose content, CIC-SB was classified as a low amylose variety whereas all the other varieties were classified as high. The portion size for one individual was determined based on the digestible carbohydrate content (CIC-RF = 69.6%, CIC-WB = 78.1%, CIC-SB = 80%, BG 352 = 76%). In-vivo starch digestion revealed that string hoppers made from CIC-RF and CIC-WB had low GI values (50.0 ± 6.0 and 54.0 ± 7.1, respectively). In contrast, those made from CIC-SB and BG 352 were categorized as medium GI (64.0 ± 5.3 and 66.0 ± 9.0, respectively). GI values of string hoppers were almost the same as the published GI values of the cooked rice of the same varieties. This comparison indicates that the form (string hoppers vs. cooked rice) does not significantly impact the GI. Conclusively, food products that are produced using CIC-RF and CIC-WB rice flour can be recommended for diabetes patients as they contain low GI.

Keywords: Amylose content, Glycemic index, Long-grain rice, String hoppers

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2523 - Nutritional Strategies in the Management of BRASH Syndrome; A Case Report

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The BRASH syndrome is a rare condition characterized by bradycardia, renal failure, atrioventricular nodal blockade, shock, and hyperkalemia. These interrelated symptoms can create a harmful cycle: bradycardia leads to decreased cardiac output, which worsens renal function and hyperkalemia; in turn, hyperkalemia exacerbates bradycardia. Early recognition is vital to improve outcomes. In severe cases, transvenous pacing and renal replacement therapy may be necessary. This case study aims to report on the nutrition management of BRASH syndrome using appropriate nutrition intervention to maintain muscle mass, and continuous assessment and modifications for a 79-year-old female patient with a history of type-2 diabetes, dyslipidemia, chronic kidney disease, asthma, and anaemia who admitted to the Intensive Care Unit (ICU), with the symptoms of shortness of breath, lethargy, generalised weakness, loss of appetite, and reduced urine output. A 5% weight loss was observed in the past weeks due to reduced oral intake. She has experienced the same symptoms recurrently for last month. Initial investigations revealed bradycardia, hypotension, hyperkalemia, and anaemia. Her weight and height were 60 kg and 161 cm. At ICU she started with low-potassium diabetic clear fluids once stabilized for the first 24 hours and gradually transitioned to low-potassium diabetic high-protein liquids. To avoid refeeding and reduce stress on her heart, < 50% of 1500 kcal of energy requirement was given by clear-liquids and then achieved >75% of calories through liquid diet. A diabetic-specific formula was included for better diabetes control and to achieve energy needs. By day four, she was on a high-protein diabetic semi-solid, reaching 25 kcal/kg/day and 66g/day of protein. Her potassium and heart rate improved, and after five days, she was discharged on a soft diet with supplements. This case indicates the significance of early recognition and multidisciplinary management of BRASH syndrome with tailored nutritional support being an integral of recovery.

Keywords: Atrioventricular nodal blockade, Bradycardia, BRASH syndrome, Hyperkalemia, Nutrition

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2525 - Prevalence and Predictors of Postpartum Weight Retention in the First Year: Insights from Maternal and Child Health Clinics in Galle

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Postpartum weight retention (PWR) denotes the difference in weight at a certain point after childbirth and pre-pregnancy weight. PWR increases the lifetime risk of overweight, obesity, and Non-Communicable Diseases (NCD) in women of reproductive age extending to the offspring, creating an inter-generational cycle of obesity and NCDs. The study aimed to assess the prevalence, patterns, and associated factors with PWR among women in the first postpartum year attending Maternal and Child Health clinics of Galle and Bope-Poddala Medical Officer of Health areas in Galle. A cross-sectional study was conducted among a consecutive sample of 256 postpartum women, employing an interviewer-administered questionnaire and locally validated tools to assess perceived social support (Multidimensional Scale of Perceived Social Support) and psychological problems (Depression Anxiety Stress Scale-21). Among postpartum women, 58.2% had PWR (mean PWR±SD = 2.4±3.7kg), which showed a negative linear relationship with the pre-pregnancy Body Mass Index (BMI) in the first 4-5 months, thereafter, reverting to higher weight status. In bivariate analysis, presence of PWR was significantly associated with ethnic minorities (p=0.023), extended families (p=0.001), low perceived social support (p=0.049), low/normal pre-pregnancy BMI (p=0.000), cesarian delivery (p=0.010), unplanned pregnancies (p=0.019), breastfeeding for six months or more (p=0.025), seven or more sleeping hours (p=0.003), not sleeping during daytime (p=0.001) and symptoms of stress (p=0.006). However, only pre-pregnancy BMI (OR=3.131, p<0.001) and having symptoms of stress (OR=2.189, p<0.05) remained as significant predictors of PWR in the first postpartum year after controlling for confounders. Postpartum weight retention (PWR) affects over half of postpartum women, with significant predictors being pre-pregnancy BMI and postpartum stress. Regular weight monitoring, psychological screening, and targeted health education during antenatal care are essential to mitigate PWR and its long-term health.

Keywords: First postpartum year, Galle, Postpartum women, Weight retention

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2526 - The Effectiveness of Renal Nutrition Intervention on Improving Nutritional Knowledge and Behaviour among Dialysis Patients

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Chronic Kidney Disease is evidently a growing concern as seen by the increase in the number of newly diagnosed patients requiring dialysis. Proper nutrition not only compensates for dialysate losses but also plays a contributing factor in determining the prognosis of CKD. Early diagnosis, adequate dietary knowledge and regular follow up can slow disease progression. Diet is a modifiable factor and structured integration of dietary interventions can improve dialysis outcomes. The aim was to evaluate the effectiveness of nutritionalintervention on nutritional knowledge and behavior of hemo-dialysis patients. A prospective cross sectional intervention study with before-and-after comparison of 50 participants; aged 18 and above, having sound cognition on regular hemodialysis from Kings Hospital Colombo was done. Interviewer administered questionnaire was completed to assess the understanding of nutrition related knowledge and behavior. A nutritional intervention in the form of an info-graphic booklet containing evidenced based dietary guidelines was explained. After 4 weeks, postt est was doneusing the same questionnaire to assess efficacy. The study was statistically analyzed using IBM SPSS Statistics (20). Pre and post test scores statistically analyzed with paired sample t-test, showed significant increase in overall nutritional knowledge ($t= -7.564$; $p<0.001$; 95% CI:-9.087 to -5.273) across all areas ranging from energy ($t= -5.052$), protein ($t= -5.079$), potassium ($t= -6.024$), phosphorous ($t= -5.414$), salt ($t= -3.843$) and fluid ($t= -2.605$). Highest statistical significance was observed for potassium and phosphorus related knowledge. Protein consumption frequency increased($Z=-5.149$; $p<0.001$). Based on Levene's test, no notable differences were recorded between genders ($t=0.842$, $p>0.05$). Due to knowledge improvement, several misconceptions were decimated. Participants were empowered to make informed choices with more confidence to self-manage. Conclusively, significant improvement was observed in both nutritional knowledge and diet behavior along with correcting common dietary misconceptions. The educational intervention effectively increased participants' knowledge of key nutrients essential for dialysis patients.

Keywords: Diet, Hemodialysis, Knowledge, Nutrition, Nutritional intervention

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2530 - Assessment of Physical, Mental and Nutritional Health among Ageing Women in Rural Sri Lanka: A Cross-Sectional Study

M.R.F. Fazna[1], G. Somaratne[1,2] and U. Walallawita[3]

Ageing women are vulnerable to physical and mental health challenges. In rural Sri Lanka, limited healthcare access and cultural factors exacerbate health disparities. This study aimed to assess physical and mental health, including nutritional status and physical activity, and examined their associations with depression among ageing women in the Polonnaruwa district of Sri Lanka. A community-based cross-sectional study was conducted among 217 women aged 65 and older, selected using simple random sampling from the Polonnaruwa district. Data collection included validated questionnaires and anthropometric measurements including weight, height, and BMI. Depression was assessed using the Geriatric Depression Scale - Short Form (GDS-SF), nutritional status via the Mini Nutritional Assessment - Short Form (MNA-SF), and physical activity levels using the International Physical Activity Questionnaire - Short Form (IPAQ-SF). Dysphagia risk was evaluated using the EAT-10 tool. Statistical analyses included the Shapiro-Wilk test, Mann-Whitney U test, and Chi-square test, with multinomial logistic regression at a significance level of 0.05. The mean age of participants was 69.55 ± 5.36 years. Depression prevalence was 37.33% (95% CI: 0.31–0.44), while malnutrition prevalence was 18.89% (95% CI: 0.14–0.25), with 30.41% (95% CI: 0.25–0.37) at risk of malnutrition. Furthermore, 38.71% (95% CI: 0.32-0.45) of participants engaged in low physical activity levels. Nutritional status and physical activity levels were statistically significantly associated with depression ($p < 0.05$). Women with normal nutritional status (OR = 0.40, 95% CI: 0.195–0.852) and higher physical activity levels (OR = 0.33, 95% CI: 0.121–0.899) were less likely to experience depression. Maintaining a healthy nutritional status and engaging in regular physical activity are vital for improving physical and mental health outcomes among ageing women in Polonnaruwa. Targeted interventions addressing these factors could substantially lower depression risk and enhance well-being in this population.

Keywords: Ageing, Depression, Nutritional status, Physical activity, Women

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2541 - Prevalence of Anemia and Its Determinants in Pregnant Mothers in Medadumbara MOH Area

D.G.V. Keerthi [1] and R.M.T.K. Ranatunga [1]

Anemia in pregnancy reduces red blood cells or Hemoglobin (Hb), limiting oxygen delivery to tissues. It increases risks of preterm birth, low birth weight, and maternal mortality, making it a significant health issue in Sri Lanka. Anemia in pregnancy, affects approximately 29.3% of pregnant women in Sri Lanka, highlighting as a significant public health concern. This study aimed to assess the prevalence of anemia and to identify the relationship between dietary patterns and Hb level during pregnancy in Medadumbara MOH area, where no prior studies have been conducted. The study employed a cross-sectional design involving 237 pregnant mothers from the Medadumbara MOH region, selected through random sampling. Interviewer-administered questionnaires on sociodemographic and economic information, Full Blood Count (FBC), and Food Frequency Questionnaires (FFQs) and anthropometric information were gathered. Hb levels were measured using hematology auto analyzer. Data were analyzed using SPSS software. Hb concentration more than 11 g/dL were considered as normal while Hb concentration 10-10.9 g/dL considered as mild anemia, 7-9.9g/dL considered as moderate anemia and less than 7g/dl considered as severe anemia respectively. The mean Hb concentration was 11.88 g/dL (SD = 1.19). About 17% of mothers were having mild anemia, while 5% mothers having moderate anemia. About 78% of mothers did not have anemia. Significant positive correlation between hemoglobin levels and the consumption of vegetables ($p < 0.001$), fruits ($p < 0.001$), animal- origin foods ($p < 0.001$), pulses ($p = 0.005$), and milk products ($p = 0.029$) were observed. Conversely, a significant negative correlation was observed between Hb concentration and tea intake ($p < 0.001$), suggesting that regular tea consumption may hinder iron absorption and elevate the risk of anemia. These findings underscore the critical role of dietary habits in managing anemia among pregnant women in the Medadumbara MOH area.

Keywords: Anemia, Dietary pattern, Hemoglobin, Pregnancy

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2544 - Enhancing Athletic Performance through Targeted Dietary Modifications: A Study on Athletes

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Aerobic endurance is a critical determinant of athletic performance, particularly in elite athletes. Dietary modifications, including supplementation with whey protein, have been proposed as a strategy to enhance performance by improving aerobic capacity. This interventional study aimed to investigate the impact of whey protein supplementation on athletic performance enhancement, specifically focusing on VO_2 max among elite athletes using a mixed method study design. Conducted with ethical approval from Ethics Revie Committee of Faculty of Livestock, Fisheries and Nutrition, 22 elite athletes (15 males, 7 females; age range 20–28 years) were recruited using purposive sampling and randomly assigned to an intervention group (n=11) or a control group (n=11). The intervention group received whey protein for 6 weeks. VO_2 max was assessed via the beep test, and triglycerides and liver enzymes (ALT and AST) were measured enzymatically using a spectrophotometer. Statistical analysis included paired t-tests and ANOVA using Minitab17 to compare pre- and post-intervention values. Results showed a 12.3% increase in VO_2 max in the intervention group ($p=0.015$), with no significant change in the control group ($p=0.314$). Triglyceride levels decreased by 15.8% ($p=0.039$), while ALT and AST levels reduced by 14.7% and 11.9%, respectively ($p=0.018$), in the intervention group, compared to the control group, suggesting potential connections between whey protein, improved metabolic health, and insulin resistance reversal. These findings underscore the efficacy of whey protein supplementation in enhancing aerobic endurance and suggest broader metabolic benefits, including lipid profile improvements and liver function optimization. The observed changes may contribute to better insulin sensitivity, highlighting whey protein's role in supporting athletic performance and overall metabolic health. This study offers valuable insights into sports nutrition and exercise physiology, demonstrating the potential of dietary interventions to optimize performance. Further research is needed to understand the mechanisms behind these benefits and refine dietary strategies for elite athletes.

Key words*:* Aerobic endurance, Beep test, Metabolic health, VO_2 max, Whey protein supplementation

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2558 - The Impact of Circadian Disruption and Chronotype on Cardiometabolic Risk Markers and Eating Patterns in Shift Workers

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Shift work-induced circadian disruption has been strongly linked to cardiometabolic diseases including obesity, diabetes & cardiovascular disease. Limited studies have explored the impact of different variables such as night work durations, intensity and chorotype on cardiometabolic risk. The study aimed to determine the impact of circadian disruption on cardiometabolic risk markers in shift workers. This case-control study was conducted with 104 male workers (shift workers; n=52, mean age ±SD; 43.3±10.2 and non-shift workers; n=52, mean age ±SD; 41.2±9.8). Shift work status, durations and intensity of night shifts were determined using an interviewer administered questionnaire. Cardiometabolic risk were evaluated through anthropometric (height, weight, waist circumference and body composition), biochemical (fasting glucose and lipid profile), clinical (blood pressure) and dietary assessment (24-hr recalls from normal days and work days). Chronotype was determined using the Munich Chronotype Questionnaire (MCTQ). Data were analyzed using t-tests and ANOVA, with adjustments made for potential confounding factors. Shift-workers had significantly higher mean body fat percentage (31.7, 22.7% p=0.031), systolic blood pressure (138.6, 128.5mmHg p=0.009), pulse rate (78.7, 72.3bpm p=0.015), triglycerides (1.60, 1.30mmol/l p=0.021) and LDL-C (3.90, 3.40mmol/l p=0.012) than non-shift workers. Evening chronotype shift workers had significantly higher visceral fat level (12.8, 8.90 p=0.001), systolic blood pressure (137.0, 127.6mmHg p=0.006), pulse rate (82.7, 73.3bpm p=0.005) and LDL-C (4.00,3.40mmol/l p=0.039) than shift workers with morning chronotype. Shift workers had higher mean daily intake of energy percentage derived from added sugar (6.76, 5.98% p=0.001). Highest energy intake per day exhibited during the night (18:00pm–6:00am) by shift workers. This study concludes that shift work, particularly among those with an evening chronotype, significantly increases cardiometabolic risk markers, highlighting the need for targeted interventions to mitigate these risks and improve health outcomes in shift workers.

Keywords: Cardiometabolic risk factors, Chronobiology, Chrono-nutrition, Circadian misalignment, Circadian rhythm

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2560 - Association of Adiposity with Arterial Stiffness in Adolescents Aged 17-18 Years

A.P.L. Malathi [1], D.S. Perera [1] and K.M. Rathnayake [1]

Number of adolescents with overweight and obesity are increasing worldwide. Children and adolescents with excess adiposity are at risk of cardiovascular diseases in the future. Excess adiposity can trigger stiffness of the arteries, which is an early sign of cardiovascular diseases and vascular functions. The influence of dietary pattern, physical activity level, and birth weight on arterial stiffness is unclear in the current literature in Sri Lanka. The objective of this study was to determine the association of adiposity with arterial stiffness in adolescents aged 17–18 years. A cross-sectional school-based study was conducted among 300 adolescents (mean age 17.7 ± 0.4 years) including both males (n=150) and females (n=150) from Gampaha, Kurunegala, and Puttalam districts. Arterial Stiffness was measured in terms of Pulse Wave Velocity by a Pulse Wave Analyzer, Mobil-O-Graph and adiposity was measured by using a multi-frequency body composition analyzer. A 24-hour recall and short version of international physical activity questionnaire were used to assess the Dietary Diversity Score and energy expenditure, respectively. The association of adiposity with arterial stiffness were evaluated using Spearman Rank Correlation test. BMI-for-age z-score was -0.5± 0.4 and 11.3% of the study sample was overweight and 4.3% was obese. Mean arterial stiffness of the study sample was 4.7± 0.4 ms-1. Arterial stiffness showed a positive correlation with visceral fat level (r=0.328, p=0.0001). Dietary Diversity Score (DDS) was calculated using 12 food groups. According to the results, urban school adolescents (9/12) had a higher DDS than rural school adolescents (8/12). In conclusion, visceral adiposity was positively associated with arterial stiffness in adolescents aged 17-18 years. These results support the view that adiposity was a determinant of early vascular aging in adolescents. Overall, these findings could guide specific therapeutic interventions and studies for young individuals aiming to mitigate the risk of future cardiovascular diseases.

Keywords: Anthropometry, Cardiovascular disease, Dietary Diversity Score, Pulse wave velocity

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2561 - Development and Application of a Clinical Screening Tool for Metabolic Syndrome Pre-Risk Assessment

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Metabolic Syndrome (MetS) is a critical public health concern attributable to cardiovascular disease and Type 2 diabetes mellitus, influenced by insulin resistance. It is characterized by major risk factors including atherogenic dyslipidemia, elevated blood pressure, plasma glucose, prothrombotic and proinflammatory states. The TyG index could be considered as an efficient surrogate marker for insulin resistance. Early detection is crucial, since metabolic changes occur sequentially, enabling early intervention to delay complications and associated risks. Therefore, this study aimed to develop a pre-screening tool to identify vulnerable individuals for further testing against established metabolic syndrome criteria. The tool was developed based on key factors such as demographic details, biochemical and clinical markers, anthropometric measures, past medical and family history, lifestyle attributes, and female-specific factors, obtained through literature reviews. The tool contained 18 questions, with the pre-risk categories interpreted as low pre-risk <7, moderate pre-risk 8-10, and high pre-risk >11. This tool was applied practically to 149 participants, suspected of having varying levels of MetS pre-risk. The findings showed that scores ranged from 3 to 18, categorizing 42% of participants as low pre-risk, 39% as moderate pre-risk, and 19% as high pre-risk. Mean TyG index increased with increasing pre-risk levels: from 8.54 (low) to 8.80 (moderate) and 9.11 (high). Similarly, fasting blood glucose, systolic, and diastolic blood pressure showed an increasing trend with an increase in the MetS pre-risk scores. Notably, MetS pre-risk scores were also correlated with BMI, with the highest scores observed in the obese group (>25 kg/m²). Overall, these findings emphasize the potential of this tool to stratify individuals based on MetS pre-risk. This tool delivers a valuable approach for early identification of individuals to the risk of MetS and enabling timely interventions to prevent or manage metabolic syndrome and its associated complications.

Keywords: Insulin resistance, Metabolic syndrome, Pre-risk assessment, Screening tool, TyG index

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2562 - Dietary Patterns and Metabolic Syndrome Risks among Asian Indians across Geo-Climatic Regions

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MetS is defined by central obesity, dyslipidemia, hypertension, and insulin resistance, which significantly increases the risk for cardiovascular diseases and type 2 diabetes. This paper aims to study the link between dietary habits and risk of MetS in Asian Indians from varied geo-climatic regions of India. The study consisted of 1178 adults aged 21 to 60 years from five geo-climatic regions like hill, plateau, plains, delta, and coastal regions of West Bengal, India. Dietary patterns were assessed by using a food frequency questionnaire. MetS was diagnosed based on NCEP-ATP III criteria. Multivariate logistic regression determined the association of diet patterns with MetS. Overall prevalence of MetS in the study population was 34.5%. The highest proportion was found in plains with 42.8% and the lowest in the hilly region with 24.6%. Compared to the regions with low incidences of MetS, those from the plains, whose diet was high in refined carbohydrates, fats, and sugar-containing processed foods, had a higher risk of having MetS by a risk ratio of 3.28; 95% CI: 2.13-4.88, $p<0.001$. The regions from the coastal parts, whose diets were characterized with the high contents of fish, fiber, and vegetables, experienced relatively low prevalence of MetS at 27.3% and reduced the risk of having MetS by a risk ratio of 1.72; 95% CI: 1.01-2.94, $p<0.05$. After adjustment for confounders, the association between consumption of processed foods and MetS was maintained to be of statistical significance. AOR=2.89; 95% CI: 1.88-4.42, $p<0.001$. Higher intakes of processed and refined foods have been associated with a higher prevalence of MetS; higher intake of fish and fibre is associated with a decreased risk of MetS. Region-specific dietary interventions are the need of the hour to address the growing burden of MetS.

Keywords: Asian Indian adults, Dietary pattern, Geo-climatic variation, Metabolic syndrome

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2528 - Effects of Polishing and Parboiling on the Nutritional and Antioxidant Profiles of Different Sri Lankan Basmathi Rice Varieties

M.S. Christopher[1], G.R. Dunuwila[1], G.M. Somaratne[1], D.C.S. Gunasekara[2], D.S.D.Z. Abeysiriwardena[2] and B.D.R. Prasantha[1]

This study investigated the impact of varietal differences, polishing levels, and parboiling on the milling characteristics, proximate composition, total phenolic content (TPC), and antioxidant activity of three rice varieties: CIC red basmati improved (RBI), CIC red basmati (RB), and CIC white basmati (WB). Both parboiled and non-parboiled rice were polished at 10%, 60%, and 100% levels. The milling outturn, head rice yield, proximate composition, and cooking characteristics were evaluated for each variety. TPC and antioxidant capacity were measured using the Folin-Ciocalteu method, and scavenging assay, respectively. Results showed that parboiled rice had the highest milling outturn. Parboiling increased ash and crude fiber content but significantly ($p<0.05$) decreased these components as polishing levels increased. For example, non-parboiled RBI rice showed a reduction in ash content from 1.14% (10% polishing) to 0.98% (100% polishing), while parboiled RBI rice had higher ash content, ranging from 1.49% to 1.02%. Parboiled rice retained higher ash content due to nutrient migration from the outer bran into the endosperm during the parboiling process. A statistically significant ($p<0.05$) decline in TPC and antioxidant activity was observed with increased polishing levels across all varieties. In non-parboiled RBI rice, TPC decreased from 38.79 ± 0.29 mg GAE/g (10% polished) to 29.05 ± 0.50 mg GAE/g (100% polished), with antioxidant activity reducing from 94.61 ± 0.55% to 61.51 ± 1.26%. Parboiled RBI rice exhibited even lower TPC, ranging from 21.10 ± 0.22 mg GAE/g (10% polished) to 11.57 ± 0.57 mg GAE/g (100% polished), with a corresponding decrease in antioxidant activity from 57.59 ± 1.28% to 43.26 ± 0.89%. This research highlights the significant effects of parboiling and polishing on rice composition and nutritional value, emphasizing the need for informed rice processing decisions to meet specific dietary requirements.

Keywords: Antioxidants, Basmathi, Parboiling, Phenolic content, Polishing level

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2529 - Perceptions of Teachers and Experts Regarding School Gardening Practices to Enhance Agriculture and Food Literacy among School Children

O.S. Indramali[1], M.M.S. Karunanayaka[1], T. Perera[1], U. Dissanayke[2], T. Kudagammana[3], A.J. Mohotti[4], D. Hunter[5] and K.D.R.R. Silva[1]

School garden provides opportunities for shaping children's food choices through hands-on learning that promotes healthy eating habits. This qualitative study aimed to identify current agronomic practices, explore challenges in school gardening and suggest improvements for a model garden to enhance students' knowledge, and attitudes toward agriculture, and nutrition. The present study involved in-depth interviews with 10 agriculture teachers from 18 schools across two districts (Kurunegala and Gampaha) in Sri Lanka, and 10 agriculture experts. Information on agronomic practices, challenges in school gardening, and best strategies for implementing model garden to positively impact students' knowledge, attitudes toward agriculture, and nutrition were gathered through interviews. Most of the agronomic practices observed were conventional, with limited use of technology. The challenges of school gardens identified were maintaining gardens during school vacations, lack of funding, time constraints, damage caused by wild animals and negative attitudes of children towards gardening. Experts suggested incorporating innovative methods such as vertical farming, drip and sprinkler systems, permaculture, and hydroponics to increase student enthusiasm. Further, they suggested integrating gardening with core school subjects such as Mathematics and Science. Additionally, they proposed establishing student-managed gardening clubs with shared responsibilities to reduce reliance on teachers. Integrating nutrition information into gardening by displaying crop nutritional benefits and conducting cooking demonstrations with garden harvests were also suggested. In conclusion, this study identified that most school gardens rely on conventional agronomic practices with limited use of technology. The key challenges were maintenance during school vacations, insufficient funding, limited space and time, negative attitudes among students, and damage caused by wild animals. Teachers and experts suggested incorporating technology and integrating hands-on gardening activities with nutrition-related lessons in subjects. Implementing a model school garden that addresses these challenges holds a significant potential as an educational tool to promote agriculture and food literacy among school-aged children.

Keywords: Agriculture literacy, Food literacy, School children, School garden, Sri Lanka

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2531 - Comparative Assessment of Quality Parameters of Branded and Non-Branded Coconut Oil Available in the Kamburupitiya Area in Matara District

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Coconut oil is the main edible oil used in Sri Lanka. There are different brand and non-brand oil types available in the market while some quality defects are reported in time to time. Therefore, this study was conducted to assess the quality parameters of branded and non-branded coconut oil available in Kamburupitiya area in Matara district. Two samples each of branded (B1 and B2) and non-branded (NB1, NB2) coconut oil were purchased from various stores and control sample (C) was extracted under laboratory conditions. Physical (moisture, volatile matter, color, density), chemical (acid, peroxide, iodine, saponification, pH values), and functional properties (polyphenol, flavonoid, antioxidant activity) of the collected coconut oil samples were analyzed using standard methods. Total Aflatoxin level and aflatoxin B1 content were measured using HPLC method. The data were analyzed using one-way ANOVA followed by Tukey's Post-hoc multiple comparison test. All the tested coconut oil samples met SLS standards for moisture, relative density and volatile matter with NB1 sample showed the highest moisture content (0.38±0.04 g/100 g) and B2 showed the highest volatile matter content (0.42±0.08 g/100 g). A significant difference was observed in peroxide, saponification and acid values while peroxide and saponification values of B1 sample showed higher values than SLS standard (3 meq./kg and 264 mg KOH/g, respectively). The sample NB2 showed highest acid value (0.964±0.08 mg KOH/g) significantly exceeding SLS standards which indicates a higher degree of hydrolysis and potential rancidity while B1 exhibits the lowest acid value (0.126±0.03 mg KOH/g). Non-branded coconut oil samples had higher polyphenol content and antioxidant activity than the other samples. Total aflatoxin content of all the tested samples were within the SLS standard. Overall, non-branded coconut oil samples exhibited higher moisture and acid values, while branded samples demonstrated better compliance with SLS standards for relative density, peroxide value and iodine value.

Keywords: Aflatoxins, Coconut oil, Functional properties, Physico-chemical properties

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2533 - Secondary School Teachers' Self-confidence in Delivering Food Literacy Education (Grades 6 to 11)

M.P.S. Rathnayake[1], J. Nanayakkara[2], T. Perera[1], A. Worsley[3], A.O. Booth[2] and K.D.R.R. Silva[1]

Teachers' confidence in their ability to teach food literacy is crucial for effective food literacy education. This study investigated the self-confidence of grade 6 to 11 school teachers in delivering food literacy education, examining their confidence levels, influencing factors, and resources needed for improvement. A cross-sectional survey was conducted across eight provinces in Sri Lanka, recruiting 373 teachers (82.2% female, 15.5% male) through convenience sampling from urban (19.6%), semi-urban (25.7%), and rural, including estate, schools (54.7%). Participants taught various subjects related to food literacy, including Home Economics (49.6%), Health and Physical Education (15.5%), Practical and Technical Skills (60.9%), Agriculture and Food Technology (30.8%), and Science (11.3%). Results showed that teachers exhibited at least 73% confidence across all given 30 food literacy topics. Ninety-six percent of the teachers indicated confidence in their knowledge, and 97% stated they were confident in engaging students. Female teachers reported significantly higher confidence (97.1%) than male teachers (89.7%, $p = 0.022$). Teachers with qualifications in Home Economics exhibited greater confidence in teaching food literacy (98.3%) compared to others (85.4%, $p < 0.001$). Additionally, teachers with less than 20 years of experience demonstrated higher confidence in utilizing technology for food literacy education (67.5%) compared to those with over 20 years (44.4%, $p < 0.001$). Teachers identified significant challenges, including limited teaching-learning resources (90%) and unsupportive home environments with low family food literacy (87%), where healthy food behaviors are often not reinforced, undermining what is taught in school. Commonly used teaching tools were blackboards and printed materials, with notable variations by school location and type. In conclusion, teachers in Sri Lankan schools exhibit high self-confidence in delivering food literacy education. However, addressing resource limitations and unsupportive home environments is vital. The need for digital teaching tools and tailored interventions for different school settings is highlighted as a key area for improvement.

Keywords: Curriculum, Food literacy education, Self-confidence, Teaching tools, Quantitative survey

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2534 - Designing a YouTube Platform for Promoting Knowledge in Healthy Eating and Nutrition Practices Targeting Mothers of Preschoolers in Sri Lanka

I.G.R.I. Jayasekara[1], G.M. Somaratne[2] and U. Walallawita[3]

Preschoolers, aged between 3 to 5 years old, undergo rapid physical, cognitive, and emotional development, making proper nutrition management essential during this formative stage. Mothers play a crucial role in shaping children's dietary behaviors. This makes them as key targets for interventions that promote healthy eating among preschoolers through social media. Leveraging social media to deliver health promotion messages and support behavior change initiatives offer a convenient and accessible way of reaching mothers with evidence-based nutrition information to facilitate positive dietary changes for their children. Initially a screening questionnaire was distributed among mothers and 75 participants responded with signed consent. Only 65 eligible participants were recruited to the study. Content of the YouTube channel was developed and participants were asked to follow the content through Whatspp messages and Facebook page, within three months period. Knowledge based questionnaires with different questions were given at the beginning and end of the intervention. The mean total nutrition knowledge score increased by 2.42 (pre-test to post-test: 9.446±1.937 to 11.862±1.379) which elaborates social media has a significant positive impact on improving the knowledge of nutrition and healthy eating practices among mothers ($t=9.35$, $p<0.005$). The usability and effectiveness of the designed social media platform was evaluated through qualitative and quantitative methods. Feedback of mothers showed satisfaction on the features of YouTube channel including content, attractiveness, quality of video, audio, clarity, relevance, and knowledge improvement. The majority of mothers have agreed that the content of the YouTube videos provide better awareness and practical solutions compared to written articles ($p < 0.005$). YouTube was the most preferred (86%) and convenient (81%) social media platform according to the participants' insights and analytics (subscribers: 600, views: 30.9k, impressions: 774.6k and click-through rate: 3.5%). Social media-based interventions can be an effective channel for promoting healthy eating practices for preschoolers.

Keywords: Healthy eating, Knowledge improvement, Nutrition practices, Preschoolers, Social media

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2536 - Educators' Perspectives on School Gardens and The Food Environment in Sri Lankan Schools

I.P. Rajapaksha[1], M.M.S. Karunanayaka[1], T. Perera[1] and K.D.R.R. Silva[1]

Children spend significant time and consume a substantial portion of their daily food intake in the school environment. However, there remains a gap in understanding educators' perspectives on the school food environment and its appropriateness for fostering children's food literacy in Sri Lanka. This qualitative study aimed to explore the perceptions of teachers and principals regarding school gardens and school food environments. In-depth interviews were conducted with 10 principals and 20 teachers from secondary schools with garden in the Gampaha and Kurunegala districts. NVivo 14 software was used to identify themes related to practices, resources, benefits, and barriers associated with school gardens, nutrition education, school canteens, policies related to nutrition, and social factors. The findings showed that while teachers identified healthy food choices as a key nutrition topic, nutrition education was embedded sporadically across various subjects, often as elective subjects. This fragmented approach results in uneven exposure to food and nutrition concepts among students. Teachers recognized school gardens as a valuable tool for hands-on experience in nutrition education, yet many schools utilize school gardens for income generation rather than educational purposes. School canteens have diverged from the existing school canteen policy, catering more to students' food preferences and profit-driven marketing strategies by selling unhealthy food. Furthermore, the media focuses on promoting unhealthy processed food options and giving little attention to healthy food. Cultural and familial influences significantly shape students' eating habits, challenging efforts to promote healthier food choices. In conclusion, teachers and principals perceive the school food environment as a critical factor in enhancing food literacy, yet its potential remains underutilized. There is a clear need for revisiting the nutrition education frameworks, stronger policy enforcement in school canteens, and concerted efforts to counterbalance media influences to foster healthier dietary behaviors among school-aged children in Sri Lanka.

Keywords: Food literacy, School gardens, School food environment, Nutrition education, Secondary schools

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2540 - The Current Status of School Food Environment in Secondary Schools in Kurunegala District, Sri Lanka

I.T. Thalwaththa[1], M.M.S. Karunanayake[1], T. Perera[1] and K.D.R.R. Silva[1]

The school food environment plays a crucial role in shaping the food choices of schoolchildren. School gardens, as a part of this environment, provide opportunities to learn about food crops while promoting healthier eating. As a result, school-based interventions, including gardening initiatives, to promote nutrition have received attention. However, evidence on the school food environment, including school gardens in Sri Lanka is limited. This study assessed the current status of food environment in Sri Lankan secondary schools through a cross-sectional survey of students and teachers in selected secondary schools (n=10) in Kurunegala district, Sri Lanka. Data was collected using self-administered questionnaires from a sample of junior secondary school students (n=160) and teachers (n=30). Descriptive analysis was performed using SPSS version 22. The students' survey included 70% female and 30% male students while the teachers' survey included 80% female and 20% male respondents. Findings revealed that 64% of students and 27% of teachers frequently participated in school garden activities. There was high student engagement and positive attitudes toward school gardening activities with 67% of students perceived it as a valuable learning opportunity. Furthermore, 63% of teachers reported using school garden for teaching purposes. However, limited time for gardening (43% of teachers) and unhealthy snacks with high sugar, fat, and salt in school canteens which were preferred by 71% of students were the main challenges. Fruit consumption during school time was notably very low, with 1% of students reported reporting fruit intake. In conclusion, while school gardening activities are valued by students and teachers, they are underutilized due to time constraints and competing priorities. Unhealthy food choices in school canteens further undermine the efforts to promote healthy eating. Addressing these barriers and better integrating school gardens into the curriculum could improve the food environment and encourage healthier dietary behaviors among children.

Keywords: Food choices, Nutrition, School-based interventions, Food environment, School gardening

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2545 - Knowledge, Attitudes and Behavior Related to Revised Food Based Dietary Guidelines of Sri Lankans, A Pilot Study

G.M.S. Sarap[1], L.K. Jayasundara[1], D.I.H.W.S. Paranayapa[1], S.W.N Silva[1] and G.A.P. Chandrasekara[1]

Food-based dietary guidelines (FBDGs) are essential for directing populations towards healthier eating patterns, aimed at addressing nutritional deficiencies and preventing non-communicable diseases (NCDs). In Sri Lanka, where dietary habits are undergoing changes significantly, it is crucial to understand the knowledge, attitudes, and behavior (KAB) of the population regarding FBDGs for effective public health planning. This study aimed to assess the KAB of Sri Lankan adults in relation to the eighteen national FBDGs. A cross-sectional study was conducted with a representative sample of 320 participants from patients, women of reproductive age and health care providers. Data were collected using a questionnaire that evaluated participants' awareness of FBDGs, their knowledge, attitudes, behaviors related to nutrition and health, and self-reported dietary practices. Descriptive statistics and AMOS analyses were used to examine the relationships between KAB and demographic factors. The findings indicated that participants had higher knowledge regarding the need of vegetable consumption, moderate knowledge on fruits and dairy products, and low awareness of sugar and coconut oil intake. Knowledge about omega-6 and omega-3 fatty acids was significantly lower compared to other components, such as fruits, vegetables, and whole grains in the diet. A significant relationship between knowledge and behavior was identified ($p<0.001$), while no significant effect of attitudes on behaviors was observed. However, a strong correlation between knowledge and attitudes was noted ($p<0.001$). Age group and income level were significant factors affecting behavior ($p<0.001$). Overall, the participants exhibited a moderate level of knowledge regarding the FBDGs of Sri Lanka. Their behavior towards healthy food choices and consumption was considerably low. However, their attitude towards the health and nutritional benefits of food was significantly high. This study highlights the need for targeted educational and social marketing initiatives to improve FBDG awareness and practical usage to facilitate healthier food choices and food behaviors among Sri Lankans.

Keywords: Attitudes, Behavior, Food-based dietary guidelines, Knowledge, Sri Lanka

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2548 - Development of a Culturally Appropriate Diet Diary for Sri Lankan Population

V.P.C. Rajakaruna[1], C.J. Wijesinghe[1] and K.T.A.A. Kasturiratne[2]

Diet recording and analysis is an important prerequisite for dietary modifications in the management of diet-related chronic diseases. In Sri Lanka, the tools used for diet recording are adapted from foreign countries. A culturally appropriate dietary data collection tool will enable collection of high-quality data. Therefore, this study aimed to develop a culturally sensitive and population specific diet diary. Development of the tool was based on data obtained from a purposive sample of participants (n=30) in Warakapola health unit area, representing a diverse population. Participants' experience, perceptions and expectations on a standard dietary data collection tool were assessed in three focus group discussions, after completion of a 7-day food diary. Qualitative content analysis was used and done by manually to identify key themes, based on which version 01 of the tool was prepared in all three languages. It was reviewed by four expert professionals in nutrition and revised accordingly to develop version 02. Version 02 was pretested among 12 participants with written feedback to develop the final version of the tool. Three themes were used for the preparation of version 01; i.e. "expectations on the improvement of the diet diary", "benefits of record keeping" and "difficulties in record keeping". The new diet dairy included four sections: description and guidance on diet recording including benefits, a photo guide of locally consumed food to determine portion sizes, example page and seven diary pages. The final version of the diet diary was designed to assess the pattern (time of intake), format (food variety, quantity) and context (social aspect, mood) of eating. Participants' feedback confirmed that the diet diary is user-friendly, culturally acceptable and useful for monitoring their usual diet, enhancing feasibility of dietary data collection in the community.

Keywords: Diet, Dietary data collection, Diet tools

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2552 - Nutritional Status of Pregnant Women and Associated Dietary Factors: A Cross-Sectional Study from Southern Sri Lanka

G.B.D Hansika[1], H. Rathnayake [2] and A. Chandrasekara[3]

The nutritional status and associated dietary factors of pregnant women are critical aspect of maternal and fetal health. Proper nutrient intake is essential to minimize the health risks of mother and the child, yet in many local regions pregnant mothers encounter nutritional challenges. This study aimed to assess the nutritional status and associated dietary factors of pregnant women in Bope Poddala and Galle Medical Officer of Health (MOH) areas. A descriptive cross-sectional study was conducted among 230 pregnant women who attended to antenatal clinics. Participants were recruited by convenient sampling techniques and essential data were extracted from pregnancy record book. Pre-pregnancy Body Mass Index (BMI) was compared with current BMI to calculate the weight gain. Recommended weight gain for the pre-pregnancy BMI was used to assess nutritional status. Dietary data were collected using 24-hour dietary recall and nutrient intake was estimated using FoodBase2000 software with a database validated for Sri Lankan recipes. The chi-square test was used to identify associations between categorical data. Ethical approval was obtained from Faculty of Medicine, University of Ruhuna. The mean (SD) age of women was 28 (4) years. Approximately a half of pregnant women were Sinhalese, (51%) and the rest were Muslims (46%) and Tamils (3%). According to the pre-pregnancy BMI, 17%, 48%, 26% and 9% were underweight, normal, overweight and obese, respectively. Mean (SD) daily intake of energy, protein, calcium and iron were 1872.84 (587.98) kcal, 53.18 (17.71) g, 643.48 (377.46) mg and 14.28 (10.03) mg respectively. Mean daily dietary intake of protein was above the RDA of 51 g/day but mean intakes of total energy, iron and calcium were below the RDA. Adequate weight gain during pregnancy was positively associated with energy ($\chi 2$=4.82, df=1, p=0.028) protein ($\chi 2$=5.04, df=1, p=0.025) and calcium intake ($\chi 2$=9.85, df=1, p=0.002). Inadequate intake of energy, iron, and calcium indicative of potential health risks while weight gain during pregnancy was positively associated with higher energy, protein, and calcium intake, emphasizing the importance of balanced nutrition during pregnancy.

Keywords: Dietary factors, Nutritional status, Pregnant women, Weight gain

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2555 - Mapping School Food Environment Using GIS Techniques

M.P.Y. Wickramarathna[1], M.M.S. Karunanayake[1], T. Perera[1], K.D.R.R. Silva[1] and H.K. Kadupitiya[2]

The formative years of students are critical for their development, with schools playing an important role in fulfilling a significant portion of their daily nutritional requirements. Consequently, the school food environment has a great influence on students' dietary habits, shaping their overall health and well-being. This study aimed to apply Geographic Information System (GIS) techniques to assess the availability, accessibility, and distribution of healthy and unhealthy food options around and inside the schools. This study was carried out in the Negombo education zone in Western Province, Sri Lanka covering 30 purposively selected schools from three educational divisions. Out of the surveyed schools, 25 were equipped with canteens, while 14 featured aesthetically pleasing and well-maintained school gardens. Using ArcGIS software, food availability and accessibility within a 500-meter radius of each school were analyzed. A total of 476 food outlets were found within this area, showing a high concentration of grocery and pastry shops, as well as a noticeable presence of mobile vendors. The most common food options available around schools included starchy foods, dairy products, nuts and seeds, carbonated beverages, sweets, sugary drinks, fried foods, and processed items. Also, the results revealed that there was more to get unhealthy foods inside the school is less, and the availability and accessibility of unhealthy food options is more than healthy food options around the schools with numerous food outlets easily reachable. This study highlights the importance of spatial analysis in understanding the distribution of food choices around schools. These findings are essential for designing targeted interventions that promote healthier eating habits and support student well-being. Also, it emphasizes the need for coordinated efforts between schools and surrounding communities to build a healthier school food environment.

Keywords: Food options, Geographic information system, School food environment, Spatial maps

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2556 - The Knowledge and Practices on Food and Nutrition among Preschool Teacher in Jaffna, Sri Lanka

S. Mathusha[1], K.D.D. Silva[2] and W.D.W. Senanayake[3]

Early childhood nutrition plays a critical role in children's development. However, previous studies indicate that many preschool educators in Sri Lanka have only basic nutrition knowledge. This study aimed to evaluate the food and nutrition knowledge and practices of preschool teachers in Jaffna district. A cross-sectional survey was conducted during a nutrition education program using a structured, validated questionnaire among 36 randomly selected preschool teachers from five divisional secretariats. Responses were analyzed using SPSS software. The sample included 55.6% Hindus and 44.4% Christians, with 41.7% of teachers holding diplomas in early childhood development. Over half (52.7%) had attended nutrition-related seminars, and 61.1% were familiar with Sri Lankan Food-Based Dietary Guidelines. However, only 13.9% could correctly identify nutrient groups, and none accurately identified food groups. Most preschools followed weekly food charts, with 94.4% reporting adherence by students; poverty was cited as the main barrier to compliance while 66.7% of teachers reported having food courts on their premises, 30.6% faced challenges accessing clean water. A weak positive relationship (R^2 = 0.031) was found between teachers' education levels and nutrition knowledge, indicating other influencing factors. Almost all students brought homemade meals, including legumes, with 38.9% of teachers identifying low weight as a major nutrition issue. Additionally, 55.6% recognized legumes as healthy snacks, but awareness of first aid in food-related emergencies was inadequate. These findings underscore the need to integrate nutrition education into teacher training programs, create supportive school environments, and implement effective monitoring and evaluation strategies to improve preschoolers' nutritional well-being.

Keywords: Jaffna, Knowledge, Nutrition, Preschool, Teachers

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2559 - Association of Adiposity with Blood Pressure among Adolescents Aged 17-18 Years

N.G.W.M. Gamage [1], D.S. Perera [1] and K.M. Rathnayake[1]

The prevalence of obesity among adolescents is increasing, raising concerns about potential health implications, including elevated blood pressure and increased risk of cardiovascular disease events in late adulthood. This cross-sectional study aimed to investigate the association between adiposity and blood pressure in adolescents aged 17-18 years and to determine the adherence to Sri Lankan food-based dietary guidelines among adolescents. A total of 300 adolescents (mean age 17.7 ± SD 0.4 years) were recruited from selected schools in Gampaha, Puttalam, and Kurunegala districts, Sri Lanka, representing both urban and rural sectors. The study sample consisted of 150 males and 150 females. Body composition was assessed using a multi-frequency body composition analyzer (TANITA MC-780). Blood pressure measurements were obtained using a clinical blood pressure monitor. A 24-hour recall and a short version of the International Physical Activity Questionnaire were used to assess adherence to Food-based Dietary Guidelines and energy expenditure from physical activity, respectively. The association between adiposity and blood pressure was evaluated using the Spearman Rank Correlation test. The study sample's mean systolic and diastolic blood pressure levels were 118 ± 13.5 mm Hg and 75 ±10.7 mm Hg, respectively. The prevalence of overweight and obesity in the study sample was 11.3% and 4.7%, respectively. The prevalence of elevated blood pressure, stage 1, and stage 2 hypertension among adolescents was 19%, 11.7%, and 7%, respectively. A significant positive correlation was found between adolescents' visceral fat level and systolic blood pressure ($p=0.001$, $r=0.303$). Adherence to vegetables, fruits, eggs, nuts, and oily seeds was lower than the recommendations as per Sri Lankan Food-based Dietary Guidelines. The study revealed a positive correlation between visceral fat levels and systolic blood pressure in adolescents, underscoring the need for early interventions targeting lifestyle modifications to address excess adiposity-related health concerns.

Keywords: Adiposity, Adolescents, Blood pressure, Obesity, Overweight

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2563 - Sensory, Glycemic Index and Satiety Response Evaluations of Whole Grain Rice Based Functional Beverage Formulations

I.U. Rajapaksha[1], P.H.D. Thathsarani[1], G.M.S. Sarap[1] and G.A.P. Chandrasekara[1]

Beverages play a crucial role in the daily diet of people offering a means to incorporate essential nutrients and bioactive compounds. The first drink taken before the breakfast of the day is personalized among people. This study aimed to determine the sensory attributes, glycemic index (GI) values, and satiety responses of ready-to-serve rice-based beverages which can be used as first drink in the morning and tailored for effective gastritis management and overall health promotion. A sensory evaluation was conducted with 50 untrained panelists to assess eight beverages made from whole-grain rice, soy milk or coconut milk against the control made of whole-grain rice. The sensory evaluation showed a clear preference for beverages added with soy or coconut milk over the whole-grain rice only beverage. For the evaluation of glycemic index and satiety responses, three products were selected: BR (rice-only beverage), BRSV (rice with soy milk and vanilla flavoured), and BRCC (rice with coconut milk and cinnamon flavoured). Two randomized crossover clinical trials were executed, with 15 healthy adults participating in each trial for GI and satiety response evaluations. For GI testing, participants were administered 25g of glucose dissolved in 200 ml of water as the control. Three beverages were tested after 10 hours of fasting in separate days. Beverages were ingested within 10 minutes. Blood glucose levels were monitored at specific time intervals over 2 hours. In the satiety response evaluation, as the control beverage, a commercially available ready to serve product comprising of 25g of available carbohydrates was administered. The tested beverages were consumed on three separate days after 10 h of fasting. The satiety ratings were assessed at every 15 minutes for 2 hours using a 7-point hedonic scale. The mean GI values of the three tested beverages varied from 55.2 ± 24.8 to 70.9 ±18.8. The mean satiety response values varied from 70.3 ± 66.3 to 90.9±45.5 % showing low satiety responsiveness. In conclusion, beverages added with soy or coconut milk are preferred and they are belonging to medium GI category. All beverages show low satiety responsiveness. There is a potential of using novel rice based functional beverage as the first drink of the day for gastritis management and overall health promotion.

Keywords: Glycemic response, Randomized cross-over clinical trial, Whole-grain rice beverage

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ORAL PRESENTATIONS





























Awards and Prizes - Clinical Nutrition

Best Oral Presentation: Ms. Yamini Umapathy

1st Runner-up: Ms. B.V.S. de Silva

2nd Runner-up: Mr. P.S. Datta

Awards and Prizes - Applied Nutrition

Best Oral Presentation: Ms. O. S. Indramali

1st Runner up: Ms. G.M.S. Sarap

2nd Runner up: Ms. M.P.S. Rathnayake

Abstracts of Poster Presentations

2501 - Evaluation of Nutritional Status and Its Clinical Correlates in Hospitalized Patients in a General Surgical Unit: A Prospective Study from a Tertiary Care Centre in Sri Lanka

B. D. Gamage[1], N. M. Perera[2], M. A. C. Lakmal[3] and C. S. Kodikara[4]

Malnutrition among hospitalised patients is linked to impaired treatment outcomes and increased healthcare costs. This study evaluated the nutritional status and clinical correlations among inward patients in the Professorial Surgical Unit of Colombo South Teaching Hospital, Sri Lanka. Patients aged over 18 years, admitted for intermediate (e.g., cholecystectomy, hernia repair) or major surgeries (e.g., colorectal cancer resection, hepatectomy), with a ward stay exceeding 48 hours, were included. Nutritional status was assessed using validated screening tools over one year, and data were analysed using SPSS version 23. The study included 253 patients, with a mean age of 55.46 ± 17.52 years (range: 6–93 years). Males comprised 56.9% of the sample. Acute abdomen (18.2%) and routine surgeries (12.3%) were the most common reasons for admission. Comorbidities were present in 64.0%, with diabetes mellitus (9.9%) and hypertension (11.1%) being the most frequent. Based on BMI, 43.5% had normal weight (18.5–25.0 kg/m²), 25.3% were undernourished (BMI <18.5 kg/m²), and 31.2% were overweight or obese (BMI >25.0 kg/m²). The analysis examined BMI correlations with diagnosis (e.g., appendicitis, hernias, and malignancies), comorbidities, weight loss, appetite changes, supplementation, and tube feeding. Relationships between BMI and serum albumin, creatinine, and urea levels were also explored. Most patients (87.7%) had no complications, while 7.9% experienced poor wound healing or infections, 0.4% had cardiovascular complications with renal failure, and 3.6% faced respiratory, thromboembolic, or gastrointestinal issues. Malnutrition was prevalent among hospitalised patients, with 25% being underweight and 30% overweight or obese. Although no significant associations were identified between nutritional indicators and clinical parameters in this study, a comprehensive study with a larger sample size is needed to better explore and identify these associations.

Keywords: Body mass index (BMI), Clinical correlations, Malnutrition, Nutritional status, Surgical hospitalized patients

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2503 - Nutritional Status of Adolescents in Child Care Institutions in the Galle District

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The number of institutionalized *adolescents* is increasing across the world including Sri Lanka, creating a significant problem. P*roper nutrition is essential for the optimal growth and development of adolescents*. Since the studies done on institutionalized adolescents are limited, the present study was done to assess the nutritional status of institutionalized adolescents in the Galle district. A descriptive cross-sectional study was conducted in childcare institutions (n=12) in the Galle district enrolling 320 subjects. Nutritional status was assessed using body mass index (BMI) and dietary recall. The BMI was calculated and interpreted by using the growth reference data according to the percentiles for school-aged children and adolescents by WHO. A 24-hour dietary recall was done to check whether study subjects received the recommended servings of foods and beverages per day according to the food-based dietary guidelines (FBDGs). The quantity of the food items consumed was recorded using cups, tablespoons, teaspoons, etc. as measuring devices. After collecting data, the serving sizes of meals were categorized according to food categories. Among the participants (response rate: 90%), the majority (60.6%, n=194) were females. The age range of the subject was 10-19 years. The most common reason for institutionalization was for protection (n=108, 33.8%). According to the findings, the majority (57.8%, n= 185) belonged to the normal weight category. However, 30.9% (n=99) of adolescents were overweight or obese and only 11.3% (n=36) of the subjects were underweight. Only 34.7% and 29.7% of adolescents received the recommended servings for cereals/starchy food and pulses respectively. In conclusion, the overall nutritional status of the majority of the adolescents was satisfactory. Participants with obesity and overweight should be encouraged to have the ideal weight. However, the majority of subjects were not getting the recommended serving of cereals, starchy food, and pulses. Therefore, diet should be planned according to the FBDGs and donors should be instructed to supply meals accordingly.

Keywords: Adolescents, Body mass index, Dietary recall, Institutionalized children, Nutritional status

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2507 - Effect of Smartphone-Based Nutrition Education Interventions on Lifestyle Modification and Glycaemic Control of Women Affected with Hyperglycaemia in Pregnancy (HIP)

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Lifestyle modification is the primary focus of HIP management. Self-management education (SME) facilitates the HIP related skills development, self-awareness and self-efficacy. SME programs have reported to be cost effective and sustainable interventions to improve the pregnancy related outcomes such as postpartum cardiometabolic disease and long-term diabetes risk in women affected with HIP. Therefore, current study was planned with the objective of assessing the effect of smartphone based educational interventions on lifestyle modification and glycaemic control of women affected with HIP. Forty-five women affected with HIP were recruited as subjects. They were assigned either to receive smartphone-based nutrition education interventions or standard care. Smartphone based interventions include educational videos on healthy food choices, carbohydrate intake, healthy food preparation and snacking; interactive games to improve their knowledge on the HIP condition, use of healthy diet and physical activities for managing blood glucose level; access to educational website and YouTube channel. Anthropometric data, fasting plasma glucose level, dietary intake and physical activity level of the HIP affected women were collected at the baseline (t=0 weeks) and the end (t=15 weeks). After the 15 weeks of the intervention, there were significant improvements observed among the HIP women affected with HIP of the treatment arm in the fasting plasma glucose, physical activity level, total energy intake, energy from carbohydrates and fat compared to the control group. Further, protein intake of the women affected with HIP was significantly improved compared to the control group. Therefore, it can be concluded that the smartphone-based interventions were effective in improving the lifestyle modification and glycaemic control of the women affected with HIP.

Keywords: Glycaemic control; Hyperglycaemia in pregnancy; Lifestyle modification; Nutrition education.

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2509 - Fish Poisoning Associated with Histamine – A Review

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Histamine fish poisoning (HFP) is initially caused by consumption of fish muscle tissue containing a high level of free histidine. It is also known as Scombrotoxicosis. This review was conducted due to the increasing demand for fish among customers and the rising prevalence of fish intoxication cases in today's society. Several viewpoints have been shown to clarify the reason which histamine intake in contaminated fish is highly toxic than pure histamine that is consumed orally. Histamine poisoning which was led by Fish species that belong to the Scombridae family that we consume are rich in histamine. Even though it is commonly concerned with the elevated degrees of histamine in spoiled fish by some bacterial species, the pathogenic conditions of histamine food poisoning were not specifically clarified. This study was done by reviewing research papers from 1980–2024 using the databases of Science Direct and Google scholar. The results and findings of the review are: Histidine decarboxylase enzyme-producing bacteria synthesize histamine from the naturally occurring histidine in fish that are contaminated. The clinical symptoms of histamine poisoning are quite similar to those of allergic reactions. Therefore, HFP is sometimes misunderstood as having allergic conditions and the treatment is delayed. The epidemiological features clearly mentioned that Asian countries like Japan are facing histamine poisoning mostly due to the consumption of raw fish. The efficacy of antihistamine therapy, the allergic like symptomology, and the finding of high levels of histamine in the implicated foods suggest strongly that histamine is the causative agent. Histamine ingested with spoiled fish appears to be much more toxic than histamine ingested in an aqueous solution.

Keywords: Biogenic amines, Histidine decarboxylase, Scombroid, Toxicology

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2511 - Bioactive Components of Flaxseed and Their Impact on Biochemical Pathways for Weight Reduction – A Brief Review

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With rising rates of obesity, effective management strategies are essential. This review examines the bioactive components of flaxseed and their impact on biochemical pathways that contribute to weight reduction using PubMed, Google scholar, and Scopus, focusing on studies published since 2014. In addition to their basic nutritional compounds, Flaxseeds are rich in omega-3 and omega-6 fatty acids (FAs), lignans and dietary fibers. Animal studies have demonstrated that omega-3 FAs, particularly eicosapentaenoic acid and docosahexaenoic acid, decrease the expression of sterol regulatory element-binding protein 1c (SREBP-1c), inhibit lipogenesis and enhances the FA oxidation. This leads to a high AMP/ATP ratio in the body and activates the AMP-activated protein kinase (AMPK) pathway. AMPK activation stimulates mitochondrial biogenesis and reduces visceral fat. Additionally, omega-3 FAs activates free FA receptor 4 (FFAR4) which blocks the release of pro-inflammatory cytokines such as TNF-α and IL-6, improves insulin sensitivity and regulate adipogenesis. It also modulates hormones such as adiponectin and leptin and helps in balancing energy levels. Both omega-3 and omega-6 FAs activate peroxisome proliferator-activated receptors (PPARs), which promote adipogenesis, enhances FA oxidation, and regulates glucose metabolism. The plant lignans in flaxseeds, particularly secoisolariciresinol diglucoside (SDG), enhances carnitine palmitoyl transferase-1 (CPT-1) activity which increases FA oxidation. When flaxseed lignans are ingested, they are metabolized by intestinal flora into mammalian lignans, such as enterolactone and enterodiol. These mammalian lignans from flaxseeds upregulate key genes like GLUT4, PPARs, and AMPK, improving FA storage regulation, glucose metabolism, and insulin sensitivity. The soluble and insoluble fibers of flaxseeds promote beneficial gut microbiota by producing short chain FAs and lowering the cholesterol by enhancing the production of bile acids. Insoluble fibers absorb water and physically expand the stomach and signal the brain for satiety and suppress appetite. While the study supports the potential of flaxseeds in weight reduction, it emphasizes the need for further human research to confirm these benefits with dosages.

Keywords: Bioactive components, Dietary fibers, Flaxseed, Lignans, Obesity

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2512 - Correlation of Skeletal Mass and Muscle Power of Junior Rugby Players

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Skeletal muscle mass is a key determinant of athletic performance, especially in contact sports like rugby, where strength and power are crucial. In junior rugby players, the correlation between skeletal muscle mass and muscle power provides insights into their physical conditioning. This study examines the relationship between muscle mass and power and provides guidance for optimizing training programs to enhance performance. The study involved under-19 junior rugby players. Body composition, specifically skeletal muscle mass, was measured using bioelectrical impedance analysis (BIA). Handgrip power in both the right and left hands was evaluated using a digital hand dynamometer. Standard methods were used for all measurements. There were 51 male junior rugby players, with a mean age of 18.08 years. The mean skeletal mass was 24.6 kg (SD 3.7); as a percentage, it was 36.1% (SD 2.2). The mean handgrip power for the right and left hands was 45.9 kg (SD 9.0) and 43.0 kg (SD 8.4), respectively. The skeleton mass (in kilograms) and handgrip power in both hands showed a moderate positive correlation ($r= 0.45$; $p = 0.001$). Although a stronger correlation was anticipated, the findings suggested that multiple factors may influence muscle power.

Keywords: Athletic performance, Handgrip power, Junior rugby players, Muscle power, Skeletal muscle mass

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2514 - Knowledge, Attitudes and Practices (KAP) of Medical Officers and Consultants Towards Nutrition Care in Hospitals: A Qualitative Study

W.M.S. Pushpakumara[1] and K.D.R.R. Silva[1]

Nutrition care is increasingly recognized as integral to medical treatments for various diseases. Understanding the Knowledge, Attitudes, and Practices (KAP) of medical officers (MO) and consultants is crucial for improvement of treatment plans. This qualitative study explored the current KAP of MOs and consultants towards nutrition care in local hospitals in Ragama. Eighteen medical practitioners (10 MOs and 8 consultants) were recruited via purposive, maximum variation sampling. Data were gathered via a semi structured; pre tested; in-depth interviews and analyzed using 'NVivo 14 software.' The age and experience ranges of subjects were 32-62 years and 3-30 years, respectively. They highlighted the importance of nutrition screening and dietary advices for all patients as a part of the routine care in hospital settings but had the opinion that it is not practical in Sri Lankan settings. A strong agreement on the positive impact of nutrition counseling and necessity of dietitians in the medical team was identified. The main challenges to provide nutrition care in the hospitals identified included: economic constraints, patients' nutrition knowledge and inadequate human resources. Predominance practices included: prescribing dietary changes before prescribing medicines, encouraging lifestyle modifications alongside medications and referring to nutrition professionals for specific nutrition management. It was found that dietary advices given by medical practitioners are mostly general, and knowledge acquisition primarily occurred through peer interaction, forums, and literature review. In conclusion, while medical practitioners recognize the importance of integrating nutrition care into routine treatments, its effective implementation is hindered by resource limitations, patient knowledge gaps, and economic constraints, underscoring the need for dedicated dietitians and improved hospital support.

Keywords: Dietitians, Medical practitioners, KAP (Knowledge, attitudes and practices), Nutrition care

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2517 - Feeding Children with Cancers: Diet Diversity and Associated Factors

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Childhood cancers and their treatment closely interact with the nutritional status. Sri Lanka is facing the double burden of malnutrition and an increasing trend of childhood cancers. Therefore, this study was conducted to determine the factors associated with nutritional status and intake among children with cancers. A convenient sample of children with cancers admitted to the National Cancer Institute Maharagama (NCIM) was selected as the study sample. Data on symptoms affecting dietary intake and undesirable dietary behaviours was collected from parents/ caregivers by trained data collectors using a validity-ensured, interviewer-administered data collection tool. Diet Diversity Score (DDS) by the Food and Agricultural Organization for the United Nations was used to assess dietary diversity. Relevant clinical details were extracted from the BHT, and height, weight and Mid-Upper Arm Circumference (MUAC) were measured. Data was analysed to present descriptives using means and frequencies. The associations and correlations between selected variables were assessed using the chi-square test and Spearman Rho coefficient. Sixty-seven children, between seven months to 18 years of age, were included in the study sample. Acute lymphoblastic leukaemia was the most common cancer (44, 65.8%). Only 20 (29.9%) children showed symptoms affecting feeding and 44 (65.7%) had undesirable dietary habits. The mean Dietary Diversity Score (DDS) was 8.7 (SD 1.8) and 35 (52.2%) children had DDS more than eight and were considered as good dietary diversity. The underweight, wasting and stunting percentages were 25.4%, 25.4% and 19.4% respectively. Diet diversity (r=0.29), symptoms affecting feeding (r=0.30) and undesirable dietary habits (r=0.25) showed a significant positive correlation with the time since diagnosis. None of the other variables showed significant associations. Malnutrition and feeding problems are significant in children with cancers. However, overall dietary diversity was satisfactory. The early phase following diagnosis is crucial for nutrition management in children with cancers.

Keywords: Childhood cancers, Diet diversity, Nutritional status

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2520 - Whey and Creatinine Protein Supplements: Biochemical Pathways and Long-Term Health Risks – A Mini Review

G.D.I.M. Thilakarathne[1] and M.S.K. Rabindrakumar[1]

Protein supplements (PS) are commonly used by athletes, young adults, and teenagers to augment muscle growth and enhance athletic performance and are a cornerstone in the fitness industry. This review aims to examine whey and creatinine PS in the fitness industry, focusing on their biochemical pathways and evaluating their long-term health implications using studies published since 2014 from PubMed, Google scholar, and Scopus. Whey PS are the most popular type of PS consumed worldwide, while creatinine supplements remain the top choice among athletes and fitness enthusiasts. Whey is a complete protein, rich in branched-chain amino acids (BCAAs) including leucine, isoleucine, and valine. These amino acids (AAs) particularly leucine play a key role in preventing muscle hypertrophy by activating the mechanistic target of rapamycin (mTOR) signaling pathway. The activation of mTOR stimulates S6K1 which regulates cAMP-dependent transcription and inhibits 4EBP1 (involved in cap-dependent translation), enhancing protein translation. Creatine supplements regulate ATP, replenishing it to improve muscle recovery and energy production. Creatine draws water into muscle cells, promoting growth and enhancing satellite cell activation, which stabilizes cellular membranes and reduces inflammation for muscle repair. Protein supplements can also enhance psychological well-being by supplying essential AAs, which serve as precursors for neurotransmitters like serotonin, dopamine, and norepinephrine that regulate mood, motivation, and stress response. Despite their benefits, caution is advised regarding excessive consumption, as it can negatively affect gut microbiota, leading to dysbiosis. High protein intake has shown to lead hyperfiltration and increased urinary calcium excretion, potentially contributing to chronic kidney disease. Elevated AAs can contain toxins and mutagens, increasing the risk of tumors. Moreover, high homocysteine and low arginine levels are associated with cardiovascular diseases, resulting in endothelial dysfunction and atherosclerosis. However, clinical trial studies with dosage are limited. The review encourages clinical trials focusing on long-term health effects of PS.

Keywords: Creatinine protein, Fitness, Protein supplements, Whey protein

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2521 - Disordered Eating Behaviors among Adolescent School Children in Matara Educational Division: A Preliminary Study

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Disordered eating behaviors are common among adolescents and can lead to eating disorders. This study aimed to assess the disordered eating behaviors among adolescent school children in Matara Educational Division of Matara district. A school-based, cross-sectional study was conducted among a sample of 163 adolescent school children aged 16-19 years schooling in the Matara Educational Division of Matara district. Simple random sampling was used in selecting the schools and the classes. Consecutive sampling method was used in selecting the students from a class. Data on disordered eating behaviours were collected using judgmentally validated, self-administered Sinhala version of the Eating Disorders Examination Questionnaire 6.0 (EDEQ). Data were analyzed using Statistical Package for Social Sciences Software. Mean scores of each subscales; restraint, eating concern, shape concern, weight concern of EDEQ were calculated and compared those scores between genders, grade of study and area of residence using independent sample t-test. The mean age (SD) of the sample was 16.9 (1.02) years and 52.7% (n=88) were females while 47.3% (n=79) were males. The majority (61.7%) were from rural areas while 38.3% were from urban areas. A majority were Sinhalese (96.4%); 53.3% studied in grades below GCE (O/L) and 46.7% above GCE (O/L), representing different subject streams. Mean scores (SD) of the EDEQ subscales (possible range: 0-6) were 0.55 (0.89) for restraint, 0.86 (0.94) for eating concern, 1.42 (1.33) for shape concern and 1.22 (1.23) for weight concern. Mean scores of all the subscales were significantly higher among urban adolescents ($p<0.05$), but no significant differences were found between genders and grades. Regarding the eating behaviors, 9.6% had restraint over eating, whereas 1.8% had food avoidance. Three percent of the adolescents followed dietary rules and 34.7% had overeating. Nearly 3% used vomiting and 2.4% used laxatives to lose weight. Although affecting only a minority, further research is recommended to explore disordered eating behaviors among Sri Lankan adolescents to identify patterns, trends and correlates. Appropriate screening programs and tools are needed for early detection of disordered eating behaviors among adolescents.

Keywords: Adolescent school children, Disordered eating behaviors, Matara educational division, Preliminary study

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2522 - Determination of Functional and Physicochemical Properties of Vegan Sausage during Storage under Ambient Conditions

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The non-communicable diseases have directly impacted on the day-to-day lifestyle of the peoples and trend vegetarian diet by reducing the consumption of red meat or its processed products. The vegan diet promotes the health by offering fiber-rich cholesterol free products which can reduce the chronic diseases while mitigating the environmental impact of meat production. It expanding the market potential and culinary versatility, improving taste and texture is crucial for wider acceptance of such meat alternatives. Through comprehensive research and development efforts, this study seeks to develop an appealing and nutritious vegan sausage aligning with changing consumer preferences and global sustainability goals. An online questionnaire survey conducted among Sri Lankan consumers highlighted a high willingness to embrace vegan sausage products, driven by taste, convenience, and health considerations. Despite limited awareness of vegan sausage options, respondents expressed enthusiasm for innovative alternatives. The formula based on baby jackfruit and horse gram was demonstrated the superior acceptability by both untrained and trained panelists. The proximate composition revealed that higher protein, lower fat, carbohydrate, moisture, total ash and the higher calcium content compared to the formula-01 as 4.52%, 6.02%, 27.70%, 58.69%, 3.06% and 13.2 mg/L. Physicochemical properties of the both formulas complied with the company standards such as pH, water activity, color, hardness, springiness, chewiness and resilience. Also, qualitative phytochemical analysis revealed the presence of various phytochemicals such as alkaloids, steroids, flavonoids, terpenoids and coumarins. The total polyphenolic content and IC_{50} at initial and after one month period were 0.314 and 0.317 GAE mg/ mL; 435.19 and 422.97 respectively. Further functional groups of –OH, -CO, -OCO, -COC, and –COOH were identified through the FTIR procedure. The shelf-life evaluation revealed that the vegan sausage could be stored under ambient conditions for up to 14 days without the addition of preservatives. In conclusion, vegan sausage analogues can be prepared with local available non meat items by addressing consumer preferences and nutritional concerns while emphasizing the importance of appropriate storage practices for product stability.

Keywords: Conventional meat-based products, Meat alternatives, Vegan sausage, Veggie sausage

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2524 - Comparative Analysis of Physicochemical, Nutritional and Functional Properties of Selected Commercially Grown Edible Mushrooms in Sri Lanka

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Mushrooms are highly nutritious food which is popular in Sri Lanka. However, only few research studies have been conducted to analyze the nutritional and functional properties of commercially grown mushrooms in Sri Lanka. Therefore, the current study aims to evaluate physicochemical, nutritional and functional properties of five selected commercially grown edible mushrooms in Sri Lanka viz, American Oyster (*Pleurotus ostreatus*), Black Oyster (*Pleurotus* sp.), Abalone (*Pleurotus cystidiosus*), Button mushroom (*Agaricus bisporus*) and Chinese Oyster (*Pleurotus* sp.). Initially, dried and powdered mushroom samples from above five varieties were analyzed for their physicochemical, nutritional and functional properties. Antioxidant activity, total phenol content and total flavonoid contents were determined by using DPPH assay, Folin-Ciocalteu and Alkaline regent test respectively. Moisture, ash, and protein contents of the studied mushroom species ranged from 90.01-93.45%, 6.68-9.83% and 21.51-37.55%, respectively. The highest moisture content was found in Button mushroom (92.76±1.58%), while Abalone mushroom had the highest ash content (9.83%). The Chinese Oyster showed the highest protein content in (37.35%). When considering the physicochemical properties of the powdered mushroom samples, Abalone exhibited the highest pH (6.53±0.06), Button mushroom had the highest titratable acidity (0.62±0.00), and Black Oyster had the highest total soluble solids (5.8±0.1 °Bx). According to the results of functional properties, Button mushroom showed the highest flavonoid content (45.56±1.33 mg QE/100 g DW) and Antioxidant activity (86.38±0.63 mM Trolox/g) both of which statistically significant ($P \leq 0.05$). The Black Oyster demonstrated the highest phenolic content (515.33±1.53 mg GAE/100 g) among the samples analyzed. Based on these findings it can be concluded that Button mushroom demonstrated superior functional properties compared to other four varieties. This study provides valuable insights into the physicochemical, nutritional and functional properties of these selected mushroom varieties which could support the development of medicinal drugs in pharmaceutical industry based on their bioactive components while also enhancing the nutritional status of consumers.

Keywords: Commercial mushroom, Edible fungi, Functional properties, Nutritional properties, Physicochemical properties

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2527 - Nutritional Compositions of ‘Hath-Maaluwa’ in Various Parts of Sri Lanka

L.A.P.M. Liyanaarachchi[1] and K.D.R.R. Silva[2]

'Hath-Maaluwa,' is a unique, traditional one-pot dish in Sri Lanka, typically served during the New Year season, and prepared using seven plant-based ingredients, with regional variations. Despite its cultural importance, research on the nutritional compositions of ‘Hath-Maaluwa’ prepared in different geographical regions is limited. This study aimed to estimate the nutritional compositions of 'Hath-Maaluwa' prepared in four distinct areas: Kegalle, Horana, Kandy, and Polonnaruwa. Additionally, it compared four recipes of 'Hath-Maaluwa' to Sri Lankan cashew curry, a vegetarian dish traditionally considered nutritious but expensive. Data were collected through interviews and a recipe survey conducted for one recipe from each area. Nutritional composition estimation was performed using the food composition database - Foodbase 2000 software, which contains the compositions of Sri Lankan food ingredients. Notable differences in calorie, fat, and nutrient content were found among the regional ‘Hath-Maaluwa’ recipes. The Kegalle recipe contained the highest calorie (234 kcal/100 g) and fat content (19 g/100 g), likely due to its use of coconut oil. In contrast, the Polonnaruwa recipe contained the highest mineral content, including calcium (143 mg/100 g), iron (3.19 mg/100 g), zinc (0.73 mg/100 g), and selenium (1.9 mg/100 g). Compared to cashew curry, all four ‘Hath-Maaluwa recipes had lower calorie content (198-234 kcal/100 g vs. 476 kcal/100g) and higher fiber content (0.8-1.5 g/100g vs. 0.7 g/100 g). Furthermore, ‘Hath-Maaluwa’ recipes contained higher levels of certain micronutrients such as Riboflavin (0.06-0.1 mg vs. 0.02 mg/100 g), Niacin (1.0-1.2 mg vs. 0.05 mg/100 g), Pyridoxine (0.06-1.0 mg vs. 0.08 mg/100 g), Vitamin C (5.8-18.4 mg vs. 0.6 mg/100 g), Retinol equivalents (22-71 µg vs. 6 µg/100 g), and Calcium (62-143 mg vs. 37 mg/100 g). These findings suggest ‘Hath-Maaluwa’ is a nutrient-dense, cost-effective, and time-efficient dish. Promoting ‘Hath-Maaluwa’ could enhance healthier and affordable dietary practices while preserving Sri Lankan culinary heritage.

Keywords: ‘Hath-Maaluwa’, Nutritional composition, One-pot dish, Sri Lankan food culture

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2532 - Physicochemical and Functional Properties of Hot Chocolate Tablet Based on Off-grade Spray Dried Full Cream Milk Powder

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Spray drying is a popular milk processing method, produced milk powder with enhanced shelf-life period, and significant for increased the waste due off- grade milk powder formation. This study was directed to value addition of off- grade milk powder as a hot chocolate tablet and determine its physicochemical, organoleptic and shelf-life period. The proximate composition of Grade-A and Grade-B off-grade milk powder was determined. The moisture, crude-fat, crude-protein, carbohydrate, and ash content of grade-A were 0.43±0.05%, 21.80±0.40%, 22.30±0.30%, 54.97±0.60%, and 0.17±0.09% respectively. Similar values for Grade-B were 0.69±0.03%, 20.70±0.50%, 20.25±0.25%, 57.33±0.40%, and 0.15% respectively. The pH variation, total soluble solids contents, color, moisture, and water activity were further analyzed during a three week storage period, and grade-A was selected as the best raw material for hot chocolate tablet development. Most consumer preferred hot chocolate formula was selected through sensory analysis with 30 untrained panelists and response were collected using five point hedonic scale. The moisture content, crude-fat, crude-protein, carbohydrate, and ash content of the hot-chocolate tablet were 4.87±0.3%, 22.64±0.2%, 20.32±0.2%, 47.81±0.4%, and 4.36±0.2%, respectively, while control was made with normal full-cream milk power. The Monosaccharides, polysaccharides, carboxylic groups of proteins, phosphorylated carbohydrates, esters, amino acids, phenols, and halogen like functional groups were identified through FTIR analysis. The antioxidant activity and total phenolic content were 17.186 ppm and 4.252 GAE mg/mL respectively. It has reported approximately ten weeks of shelf-life without addition of any preservatives during the 15 weeks of research period. Therefore, off-grade milk powder can be effectively utilized for hot-chocolate tablet preparation which serves as a hot-chocolate drink.

Keywords: Chocolate, Full cream milk powder, Off-grade full cream milk powder, Spray drying

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2535 - Effectiveness of Using Curcuma longa in Treating Osteoarthritis in Older Adults: A Narrative Review

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Osteoarthritis (OA), a degenerative disease that mostly occurs with ageing. Loss of chondrocyte resulting from persisting inflammation worsen OA over time. Purpose of this narrative review is to identify the effectiveness of *Curcumin longa* in treating OA. Studies between 2016 – 2021 were searched in Google Scholar, Medline and Web of Science using the key words OA, curcumin, inflammation and effectiveness. Four systematic reviews and meta-analysis, two systematic reviews, two randomized control trials (RCT) and three reviews were analyzed. Oral administration of various curcumin formula had reduced OA symptoms and pain, and improved physical function and life quality of elderly people with no severe adverse effects (AE). Mild gastrointestinal symptoms have been reported as AE of curcumin. Curcuminoid had provided better pain relief when compared to NSAID; recommended to be used as an adjunctive treatment. High and low doses of curcumin have shown same effect on OA pain scale. Combination of curcumin with diclofenac compared to diclofenac alone did not produce any significant beneficial effect in OA. Highest dose and longest period of curcumin that have been studied so far are 2000 mg and 4 months. Few studies have shown that curcumin ointment reduces pain in knee OA. Mechanisms of curcumin that have been suggested are anti apoptotic effects of key inflammatory mediators (NF-kB, IL, etc.) and inhibition of MMP3, thereby suppress the inflammatory pathways associated with OA. Most of these studies have been conducted in Asian region. Curcumin has been criticized for its less bioavailability: adding piperine and phophatidyl choline, and nanoparticle formulation are some of the recommended ways to improve curcumin bioavailability. As conclusion, further RCTs are required to identify the individual variability with long term intervention of curcumin and formulated curcumin, in diversified ethnic groups in varying doses, to reduce OA symptoms, pain and treatment cost.

Key Words: Curcumin, Inflammation, Osteoarthritis

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2538 - Physiological Effects of Beetroot Juice Supplementation on Cardiorespiratory Endurance in Athletes; A Narrative Review

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Dietary supplementation with beetroot juice (BRJ), a naturally rich source of nitrate, is an area of considerable interest to athletes for enhancing training outcomes and performance. This literature review aimed to evaluate the effects of BRJ supplementation on cardiorespiratory endurance in athletes. A keyword search of Google-Scholar, PubMed and Web of Science databases was conducted, focusing on publications between 2018 and 2024. The primary active compound in BRJ is dietary nitrate ($NO3^-$). Nitrate is metabolized by conversion to nitrite and subsequently nitric oxide. The evidence indicates that dietary nitrate of beetroot juice supplementation can enhance cardiorespiratory endurance by strengthening muscular contractions, lowering exercise-induced oxygen demand, and optimizing oxygen consumption. It enhances exercise efficiency by prolonging time to exhaustion at submaximal intensities, and potentially enhancing performance at both anaerobic threshold intensities and maximal oxygen uptake (VO_2max). BRJ has been shown to positively affect mitochondrial biogenesis and efficiency, which may contribute to the improved aerobic capacity in athletes. Nitric oxide is also a key factor in regulation of anabolic hormones, influencing the release of various neurotransmitters and critical stress mediators involved in acute hypothalamic-pituitary-adrenal response to physical activity. Although there is some conflicting evidence in literature, findings suggest that beetroot juice might reduce the ergo-lytic effect of hypoxia on cardiorespiratory endurance in athletes. As highlighted in literature, intake of beetroot juice should be initiated within 90 min before athletic effort for potential benefits as peak value of $NO3^-$ occurs within 2–3 h after ingestion. Athletes with a high training level can increase their intake of $NO3^-$, which must be at least 6–8 mmol. Recent evidence suggests individual variability in response to BRJ supplementation, potentially influenced by genetics, baseline nitrate intake and training status. As a conclusion, BRJ supplementation enhances endurance, reduces muscle soreness, improves recovery, lowers aerobic cost.

Keywords: Athletes, Beetroot juice, Cardiovascular endurance, Dietary nitrate, Physiological effects

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2542 - Development and Characterization of Ash Gourd (Benincasa hispida) and Beetroot (Beta vulgaris) Jam Incorporated with Cinnamon (Cinnamomum verum) Flavour

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Despite the increasing demand for natural and healthier food options, many commercially available jams are still artificially flavoured and coloured. This creates a need for healthier natural alternatives to meet the evolving preferences of consumers. Therefore, this research study was focused on the development of ash gourd (*Benincasa hispida*) jam added with beetroot (*Beta vulgaris*) extract incorporated with cinnamon (*Cinnamomum verum*) flavour. After a series of preliminary experiments, six jam formulations were developed with ash gourd pulp (AGP), beetroot extract (natural colorant) (BE), and cinnamon powder (natural flavouring) (CP) based on SLS standards. The amount of AGP (50 g) and CP (0.2 g) were kept constant, while the BE was added in varying amounts, including AGP only (control: C1), AGP with CP (control: C2), AGP with 5 g BE and CP (F1), AGP with 10 g BE and CP (F2), AGP with 15 g BE and CP (F3) and AGP with 20 g BE and CP (F4). The sensory, and colour analyses were carried out for all formulations. The F3 formulation was selected as the best in terms of texture, aroma, taste, and overall acceptability. The lightness (L*) and yellowness (b*) were decreased with increasing BE concentration, whereas redness (a*) was increased with increasing BE concentration. Proximate composition was analysed for the formulation F3: crude protein- 0.72±0.04%, crude fat- 0.65±0.06%, crude fiber- 0.18±0.01%, ash- 0.28±0.01%, and moisture- 25.86±0.86%. Further, the microbial count of F3 formulation was monitored every 15 days for 75 days under both room (30 ^{o}C) and low (4 ^{o}C) temperature storage conditions. No detectable microbial growth was observed in either storage condition. Total phenolic content (TPC) of the F3 formulation was 0.38 mg GAE (gallic acid equivalent)/g. Overall, this study demonstrated that beetroot could serve as a viable alternative to synthetic colorants in ash gourd jam, while cinnamon can be a suitable substitute for synthetic flavouring.

Keywords: Ash gourd, Beetroot extract, Cinnamon, Jam, Sensory analysis

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2543 - Evolution, Current Status and Future Challenges of the Dietetics Profession in Sri Lanka

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The role of dietitians in Sri Lanka has evolved significantly, adapting to changes in healthcare and dietary patterns. Understanding the history, current status and future prospect of Sri Lankan dietitians are crucial to assess their impact on public health and identify areas for development. Qualitative analysis was employed as the primary analysis technique to explore the evolution, current status, and challenges facing the dietetics profession in Sri Lanka. The data collection process involved a mixed-methods approach, including reliable written materials, face-to-face interviews, and google questionnaire disseminated to registered dietitians, academic experts from Wayamba, Kelaniya, and Peradeniya universities, and key professionals from the Ministry of Health and the Sri Lanka Medical Council (SLMC). The dietetic profession was first introduced in Sri Lankan government hospitals in the 1960s and expanded to private hospitals in 1988. Nutrition and dietetic education began in 1974 at Kelaniya University. At present, Wayamba University is playing a key role in delivering dietetics education. There were 110 SLMC-registered dietitians in Sri Lanka at the time of data collection. Among the 87 respondents, the majority work in the private sector (57), while 21 are in the government sector, and 9 are not engaged in dietetic-related roles. The main challenges faced by dietitians include the lack of government support, low salaries, and the encroachment of other healthcare professionals on the dietetic field. The dietetic profession in Sri Lanka has a history of over 50 years, starting in the 1960s, and significant growth. To help the profession grow even more and improve public health, it is important to secure more support from the government.

Keywords: Current status, Dietitians, Historical development, Sri Lanka

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2546 - Contextualized Nutrition Guidelines for Children of Middle Childhood (5-10 Years) in Sri Lanka

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Children of middle childhood are in a critical period for development and are laying foundation for a healthy adulthood. They experience slow and steady physical growth and important changes in brain development during this period. Proper nutrition plays a major role in physical, cognitive and social development that affects through the life course and future generations. Nutrition guidelines specifically address this age group is lacking in the Sri Lankan context. The aim of this work was to present contextualized nutrition guidelines for children aged 5 to 10 years in Sri Lanka. The nutritional status of children of 5-10 y old in Sri Lanka was reviewed using available secondary data. A desk review was conducted on the existing nutrition guidelines for middle childhood. Information was sourced from the Food Based Dietary Guidelines (FBDGs) repository of the Food and Agriculture Organization (FAO). Mother's knowledge, attitude and behaviors (KAB) on fulfilling middle childhood nutrition requirements in Sri Lanka was investigated. Several rounds of stakeholder consultative meetings were conducted in the process of contextualizing, nutrition guidelines for 5-10 y old children in Sri Lanka. The whole process was led by the Nutrition Society of Sri Lanka. All forms of malnutrition such as stunting, wasting, underweight and obesity and micronutrient deficiencies exist among children old 5-10 y in Sri Lanka. Fourteen guiding principles are focused to contextualize nutrition guidelines. Seven nutrition guidelines namely, add good quality proteins adequately, eat a variety of fruits and vegetables, encourage healthy snacks, hydrate often, be active daily, get good quality sleep at night-time, and promote safe food and healthy food behavior were formulated. These nutrition guidelines help stakeholders and relevant institutions deal with nutrition of children old 5-10 y in Sri Lanka. Guidelines are available in local languages to facilitate understanding and usage among stakeholders.

Keywords: Attitudes, Behavior, Food-based dietary guidelines, Knowledge, Middle childhood

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2547 - Case Report on Step-down Nutritional Management of Persistent Hypomagnesemia in a Severely Malnourished Patient with Esophageal Carcinoma

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Hypomagnesemia is a common complication in patients with esophageal carcinoma undergoing chemotherapy, particularly with cisplatin, which can cause remarkable electrolyte imbalances. This case report highlights the nutritional management of persistent hypomagnesemia resistant to routine treatment of a patient with mid-esophageal carcinoma complicated by severe malnutrition. A 70-year-old male with mid-esophageal carcinoma presented with persistent hypomagnesemia (0.49 mmol/l), hypocalcemia (1.89 mmol/l), hypokalemia (3.8 mmol/l), and hypoalbuminemia (2.19 g/dl). Initial nutritional assessment revealed acute severe malnutrition based on GLIM criteria, with a calorie intake of 15 kcal/kg/day and 0.7 g/kg/day of protein. The patient was at risk of refeeding syndrome per NICE-2002 criteria. He was on routine supplementation with IV $MgSO_4$ 2g daily and oral Magnesium Glycinate 400mg sachet twice daily, but showed intolerance to magnesium glycinate sachet, experiencing diarrhea. Hypoalbuminemia and severe malnutrition also contributed to hypomagnesemia. A personalized nutritional approach was implemented, gradually increasing caloric intake to 40 kcal/kg/day and protein to 1.5 g/kg/day while managing electrolyte imbalances. Magnesium-rich foods were introduced, including cashews, soybeans, avocado, and spinach according to patient preference, providing 12.48-16.56 mmol of elemental magnesium daily. Magnesium Lactate 470 mg tablet twice daily (4 mmol of elemental magnesium) was prescribed to supplement dietary intake. IV $MgSO_4$ 2g daily was continued initially and tailed off as oral intake improved. After one month, serum magnesium levels stabilized (0.86 mmol/l ← 0.66 mmol/l ← 0.49 mmol/l) and nutritional status improved (BMI: 19.53 kg/m^2 ← 18.82 kg/m^2; serum albumin: 2.9 g/dl ← 2.4 g/dl ← 2.1 g/dl). This case demonstrates the effectiveness of personalized nutritional interventions, alternative supplementation strategies, and the importance of managing severe malnutrition in persistent hypomagnesemia. The step-down approach was crucial for balancing patient tolerance and nutritional needs. This demonstrates how a personalized, multidisciplinary approach to managing malnutrition and electrolyte imbalances in esophageal carcinoma patients, can improve clinical outcomes.

Keywords: Esophageal carcinoma, Persistent hypomagnesemia, Personalized nutritional approach, Severe malnutrition

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2549 - Dietary Intake and the Nutritional Status of the Health Staff in a Selected Hospital Setting in the Gampaha District

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Health staff play a crucial role in maintaining the health and well-being of their patients. However, their nutritional status can have a significant impact on their productivity and work performance. Despite their nutritional knowledge, health staff may neglect their own dietary needs, leading to malnutrition status. Therefore, this cross-sectional study was conducted among 45 members of the health staff (20 males and 25 females) at District Government Hospital Ja-Ela in Gampaha District to assess the nutritional status and food consumption patterns. A pre-tested interviewer-administered questionnaire and a three-day diet diary were used as data collection tools. An individual's Body Mass Index (BMI) was calculated by measuring the weight (kg) and height (m) of the subjects to estimate the nutritional status. Data were analysed by using simple descriptive statistics and food Intake from different food groups was compared with daily recommended servings for each food group. Ethical clearance was obtained from the ethical review committee of the Wayamba University of Sri Lanka. The results showed that only 8 (17.8%) had a normal body mass index (18.5–22.9 kg/m^{-2}), while 27 (60%) were obese, 11.1% were overweight, and 11.1% were underweight. Out of the total, 24 (53.3%) were suffering from chronic disease. Daily dietary intake showed that all consumed cereals and cereal products more than the recommended servings for an adult Sri Lankan. Around 49% of the sample daily consumed recommended servings of foods from the meat/fish/poultry group. However, daily intake of vegetables and fruits was found to be suboptimal. The study highlights the need for nutrition education on healthy dietary patterns to improve the nutritional status of the studied health staff. Further, findings suggest that a significant proportion of health staff were at risk of chronic diseases due to their unhealthy dietary patterns and nutritional status. Therefore, it is essential to promote healthy eating habits among the health staff to ensure their health and well-being, which is critical for delivering high-quality patient care.

Keywords: Adults, Food consumption, Nutritional status, Recommended servings

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2550 - Impact of Different Drying Methods on Nutritional Characteristics of Carrot, Sweet Potato and Moringa Leaf Powder and the Production of Noodles

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The increasing consumer demand for nutritious fast foods, particularly noodles, has necessitated the investigation of alternative ingredients. Therefore, this study focused on producing nutrient-enriched noodles. The objective of this research was categorized into two; 1. investigate the impact of different drying methods such as freeze drying (FD), cabinet drying (CD), microwave drying (MD), and oven drying (OD) on the nutritional characteristics of sweet potato, carrot, and moringa leaf powders, and 2. the selection of the optimal drying method and the development of nutritious noodles using selected dried powders. The MD was optimal for sweet potato (moisture content- 5.13±0.12%, ash- 3.59±0.08%, crude protein 3.5±0.25%, crude fat 0.35±0.04%, crude fiber 10.66±0.27%, total phenolic content (TPC) 67.58±7.39 mg gallic acid equivalent / 100g (mg GAE/100g), and total flavonoid content (TFC) 2.88±0.55 mg quercetin equivalent (mg QE/100g)). The CD was optimal for carrot powder (8.59±0.22% moisture, 2.64±0.13% ash, 8.17±0.53% crude protein, 6.02±0.52% crude fat, 7.25±0.32% crude fiber, 63.68±1.36 mg GAE/100g TPC, and 3.53±0.5 mg QE/100g TFC), whereas the FD was optimal for moringa leaf powder (5.49± 0.27% moisture, 9.67±0.20% ash, 27.42±0.39% crude protein, 5.93±0.07% crude fat, 8.16±0.68% crude fiber, 97.28±3.41 mg GAE/100g TPC, and 7.69±2.28 mg QE/100g TFC). The noodles were then formulated by incorporating optimal dried sweet potato, carrot, and moringa leaf powders in various ratios. Among, the most promising noodle formulation was comprised of 90% sweet potato powder, 5% carrot powder and 5% moringa leaf powder according to nutritional (12.2±0.53% moisture, 4.53±0.04% ash, 10.28±0.22% crude protein, 1.02±0.06% crude fat, 3.6±0.35% crude fiber, 59.21±1.85% mg GAE/100g TPC and 10.95±0.32% mg QE/100g TFC) and cooking properties (optimum cooking time- 2.4±0.26 min, cooking yield- 298.37±14.26%, swelling index- 323.31±28.31%, cooking loss- 4.19±0.79% and water absorption capacity- 1.98±0.14 g/g). Overall, this study demonstrated the potential of incorporating sweet potato, carrot, and moringa leaf powders into noodles to develop a nutrient-enriched food product.

Keywords: Carrot powder, Drying methods, Moringa powder, Nutrient-enriched noodles, Sweet potato powder

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2551 - Developing an Efficient Green Approach for The Extraction of Polyphenol from Spent Tea

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Tea (Camellia sinensis) consumption generates spent tea as a by-product, which is rich in bioactive compounds such as polyphenols. This study focused on developing a sustainable green extraction method to efficiently recover these valuable bioactive compounds from spent tea. Air-dried spent tea samples were pretreated using three methods; microwave-oven drying (P30 and P50 for 15 minutes), oven drying (50 °C and 60 °C for 5 hours) and steaming (10 minutes and 15 minutes). Pretreated samples were extracted using shaking method (200 rpm for 48 hours) with two solvent systems: glycerol-water mixture (30%, v/v) and acetic acid buffer (pH 1.5). Different sample: solvent ratios (w/v) (1:10, 1:20, 1:30) were used to select the optimum ratio. The samples were analyzed for total phenolic content (TPC), total flavonoid content (TFC), total antioxidant content (TAC) and antioxidant activity (AA) using phosphomolybdenum assay. The traditional (Soxhlet) extraction method served as the control. Data were analyzed using One – way ANOVA and Nested ANOVA using MINITAB (17). The sample: solvent ratio of 1:30 ratio yielded the highest TFC, which was subsequently used for further studies. The glycerol-water mixture yielded the significantly highest TFC in the control sample (48.19±0.60 mg gallic acid equivalent/g) and microwave oven-dried sample (at P30 for 15 minutes) (46.26±0.33 mg gallic acid equivalent/g). TFC and TAC were significantly higher ($p<0.05$) in all pretreated samples than control sample. Microwave oven drying (at P30 for 15 minutes) combined with the glycerol-water solvent resulted in the highest TFC (171.65±1.26 mg quercetin equivalent /g). The highest AA ($p<0.05$) was observed in samples pretreated by oven-drying (at 60°C for 5 hours) (0.152±0.00 mg ascorbic acid equivalent/g) and steaming (for 10 minutes) (0.163±0.019 mg ascorbic acid equivalent/g) with the glycerol-water mixture. Compared to the Soxhlet method, shaking method yielded higher ($p<0.05$) TPC and TFC. In conclusion, this study suggests that the extraction of polyphenols using the shaking method combined with a glycerol water mixture is an effective and environmentally friendly approach to extract bioactive compounds from spent tea.

Keywords: Antioxidants, Extraction, Flavonoid content, Phenolic content, Spent tea

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2553 - Estimation of Iron and Zinc Contents in Whole Grains, Polished Grains and Bran of Selected Traditional Rice Varieties in Sri Lanka

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Traditional rice varieties (Oryza sativa L.) have been a part of the Sri Lankans diet for centuries. Even though the nutritional composition of some of these varieties has been evaluated, there is a gap in research on the distribution of the nutrients across different parts of the rice grains. Therefore, the aim of the current study was to determine the iron and zinc contents in whole grains (WG), polished grains (PG), and bran of selected commonly consumed traditional rice varieties. Seven traditional rice varieties (Sudu Heenati, Pachchaperumal, Madathawalu, Kalu Heenati, Beheth Heenati, Suduru Samba and Rathal) were obtained from the Bathalagoda Rice Research Station and were dehusked and polished, at a polishing rate of 8–10%. The separated fractions of bran, PG and WG were subjected to determine iron and Zn concentrations using acid digestion and ICP-MS. Accordingly, there were significant differences ($P<0.05$) in the iron and Zn contents (mg/100g) of PG, WG, and bran among tested varieties. The highest iron content (mg/100g) in the PG and WG were reported in Sudu Heenati (PG=6.44±0.28 and WG=6.75±0.32) and Beheth Heenati (PG=6.65±0.29 and WG=6.74±0.54) and the lowest in Rathel (PG=2.48±0.4 and WG=2.77±0.24). The highest and lowest iron content(mg/100g) in bran were observed in Beheth Heenati (13.98±2.56) and Sudu Heenati (8.41±0.13) respectively. Suduru Samba and Beheth Heenati reported the significantly ($P<0.05$) highest zinc content (mg/100g) in PG (3.05±0.21, 3.35±0.92), whereas Kalu Heenati had the highest zinc content in WG (5.1±0.41). The highest zinc content (mg/100g) in bran was observed in Rathal (15.6±0.85). Significantly lowest Zn contents (mg/100g) were observed among PG, WG in Pachchaperumal (PG=2.55±0.49, WG=2.70±0.14) and bran in Kalu Heenati (8.35±0.16). The results indicate traditional rice varieties as good sources of iron and zinc. However, further studies are required to assess the bioavailability of these minerals in the PG and WG where at the pattern of consumption.

Keywords: Acid digestion, Distribution, ICP-MS, Minerals

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2554 - Validation of Phone-based 24-Hour Recall Method against Weighed Food Records for Dietary Assessment in Sri Lankan Female Adults

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Dietary assessment data in low- and middle-income countries is often limited due to high cost, time constraints and administrative challenges of associated with standard face-to-face 24-hour recall method. Phone-based 24-hr recall method offers a promising approach for dietary assessment, providing cost-effective and convenient data collection particularly beneficial in such settings. The study aimed to validate of phone-based 24-hr recall (P24HR) against the gold standard method of dietary intake assessment, Weighed Food Records (WFR). Thirty female adults from Monaragala district in Sri Lanka (15 in the 25-35 years and 15 in the 35-55 years) were recruited. Dietary data were first collected using WFR, followed by P24HR on the next day by trained enumerators. Dietary data were converted into nutrients and compared. Statistical analysis showed no significant differences in nutrient intakes between the methods ($p > 0.05$) with a minimum mean difference of 0.04% observed for energy ($p=0.067$). Pearson correlation coefficients indicated strong positive linear associations (0.84 to 0.95) for nutrients such as protein, fat, carbohydrate, calcium and iron, demonstrating a considerable degree of similarity between the nutrient intake values obtained through both methods. In conclusion, the P24HR method showed validity in assessing dietary intake in female adults in Sri Lanka. Further research is warranted to explore the validation of P24HR across larger, more diverse populations, including different age groups, genders, and geographical regions.

Keywords: Dietary assessment, 24-Hour recall, Validation, Weighted food records

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2557 - Validation of the Visual Analog Scale (VAS) Appetite Assessment Tool for Hospitalized Patients

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Appetite assessment is important in hospitals because many patients experience a loss of appetite during hospitalization. Lack of appetite, or disease-associated anorexia significantly contributes to inadequate food intake, prolonging hospital stays and recovery periods and increasing hospital food waste. The Visual Analog Scale (VAS) is a practical tool for appetite assessment in clinical settings, requiring minimal time and being easy to use. Currently, there is no validated VAS to measure the appetite levels of Sri Lankan hospitalized patients. This cross-sectional study aimed to validate the VAS appetite assessment tool against the gold standard Functional Assessment of Anorexia/Cachexia Therapy (FAACT) tool for detecting anorexia. Hospitalized patients with low food intake, identified using the Malnutrition Screening Tool (MST) at a private hospital, were considered for the study. Thirty-five low-food intake patients were recruited using purposive sampling (18 M: 17 F; mean age 58.8±15.2 years). After gaining informed consent, sociodemographic and health-related information were gathered using an interviewer-administered questionnaire. An anorexia diagnosis was determined by a total score of ≤30 in the FAACT and a VAS score of ≤50. Both VAS and FAACT tools were administered separately by two researchers. Statistical analysis was conducted using SPSS software. The prevalence of anorexia among patients with low food intake was 74% according to the FAACT tool and 69% according to the VAS tool. The VAS tool demonstrated good sensitivity (92.3%) and specificity (81.8%), with a positive predictive value of 92.3% and a negative predictive value of 81.8%. The agreement between the tools was substantial, with a kappa coefficient of 0.741. In conclusion, the VAS tool is a sensitive and reliable tool for assessing appetite in hospitalized patients, which can be integrated into dietetic practice to improve patients' health status by assessing appetite levels accurately.

Keywords: Anorexia, Appetite, Hospitalization, Sri Lanka, Validation

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2564 - Effects of Pretreatments and Drying Techniques on the Quality of Dehydrated Tomato

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Tomatoes (*Lycopersicon esculentum*), a staple in diets worldwide, are highly perishable, leading to significant postharvest losses. Drying offers an effective solution to extend shelf life and preserve surplus tomatoes. This study aimed to investigate the effects of different pretreatments and drying methods on the quality of dehydrated tomatoes. Uniformly sized tomato (Padma F1 variety) slices were subjected to various pretreatments: distilled water, calcium chloride ($CaCl_2$, 1% (w/v)), sodium metabisulphite (SMS, 0.25% (w/v)), ascorbic acid (AA, 0.25% (w/v)), and a combination ($CaCl_2$, 1% (w/v) + SMS, 0.25% (w/v) + AA, 0.25% (w/v)) with untreated slices as controls. Dehydration methods included cabinet drying (CD) at 60 °C and 70 °C, microwave drying (MD) at 300W and 500W, and freeze drying (FD). The dehydrated tomato slices were ground into powder and analyzed for moisture content, protein content, ash content, crude fat content, total phenolic content (TPC), total flavonoid content (TFC), antioxidant capacity, lycopene content, and water activity. Statistical analysis, conducted with MINITAB (17), revealed that both pretreatments and drying methods significantly influenced ($p<0.05$) the quality of the dehydrated tomatoes. MD at 500W was most effective for retaining protein, ash, and flavonoid content, while FD best preserved fat with minimal variation between pretreatments. The highest lycopene retention (9.29±0.13 mg/100g) was reported in the sample subjected to CD at 60 °C with the pretreatment ($CaCl_2$ + SMS + AA). Pretreatments such as $CaCl_2$, SMS, and AA improved nutrient retention in all drying methods. MD at 500W and CD at 60 °C were found to be superior for preserving antioxidants (15.05±0.63 mg ascorbic acid equivalent/g) and TPC (49.34±1.3 mg gallic acid equivalent/g), followed by FD. Pretreatments with AA and $CaCl_2$ aided in the retention of flavonoids especially when paired with drying techniques such as CD at 60 °C (97.09±0.41 mg CE/g) and MD at 500W (89.04±0.72 mg CE/g). FD was reported to be the most efficient method to reduce the water activity, followed by MD at 300W and CD at 70 °C. In conclusion, MD at 500W and CD at 60 °C were identified as the most effective methods for retaining nutrients. Therefore, tailoring the choice of pretreatment and drying technique based on target nutrients can greatly enhance the quality of dehydrated tomato products.

Keywords: Dehydrated tomatoes, Drying methods, Lycopene, Nutrient retention, Pretreatments

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2566 - Food Insecurity during the Economic Crisis in Sri Lanka: A Comparative Study between Western and Uva Provinces

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Sri Lanka's economic collapse, stemmed by declining foreign reserves and the debt default announcement on May 8, 2022, led to fuel shortages, power outages, high inflation, and a scarcity of essentials. Rising food prices limited dietary options and reduced fruit and vegetable consumption, resulting in nutrient deficiencies. To compare the food insecurity in general public during the economic crisis between Western Province (WP) and Uva Province (UP), we conducted a descriptive comparative study in November-December 2022. Sample size was calculated using the formula to compare means of two groups. Adults (1568 per province) selected by two-stage stratified random cluster sampling method were interviewed via telephone. Food security was assessed using the 8-item Latin American & Caribbean food security scale, categorized into four levels; food security (total score=0), mild food insecurity (1–3), moderate food insecurity (4–6) and severe food insecurity (7-8). Proportions were compared using the Chi-square test in SPSS. Response rate was 66.7% (1043/1568) in WP (mean age:49.53 years [±13.87], females:51.0%) and 64.7%(1016/1568) in UP (Mean age:47.2 years[±13.76], females:49.6%). Majority had primary occupations (WP:98.6%,UP:96.7%), with a small portion engaging in secondary occupations (WP:4.1%,UP:8.2%). Most participants (WP:82.9%,UP:86.9%) reported changes in food consumption due to EC, contributing factors like shortages of essential items (WP:58.3%,UP:41.9%), price inflation (WP:96.5%,UP:92.1%), a trend towards home gardening (WP:41.9%,UP:37.8%), and lower incomes (WP:78.3%,UP:88.3%). Overall food security level was low (WP:18.4%,UP:12.7%). Severe food insecurity was more prominent in UP (23.4%) compared to WP (12.1%) (P-value<0.001, OR=1.9, 95% CI: 1.62-2.23). A higher proportion experienced mild (WP:43.8%,UP:33.1%) and moderate (WP:25.7%,UP:30.8%) food insecurity. Further, 66.1% of WP households and 78.4% of UP reported not having a healthy diet, and 63.5% of WP and 74.2% of UP often had limited dietary diversity. Majority experienced mild and moderate food insecurity and severe food insecurity was prominent in UP.

Key words: Economic crisis, Food insecurity, Food security scale, Inflation of foods

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2567 - Mini Nutritional Assessment in Chronic Kidney Disease Patients in Anuradhapura: Preliminary Survey

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Chronic kidney disease (CKD) is a worldwide public health problem. Malnutrition is associated with poor prognosis in CKD. This research aimed to assess the nutritional status of CKD patients using the Mini Nutritional Assessment (MNA) score and anthropometry. This preliminary descriptive cross-sectional study included 50 patients with CKD attending the Horowpothana Divisional Hospital in Anuradhapura**.** Patients were screened using MNA score which evaluates four different aspects: anthropometric measures, general assessment, short dietary assessment and subjective assessment. According to the MNA score they were categorized as having normal nutritional status (24-30 points), at risk of malnutrition (17-23.5 points) and malnourished (<17 points). Blood hemoglobin was estimated. Overweight was defined when BMI was ≥ 23 kgm^{-2}. Central obesity was defined when waist circumference (WC) was ≥90 cm in men and ≥80 cm in women. Data were analyzed using descriptive statistics. There were 26(52%) males and 24(48%) females. Their mean age (± SD) was 64.4 (±10.4) years old (age range of 20 – 80 years). Out of them, 4(8%) were on hemodialysis. The majority 21(42%) of them were involved in agriculture. According to the MNA score, 10(20%) had normal nutritional status, 35(70%) were at risk of malnutrition and 5(10%) were malnourished. Based on BMI 23(46%) and 7(14%) of them were overweight/obese and underweight respectively. Central obesity was present in 31(62%). Prevalence of anemia was 28(56%). Among the patients who are at risk of malnutrition and patients who are already malnourished had anemia at a rate of 57.1% and 80%, respectively. Overweight-obesity, malnutrition, and anemia co-exist among CKD patients. This reflects the need for better nutritional care in the management of CKD patients.

Key words: Anemia, Chronic kidney disease, Mini nutritional assessment

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POSTER PRESENTATIONS


















Awards and Prizes

Best Poster Presentation: Dr. L.A.P.M. Liyanaarachchi

1st Runner-up: Dr. L.A.P.M. Liyanaarachchi

2nd Runner-up: Dr. P.A.R.I. Kulathunge

Quiz Competition

Winner: Ms. Amasha Bandara

Captures from the Symposium


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Closing Remarks

Conference Coordinator: Ms. Dilki S. Perera

I am honored to present the closing remarks of Annual Scientific sessions of the Nutrition Society of Sri Lanka 2025.This time we held the Annual scientific session with the theme of "Empowering communities through advanced Nutrition and health Literacy. We are honored to have the Hon. Minister of Health & Mass Media Dr. Nalinda Jayatissa as the chief guest for the session and Dr. Abner Elkan Daniel, Health and Nutrition Manager, UNICEF Sri Lanka as the Keynote speaker. The Annual scientific session comprised with 4 symposia, free communication session, and a Nutri Quiz competition. In the inauguration, the keynote speech delivered under the theme of Nourishing Futures: Evidenced based Nutrition Actions Across sectors for Transforming Childhood wellbeing, the emphasized how Health, Food, Education, WASH, and Social Protection sectors intersect to build a holistic support system for addressing all forms of malnutrition in children.

The first symposia with the theme of Healthy Lifestyle and Non- Communicable Diseases, all speakers, including plenary speech, highlighted the importance of early preventive strategies and dietary management strategies in reducing the chronic disease burden existing in the country. The second symposia under the theme of Nutrition for All: Reducing Nutrition and Health Disparities through Education gave the key take home message that One of the most effective ways to promote better nutrition is through education which leads to behaviour change though it is not always easy. The Third symposia - Nutrition in the Digital Age: Leveraging Technology to Enhance Health and Wellness highlighted the transformative potential of digital innovation in education and its implications for learners, educators, and institutions alike in navigating the complexities of the digital age. Further, it highlighted that collaborative efforts and public awareness campaigns, the transformative power of AI can be embraced to achieve a healthier future for all and showed existing evidence of some AI based tools used in Food and Nutrition related research. Fourth symposia Beyond Energy: Exploring the Multifaceted Roles of Edible Fats and Oils in Health and Nutrition discussed the nutrition

value of different types of oil, ways of minimizing the negative effect of oil. Moreover, it revealed that the dietary dilemmas surrounding fats and cardio-metabolic risk are multifaceted and complex.

Prof. C.C. De Silva memorial oration delivered by Ms. Visakha Tillekeratne explored the definition of food, nutrition and health literacy. She highlighted the importance of communications strategies which encompasses methods for reinforcing awareness, changing food environments in all spheres of family, society, food environment etc.

Free communication session, where 53 presenters presented their excellent and innovative findings representing number of universities in Sri Lanka and one from India. Among them, there were 28 oral presentations delivered under 2 themes namely Personalized and clinical Nutrition and Applied Nutrition Action. There were 27 abstracts presented as flash posters. First time at Nutrition Society Annual sessions Nutri Quiz competition conducted with the participation of all island undergraduates.

I congratulate all presenters for their excellent attempts, invite them to bring up these findings up to a stage which they can contribute for the betterment of our nation. At last, but not least, I want to express my sincere gratitude to all Chairs, speakers, evaluators and abstract reviewers for their support and contribution in success of this event.

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