

EMPOWER 2021

PROGRAMME AND ABSTRACTS

Combating Non-communicable Diseases Towards Healthy Ageing

Virtual conference
2- 3 June 2021

Organised by :



UNIVERSITI
KEBANGSAAN
MALAYSIA
National University
of Malaysia

Co-organisers:



Centre for
CARE
CENTRE for
ADVANCED RESEARCH

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MESSAGE FROM DEAN, FACULTY OF HEALTH SCIENCES, UNIVERSITI KEBANGSAAN MALAYSIA



Salam Sejahtera.

On behalf the Faculty of Health Sciences, Universiti Kebangsaan Malaysia, I would like to extend a warm welcome to all participants of the EMPOWER 2021, organised by the Centre for Healthy Ageing and Wellness (H-CARE), Faculty of Health Sciences, Universiti Kebangsaan Malaysia.

The seminar's theme "Combating Non-Communicable Diseases Towards Healthy Ageing"; is a relevant topic for discussion as non-communicable diseases have become the primary health concern in most countries around the world. Realising this, EMPOWER 2021 has collaborated with several academic and research institutions in the Southeast Asian region including Indonesia, Thailand and Brunei in organising this year's seminar. Although we are restricted by physical distance and have to have the seminar virtually due to the Covid-19 pandemic, I believe that the running of this seminar will still benefit us all.

It is our hope that this seminar will become a platform for academicians, researchers, educators, clinicians, and students to gain knowledge, exchange ideas, experiences and collaborate towards improving the strategy and quality in combating and managing non-communicable diseases. Indeed, this seminar has always been and will always be a great treasure to the members of the faculty.

I would like to take this opportunity to heartily congratulate all members of the committee who have organised EMPOWER 2021. I believe that EMPOWER 2021 will be a great avenue for networking and knowledge sharing. Last but not least, *terima kasih* to all speakers, presenters and participants for your participation, and stay safe!

PROF. DR. SUZANA SHAHAR
Dean
Faculty of Health Sciences

MESSAGE FROM THE CHAIRMAN, EMPOWER 2021 ORGANISING COMMITTEE



Greetings from Kuala Lumpur,

On behalf of the Organising Committee, it is my pleasure to welcome everyone to EMPOWER 2021: Combating Non-Communicable Diseases Towards Healthy Ageing organised by the Healthy Ageing and Wellness Research Centre (HCARE), Faculty of Health Sciences, Universiti Kebangsaan Malaysia in collaboration with international co-organisers from Srinakharinwirot University, Chiang Mai University, Chulalongkorn University, IPB University, Airlangga University and Universiti Brunei Darussalam. In keeping with the tradition, this annual EMPOWER seminar held since 2013 provides a platform for researchers to exchange ideas with the focus to empower independence in older adults in the community.

Since last year, EMPOWER has been hosted virtually and this is continued for EMPOWER 2021 with a commitment for the safety and well-being of its participants of this meeting. As all scientific events, EMPOWER also focuses on young and emerging researchers blended with an opportunity for established scientists to develop collaborative networks. The Scientific Committee had prepared a comprehensive programme covering different aspects of healthy ageing and how to combat NCDs among this group of population which includes three (3) plenary lectures, four (4) Symposia sessions with 18 invited speakers from Malaysia, Thailand, Indonesia, Brunei, Australia, UK and USA, three (3) rapid oral presentations sessions involving 30 young budding scientists plus an exciting public forum session. We are hopeful that this 2-day virtual EMPOWER 2021 seminar will proceed smoothly as planned.

I would like to sincerely thank Dato' Dr. Noor Azmi Ghazali, Deputy Minister 1, Ministry of Health Malaysia for launching EMPOWER 2021 and Prof. Dato' Ts. Dr. Mohd Ekhwan Hj. Toriman, Vice Chancellor, Universiti Kebangsaan Malaysia for his presence and support towards the program. Thank you to all speakers for accepting our invitation and the 150 participants for your support to make this seminar possible. To all co-organizers from Thailand, Indonesia dan Brunei, thank you for coming together virtually on this journey with us in Kuala Lumpur to make EMPOWER 2021 a success. Last but not least, to all the organising committee, thank you for not only your good work but also for all the support you have given each other throughout the project. Thank you for all your effort.

Please take advantage of everything our scientific seminar has to offer, and your participation and attendance are what makes the meeting successful. I wish you well during the meeting and hope that you find the program stimulating, enlightening, and inspiring.

Thank you.

ASSOC. PROF. DR. MOHD RAZIF SHAHRIL

Chairman
EMPOWER 2021 Organising Committee

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PROGRAMME OVERVIEW

DAY 1 2nd JUNE 2021 (WEDNESDAY)	
TIME	ACTIVITIES
8.30 am	Registration
8.50 am	Welcome Remarks Assoc. Prof. Dr. Mohd Razif Shahril Chairman EMPOWER 2021
9.00 am	Plenary Lecture 1 Micronutrients, Genomic Stability and Successful Ageing Prof. Dr. Michael Fenech, University of South Australia Distinguished Professor, Universiti Kebangsaan Malaysia Chairperson: Assoc. Prof. Dr. Razinah Sharif
10.00 am	Opening Ceremony Welcome Address YBhg. Prof. Dato' Ts. Dr. Mohd Ekhwan Hj. Toriman Vice Chancellor, Universiti Kebangsaan Malaysia Launching By YBhg. Dato' Dr. Haji Noor Azmi bin Ghazali Deputy Minister I, Ministry of Health Malaysia
10.30 am	Break
10.40 am	Plenary Lecture 2 Modifiable Risk Factors that Impact on Brain Health and Risk of Dementia Prof. Dr. Kaarin Jane Anstey, UNSW Sydney, Australia Chairperson: Prof. Dr. Nor Fadilah Rajab
	Symposium 1: Southeast Asia Updates on Non-Communicable Diseases and Ageing Chairperson: Assoc. Prof. Dr. Mohd Razif Shahril
11.40 am	Non-Communicable Diseases in Malaysia Dr. Feisul Idzwan Mustapha Ministry of Health Malaysia
12.00 pm	Non-Communicable Diseases and Ageing in Indonesia Prof. Dr. Ir. Hardinsyah MS IPB University, Bogor, Indonesia
12.20 pm	A Qualitative Analysis of Self-Care Management of Common Non-Communicable Diseases Among Elderly in Brunei Darussalam Dr. Khadizah Haji Abdul Mumin Universiti Brunei Darussalam
12.40 pm	The Malaysian Cohort: A Key Resource for the Precision Medicine Initiative in Malaysia Prof. Datuk Dr. A. Rahman A. Jamal Universiti Kebangsaan Malaysia
1.00 pm	Break

(cont.) DAY 1

2 nd JUNE 2021 (WEDNESDAY)			
TIME	ACTIVITIES		
	CONCURRENT SESSION (BREAKOUT ROOMS)		
	Symposium 2A: Research into Natural Products in Combating NCD Chairperson: Dr. Hanis Mastura Yahya	Symposium 2B: Advanced Technology in Ageing and NCD Research Chairperson: Dr. Sumaiyah Mat	
2.00 pm	Mechanisms of Natural Products for Anti-Ageing and Anti-Neurodegeneration: An Opportunity of Developing Innovative Health Products Dr. Tewin Tencomnao Chulalongkorn University, Thailand	Usage of Technology to Combat Non-Communicable Diseases and Promote Successful Ageing Assoc. Prof. Ir. Dr. Siti Anom Ahmad Universiti Putra Malaysia	
2.25 pm	High Level of Blood Glucose as a Determinant Factor for Ischemic Stroke in The Eastern Part of Indonesia Assoc. Prof. Dr. Santi Martini Airlangga University, Indonesia	The Connection of Ionizing Radiation with Human Ageing Dr. Thititip Tippayamontri Chulalongkorn University, Thailand	
2.50 pm	Tapioca Resistant Maltodextrin as a Functional Ingredient in Oral Nutrition Supplement for Diabetes Assoc. Prof. Dr. Suwimol Sapwarobo Chulalongkorn University, Thailand	Walking Meditation Relieves Peripheral Neuropathic Symptoms in Persons with Type-2 Diabetes Comparative to Massage Asst. Prof. Dr. Saitida Lapanantasin Srinakharinwirot University, Thailand	
3.15 pm	Experiencing Innovation of Catfish (Clarias gariepinus): Innovative Solution for a vulnerable groups Prof. Dr. Drh. Clara Meliyanti Kusharto IPB University, Bogor, Indonesia	Interactive Physical-Cognitive Game-Based Training Reduces Fall Risk in Older Adults Assoc. Prof. Somporn Pan Sungkarat Chiang Mai University, Thailand	
3.40 pm	Q & A Session		Q & A Session
	CONCURRENT SESSION (BREAKOUT ROOMS)		
	Rapid Oral Presentation 1: Nutrition and Dietetics Chairperson: Dr. Amalina Ahmad Azam	Rapid Oral Presentation 2: Nutrition, Physical and Function Chairperson: Dr. You Yee Xing	Psychosocial and New Laboratory Discoveries Chairperson: Dr. Ooi Theng Choon
4.00 pm	Healthy Eating Index: The Link with Gestational Weight Gain Dr Ng Choon Ming	Assessment of Body Composition Among Community-Dwelling Older Adults in Kuala Lumpur: Preliminary Findings from AGELESS Trial Study Ms Norhayati Mustafa Khalid	Physical Function Recovery Among Stroke Patients: The Identification of the Psychological Variables Predictor Dr Shazli Ezzat Ghazali
4.08 pm	The Relationship Between Sleep Duration and Nutrition Status of Students of SMAN 22 Surabaya During the Pandemic Ms Reza Farhana Zuhar	Effectiveness and Sustainability of Diabetes Specific Meal Replacement On Obese and Overweight T2DM Patients: A Study Protocol Mr Lew Leong Chen	Reliability and Validity of the Reminiscence Function Scale in Malay Language for Older Adults with Non-Communicable Disease Ms Ahsha Vaksalla Thiyagarajan
4.16 pm	Eating Jet-Laggers: An Insight into Their Chrononutrition Profile and Weight Status Dr Satvinder Kaur	Relationship between the Functional Reach and Lateral Reach Tests in Elders Mrs Araya Yankai	Effect of Low Dose X-Ray On Leukemic K562 Cells: Cell Viability, Iron Level and Lipid Peroxidation Ms Sakornniya Wattanapongpitak

(cont.) DAY 1

2 nd JUNE 2021 (WEDNESDAY)			
TIME	ACTIVITIES		
	(cont.) CONCURRENT SESSION (BREAKOUT ROOMS)		
	Rapid Oral Presentation 1: Nutrition and Dietetics Chairperson: Dr. Amalina Ahmad Azam	Rapid Oral Presentation 2: Nutrition, Physical and Function Chairperson: Dr. You Yee Xing	Psychosocial and New Laboratory Discoveries Chairperson: Dr. Ooi Theng Choon
4.24 pm	The Impact of Nutrition Education Intervention On Knowledge, Attitude and Practice of Anaemia Prevention Among Adolescents in Nabire and Sumbawa Indonesia Ms Farida Dwi Rokhmah	Readiness of Technology Usage Among Community-Dwelling Older Adults in Kuala Lumpur: A Preliminary Study Ms Nurul Hidayah Md Fadzil	Sociodemographic, Medical, Lifestyle and Physical Profiles of Older Persons with and Without Cognitive Frailty in Kuala Lumpur: Preliminary Findings Ms Azianah Mohamad Ibrahim
4.32 pm	Chrono-Nutrition: Diverging The Metabolically Healthy Obesity Ms Fatin Hanani Mazri	Multimorbidity Among Robust and Cognitive Frailty Groups Within Community Dwelling Older Persons. Ms Resshaya Roobini Murukesu	Cognitive Status of Community Dwelling Older Adult in Malaysia: Some Preliminary Findings Ms A'isyah Mohd Safien
4.40 pm	Effects of Nutrition Education Related to Hypertension and Indonesian Balanced Nutrition in Preventing Adult Hypertension Ms Mia Mustika Hutria Utami	The Impact of Premarital Nutrition Education On Knowledge, Attitude, And Practice in Childbearing Age During a Pandemic Covid-19 Ms Anisah Nimah Azizah	Effect of 4-hydroxybenzoic Acid and 4-hydroxy-3-methoxybenzoic Acid On Anticancer Activity in Leukemic K562 Cell Line and Its Possibility Mechanism Ms. Ohnmar Myint
4.48 pm	Knowledge, Attitude and Practice Towards Salt Intake Among Street Food Consumers in Klang Valley Ms Zainorain Natasha	Dietary Risk Factors and Odds of Colorectal Adenoma in Malaysia: A Case Control Study Ms Nur Mahirah Amani Mohammad	Healthcare Facility Visits Among Malaysian Community Dwelling Older Adults with Non-Communicable Disease During Covid-19 Pandemic Ms Pavapriya Ponvel
4.56 pm	Mindful Eating and Its Relationship with Adiposity Trait, Dietary Intake, And Night Eating Syndrome Ms. Siti Munirah Abdul Basir	Effect of Nutrition Education On Knowledge, Attitude and Practice of Emerging Adults Related to Health and Nutrition During Covid-19 Pandemic Ms Muh Guntur Sunarjo Putra	Effect of Gallic Acid On Pirarubicin Transport Kinetics in Living Leukemic K562 and K562/DOX Cell Lines Ms.Khin Thenu Aye
5.04 pm	The Relationship of Nutritional Adequacy Figures to The Nutritional Status of Students of SMA Negeri 10 Surabaya During the Pandemic Ms Aida Verdy Kumala Yuniar	Comparison of Clinical and Physical Statuses in Older Adults with and Without Falls Mrs Janet Bong	Metabolomic Signatures and Malnutrition Among Children in Asian Landscape: A Scoping Review Mrs Ika Aida Aprilini Makbul
5.12 pm	Effect of Nutritional Intervention On Growth Parameters Among Children and Adolescents with Inborn Error Metabolism (IEM): A Scoping Review Ms Lim Jing Ying	Health Literacy of Community Dwelling Older Adult in Malaysia: Preliminary Findings Mrs Jamilah Mohammad Hanipah	Reviving A Cryopreserved Peripheral Blood Mononuclear Cells - A Scoping Review Mr. Mohammad Nadzmi Zakaria
5.30 pm	End of Day 1		

DAY 2

3rd JUNE 2021 (THURSDAY)	
TIME	ACTIVITIES
8.30 am	Registration
9.00 am	<p style="text-align: center;">Plenary Lecture 3</p> <p style="text-align: center;">Chrononutrition: Consequences and Determinants of Food Timing Dr. Hassan S Dashti Massachusetts General Hospital, Harvard Medical School</p> <p style="text-align: center;">Chairperson: Assoc. Prof. Dr. Zahara Abdul Manaf</p>
10.00 am	Break
	<p style="text-align: center;">Symposium 3: Preventive Nutrition in NCDs Chairperson: Dr Nurul Huda Razalli</p>
10.10 am	<p style="text-align: center;">Weight Management During the Covid-19 Pandemic: Potentials and Challenges Assoc. Prof. Dr. Zahara Abdul Manaf Universiti Kebangsaan Malaysia</p>
10.30 am	<p style="text-align: center;">Salt in Street Foods: Hidden Threat in NCD Risk? Assoc. Prof. Dr. Hasnah Haron Universiti Kebangsaan Malaysia</p>
10.50 am	<p style="text-align: center;">Flipping the Metabolic Switch: Understanding and Applying the Health Benefits of Intermittent Fasting in the Ageing Population Assoc. Prof. Dr. Razinah Sharif @ Mohd. Sharif Universiti Kebangsaan Malaysia</p>
	<p style="text-align: center;">Symposium 4: Technology and Innovation in Healthy Ageing Chairperson: Dr. Arimi Fitri Mat Ludin</p>
11.10 am	<p style="text-align: center;">Physical Activity and Ageing: The Benefits of Wearable Technology Prof. Dr. Raymond Lee University of Portsmouth, UK</p>
11.30 am	<p style="text-align: center;">Innovation in Managing Age-Related Hearing Loss Dr. Wan Syafira Ishak Universiti Kebangsaan Malaysia</p>
11.50 am	<p style="text-align: center;">Digital Innovation, Behaviour and Successful Ageing UKM Adjunct Prof. Mr. Azran Osman-Rani Naluri, Malaysia</p>
12.10 pm	<p style="text-align: center;">Closing and Prize Giving Ceremony By Prof. Dr. Suzana Shahar Dean, Faculty of Health Sciences, Universiti Kebangsaan Malaysia</p>
1.00 pm	Break
2.00 pm	<p style="text-align: center;">Public Forum (Session in Malay Language) “Pencegahan Penyakit Tidak Berjangkit untuk Penuaan Sihat”</p> <p style="text-align: center;">Panellists: Prof. Dr. Noran Naqiah Mohd Hairi, Professor of Epidemiology and Public Health, University Malaya</p> <p style="text-align: center;">Assoc. Prof. Dr. Khadijah Alavi Psychosocial Expert, Universiti Kebangsaan Malaysia</p> <p style="text-align: center;">Assoc. Prof. Dr. Zahara Abdul Manaf, Dietetic Consultant, Universiti Kebangsaan Malaysia</p> <p style="text-align: center;">Dr. Noor Ibrahim Mohamed Sakian, Medical Doctor</p> <p style="text-align: center;">Moderator: Dr. Shobha Sharma</p>
4.00 pm	End of Day 2

PLENARY LECTURE 1

Micronutrients, Genomic Stability and Successful Ageing



Prof. Dr. Michael Fenech
Genome Health Foundation

Abstract

Structural and numerical chromosomal aberrations, excessive telomere shortening, and loss of mitochondrial DNA integrity increase chronologically and accelerate the ageing process by causing deleterious changes in gene expression and triggering pro-inflammatory senescence mechanisms such as the cGMP-AMP synthase-stimulator of interferon genes (cGAS-STING) cytosolic DNA sensing pathway and the Senescence Associated Secretory Phenotype (SASP). In this presentation I shall (i) discuss current knowledge on the mechanisms by which nutritional deficiencies and excesses cause DNA damage, (ii) explain why loss of DNA integrity accelerates ageing and induces senescence and inflammation, and (iii) explore emerging evidence that specific nutrient intake recommendations are required to mitigate against DNA damage and the inflammation induced by cGAS-STING and SASP either by elimination of persisting senescent cells or inhibiting their chemokine signalling.

PLENARY LECTURE 2

Modifiable Risk Factors that Impact on Brain Health and Risk of Dementia



Prof. Dr. Kaarin Jane Anstey,
UNSW Sydney, Australia

Abstract

The importance of lifestyle, sociodemographic, and medical risk factors for cognitive decline and risk of dementia will be examined taking a population health approach. This will demonstrate that a large proportion of cases of dementia may be attributable to lifestyle risk factors, providing a strong rationale for risk reducing interventions. The Cognitive Health Environment Lifestyle Model (CHELM) presents a way to conceptualise the complex range of risk factors for cognitive and brain health and this will be presented. Recent multidomain, randomised controlled trials to reduce risk of cognitive decline and dementia will also be discussed in light of their strengths, unintended benefits and also some limitations.

PLENARY LECTURE 3

Chrononutrition: Consequences and Determinants of Food Timing



Dr. Hassan S Dashti
Massachusetts General Hospital, Harvard Medical School

Abstract

The circadian system regulates human physiology and behaviour by synchronizing to external rhythmic cues, such as the light/dark cycle and food consumption. The timing of food intake is emerging as an important predictor of overall health and a relevant risk factor for obesity in adults. In addition, human studies have shown that late food timing is associated with hyperglycemia, dyslipidemia, insulin sensitivity, and metabolic syndrome. This seminar will review some evidence supporting the role of food timing as an independent risk factor and a novel dimension for cardiometabolic health. Observations that mistimed food intake may have adverse metabolic health effects have generated interest in personalizing food timing recommendations in interventional studies and public health strategies for the purpose of disease prevention and improving overall health. Small, controlled, and short-termed intervention studies suggest that food timing may be modified as it is presumed to be primarily regulated by choice. Identifying and evaluating social and biological factors that explain variability in food timing may determine whether changes in food timing in uncontrolled, free-living environments are sustainable in the long term. The seminar will review factors that influence the timing of when people consume foods, which include: 1) cultural and environmental factors; 2) behavioural and personal preference factors; and 3) genetic and physiological factors.

SYMPOSIUM 1
Southeast Asia Updates on Non-Communicable Diseases and Ageing

Invited Lecture 1

Non-Communicable Diseases in Malaysia



Dr. Feisul Idzwan Mustapha
Disease Control Division, Ministry of Health Malaysia

Abstract

Malaysia is currently faced with many health challenges. One of the key challenges is the increasing burden of Non-Communicable Diseases (NCDs), including mental health. This increasing burden is related to the wider determinants of health that we face in the country.

In this symposium, I will provide an overview on the following key points:

1. Our population is fast becoming an ageing population. This will also increase the burden of NCDs.
2. The current economic disparity among the population – as evidenced by our current GINI coefficient.
3. Related to point #2, the economic pressure faced by vulnerable Malaysians, now further amplified by the COVID-19 pandemic and our response to the pandemic.
4. Poor health literacy of our population – as evidence by the latest National Health and Morbidity Survey (NHMS) 2019.
5. The public health considerations are often considered at odds or in opposition in policies relating to economic development.
6. The current healthcare system is already struggling to provide quality care to patients living with NCDs at all levels of care, and throughout the whole continuum of NCD care.

SYMPOSIUM 1
Southeast Asia Updates on Non-Communicable Diseases and Ageing

Invited Lecture 2

Non-Communicable Diseases and Ageing in Indonesia



Prof. Dr. Ir. Hardinsyah MS
Professor in Nutrition Science, Department of Community Nutrition, Faculty of Human Ecology, IPB University, Bogor, Indonesia

Abstract

Indonesia with 270.2 million population, which is the third populated country in Asia, is now facing a triple burden of malnutrition as well as increasing prevalence of non-communicable diseases (NCDs). The cause of death by NCDs increased double from 37% to 71% during the last three decades. Stroke, diabetes and cancer are the four major cause of death currently. During the last five years the prevalence of stroke, diabetes mellitus and cancer increased significantly. Studies showed the risk factors of the increasing NCDs are increasing prevalence of obesity, hypertension, hyperglycemia, hypercholesterol, smoking and sedentary lifestyle. Both prevalence of elderly (PE) and life expectancy (LE) are increasing slowly, but they are not reflecting the quality of ageing or healthy lifespan. In response to the increasing burden of NCDs, the MOH established the Directorate of Noncommunicable Diseases, to lead and manage NCD prevention in Indonesia. NCD programmes include dietary guideline and physical activity promotion, regulation on cigarettes and smoking (tax, advertising, labelling, no smoking areas etc), regulation and guidelines in limiting sugar, sodium and fat intake, NCDs community-based program at village level called *Posbindu*. The activities of *Posbindu* are basic health screening (BMI, waist line, blood pressure, blood glucose, blood cholesterol), physical exercise, nutrition related NCDs prevention education, medicinal plants planting for home gardening. However, the COVID-19 pandemic has reduced the government budget for the NCDs program, reduced private and community participation which ultimately weakened NCDs programs as well as *Posbindu's* activities.

**SYMPOSIUM 1
Southeast Asia Updates on Non-Communicable Diseases and Ageing**

Invited Lecture 3

**A Qualitative Analysis of Self-Care Management of Common Non-Communicable Diseases
Among Elderly in Brunei Darussalam**



Dr. Khadizah Haji Abdul Mumin
Universiti Brunei Darussalam

Abstract not available

SYMPOSIUM 1
Southeast Asia Updates on Non-Communicable Diseases and Ageing

Invited Lecture 4

The Malaysian Cohort: A Key Resource for the Precision Medicine Initiative in Malaysia



Prof. Datuk Dr. A. Rahman A. Jamal
MD (UKM), MRCP (Ire), PhD (Lond), GDHM (SMU-SingHealth), FASc
Universiti Kebangsaan Malaysia

Abstract

Precision medicine is transforming healthcare worldwide and is evolving into a more encompassing concept of healthcare that takes into account the individual uniqueness in terms of genetic, environmental exposure and lifestyle data. The expanded definition of precision medicine is the tailoring of medical treatment to the individual characteristics of each patient aiming to classify individuals into subpopulations that differ in their susceptibility to a particular disease or their response to a specific treatment. After the UK Biobank project was completed in 2012, the United Kingdom launched its precision medicine initiative in a big manner in 2012 with the 100,000 Genomes England project that involves genome sequencing of cancers, pathogens, and rare diseases. The United States soon followed suit with the announcement, by President Barack Obama himself, of its own Precision Medicine Initiative in 2015 (3). One of the core programs in the initiative is a cohort of 1,000,000 individuals, named All of US that will have participants contribute their healthcare data as well as their genome data to a central database. Since these two big initiatives, many other countries have embarked on similar initiatives albeit on a smaller scale. We are fortunate that the government approved The Malaysian Cohort project in 2006 and to date we have recruited nearly 120,000 participants and collected the biospecimens. The key lynchpin for precision medicine is the genome data, and the other omics related profiles, hence the challenge now is to scale up genome profiling and genotyping analysis and relate this to the various disease phenotypes and outcomes. Discovery research on pre-diagnostic samples i.e., before symptoms appear, will allow the identification of biomarkers for early detection of cancers and other diseases. Generating evidence for the application of precision medicine is crucial, and this will require big data and large numbers of biospecimens. The Malaysian Cohort will be a key enabler to this.

SYMPOSIUM 2A
Research into Natural Products in Combating NCD

Invited Lecture 1

Mechanisms of Natural Products for Anti-Ageing and Anti-Neurodegeneration: An Opportunity of Developing Innovative Health Products



Dr. Tewin Tencomnao
Chulalongkorn University, Thailand

Abstract

This study aims to investigate the neuroprotective effect of three extracts of *Lignosus rhinocerus* (LR) or Tiger Milk Mushroom against oxidative stress in both HT22 cells and *C. elegans* as well as longevity in *C. elegans*. In HT22 cells, we assessed the toxicity of three LR extracts (LRE, LRC and LRH) and their protective activity by MTT assay, Annexin V-FITC/propidium iodide staining, Mitochondrial Membrane Potential (MMP), and assessment of intracellular ROS accumulation. In addition, we determined the antioxidant gene expression by qRT-PCR. In *C. elegans*, wild-type N2 were determined survival rate under oxidative stress and intracellular ROS. Transgenic strains including TJ356, TJ375, CF1553, CL2166 and LD1 were used to detect DAF-16, HSP-16.2, SOD-3, GST-4, and SKN-1, respectively. Lifespan and aging biomarkers including lipofuscin and pharyngeal pumping rate were also assessed. Furthermore, the neuroprotective effects, such as chemotaxis behavior and PolyQ40 formation were assessed as well. We found that only LRE significantly reduced both apoptotic cells and intracellular ROS level but significantly increased antioxidant genes expression after glutamate-induced oxidative stress in HT-22 cells. However, in *C. elegans*, all LR extracts decreased intracellular ROS and protected the worms from oxidative stress through DAF-16/FOXO pathway leading to increase SOD-3 and decrease HSP-16.2. On the other hand, the SKN-1 and GST-4 were not changed. All the extracts extended lifespan and reduced lipofuscin, whereas only high concentration improved pharyngeal pumping rate. All the extracts did not alter the body length and the progeny of the worms excluding dietary restriction. In addition, they exhibited the neuroprotective effects by enhancing chemotaxis Index (CI) in A β containing worms and decreasing PolyQ40 aggregation. Interestingly, only LRE exerted neuroprotection on both *in vitro* and *in vivo*. Therefore, this novel study could suggest that LR extracts, especially LRE, may be an alternative for development of neuroprotectants.

SYMPOSIUM 2A
Research into Natural Products in Combating NCD

Invited Lecture 2

High Level of Blood Glucose as a Determinant Factor for Ischemic Stroke in The Eastern Part of Indonesia



Assoc. Prof. Dr. Santi Martini
Faculty of Public Health, Universitas Airlangga, Indonesia

Abstract

Stroke is the leading cause of death among adult and prediction of death due to stroke is increased twice between 2003 and 2030 in the world. Meanwhile, stroke is the first rank as causation for death in Indonesia since 2007. Unhealthy lifestyle is related to non-communicable diseases, one of those diseases is stroke. The objective of this research was to determine which factors among biologic factors such as hypertension, diabetes mellitus, hypercholesterolemia, hyperuricemia, obesity, history of diseases, behaviour factor such as smoking behaviour as risk factors for ischemic stroke. The study was an observational study with case control design, a hospital-based research with sample size of 164 subjects. Cases group were ischemic stroke based on diagnosis of medical doctor and control group were non stroke cases matched by sex and age to cases group. This research conducted at the Soetomo hospital as referral hospital from eastern part of Indonesia. The independent variables analysed were 17 risk factors and confirmatory factor analysis was used to determine the significant risk factors. Among 17 risk factors analysed there were twelve actors having significant association with ischemic stroke such as cigarette smoke exposure, hypertension history, diabetes mellitus history, hyperuricemia history, high diastolic blood pressure, high systolic blood pressure, high level of casual blood glucose, high level of fasting blood glucose, high level of two hours post-prandial blood glucose, high level of hemoglobin glyated, total hypercholesterolemia and HDL hypercholesterolemia. The other five factors not having significant factors were dyslipidemia history, LDL hypercholesterolemia, hyper-triglyceride and hyperuricemia. High level of blood glucose had the highest association to ischemic stroke with coefficient validity were 0.93, 0.97, 0.93 for high level of casual blood glucose, high level of fasting blood glucose, high level of two hours post-prandial blood glucose respectively.

SYMPOSIUM 2A
Research into Natural Products in Combating NCD

Invited Lecture 3

Tapioca Resistant Maltodextrin as a Functional Ingredient in Oral Nutrition Supplement for Diabetes



Assoc. Prof. Dr. Suwimol Sapwarobo
Chulalongkorn University, Thailand

Abstract

This study aims to evaluate the efficacy of three developed oral nutritional supplements (ONS) with modified-carbohydrate composition using tapioca resistant maltodextrin (RMD): original, RMD15 (replacement of 15% maltodextrin using tapioca RMD), and RMD30 (replacement of 30% maltodextrin using tapioca RMD). Healthy young adults ($n=17$, female (58.8%), mean age 26 ± 0.62 years old) received original, RMD15, and RMD30 ONS in three different days in a randomized-cross over control study. Plasma glucose was examined at 0 min (baseline) and postprandially at 30, 60, 120 and 180 mins after ONS ingestion. The peaks of plasma glucose were reached at 30 min in all formulas. The highest peak of plasma glucose was obtained after the original formula (119.25 ± 4.63 mg/dl). Replacement of tapioca RMD by 15% and 30% decreased postprandial plasma glucose by 4.05% and 4.96%, respectively. The peak of incremental plasma glucose following original, RMD15, and RMD30 formulas were 35.08 ± 4.06 mg/dl., 31.25 ± 5.37 mg/dl., and 31.75 ± 3.54 mg/dl., respectively. Replacement of tapioca RMD by 15% and 30% reduced the peak of incremental plasma glucose by 10.93% and 9.50%, respectively. Reductions of iAUC were not significantly different between formulas (original formula: $1,515 \pm 269.59$ mg/dl x min, RMD15: $1,543.75 \pm 290.56$ mg/dl x min and RMD30: $1,480 \pm 219.94$ mg/dl x min). As a conclusion, carbohydrate modification using tapioca RMD in ONS insignificantly decreased the postprandial blood glucose in healthy adults. It is believed that a tight glucose homeostasis in healthy participants, might be the reason of these insignificant changes. Study in the subjects with impaired fasting blood glucose is needed to warrant the result.

SYMPOSIUM 2A
Research into Natural Products in Combating NCD

Invited Lecture 4

Experiencing Innovation of Catfish (*Clarias gariepinus*): Innovative Solution for Vulnerable Groups



Prof. Dr. Drh. Clara Meliyanti Kusharto
IPB University, Bogor, Indonesia

Abstract

The cheap and easy to cultivate catfish (*Clarias gariepinus*) can be processed into various high nutritive value and healthy products, that's can further enhance the wealth of catfish farmer. The Clarias flour and processed foods, such as biscuits and its derivative product innovation in the food sector may supports sustainable development. These products can support nutritional needs of the people as the innovative solution of the vulnerable groups to overcome malnutrition at affordable cost. Aside to its main purpose as high protein diet, by continuing one research to other high value by products can further be developed, such as Soft gel fish oil and Modified Liquid Formula. These products finished pre and clinical test which was significantly proved for their potential effect in preventing Non-Communicable Diseases (NCD) among Elderly and the productive young age.

SYMPOSIUM 2B
Advanced Technology in Ageing and NCD Research

Invited Lecture 1

Usage of Technology to Combat Non-Communicable Diseases and Promote Successful Ageing



Assoc. Prof. Ir. Dr. Siti Anom Ahmad
Universiti Putra Malaysia

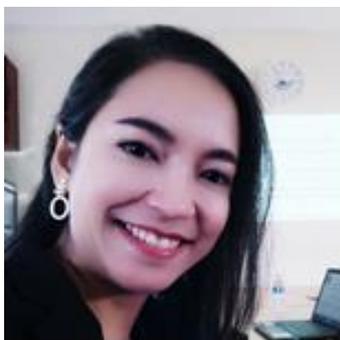
Abstract

Inevitably all countries are facing ageing population. Malaysia is expected to become an aged nation in 2030 where 15% of the total population are older persons 60 years old and above. Information and communication technology (ICT) within healthcare covers a wide range of technologies. The aim is to use ICT in improving disease management. Even though there are increases in the ICT use in healthcare, there are several challenges remaining. This talk describes some of the challenges in using ICT in appropriate management of NCD among older persons and how it could be used to encourage successful ageing.

SYMPOSIUM 2B
Advanced Technology in Ageing and NCD Research

Invited Lecture 2

The Connection of Ionizing Radiation with Human Ageing



Dr. Thititip Tippayamontri
Department of Radiological Technology and Medical Physics, Faculty of Allied Health Sciences,
Chulalongkorn University, Bangkok, Thailand

Abstract

The increasing number of people surviving into old age and the resulting increase of the age-related health effects make it particularly important to reveal the mechanism of aging. The effect of ionizing radiation on longevity was previously reported. Although high dose of ionizing radiation can induce radiation injuries and the multiple symptoms of premature aging, the evidence with low doses and dose rates is remain unclear. This work aims to review the contemporary evidence that high and low doses of ionizing radiation can accelerate aging, degenerative health effects and mortality. A systematic search of several electronic databases, including Medline and PubMed authors experience on ionizing radiation and aging. Aging and age-related health effects of ionizing radiation involve a deterioration of cell and the functions and changes that may predispose the cell to undergo an oncogenic transformation, as well as the non-cancer diseases like heart disease, stroke, digestive diseases and respiratory diseases. With evidence from epidemiological, animal and in vitro studies, mechanistic studies underlying radiation-induced effects include DNA damage and genomic instability, telomere erosion, oxidative stress and inflammation, as well as cellular senescence and epigenetic alteration. There is a strong relationship of radiosensitivity changes with age. Moreover, radiation can induce hormesis effect, which is an adaptive response of cells to a moderate stress that will result in beneficial effects including more resistant to aging. Deep understanding of the radiosensitivity changes with age and age-related health effects after radiation exposure becomes increasingly relevant. Additionally, elucidation of biological mechanisms underlying the relationship between aging and radiosensitivity may greatly impact the radiation biology and radiation protection fields.

SYMPOSIUM 2B
Advanced Technology in Ageing and NCD Research

Invited Lecture 3

**Walking Meditation Relieves Peripheral Neuropathic Symptoms in Persons with Type-2 Diabetes
Comparative to Massage**



Asst. Prof. Dr. Saitida Lapanantasin
Srinakharinwirot University, Thailand

Abstract

Peripheral Neuropathy is a common risk factor resulting in foot ulcers and amputation in type-2 diabetes. Neuropathic symptoms in diabetic foot have been known to be reduced by improving blood circulation with massage or weight bearing exercise as walking. Thus, this study aimed to examine comparative effect of walking meditation (WM) and massage (M) on neuropathic symptoms of diabetic foot. Twenty-six participants with type-2 Diabetes aged 42-69 years were randomized into 3 groups; WM (n=8), M (n=9), and control (n=9). WM and M groups attended 4 weeks-practice (30 min/day, 3 days/week). All groups received a basic education for diabetic patient to taking care themselves. The outcome measures for neuropathic symptoms were perceptions of pressure and vibration senses, which assessed by a 10-g monofilament, and a 128-Hz Tuning fork respectively, at pre- and post-training. The pressure sense perception was represented as numbers of the intact sites when tested with the monofilament (10 sites/foot), while the vibration sense perception was reported as a perceivable time for the vibration in seconds. Data were analysed by nonparametric statistics. The results showed that, at pre-training, pressure and vibration outcomes of the three groups were not significantly different. At post-training, WM and M groups presented better pressure sense perception than pre-training ($p=.012$), and also than the control group significantly (WM: $p=.001$, M: $p=.014$), but no significant difference between WM and M groups. Additionally, WM and M groups demonstrated significant improvements of vibration perception when compared to baseline ($p=.012$), while the control group did not. In conclusion, the findings support that either walking meditation or massage comparatively reduces peripheral neuropathic symptoms of diabetic foot. Therefore, WM can be an interesting mind-body practice for relieving neuropathic symptoms in individuals with type-2 diabetes.

SYMPOSIUM 2B
Advanced Technology in Ageing and NCD Research

Invited Lecture 4

Interactive Physical-Cognitive Game-Based Training Reduces Fall Risk in Older Adults



Assoc.Prof. Somporn Pan Sungkarat
Chiang Mai University, Thailand

Abstract

Declines in physical and cognitive functions are recognized as important risk factors for falls in older adults. The aim of this study is to evaluate the effects of the interactive physical-cognitive game-based training on fall risk of community-dwelling older adults. Forty participants were randomly allocated to the intervention (n=20) and control (n=20) groups. Participants in the intervention group performed a 60-minute session of the interactive physical-cognitive program using Kinect-based exergames, 3 times a week for 12 weeks. The Physiological Profile Assessment (PPA) and Montreal Cognitive Assessment (MoCA) were assessed at baseline and post-training to reflect fall risk and cognitive performance, respectively. Thirty-nine participants (mean age = 69.81 ± 3.78 years) completed the study, with the mean adherence rate of 98.8% and no adverse events. After training, participants in the intervention group demonstrated significant reduction in fall risk as indicated by the PPA fall risk score ($p = 0.015$). In addition, their cognitive performance as measured by the MoCA improved significantly ($p = 0.001$) compared to controls. As a conclusion, the interactive physical-cognitive training program using Kinect-based exergames is feasible and effective in reducing physiological fall risk and improving cognitive performance in community-dwelling older adults.

SYMPOSIUM 3
Preventive Nutrition in NCDs

Invited Lecture 1

Weight Management During the Covid-19 Pandemic: Potentials and Challenges



Assoc. Prof. Dr. Zahara Abdul Manaf
Dietetic Program and Centre for Healthy Aging and Wellness, Faculty of Health Sciences,
Universiti Kebangsaan Malaysia

Abstract

Lockdown due to the Covid-19 pandemic may promote physically inactive lifestyle and change dietary behaviour which can eventually increase the risk of obesity among the population. This restriction presents unprecedented challenges to healthcare providers to deliver healthy lifestyle intervention including weight loss intervention. Internet-based and digital technology appear to be potential tools to promote health behaviour change and wellbeing. However, the capability of these modes in delivering interventions during the pandemic era is largely unknown. We explored the efficacy, potential and challenges of technological advances and social media platforms usage as an alternate mode in delivering weight loss programs among adults during the Covid-19 lockdown. Studies delivering lifestyle intervention promoting weight loss and healthy eating using information technology during the Covid-19 pandemic were considered for the review. In addition, data from our own study were also analysed. The Covid-19 pandemic has greatly encouraged the delivery of telehealth and promising potential to promote healthy lifestyle. This mode of intervention offers convenience, unlimited geographical boundaries, reduce risk of disease transmission and lower cost compared with the conventional method. However, some aspects are required to be taken into account by this approach, such as the need for a participant's adequate technological/digital literacy, internet access and attentiveness. In addition, evaluation and monitoring of outcome parameters such as anthropometric measurements can be challenging as most rely on self-report or self-measurement that cannot guarantee its accuracy. Internet-based technology is a potential strategy to deliver weight management intervention during the Covid-19 pandemic despite of several challenges. However, there is a need for the development of guidelines for more accurate evaluation and monitoring protocol to ensure the data validity and safety of participants and programme providers during the Covid-19 pandemic.

SYMPOSIUM 3
Preventive Nutrition in NCDs

Invited Lecture 2

Salt in Street Foods: Hidden Threat in NCD Risk?



Assoc. Prof. Dr. Hasnah Haron
Universiti Kebangsaan Malaysia

Abstract

Street food has made a significant contribution to society in nutrition, especially in developing countries. Nutrition content in street food also depends on the ingredients used; how it is prepared, stored and how it is sold. The most widely cited definition of street food is ready-to-eat food and beverages prepared and/or sold by vendors and hawkers especially in streets and other similar public places. The retail location 'on the street' with no physical four permanent walls, distinguishes street food vendors from more formal food service. Street food are likely to be high contributors of salt, given nearly two-thirds of Malaysians eat out at least once a day. The lack of comprehensive data on the sodium content of foods and meals, due to the absence of labelling requirements and outdated food composition data. This hindered effective implementation of consumer education. This study started with identification of the frequently available street food available in Malaysia. The survey of street food started at the Central zone of Malaysia, Kuala Lumpur and Selangor. Name, type and number of stalls selling the street food have been identified during the survey. All data was processed using SPSS to determine the frequency and ranking of the street food. The latter were divided into 3 categories which consisted of main meals, snacks and desserts. There were 15 top street food that have been identified for each category. The following step were food sampling and food analysis to determine the salt content in the street food. Sodium content was highest in main meals of street food in Selangor and in snacks of street food in Kuala Lumpur. Data on salt content of the street foods can be disseminated to the public in order to educate them to choose wisely when purchasing the street food. The findings from this work will fill in the knowledge gap needed to catalyse effective implementation of the salt reduction strategy.

SYMPOSIUM 3
Preventive Nutrition in NCDs

Invited Lecture 3

Flipping the Metabolic Switch: Understanding and Applying the Health Benefits of Intermittent Fasting in the Ageing Population



Assoc. Prof. Dr. Razinah Sharif @ Mohd. Sharif
Universiti Kebangsaan Malaysia

Abstract

Intermittent fasting (IF) refers to various dietary regimens that cycle between a period of non-fasting and a period of total fasting. This study aimed to determine the effects of IF on cognitive function among elderly individuals who practice IF who have mild cognitive impairment (MCI). A total of 99 elderly subjects with MCI of Malay ethnicity without any terminal illness were recruited from a larger cohort study, LRGS TUA. The subjects were divided into three groups, comprising those who were regularly practicing IF (r-IF), irregularly practicing IF (i-IF), and non-fasters (n-IF). Cognitive function test, bioindicators assay and metabolomics analysis were conducted for each of these subjects. Upon 36 months of follow-up, more MCI subjects in the r-IF group reverted to successful aging with no cognitive impairment and diseases (24.3%) compared to those in i-IF (14.2%) and n-IF groups (3.7%). The r-IF group's subjects exhibited significant increment in superoxide dismutase (SOD) activity and reduction in body weight, levels of insulin, fasting blood glucose, malondialdehyde (MDA), C-reactive protein (CRP), and DNA damage. Moreover, metabolomics analysis showed that IF may modulate cognitive function via various metabolite pathways, including the synthesis and degradation of ketone bodies, butanoate metabolism, pyruvate metabolism, and glycolysis and gluconeogenesis pathways. Overall, the MCI-afflicted older adults who practiced IF regularly had better cognitive scores and reverted to better cognitive function at 36 months follow-up.

SYMPOSIUM 4
Technology and Innovation in Healthy Ageing

Invited Lecture 1

Physical Activity and Ageing: The Benefits of Wearable Technology



Prof. Dr. Raymond Lee
University of Portsmouth, UK

Abstract

This presentation will highlight the importance of physical activity in maintaining health, including non-communicable diseases. Currently, the commercial wearable systems do not provide a scientifically validated method of quantifying physical activity which is related to the health of the musculoskeletal system. A new method is thus proposed. The limitation of the technology will also be discussed, and a psychobehavioural approach is required if the technology is going to provide sustainable benefits.

SYMPOSIUM 4
Technology and Innovation in Healthy Ageing

Invited Lecture 2

Innovation in Managing Age-Related Hearing Loss



Dr. Wan Syafira Ishak
Audiology Program, Center for Healthy Aging & Wellness (HCARE)
Faculty of Health Sciences, Universiti Kebangsaan Malaysia

Abstract

Hearing loss is estimated to affect approximately 430 million people which is about 5% of the world population. Although hearing loss affects people of all ages, the prevalence increases with the increment of age. Approximately one-third of persons over 65 years are affected by disabling hearing loss. Previous research has shown that hearing loss contributes to cognitive decline, increase social isolation and economic burdens of the individuals, families and communities. The purpose of this talk is to discuss how changes in hearing amplification technologies over the past years help to meet users' need, particularly the need of older adults' population as well as removing the barriers posed by hearing impairment has the potential to promote healthy aging.

SYMPOSIUM 4
Technology and Innovation in Healthy Ageing

Invited Lecture 3

Digital Innovation, Behaviour and Successful Ageing



UKM Adjunct Prof. Mr. Azran Osman-Rani
Naluri, Malaysia

Abstract not available

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RAPID ORAL PRESENTATION 1
Nutrition and Dietetics

Abstract 1

Healthy Eating Index: The Link with Gestational Weight Gain

Fiona Chuen Xin Juan, Satvinder Kaur, **Ng Choon Ming**

Faculty of Applied Sciences, UCSI University, Kuala Lumpur, Malaysia

Purpose: The healthy eating index (HEI) is useful to examine diet quality and the risk of poor maternal outcomes including suboptimal gestational weight gain and non-communicable diseases. Recently, an HEI is developed specifically during pregnancy for the Asian population. The present study aimed to determine the diet quality of Malaysian pregnant women based on HEI and to determine the association with gestational weight gain.

Methods: In total, 138 pregnant women in Kuala Lumpur (mean age: 28.3±3.8 years, gestational age: 25.1±2.1 weeks) enrolled in this cross-sectional study. Sociodemographic and anthropometric data were collected. Participants' 3-days food records (2 weekdays and 1 weekend) were analysed using the NutritionistPro software meanwhile, diet quality was determined using the Healthy Eating Index Score (HEI-SGP).

Results: Majority of the pregnant women (90.6%) had a poor HEI score (≤ 72) meanwhile, only 9.4% had a good HEI score (> 72). Approximately one quarter of the pregnant women (23.9%) had excessive rate of gestational weight gain, while 47.1% had inadequate rate of gestational weight gain. Most of the pregnant women did not achieve the recommended serving size (serves/1000 kcal) for dietary adequacy (total fruits: 73.9%, total vegetables: 89.1%) and quality of food groups (dark green leafy and orange vegetables: 71.7%, whole grains: 100%). Adjusted multinomial logistic regression demonstrated that lower dark green leafy and orange vegetables intake was associated with excessive rate of gestational weight gain (OR= 0.012, p=0.036).

Conclusion: Findings highlighted that consuming sufficient vegetables during pregnancy is important for an optimal gestational weight gain. Study findings also emphasized the need for nutritional interventions for Malaysian pregnant women to improve their diet quality, which can have implications on maternal and infant health outcomes.

RAPID ORAL PRESENTATION 1
Nutrition and Dietetics

Abstract 2

**The Relationship Between Sleep Duration and Nutrition Status of Students of SMAN 22
Surabaya During the Pandemic**

Reza Farhana Zuhar, Trias Mahmudiono

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Jawa Timur, Indonesia*

Introduction: During the Covid 19 pandemic all activities outside the room were stopped and resulted in teaching and learning activities at school being eliminated and replaced with online activities. These online school activities prevent students from visiting school and doing learning activities at home, and resulting in lifestyle changes such as daily activities, frequency of meals and sleep duration. Adolescents during pandemic times tend to experience sleep problems due to their limited space and the large number of school assignments they receive during online activities. Stress due to lack of outdoor activities and excessive use of social media during the pandemic has also caused teenagers to reduce their sleep duration at night.

Purpose: The purpose of this study was to determine the relationship between sleep duration and nutritional status in adolescents at SMAN Surabaya.

Methods: This research was an analytical observational study in the city of Surabaya with a sample of adolescents aged 15-17 years student at SMAN 22 Surabaya with changing hours of sleep during the pandemic. The sample size of this study was 170 students. Measurements were made of the respondents' nutritional status, anthropometry, and sleep duration.

Results: The bivariate results showed that 24 or 45.2% of non-obese respondents experienced short sleep duration and 29 or 54.7% of obese respondents experienced short sleep duration. 29 respondents or 50% non-obese and 29 respondents or 50% obese have enough sleep. Then 5 or 41.7% of non-obese respondents and 7 or 58.3% of obese respondents got excess sleep time. The results of the statistical analysis of this study indicate that there is a significance in the chi-square trial, the p-value is $0.003 > 0.05$ (alpha).

Conclusion: There is a significant relationship between sleep duration and the nutritional status of respondents during the pandemic.

RAPID ORAL PRESENTATION 1
Nutrition and Dietetics

Abstract 3

Eating Jet-Laggers: An Insight into Their Chrononutrition Profile and Weight Status

Satvinder Kaur, Tang Shu Ying, Ng Choon Ming

Faculty of Applied Sciences, UCSI University, Kuala Lumpur, Malaysia

Introduction: The aspect of 'when' we eat is closely related to health and metabolic outcomes, irrespective of dietary intake ('what' we eat). Particularly, the concept of eating jet-lag is proposed as the variability of meal timing on weekday versus weekend.

Purpose: This current study aimed to determine the chrononutrition profile and weight status of eating jet-laggers, as a public health measure to explore the role of meal timing differences.

Methods: An online cross-sectional survey was conducted among Malaysian Chinese adults aged 18-25 years. Sociodemographic data and weight status were collected. Chrononutrition profile (breakfast frequency, eating duration, night eating, largest meal of the day) and eating jet-lags (difference in eating midpoint on weekday versus weekend) were assessed using the Chrononutrition Profile-Questionnaire.

Results: In total, 175 adults (75.4% female) aged 22.9 ± 1.9 years participated. Approximately half of the participants had normal BMI ($n=93$, 53%), and more than a quarter ($n=67$, 38.3%) were eating jet-laggers/had delay in meal timing on weekend as opposed to weekday. Adjusted multiple linear regression demonstrated that those with lower breakfast frequency (β : -0.21, 95% CI: -0.181, -0.020) and longer eating duration (β : 0.28, 95% CI: 0.069, 0.249) had later meals on weekends as compared to weekdays. Evening (β : 0.45, 95% CI: 0.352, 1.905) and intermediate (β : 0.47, 95% CI: 0.427, 1.781) chronotypes also had later meals on weekends, as compared to a morning person. In addition, females (β : 0.25, 95% CI: 0.207, 1.020) and adults with higher BMI (β : 0.16, 95% CI: 0.001, 0.109) tend to have later meals on weekends.

Conclusion: Findings showed that eating jet-laggers tend to have suboptimal BMI and chrononutrition profile. Regularity of meal timing on weekdays and weekends can be an important aspect for health professionals to consider for health promotion, particularly relating to an optimal weight status and chrononutrition profile.

RAPID ORAL PRESENTATION 1
Nutrition and Dietetics

Abstract 4

The Impact of Nutrition Education Intervention on Knowledge, Attitude and Practice of Anaemia Prevention Among Adolescents in Nabire and Sumbawa Indonesia

Nur Indah Fitriana Ibrahim, **Farida Dwi Rokhmah**, Muayanah Hardiah, Hasna Hasriyah, Febiani Riskika, Anada Varenza Kisda, Lilik Kustiyah, Clara Melyanti Kusharto, Sri Anna Marliyati

Departement of Community Nutrition, Faculty of Human Ecology, Bogor Agricultural University, Indonesia

Introduction: Anemia is a condition in which Hemoglobin (Hb) level in the blood is less than 12 g/dl. Based on Basic Health Research 2018 in Indonesia, the proportion of anemia in girls and boys were 27.2% and 20.3% respectively.

Purpose: The aim of this research was to analyze the impact of nutrition education intervention on knowledge, attitude, and practice of anemia prevention (KAP-AP).

Methods: The study was conducted at SMP Negeri 4 Nabire and Pondok Pesantren Dea Malela Sumbawa Nusa Tenggara Barat. A total number of 49 students aged 13 to 18 were selected using purposive sampling by considering the willingness to follow activity as active respondents. Research design in this study was a Quasi-experimental one group study with pre-post test held in March to April 2021 in six steps (communicative talk, question and answer session, quizzes, leaflet and challenge by offline and online classes as a part of nutrition education intervention).

Results: Mean value of nutrition knowledge in baseline test was 43.97 ± 8.65 and pre-test (session 1-4) was 50.46 ± 9.01 and showed increased in end line with mean value 66.63 ± 13.59 and post-test (session 1-4) 73.45 ± 9.57 . Paired sample t test showed a significant difference ($p=0.000$; $p<0.05$) based on knowledge score at baseline and end line. Result of Wilcoxon test also gave the same output which was a significant difference ($p=0.000$; $p<0.05$) between pre-post test in knowledge score, as well as in attitude and practice between baseline and end line test ($p=0.000$; $p<0.05$). Energy and Iron adequacy level also had a significant difference ($p<0.05$) between baseline and end line.

Conclusion: Therefore, it can be concluded that after the intervention, there was an increment of knowledge, attitude and practice of anemia prevention (KAP-AP) score as compared to before intervention.

RAPID ORAL PRESENTATION 1
Nutrition and Dietetics

Abstract 5

Chrono-Nutrition: Diverging The Metabolically Healthy Obesity

Fatin Hanani Mazri¹, Zahara Abdul Manaf¹, Suzana Shahar¹, Arimi Fitri Mat Ludin², Norwahidah Abdul Karim³

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Introduction: The discrepancy in sleep-wake timing between work and free days as well as irregularity in temporal pattern of eating might cause circadian misalignment.

Purpose: To determine the association between social jetlag and meal timing and its composition with obesity metabolic health status in non-shift workers.

Methods: This study was conducted among 299 overweight and obese workers [Age: 40.3±6.9y; 73.6% women; BMI: 31.7±5.0 kg/m²] in Klang Valley area. They were classified in two obesity metabolic status: metabolically healthy obesity (MHO): BMI≥25kg/m² and less than three metabolic syndrome criteria (n=185); and metabolically unhealthy obesity (MUO): BMI≥25kg/m² and three or more of metabolic syndrome criteria (n=114). The social jetlag was measured by using Modified Munich Chronotype Questionnaire (MCTQ). The glycaemic and cardiometabolic profiles were determined from fasting blood samples collected and the dietary habit was obtained from diet history questionnaire.

Results: There was no significant difference in sleep duration and social jetlag between MHO and MUO. Although MUO had earlier last meal time [20:43 vs 20:19, p=0.035], but they also had greater total energy intake [1918 vs 1808kcal, p=0.037] and also energy [768 vs 663kcal, p=0.002], carbohydrate [95.4 vs 80.8g, p=0.002] and fat [30.4 vs 26.3g, p=0.010] intake in the late eating window than MHO. The energy and carbohydrate intake during late eating window at 75th and 100th percentile increased risk of developing the MUO phenotype by more than two-fold.

Conclusion: Aligning meal composition and its timing with biological circadian rhythm could improve metabolic complications among overweight and obese individual. This study suggests integrating the chrono-nutrition approach as adjunct strategies in weight management.

RAPID ORAL PRESENTATION 1
Nutrition and Dietetics

Abstract 6

Effects of Nutrition Education Related to Hypertension and Indonesian Balanced Nutrition in Preventing Adult Hypertension

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Purpose: This study aims to analyze the effect of a nutrition education intervention in knowledge, attitude, and practice (KAP) related to hypertension and Indonesian balanced nutrition of adults subject to prevent hypertension.

Methods: The study used a quasi-experimental design with one group pre-post involved 48 subjects selected purposively. The intervention was done four times, one hour once a week for each, from March to April 2021 by an online-based intervention using media PowerPoint slide and video where subjects located in 11 out of 34 provinces in Indonesia: North Sumatera Province, Riau Island, Jambi, Bengkulu, Lampung, South Sumatera, West Java, Jakarta, Central Java, East Java, and West Nusa Tenggara Province. A self-administered KAP questionnaire was conducted 3 times: before (pre-test) and after the intervention (1st post-test and 2nd post-test). Improvement in knowledge, attitude, and practice was analyzed using difference tests (Paired t-test and Wilcoxon test) before and after the intervention.

Results: There were significant increments ($p < 0.001$) in the subject's scores of knowledge, attitude, and practice related to hypertension and balanced nutrition after the intervention both at post-test 1 and post-test 2 (10 days after 1st post-test). The percentage of the subject categorized as good knowledge ($\geq 80\%$ right) was 4.2% at pre-intervention and increased to 68.8% at post-test 1 and 75% at post-test 2. The percentage of subjects categorized as good attitude ($\geq 80\%$ right) was 18.8% at pre-intervention and increased to 45.8% at post-test 1 and 50% at post-test 2. The percentage of subjects categorized as good practice ($\geq 80\%$ right) was 0% at pre-intervention and increased to 10.4% both at post-test 1 and post-test 2.

Conclusion: Online-based nutrition education could improve knowledge, attitude, and practice related to hypertension and balanced nutrition and become one of the potential strategies to prevent adult hypertension in Indonesia.

RAPID ORAL PRESENTATION 1
Nutrition and Dietetics

Abstract 7

Knowledge, Attitude and Practice Towards Salt Intake Among Street Food Consumers in Klang Valley

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Introduction: Malaysians are exposed to high salt diet in which is one of the contributors to the prevalence of hypertension among them. Improving the knowledge, attitude and practice (KAP) towards salt intake is important in the control of blood pressure, as salt intake control is a cost-effective way to reduce blood pressure. On the other hand, street food has been existing for years and became one of the preferred food choices among the citizens. Additionally, it is well known that salt added in food could influence an individual's blood pressure.

Purpose: This study aimed to determine the KAP towards salt intake among street food consumers in Klang Valley.

Methods: Cross-sectional study was carried out using a validated KAP questionnaire in which consisted of salt intake related multiple choice questions for each domain of KAP. For every question, every option has designated points, in which the best answer serves the highest point for every question. The participants obtained score for each respective domain were compared to the full score of every domain. To indicate the average level of K, A, P and the overall awareness (KAP), the total score of every domain and KAP were then referred to a KAP test score classification. The KAP questionnaire was disseminated to the subjects through online. The collected data were analysed using the IBM SPSS® Statistics software version 25.0.

Results: A total of 276 subjects consisted of Malaysian adults were involved with the study. The study reported that on average, the subjects had a moderate level of knowledge ($67.86 \pm 11.44\%$), positive attitude with an average score of $79.98 \pm 10.55\%$ and an inadequate practice ($48.98 \pm 12.54\%$) towards salt intake. As for the overall awareness, the subjects had an average score of ($65.16 \pm 8.29\%$) in which indicated that the street food consumers studied had a moderate level of awareness towards salt intake.

Conclusion: The overall awareness (KAP) towards salt intake among street food consumers in Klang Valley was on moderate level, in which there were moderate level of knowledge, positive attitude and inadequate practice towards salt intake. To complement current study, future study on the salt intake and blood pressure level could be conducted in order to observe whether the K, A, P and overall awareness reflect the salt intake and blood pressure level among adults in Malaysia.

RAPID ORAL PRESENTATION 1
Nutrition and Dietetics

Abstract 8

Mindful Eating and Its Relationship with Adiposity Trait, Dietary Intake, and Night Eating Syndrome

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Purpose: Our study aims to investigate the relationship between mindful eating and adiposity traits (BMI, body fat and waist circumference), dietary intake and night eating syndrome (NES) among overweight and obese employees of a selected public institution.

Methods: A total of 235 overweight and obese employees (age: 41.0 ± 7.6 years; 73.2% women; BMI: 31.9 ± 5.5 kg/m²) were recruited in a cross-sectional study. Mindful Eating Questionnaire (MEQ) the 7-days Diet History Questionnaire (DHQ) and Night Eating Questionnaire (NEQ) were used to assess mindful eating behaviour, dietary intake, and NES, respectively. Participants' BMI, body fat percentage and waist circumference were measured. Partial correlation was used to examine the relationship between MEQ scores and its domains with anthropometric parameters and dietary aspects controlling for gender, marital status, and household income. To examine the predictive value of the MEQ domains on adiposity measures, multiple linear regression was utilized.

Results: The mean MEQ score was 2.7 ± 0.2 . Among the five domains of the MEQ, distraction has the highest mean score (3.2 ± 0.5). The MEQ score, distraction, disinhibition, and emotional response domains were found to be negatively correlated with BMI ($p < 0.05$). Significant negative correlations were also observed between the disinhibition domain and body fat percentage, and waist circumference ($r = -0.198$, $p = 0.004$, and $r = -0.197$, $p = 0.004$ respectively). In addition, there was a significant negative correlation between the MEQ score and night eating syndrome ($r = -0.282$, $p < 0.001$). The regression model indicates that two out of five domains of the MEQ are significant predictors of BMI, waist circumference and night eating syndrome ($p = 0.001$).

Conclusion: Our study suggests for incorporating mindful eating practice in facilitating positive dietary behaviour and weight loss in weight loss intervention.

RAPID ORAL PRESENTATION 1
Nutrition and Dietetics

Abstract 9

The Relationship of Nutritional Adequacy Figures to the Nutritional Status of Students of SMA Negeri 10 Surabaya During the Pandemic

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Introduction: Nutritional adequacy figures are the amount of nutrients obtained by the body to maintain a person's nutritional status adequately. During the pandemic, the fulfillment of nutritional needs becomes more difficult. Due to the movement restrictions imposed. Consequently, teenagers also prefer to meet their needs online, such as ordering foods and beverages daily.

Purpose: This study analyzed the relationship between nutritional adequacy figures and the nutritional status of high school students during the pandemic.

Methods: This was an analytical observational study conducted at SMA Negeri 10 Surabaya, with a total of 202 students aged between 15 and 17 years. Measurements of respondents' nutritional status, anthropometry, physical activity, nutritional intake, and nutritional adequacy figures obtained through the Harris Benedict formula adjusted to the physical activity and gender of each respondent. The hypothesis was analyzed statistically using the chi-square test.

Results: The results of the nutritional status revealed that 51 students had mild deficits, 43 students had moderate deficits, 26 had severe deficits, and 24 students did not experience any deficit in nutritional adequacy. Among obese students, 33 students had no deficit, 15 students had mild deficits, 9 students had moderate deficits, and one student had a severe deficit. There was a significant relationship between the nutritional status and nutritional adequacy figures of students with $p\text{-value} < 0.001$.

Conclusion: There is a significant relationship between nutritional adequacy and the nutritional status of respondents during the pandemic.

RAPID ORAL PRESENTATION 1
Nutrition and Dietetics

Abstract 10

Effect of Nutritional Intervention on Growth Parameters Among Children and Adolescents with Inborn Error Metabolism (IEM): A Scoping Review

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Purpose: Proper dietary intervention is crucial for IEM patients to allow normal growth and development. This scoping review aims to identify the nutritional intervention in managing IEM and to determine the efficacy of nutritional intervention on growth parameters among children and adolescents with IEM.

Methods: The protocol used in this study was drafted by using the PRISMA-ScR. Relevant articles published from 2001 to 2021 were searched from bibliographic electronic databases which include PubMed, ScienceDirect (Elsevier), EBSCOhost and Cochrane Central Register of Controlled Trials (CENTRAL) and also the *Journal of Inherited Metabolic Disorders* (JIMD).

Results: Ten studies were identified at the end of literature search. All the study participants aged between 0-18-year-old. Out of 10 studies, 8 of them were prospective study while 2 of them were randomized controlled trial (RCT). 4 types of IEM which are phenylketonuria (n=3), glutaric aciduria type 1 (n=3), urea cycle disorders (n=2), methylmalonic and propionic acidaemia (n=2) were included in this review. Five categories of nutritional strategies were identified from this review: medical food (n=3), supplementation of “conditionally essential” nutrient (n=1), special low protein food (n=1), a combination of amino acid supplements, age-adjusted amino acid prescriptions and supplementation of “conditionally essential” nutrient (n=3) and protein substitute with modified composition compared to conventional protein substitute (n=2). Overall, 6 out of 10 studies reported increment in weight and height and revealed age- appropriate long-term growth development. The 2 studies used “protein substitute with modified composition compared to conventional protein substitute” did not show significant weight changes neither weight loss compared to control group indicating a modified composition is acceptable as an alternative in dietary therapy.

Conclusion: Nutritional strategies demonstrated a positive impact on the growth development of children with IEM. Hence, it is recommended to implement age-appropriate nutritional therapy for all children with IEM. More longitudinal prospective study and RCT should be conducted in the future to identify more nutritional strategies and their effects on IEM patients.

RAPID ORAL PRESENTATION 2
Nutrition, Physical and Function

Abstract 1

**Assessment of Body Composition Among Community-Dwelling Older Adults in Kuala Lumpur:
Preliminary Findings from AGELESS Trial Study**

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Introduction: Body composition has been associated with diseases and mortality in the elderly. It has also been emerged as a potential modifiable risk factor for cognitive impairment and frailty.

Purpose: The aim of this study was to assess the body composition profile among community-dwelling older adults in Kuala Lumpur, in the screening phase of multidomain intervention study among cognitive frailty older adults in Malaysia (AGELESS TRIAL).

Methods: A total of 155 older adults aged 60 years and older were recruited using purposive sampling in Kuala Lumpur. Participants were interviewed to obtain information on socio-demographic and health status. Body compositions were measured using the Body Impedance Analyzer (InBody 270) including percentage body fat, body fat mass, fat-free mass and skeletal muscle mass. Data analyses (independent *t*-test, chi-square test, fisher's exact test and one way ANOVA test) were performed using SPSS Statistics for Windows, version 21.0.

Results: Results showed that the mean age of the subjects was 68.3 ± 5.3 years old. The majority of the subjects were Malay (71.0%), women (58.7%) and married (65.2%). With respect to health status, 52.9% of the subjects had hypercholesterolemia. Nearly half of the subjects were overweight (41.3%), followed by normal (36.8%), obese (20.6%) and underweight (1.3%). This study found that women had higher body mass index (BMI), body fat mass and percentage body fat as compared with men ($p < 0.001$). On the other hand, men had higher fat-free mass and skeletal muscle mass compared with women ($p < 0.001$).

Conclusion: In conclusion, this study found that there is a sex-dependent patent variation in body composition parameters such as BMI, percentage body fat, body fat mass, fat-free mass and skeletal muscle mass. These findings can be used as reference for future intervention study to reverse cognitive frailty among older adults.

RAPID ORAL PRESENTATION 2
Nutrition, Physical and Function

Abstract 2

Effectiveness and Sustainability of Diabetes Specific Meal Replacement on Obese and Overweight T2DM Patients: A Study Protocol

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Introduction: Obesity is one of the biggest ongoing health concerns globally. Among South East Asia countries, Malaysia has the highest prevalence of obesity among adults. Obesity is closely linked to Type-2 Diabetes Mellitus (T2DM). In fact, obesity itself causes insulin resistance. Weight loss is recommended to improve fasting plasma glucose profile and HbA1c levels. Meal replacement is widely used in diabetes management program and weight loss programs due to its better compliance and easier handling. However, there are still limitations faced by some of the existing meal replacement formulations such as risks for side effects or nutrient deficiencies. There is also lack of studies on utilizing meal replacement among obese T2DM patients in Malaysia as well as lack of studies on long term sustainability of meal replacements after stopping the intervention. Hence, in this study, we are going to evaluate the effectiveness and sustainability of a diabetes specific meal replacement in weight reduction and glycaemic parameters controls of overweight and obese patients with T2DM compared to normal dietary consultation.

Purpose: To determine the effect of 3-month Metabolic Sauver meal replacement formulation and its long-term sustainability among obese or overweight T2DM patients.

Methods: The study design is a prospective, randomized, controlled clinical trial. 156 participants will be randomized equally into intervention and control group. At baseline, both groups will receive diet consultation and education from a qualified dietician. On top of that, intervention group will receive a meal replacement to replace one meal daily for 5 days a week. Duration of intervention will be 12 weeks. On the 12th week, all participants will be instructed to come back to the clinic for data collection. A further follow up will be done after six months to monitor the sustainability of the meal replacement. Primary endpoint of this study will be body weight and HbA1c reduction.

Expected Results: Participants will be expected to achieve clinically significant 5% weight loss and 0.5% HbA1c reduction from baseline levels. The observed changes from the 12-weeks' meal replacement intervention can be sustained.

RAPID ORAL PRESENTATION 2
Nutrition, Physical and Function

Abstract 3

Relationship between the Functional Reach and Lateral Reach Tests in Elders

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Introduction: Control of postural standing balance is the requirement for reaching and handling objects tasks, especially when performed by the elderly. Reaching tasks in daily living activities can be in multi-directions as well as fall in the elderly can occur not only in forward direction but also in lateral directions.

Purpose: This study aimed to examine the correlation of static standing balance ability tests between the Functional Reach Test (FRT), Right Lateral Reach Test (RLRT) and Left Lateral Reach Test (LLRT) in the elderly who were over sixty years of age.

Methods: Eighty-seven elderly persons participated and were divided into two groups: 46 persons (mean age 68.65±5.90 years) had a history of falls in the past year (falling) and 41 persons (mean age 62.02±4.42 years) had no history of falls (non-falling). All participants were tested for their footedness, then performed standing balance abilities in sequence of FRT, RLRT and LLRT.

Results: The FRT and RLRT distances had no significant correlation in both groups ($p < 0.05$). The RLRT and LLRT distances had moderate correlation in both falling and non-falling groups ($r = 0.543$, $p < 0.05$ and $r = 0.480$, $p < 0.05$ respectively) and the FRT and LLRT distances had low correlation in non-falling group ($r = 0.313$, $p < 0.05$). The FRT, RLRT and LLRT distances were significant lower in the falling group than those in the non-falling group ($p < 0.05$). Comparison between footedness and reaching tasks revealed no significant differences except that the elders in the non-falling group who had right footedness had significant longer distances in RLRT than in LLRT ($n = 18$).

Conclusions: This study suggests that examination of standing balance activity should be performed in multiple directions. The lack of correlation between forward and lateral reach found in this study may explain different requirements of postural control in multiple directions.

RAPID ORAL PRESENTATION 2
Nutrition, Physical and Function

Abstract 4

Readiness of Technology Usage Among Community-Dwelling Older Adults in Kuala Lumpur: A Preliminary Study

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Introduction: The use of technology among older adults is important to age in place. However, the levels of technology readiness among older adults is mixed depending on many internal and external factors. There is limited information regarding the readiness of technology use in Malaysian community-dwelling older adults.

Purpose: The aim of this preliminary study was to determine the readiness of technology usage among community-dwelling older adults by evaluating the presence of digital technology and Internet access as well as their intention to use it.

Methods: This study is part of the Ageless trial screening phase for developing telerehabilitation for a multi-domain intervention for older adults with cognitive frailty. A questionnaire that included evaluation of the presence of digital technology, internet access and older adults' intention to use it in their daily life was administered. Purposive sampling was used to include participants with different sociodemographic information and technology usage. The data was analysed descriptively.

Results: At this preliminary stage, 170 older adults (68.46 year old \pm 5.699) living in Kuala Lumpur city participated. Majority of participants were females (60.6%), from Malay ethnic group (71.2%), married (60.6%), attained secondary education level (48.2%) and retired (47.1%). Almost 80% of the participants were able to access internet at their homes using smartphones (80.6%), followed by computers or laptops (13.5%) and tablets (10.0%). However, only half of participants agreed that internet could enhance their quality of life. Digital technology used was mainly for communication with their family members and reading online news. Higher usage of digital technology is significantly associated to females ($p < 0.002$), higher secondary education level ($p < 0.003$) and retired ($p < 0.003$).

Conclusions: Our preliminary results suggest that most older adults have adopted digital technology, although for limited use which consist of mainly communication with family and accessing current news via online. Promotion and training of the use of digital technology for other purposes such as health literacy, e health and telerehabilitation especially among females, higher secondary education level and retired may be beneficial among Malaysian community dwelling.

RAPID ORAL PRESENTATION 2
Nutrition, Physical and Function

Abstract 5

Multimorbidity Among Robust and Cognitive Frailty Groups Within Community Dwelling Older Persons

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Purpose: It is important to identify multimorbidity amongst older persons as it increases the risk of poor health outcomes including disability, cognitive decline, and mortality. Cognitive frailty is a non-communicable geriatric syndrome defined by the simultaneous presence of both physical frailty and cognitive impairment. The objective of this study was to investigate the prevalence of multimorbidity among robust and cognitive frailty groups within community dwelling older adults.

Methods: This cross-sectional study was conducted as a sub-analysis of the ongoing “WE-RISE” randomized control trial. A total of 255 Malaysian, community dwelling, older persons aged 60 years and above (mean age of 68.6±5.7 years), who are members of the Activity Center for Older Persons (PAWE) within the Klang Valley were included in this study. Participants were screened for cognitive frailty using the Clinical Dementia Rating Scale and Fried Frailty Index and then categorised as robust, cognitive pre-frailty, and cognitive frailty. Sociodemographic and clinical characteristics were obtained via interview-based questionnaires. Multimorbidity was categorized based on the presence of two or more chronic conditions. Data was analysed descriptively, with One-way ANOVA and chi-squared test.

Results: The prevalence of multimorbidity among members of PAWE residing within the Klang Valley was 71%. When stratified by cognitive frailty groups, multimorbidity was most prevalent amongst robust older persons (63%), followed by those with cognitive frailty (19%) and cognitive pre-frailty (18.2%). Contrarily, older persons with cognitive frailty were found to have a significantly higher number of chronic diseases (3.1±1.9 diseases) followed by those who were robust (2.5±1.7 diseases) and cognitive pre-frailty (2.2±1.6 diseases) (p<0.001). This could potentially imply that older adults with cognitive frailty are more susceptible to multiple chronic diseases or vice versa.

Conclusion: Multimorbidity is highly prevalent among Malaysian community dwelling older persons. The presence of multimorbidity may be independent of cognitive frailty status. However, the occurrence of a higher number of chronic diseases and cognitive frailty could lead to debilitating health outcomes among older persons. This highlights the importance of screening for cognitive frailty status and multimorbidity within the community to promote healthy ageing and prevention of non-communicable disease.

RAPID ORAL PRESENTATION 2
Nutrition, Physical and Function

Abstract 6

**The Impact of Premarital Nutrition Education on Knowledge, Attitude, and Practice in
Childbearing Age During a Pandemic Covid-19**

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Introduction: The maternal mortality rate (MMR) 2019 in Indonesia was high, which was 4.221 per 100.000 life births. The most common causes of maternal death are anemia as one of the high percentage cases of non-communicable disease in Indonesia (48.9%), and chronic malnutrition.

Purpose: This research aimed to analyse the impact of nutrition education on knowledge, attitudes, and practice in childbearing age related to premarital nutrition during pandemic COVID-19.

Methods: This study was a quasi-experimental design with one group pre-post-test held from March to April 2021. The total subject was 88 women and men aged 17 to 35 years old from 11 out of 34 provinces in Indonesia. A self-administered Knowledge, Attitude, and Practices questionnaire and dietary records were completed before and after the intervention. Subjects received intervention in four online sessions using zoom meeting. Nutrient intakes were calculated using Nutrisurvey 2004, and the differences in Knowledge, Attitude, and Practices before and after the intervention was analysed using Paired t-test and Wilcoxon test.

Results: 88 subjects participated in the intervention i.e., 28.4% male and 71,6% female. The nutritional status of most respondents categorized as normal (72.7%). There was a significant difference ($p < 0.05$; $r = 0.467$) between knowledge, attitudes, and practices in subjects before and after the intervention. 11.3% of subjects have good knowledge and increased to 67%, 73% support attitudes and increased to 87%, 83% showed good practices after the intervention. There was a correlation between knowledge and attitudes before intervention ($p < 0.05$). There was a significant difference ($p < 0.05$) between the adequacy level of protein, iron, and vitamin C before and after the intervention.

Conclusion: The study concluded that online nutrition education could be a solution for implementing premarital nutrition education during the pandemic COVID-19. Further studies are needed to determine factors affecting awareness of childbearing age people in premarital nutrition education.

RAPID ORAL PRESENTATION 2
Nutrition, Physical and Function

Abstract 7

Dietary Risk Factors and Odds of Colorectal Adenoma in Malaysia: A Case Control Study

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Purpose: Current evidence suggests that dietary and lifestyle factors may play an important role in colorectal cancer risk but there are only a few studies that investigated their relationship with colorectal adenomas (CRA), the precursors for colorectal cancer. A case-control study was conducted to determine the relationship between dietary and lifestyle factors associated with CRA risk.

Methods: The questionnaires were used to obtain information on diet and physical activity using dietary history questionnaire (DHQ) and International Physical Activity Questionnaire- Short Form (IPAQ), involving a sample of 125 subjects with CRA and 150 subjects without CRA at Hospital Canselor Tuanku Muhriz UKM (HCTM), Malaysia.

Results: The findings of this study revealed that male gender [OR=2.71 (95% CI= 1.01-7.27)], smoking [OR=6.39 (95% CI= 1.04-39.30)], family history of cancer [OR=6.39 (95% CI= 1.04-39.30)], high body fat percentage [OR=1.25 (95% CI= 1.04-1.51)], high calorie and fat intake [OR=1.03 (95% CI= 1.01-1.06)], [OR=1.01 (95% CI= 0.95-1.09)] and red meat intake more than 100 g per day [OR=1.02 (95% CI= 1.01-1.04)] increased CRA risk. Working status [OR=0.05 (95% CI= 0.01-0.31)], high fibre intake and calcium intake decreased CRA risk with [OR=0.78 (95% CI= 0.64-0.95)] and [OR=0.78 (95% CI= 0.98-1.00)].

Conclusion: Risk factors which include gender, body fat percentage, smoking, family history of cancer, red meat intake, high fat, high energy, low fibre and inadequate calcium have significant association with risk of colorectal adenoma in the Malaysian population. The results of this study will help to inform the design of healthy lifestyle promotions which are necessary to reduce the risk of colorectal adenoma.

RAPID ORAL PRESENTATION 2
Nutrition, Physical and Function

Abstract 8

Effect of Nutrition Education on Knowledge, Attitude and Practice of Emerging Adults Related to Health and Nutrition During Covid-19 Pandemic Study

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Introduction: The Covid-19 pandemic affects eating habits and lifestyles that could negatively impact health and nutritional problems.

Purpose: This study aimed to analyse the effects of nutrition education interventions on knowledge, attitude, and practice (KAP) of health and nutrition-related to the Covid-19 pandemic.

Methods: The study applied a one-group pre-post test design which involved 54 emerging adults aged 19-29 years. Participants were recruited online from 10 provinces (Lampung, Bengkulu, Banten, West Java, Jakarta, Central Java, Yogyakarta, East Java, South Sulawesi, Bali) to answer a set of a questionnaire consisting of KAP before and after four nutrition education classes via Zoom. Data on food intake and vitamins was collected using a food record. Data on physical activity, changes in diet, breakfast habits, sun exposure, hand washing habits, screen time, health protocols, and smoking during the Covid-19 pandemic obtained using a structured questionnaire.

Results: The study showed that 9.3% of subjects were overweight, and 13% were obese. There was no significant difference between the baseline and endline nutritional status of the subjects. There were significant differences between the baseline and endline in KAP related to health and nutrition during the Covid-19 pandemic ($p < 0.05$). There was a significant difference between the baseline and the endline individual dietary diversity score ($p < 0.05$), but not with the energy and the other nutrients intake and the level of nutrients adequacy.

Conclusion: This study concludes that nutrition education significantly affects increasing knowledge, attitude, and practice related to nutrition and health during a Covid-19 pandemic.

RAPID ORAL PRESENTATION 2
Nutrition, Physical and Function

Abstract 9

Comparison of Clinical and Physical Statuses in Older Adults with and Without Falls

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Purpose: Number of medical chronic health conditions and lower physical performance have been shown to independently influence the risk of falls in older adults. There is limited information regarding this matter among Malaysian older adults. The objective of this analysis was to compare clinical and physical statuses in older adults with and without history of falls.

Methods: Data from an ongoing falls prevention study in Kuching, Sarawak was analysed. Participants' self-reported clinical statuses that included medical chronic health conditions including diabetes, hypertension, asthma, stroke, dyslipidemia, arthritis. Older adults with history of at least one or more falls in the past 12 months was considered as those with history of falls. Timed up and go (TUG), five times sit to stand (5STS) and dominant hand grip (HGS) tests were performed. Comparison of clinical and physical statuses in the group with and without falls was performed using an independent samples T- test.

Results: A total of 62 participants' data (mean age 66.7±5.6 years) were included in the analysis. Approximately 39% (n= 24) of the participants had a history of falls. Number of chronic health diseases was shown to be significantly (p<.0001) higher in participants with a history of falls compared to those without history of a fall. In addition, older adults with a history of falls took longer to complete TUG test (p<0.001), 5STS test (p<0.001), had lower handgrip strength (p<0.05) and took higher number of medications (p< 0.05) in comparison to their peers without history of falls.

Conclusion: Management of medical chronic health conditions, number of medications, balance, mobility, and muscle strength are important in falls prevention strategy among older adults.

RAPID ORAL PRESENTATION 2
Nutrition, Physical and Function

Abstract 10

Health Literacy of Community Dwelling Older Adult in Malaysia: Preliminary Findings

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Introduction: Health literacy plays a vital role in health seeking behavior. It is defined as the ability of an individual to seek, understand and use the information to make health related decision in their life. Low health literacy is most prevalence among older adults. Studies have shown associations between limited literacy with poorer health-related knowledge, behavior and higher mortality rates. It is also likely to be a determining factor for older adult to make lifestyle changes as well to take preventive measures against non-communicable diseases.

Purpose: The objective of this study is to determine the level of health literacy among community dwelling older adult in Kuala Lumpur.

Methods: This study employed a cross sectional design and was conducted in several region in Kuala Lumpur (Keramat, Bandar Baru Sentul, Jelatek and Setapak). Citizen aged 60 years and above who are able to understand Malay and English language were selected through purposive sampling. 165 participant completed the questionnaire and were included in the analysis. Health Literacy questionnaire HLS-M-18 were used in this study. The health literacy index score was categorized into four levels and later grouped into low (limited & problematic) and high (sufficient and excellent) health literacy. Data analysis was conducted descriptively, and T-test used for comparison between gender.

Results: The mean age of participant was 68.50 years old (S.D 0.43) and more than half were female. The mean HLS-M-Q18 Index Score was 36.64 (S.D 11.11). There was no significant mean difference in the health literacy score between male and female participant. Most participants had inadequate and problematic health literacy with 12.1% and 41.8% respectively. Overall, the prevalence of low health literacy was 53.9% and high health literacy, 46.1%.

Conclusion: Our preliminary finding shows more than half of our participants had a low health literacy. This finding could be a determining factor to make lifestyle changes among them. As existing evidence on health literacy among older adult in Malaysia is very limited, this factor needs to be taken into consideration while designing a health programs or specific intervention to ensure higher rate of adherence and effectiveness.

RAPID ORAL PRESENTATION 3
Psychosocial and New Laboratory Discoveries

Abstract 1

Physical Function Recovery Among Stroke Patients: The Identification of the Psychological Variables Predictor

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Purpose: Stroke is a major cause of physical disability. This study identified the influence of psychological variables on physical function recovery (PFR) among stroke patients.

Methods: Focus of this study is to examine the influence of emotional factors (anxiety, depression and posttraumatic stress symptoms) and cognitive factor (illness representation which include identity, timeline, consequences, control, illness coherence and emotional response) on PFR. This longitudinal study with two time lines (six weeks and six months after stroke) was conducted involving 129 participants after being cognitively screened by Addenbrooke's Cognitive Examination Revised (ACER). Illness Perception Questionnaire - Psychometrically Shorten [IPQ-R (PS)], Impact of Event Scale-Revised (IES-R), Hospital Anxiety and Depression Scale (HADS), and Barthel Index (Barthel ADL) were administered through face-to-face interview.

Results: The results demonstrated no significant differences between PFR according to patients' demographic factors. PFR also significantly correlated with component emotional at 6 weeks and 6 months post-stroke. After controlling demographic factors for 1st and 2nd timeline, four cognitive components that are treatment control, consequences, timeline and personal control (6 weeks) and timeline, treatment control, and consequences (6 months) found to be the predictors of PFR. For emotional factors, again after controlling patients' demographic factors, only one emotional factor that is depression predict PFR after 6 months of stroke attack. Regression analysis shows that by controlling factors demographic, cognitive factors contribute 22.8% (6 weeks), 22.9% (6 months) and emotion factor contribute 1.8% (6 weeks), 6.8% (6 months) in predicting PFR.

Conclusion: This study found that cognitive factors are more dominants than emotional in predicting PFR. This study had demonstrated that both emotional and cognitive components could help in post-stroke PFR. The findings of this study have potential to be included as guidelines to design an effective intervention programme which response to psychological needs of stroke patients in enhancing their physical recovery.

RAPID ORAL PRESENTATION 3
Psychosocial and New Laboratory Discoveries

Abstract 2

Reliability and Validity of the Reminiscence Function Scale in Malay Language for Older Adults with Non-Communicable Disease

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Introduction: Reminiscence is a common and natural mental process among older adults. Positive reminiscence has association with successful and healthy aging process. The 43 items with 8 domains of Reminiscence Function Scale (RFS) were developed to understand types of reminiscence a person using and can be an important element in intervention process.

Purpose: This study aimed to adopt and evaluate the reliability and validity of the RFS in Malay language for older adults. In the best of our search, the validation of a Malay language of Reminiscence Function Scale has not been established in Malaysia.

Methods: A cross sectional study was conducted among older adults. A total of 226 older adults living in community (non-institutional living) with age ranged from 60 to 95 years old (mean/sd; 69.23±7.62) were recruited for this study. All participants were requested to answer the questions in Malay language. Majority of participants have non-communicable disease. The RFS was translated into Malay language using the standard guidelines as recommended by the International Test Commission (ITC) and linguistic experts. The internal consistency was determined based on the Cronbach's alpha coefficient and the factor structure was assessed using exploratory factory analysis (EFA) with principal component varimax rotation. The inter-domain correlations were also assessed.

Results: The RFS Malay version has good internal consistency (Cronbach's $\alpha = .98$). Principal component analysis extracted 4 factors for the reminiscence function scale explained 77.27% of the total variance of the scale. The inter-domain correlation coefficients are ranged from 0.78 to 0.94. The newly developed Malay language version of the PWB consist of 39 items.

Conclusion: The RFS in Malay language is a reliable and valid tool to measure the reminiscence function of older adults with non-communicable disease in Malaysia.

RAPID ORAL PRESENTATION 3
Psychosocial and New Laboratory Discoveries

Abstract 3

Effect of Low Dose X-Ray on Leukemic K562 Cells: Cell Viability, Iron Level and Lipid Peroxidation

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Purpose: To investigate effect of low dose X-ray on cell viability, iron level and lipid peroxidation leukemic K562 cell.

Methods: The K562 cancer cells were irradiated to 0, 0.02, 0.05 and 0.1 Gy of X-ray. Cell viability, iron level and lipid peroxidation were determined by resazurin assay, spectrophotometric technique and TBAR assay, respectively.

Results: The percentage of cell viability was significantly decreased in irradiated K562 cancer cells when compared to non-irradiated cells. In contrast, the iron level and lipid peroxidation in irradiated K562 cancer cells were higher than non-irradiated cells.

Conclusion: These findings suggested that low dose X-ray inhibited cell viability in K562 cancer that was associated with iron level change and lipid peroxidation.

RAPID ORAL PRESENTATION 3
Psychosocial and New Laboratory Discoveries

Abstract 4

Sociodemographic, Medical, Lifestyle and Physical Profiles of Older Persons with and Without Cognitive Frailty in Kuala Lumpur: Preliminary Findings

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Introduction: Cognitive frailty (CF) is a term used for the coexistence of physical frailty and cognitive impairment in older persons. Identifying early risk factors of CF are crucial in designing prevention and management strategies for dementia.

Purpose: The aim of this study is to identify differences in sociodemographic profile, medical conditions, lifestyle and physical parameters; and risk factors among older persons with and without cognitive frailty residing in Kuala Lumpur.

Methods: Participants with age of 60 and above were recruited through purposive sampling in areas which is less than 15km distance from UKM Kuala Lumpur, Malaysia and the assessments were conducted with abiding standard operating procedure (SOP), in respect to current COVID-19 pandemic situation. Cognitive frailty was identified based on Clinical Dementia Rating score of 0.5 and Fried's criteria score of more than one. Assessments included sociodemographic data, medical history, lifestyle information and physical activity level via interview; anthropometry measurements, cognitive (Mini Mental State Examination) and physical (hand grip strength and walking speed) tests. Data obtained was analysed using descriptive, independent t-test, Chi Square test and univariable logistic regression.

Results: A total of 155 older persons participated in this study. In terms of classification, 27.7%, 25.8%, 21.9% and 24.5% participants were cognitive frail, mild cognitive impairment, physical frail and robust respectively. Although not significantly different from older persons without cognitive frailty group ($p > 0.05$), majority older persons with cognitive frailty were found to be women (74.4%), older in age (69.98yr), of Malay ethnic (74.4%), single or divorcee marital status (40.5%) and living alone (18.6%). The significant differences were that older adults with cognitive frailty had received only primary education and below ($p < 0.01$, 53.5% vs 18.4%), had lower household income (<RM1500) ($p < 0.05$, 85% vs 60.5%), higher percentage with diabetes ($p < 0.01$, 45.25% vs 13.2%), poor appetite ($p < 0.05$, 20.9% vs 5.3%) and lower physical activity level ($p < 0.001$, score 88.3 vs 148.4). Lower education, having diabetes and low appetite increase risk being CF by almost 5 times (< 0.05). Whereas lower household income increase risk by four times, one-unit increase in body mass index increase the risk by 13% and one-unit increase in physical activity level reduces risk of CF by 2%.

Conclusion: Our study results indicate that prevention and management of diabetes, improving appetite and increasing physical activity level among older persons with more emphasis among women, may be beneficial in reducing the risk of CF. This is especially important among older persons with older age and of Malay ethnic groups, without life partners, lower household income and living alone.

RAPID ORAL PRESENTATION 3
Psychosocial and New Laboratory Discoveries

Abstract 5

Cognitive Status of Community Dwelling Older Adult in Malaysia: Some Preliminary Findings

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Introduction: This article reports preliminary findings from the potential participants screened for two-year period of multidomain intervention among cognitive frail older adult in Malaysia. Specifically, the aim of this study is to determine the cognitive status of Malaysia's community dwelling older adults, alongside the related demographic data and its influence on their cognitive level.

Methods: 164 community dwelling older adults in Kuala Lumpur were screened for their cognitive status using Mini Mental State Examination (MMSE) and Clinical Dementia Rating (CDR) questionnaires. The interview was conducted using both face to face and online interview. Demographic data such as gender, race, educational level, family history of dementia, and comorbidities were also evaluated.

Results: A total of 52.4% and 48.2% of the respondents had mild cognitive impairment according to MMSE and CDR, respectively. Majority of the respondents were female (59.1%), Malay (70.7%), had their education only up to lower secondary school (57.4%), live with their spouse and children or grandchildren (59.8%), and had comorbid disease either hypertension (50.6%) or hyperlipidemia (54.3%). Gender was found to be associated with cognitive status as assessed using CDR. Whilst, level of education has a significant association with cognitive function as assessed using both MMSE and CDR.

Conclusion: Approximately half of the older adults had mild cognitive impairment. Sociodemographic factors, ie. Gender and education level was found to be associated with cognitive status and should be considered in designing and implementing the two-year multidomain intervention to prevent cognitive decline.

RAPID ORAL PRESENTATION 3
Psychosocial and New Laboratory Discoveries

Abstract 6

Effect of 4-hydroxybenzoic Acid and 4-hydroxy-3-methoxybenzoic Acid on Anticancer Activity in Leukemic K562 Cell Line and Its Possibility Mechanism

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Purpose: The objective was to investigate the effect of 4-hydroxybenzoic acid (4-HBA) and 4-hydroxy-3-methoxybenzoic acid (VA) on anticancer activity in the leukemic K562 cell line and its possible mechanism.

Methods: The cell viability was determined by using the resazurin assay. The cellular energetic states (i.e.: mitochondrial activity, mitochondrial membrane potential ($\Delta\Psi_m$), and ATP) were determined at 5, 10, 30, 60, 120, 240 mins after treatment to various concentration (0.01, 0.1, 1, and 10 mM) of HBA or VA.

Results: The results showed that 4-HBA (10 mM) and VA (5 and 10 mM) could inhibit cell viability in K562 cancer cells. 4-HBA and VA significantly decreased the mitochondrial activity, $\Delta\Psi_m$ and ATP in K562 cancer cells at all harvested time points.

Conclusion: Hence, it is concluded that 4-HBA and VA induced cell death in leukemic K562 cell line through cellular energy damage.

RAPID ORAL PRESENTATION 3
Psychosocial and New Laboratory Discoveries

Abstract 7

Healthcare Facility Visits Among Malaysian Community Dwelling Older Adults with Non-Communicable Disease During Covid-19 Pandemic

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Introduction: Globally, hospital visits and admissions have reduced dramatically during the Covid-19 pandemic. However, this information is scarce in older adults with non-communicable disease (NCD) which is one of the leading causes of mortality. The aim of this study was to determine the pattern of healthcare facility visits during the Covid-19 pandemic among community dwelling older adults with NCD in Malaysia.

Methods: This was a cross sectional survey involving 208 community dwelling older adults (mean age: 67.63 ± 5.52) from Kuala Lumpur, Pulau Pinang, Perak and Johor. In order to adhere to the standard operating procedures, two methods of data collection were employed which included via phone calls and face-to-face sessions. Upon receiving consents, sociodemographic data, health status, memory and information pertaining NCD and the number of visits to healthcare facilities were obtained based on World-Wide-Fingers-Sars-Cov-2 Questionnaire.

Results: Majority of the participants were from Kuala Lumpur (52.9%), of Malay ethnicity (83.8%), females (55.1%) and have acquired secondary education and above (68.8%). Mostly, reported that their health condition (95.7%) and memory (90.4%) is the same as before the pandemic. The common NCDs reported among the participants were high cholesterol (29.7%) followed by hypertension (28.0%) and diabetes (23.7%). Almost half of the participants with NCDs reported that visits to healthcare facilities were not needed during the pandemic (50%), while 30.3% consulted healthcare personnel for their condition, and 0.5% cancelled their appointments during the pandemic. Higher number of older adults with higher education level consulted the healthcare personnel (57.3%) as compared to those with lower education level (42.4%) ($p < 0.05$).

Conclusion: There were less visits to healthcare facilities among community dwelling older adults with NCDs, with education levels influencing their health seeking behaviour. Further investigation about the levels of NCD control among older adults with NCD during the Covid-19 pandemic is needed.

RAPID ORAL PRESENTATION 3
Psychosocial and New Laboratory Discoveries

Abstract 8

Effect of Gallic Acid on Pirarubicin Transport Kinetics in Living Leukemic K562 and K562/DOX Cell Lines

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Introduction: Leukemia is the common blood cancer leading to global death. Chemotherapy with the use of Pirarubicin (Pira) is the most preferred treatment so far. The kinetic transport of Pira into the cells contribute to the efficacy of Pira. There are studies shown that gallic acid (GA) can enhance the activities of anticancer agents in various cancer cells. So, hypothesis of this study was that GA could modify the kinetic transport of Pira into the cells.

Purpose: To investigate effect of GA on Pira transport kinetics in living leukemic K562 and K562/Dox cell lines

Methods: Noninvasive functional spectrofluorometric methods were used to analysis the kinetic transport of Pira with absent or present GA (10, 50, 100 and 200 μ M) into the living both K562 and K562/Dox cancer cell lines. To evaluate mean values between each treated group and non-treated control group, the Student's t-test was independently used. P-value of less than 0.05 for statistical significance.

Results: The results showed that GA decreased both the rate of passive uptake of Pira and rate of P-glycoprotein-mediated active efflux of Pira in K562 and K562/Dox cancer cells, respectively. Moreover, the ratio of P-glycoprotein-mediated active efflux coefficient in K562/Dox cells was decreased when concentration of GA increased. In addition, GA increased accumulation of intracellular Pira in K562/Dox cancer cells.

Conclusion: These findings suggested that GA could change the Pira transport kinetics in living K562 and K562/Dox cancer cell lines. Further, the effect of kinetics change on potential of Pira in cancer cells should be investigation.

RAPID ORAL PRESENTATION 3
Psychosocial and New Laboratory Discoveries

Abstract 9

Metabolomic Signatures and Malnutrition Among Children in Asian Landscape: A Scoping Review

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Introduction: The coexistence of over- and under-nourished children has become a major public health concern in Asia. Metabolomics as an emerging technology has good potential to study pathways to childhood malnutrition. The study that characterizes metabolomic signatures in paediatric malnutrition in this region is still limited.

Purpose: This review aims to provide an overview into the applications of metabolomics in Asian paediatric studies and identifying metabolomic signatures for children with undernutrition and overnutrition.

Methods: Using electronic search methods, we identified available papers addressing metabolomic profiles related to malnutrition among Asian children published in English language on PubMed, Web of Science and EBSCO covering from 2010 to December 2020. The search strategy performed using these following components: population (4-12 years old Asian children with malnutrition includes stunted, underweight, overweight, obese); intervention (metabolomics approach (targeted or non-targeted) in assessing malnutrition); comparisons (with/without control group) and outcomes (metabolomic signatures related with malnutrition). Search term of “metabolomic”, “metabonomic”, “metabolome”, “children”, “paediatrics”, “primary school children”, “young children”, “older children”, “malnutrition”, “over-nutrition”, “under-nutrition” and “nutrition disorder” were used for searching purpose.

Results: This paper reviewed seven studies from Asian countries in which four metabolomics studies investigating malnutrition were conducted in China and the other three were from South Korea, Nepal and India, respectively. The findings suggest that amino acid and lipid metabolism were the main affected metabolic pathways in obese and under-nourished children. Results suggest that, among identified metabolites, branched-chain amino acids (BCAAs) and aromatic amino acids (AAAs) were found to be associated with insulin resistance as biomarkers. Additionally, the concentration of BCAAs in plasma were positively correlated with change in BMI-for-age Z-score.

Conclusion: Metabolomics allows use of biospecimens to identify useful biomarkers and pathways involved in malnutrition, allowing greater understanding of the etiology of this serious condition. Application in metabolomics may be useful to predict childhood malnutrition phenotypes providing evidence-based guidelines for future public health intervention.

RAPID ORAL PRESENTATION 3
Psychosocial and New Laboratory Discoveries

Abstract 10

Reviving A Cryopreserved Peripheral Blood Mononuclear Cells - A Scoping Review

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Introduction: Cryopreservation has been documented in many scientific settings. Nevertheless, cryopreservation on peripheral blood mononuclear cells (PBMCs) has not shown a good cell survival in the past research due to its limited lifespan and heterogeneous population (i.e., a mixture of lymphocytes and monocytes) later proven to hamper the sample quality.

Purpose: The present study undertakes a scoping review of research on PBMCs cryopreservation which is well known to determine the extent of available cryopreserve methods, thawing process, possible post-thaw treatments, and the viability outcome after applying both cryopreserve and thawing processes up to date.

Methods: Online databases were used to identify paper published 2010-2021, from which we selected 32 publications from electronic databases which are PubMed, Scopus, and Web of Science (WoS), that used post-thaw viability results as an outcome variable in cryopreserved peripheral blood mononuclear cells (PBMCs) isolated from healthy human donors.

Results: Of a total of 370 articles screened, 32 relevant studies were identified. About twenty-eight (87.5%) studies included the usage of peripheral blood mononuclear cells, followed by whole blood (12.5%), leukocytes (9.3%), and others (28.1%). This review comprised several aspects related to cryopreservation, thawing methods, and post-thaw treatments. The resultant from the applied three processes influenced viability outcome as follows; the post-thaw PBMCs in liquid phase LN₂, viability ranged from 51 - 95.5%. Vapor phase LN₂ in less and more than five years, viability ranged from 60 - 98% and 56.17 - 58.6%, respectively. As for non-LN₂ storage such as -80 °C (7 days to 14 months), -70 °C and -65 °C (7 days) freezers, the viability ranged in between 78 - 94%, >60%, and 49 - 60% respectively.

Conclusion: This review has successfully synthesized a map of existing methods from all included studies and concluded that PBMCs could be viable after cryopreserved using certain growth factors. The potential application can be used mainly in nutrigenomic, or metabolomics targeted to obesity, measuring intervention effectiveness or act as surrogate by doing experiment ex vivo. We intend to refer this review for our next project regarding bioenergetics in gauging the existing weight reduction program. Moreover, we also included advice and considerations regarding cryopreservation and thawing procedures in this review.

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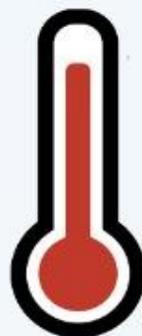


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Penerbitan

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Program Warga Emas Sihat@Komuniti

Tujuan

- memperkasa pelajar Sains Pemakanan dan Dietetik dalam menyampaikan maklumat berkaitan gaya hidup sihat kepada warga emas.

Lokasi

- Putrajaya, Kuala Lumpur, Kajang dan Bandar Baru Bangi

Peserta

- Lebih 100 orang warga emas.

Durasi

- 8 minggu



Harta Intelekt & Anugerah

- UKM.IKB.800-4/1/437 (2011): A Community Based Nutrition and Lifestyle Education Package For Healthy Aging (WE SIHAT)
- UKM.IKB.800-4/1/1474 (2017): WE SIHAT 2.0



Laman sesawang: <http://www.ukm.my/wesihat/>



UTAMA MENGENAI WESIHA T_{2.0} GALERI HUBUNGI KAMI DAFTAR MASUK



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