PERSATUAN PEMAKANAN MALAYSIA
1985
NUTRITION SOCIETY OF MALAYSIA

38th Scientific Conference

From 'sick care' to wellness – Healthy Nutrition is Key

Programme

4 - 5 July 2023

Swiss Garden Hotel Bukit Bintang, Kuala Lumpur

PROVITAL

Chan Fong
Radio DJ

GAIN MORE

IMMUNITY | ENERGY
MUSCLE & BONE STRENGTH

MALAYSIA Health & Wellness BRAND AWARDS 大马保健品牌奖 2022

Yeast Beta-glucan

Selenium | Vitamin C

Triple Immunity Protection*

*Benefits from the 3 nutrients: yeast beta-glucan, selenium & vitamin C.

Contents

Conference Secretariat

VERSACOMM (263773-W)

12-A, Jalan PJS 8/4, Mentari Plaza, Bandar Sunway,
46150 Petaling Jaya, Selangor.
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President's Welcome Message

Tee E Siong, PhD
President,
Nutrition Society of Malaysia
president@nutriweb.org.my

On behalf of the Conference Organising Committee, I welcome everyone to the 38th Annual Scientific Conference of the Nutrition Society of Malaysia (NSM)!

We are thrilled to have you all join us physically this year, after three years of virtual conference due to the pandemic. Being the main nutrition professional body in the country, the NSM is proud to be able to continue organising this annual scientific event, which serves as an important platform for nutritionists in the nation to interact, share and discuss nutrition issues, research, and findings.

The theme for this year Conference is 'From sick care to wellness – Healthy nutrition is key', which emphasises the key role of healthy nutrition in ensuring wellness and prevention of diseases. The ultimate goal of the healthcare is to improve health and strive to stay at good health for as long as possible. However, the reality is that many of the public are in the sick-care cycle and wait until one is sick before steps are taken to look for treatment to improve or control the diseases. Caring for the sick comes at a high cost to the country's healthcare system; as chronic diseases are on the rise, it added strain to accommodate the burden of illness on individuals and society as a whole. Concerted efforts need to be taken to shift the 'sick care' mindset of the population, to promote wellness, healthy habits, and preventive lifestyles in people. In this regard, NSM members and nutritionists should play the key role in delivering sound nutrition advices to the public and encouraging them to take preventive measures to stay healthy, prevent or delay the development of preventable lifestyle related diseases.

Sharing facts, new data, and useful insights from nutrition experiences, interventions, programmes, and researches among the nutritionists is also urgently needed. These can be used for the drafting and implementing of evidence-based food and nutrition policies and programmes to encourage better nutrition and health outcomes.

For this Conference, we are excited to have a diverse range of 40 oral presentations, from a mixture of international and local speakers from the academia, government agencies and private sector. In addition to the oral presentations, there are also 105 poster presentations covering a wide range of nutrition-based research. We hope everyone will be able to benefit from the insightful and inspiring knowledge sharing. We encourage everyone to take the opportunity to view all the conference materials, scientific posters and visit the exhibition booths to make the best of this event.

I take this opportunity to place on record our sincere gratitude to all who have contributed to the successful organisation of this Conference which includes all speakers, poster presenters, participants, sponsors as well as the secretariat of the Conference. My sincere appreciation to the 19th Council Members of NSM for their full cooperation in organising this Conference.

Make the best of this opportunity provide; have a fruitful conference!

Acknowledgements

The Nutrition Society of Malaysia gratefully acknowledges contributions from the following to the 38th Scientific Conference:

Major Sponsors

- Abbott Laboratories (M) Sdn Bhd
- BENEO-Institute
- Danone Specialized Nutrition
- dsm-firmenich
- Dutch Lady Milk Industries Berhad
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Co-Sponsors

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Sponsor for NSM Publication Prizes

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Sponsor for Prizes for Young Researchers' Symposium & Poster Competition

- International Life Sciences Institute (ILSI) Southeast Asia Region

Advertiser

- Mondelez Malaysia Sales Sdn Bhd

Malaysia Nutrition Leadership Programme (MyNLP)

The MyNLP is an initiative and brainchild of the Nutrition Society of Malaysia which focuses on honing the participants application and soft skills and acquiring the requisite knack towards enhancing leadership competency among nutrition professionals.

Rationale of MyNLP

The National Plan of Action for Nutrition (NPAN) of Malaysia has emphasised the importance of strengthening institutional and community capacity for nutrition. Availability of well trained human resources is crucial for successful execution of the NPAN Malaysia. The NSM is committed to contribute towards the effective implementation of the NPANM III (2006-2025).

NSM is organising MyNLP to establish critical mass of capable nutrition leaders in Malaysia.

Programme Objectives

Assists the development of future leaders in the field of human nutritional sciences through proper training

Provides knowledge and skills towards enhancing leadership skills and foster greater communication and networking among young nutrition professionals

Provides a platform of convergence to connect and provide networking opportunities among food and nutrition professionals across the country and also within the South East Asian Region

Programmes and Workshops

It is envisioned that MyNLP is able to support NPANM III by empowering aspiring professionals in the field of food and nutrition with essential knowledge, skills, and network to lead others in improving nutrition in Malaysia.

Follow our upcoming activities at www.nutriweb.org.my and email us at mynlp@nutriweb.org.my for further enquiries.

SEA PHN

Southeast Asia Public Health Nutrition Network

A collaboration among

Food and Nutrition Society of Indonesia

Nutrition Society of Malaysia

Nutrition Foundation of the Philippines, Inc

Nutrition Association of Thailand under the Patronage of Her Royal Highness Princess Maha Chakri Sirindhorn

Vietnam Nutrition Association

The **Southeast Asia Public Health Nutrition (SEA-PHN)** Network is a partnership of key stakeholders in the region, namely nutrition societies and corporate partners to promote public health nutrition among the population and alleviating nutrition problems in the region.

Please visit our website at http://sea-phn.org for more information.

Sign up for Free to download nutrition related documents at our resource area.

Key Activities of the Network

Good Nutrition – Key to Healthy Children (GNKHC) Programme

Good Nutrition Key to Healthy Children

Teaching Materials of the GNKHC Nutrition Module

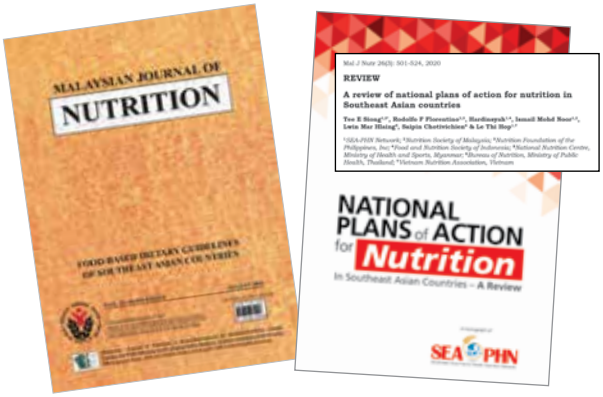
Teacher's Guidebook and Student's Workbook

Learning Slides

Materials for Interactive activities

Parent's leaflet

Research publications



Mal J Nutr 29(2): 163-241, 2023

SPECIAL INVITED REVIEW

Review of recommended energy and nutrient intake values in Southeast Asian countries

E Siong Tee[1,2*], Rodolfo F Florentino[1,3], Nalinee Chongviriyaphan[1,4], Hardinsyah Ridwan[1,5], Mahenderan Appukutty [1,2] & Truong Tuyet Mai[1,6]

[1]Southeast Asia Public Health Nutrition Network; [2]Nutrition Society of Malaysia; [3]Nutrition Foundation of the Philippines, Inc; [4]Nutrition Association of Thailand; [5]Food and Nutrition Society of Indonesia; [6]Vietnam Nutrition Association

Webinar Series

Phase 3 (Version 3)

Are You Eating Healthily ?

FIND OUT BY TAKING THE

Malaysian Healthy Diet Online Survey (MHDOS)

OBJECTIVES

- To know the diet quality of Malaysian adults
- To measure the compliance with the Malaysian Dietary Guidelines (2020)

BENEFITS

You will receive an individual report based on your survey response within 3-5 days, with feedback on your Healthy Diet Score & suggestions on how to improve your diet

WHO CAN PARTICIPATE

- Adults (18-59 years old)
- Malaysians (residing in Malaysia)
- Not pregnant or lactating
- Not having special diet due to medical conditions

HOW TO PARTICIPATE

1. Scan the QR code or open the URL link below:

   https://bit.ly/MHDOS

2. Select your language of choice (English, Malay, Mandarin, Tamil)

   MALAYSIAN HEALTHY DIET ONLINE SURVEY — Click here

3. Answer the online survey (15 minutes)

All your information will be kept CONFIDENTIAL

Participation is VOLUNTARY

FOR FURTHER INFORMATION, CONTACT :

Assoc Prof Dr Wong Jyh Eiin: myonlinedietscore@nutriweb.org.my
Ms Tan Meng Lee: myonlinedietscore@gmail.com

This study has been approved by the Medical Research & Ethics Committee, Ministry of Health Malaysia (NMRR ID-22-00158-75G)

Official Opening

DAY 1 **TUESDAY, 4 JULY, 2023**

0800 hrs **Registration**

0900 hrs	**Official Opening & Presentation of NSM Prizes & Awards** **Grand Hibiscus Ballroom**

0900 hrs **Welcome Remarks and Official Opening by**
Tee E Siong
President, Nutrition Society of Malaysia (NSM)

0910 hrs **Presentation of NSM Prizes & Awards**
- NSM Undergraduate and Postgraduate Prizes
- NSM Publication Prizes
- NSM Fellows Awards

1000 hrs **Coffee Break/Poster Viewing/Trade Exhibition**

Conference Scientific Programme

DAY 1 **TUESDAY, 4 JULY, 2023**

KEYNOTE LECTURE 1
Chairperson: Zalma Abdul Razak
Nutrition Society of Malaysia

1030 hrs **From "sick care" to wellness – Healthy nutrition is key**
Tee E Siong
Nutrition Society of Malaysia

SYMPOSIUM 1: Maternal, Infant & Young Children
Chairperson : Chin Yit Siew
Universiti Putra Malaysia

1100 hrs **Optimising gestational weight gain for the prevention of gestational diabetes mellitus: A web/smartphone-based lifestyle intervention for pregnant women in Malaysia**
Yong Heng Yaw
Division of Nutrition and Dietetics, School of Health Sciences, International Medical University, Malaysia

Tackling nutritional challenges among children in Malaysia: Insights from three studies on eating habits, physical activity, food environment, and behaviour intervention
Poh Bee Koon
Faculty of Health Sciences, Universiti Kebangsaan Malaysia

Innovation using sticker book for nutrition education in children
Sharifah Wajihah Wafa Syed Saadun Tarek Wafa
Faculty of Health Sciences, Universiti Sultan Zainal Abidin, Malaysia

Update on maternal, child and adolescent nutrition – Findings of NHMS 2022
Ahmad Ali Zainuddin
Institute for Public Health, Ministry of Health Malaysia

INVITED LECTURE 1
Sponsored by FrieslandCampina Institute
Chairperson: Mahenderan Appukutty
Universiti Teknologi MARA

1230 hrs **Sustainability healthy diet – nourishing a better planet**
Rolf Bos
Global Expert Team Nutrition, Royal FrieslandCampina, Netherlands

LUNCH SYMPOSIUM 1
Sponsored by Danone Specialised Nutrition
Chairperson: Hamid Jan bin Jan Mohamed
Universiti Sains Malaysia

1315 hrs **Anaemia screening of young children in Malaysia: The latest findings of Ironstrong Study**
Muhammad Yazid Jalaludin
Faculty of Medicine, University Malaya, Malaysia

1400 hrs **Poster Viewing & Trade Exhibition**

SYMPOSIUM 2: Food Environment & Nutrition
Chairperson : Yasmin Ooi Beng Houi
Universiti Malaysia Sabah

1430 hrs **Use nutrition information on food labels to empower consumers make informed food choices**
Norlida Zulkafly
Food Safety and Quality Division, Ministry of Health Malaysia

The role of nutritionist in promoting edible garden (Sabah success story)
Susilia Sinar
Pahang State Health Department, Kuantan, Malaysia

Relative validity and reliability of a diet quality index for Malaysian adults: Preliminary findings of the Malaysian Healthy Diet Online Survey (MHDOS)
Woon Fui Chee
Nutrition Society of Malaysia

Promoting education for food sustainability in Japanese schools: Investigating nutrition teachers' efforts for effective implementation
Wafaa Abdo
Graduate School of Human Sciences, Osaka University, Japan

INVITED LECTURE 2
Sponsored by Abbott Nutrition
Chairperson: Cheah Whye Lian
Universiti Malaysia Sarawak

1600 hrs **Optimising nutritional needs for optimal growth in children and adolescents**
Hamid Jan bin Jan Mohamed
School of Health Sciences, Universiti Sains Malaysia

YOUNG RESEARCHERS' SYMPOSIUM
Chairperson: Wong Jyh Eiin
Universiti Kebangsaan Malaysia

1645 hrs **Haemoglobin, HbA1C and nutritional status of urban B40 pregnant mothers: A prospective cohort study**
Erica Ooi Ming Yi, Misra S, Tan SS and Rokiah D
School of Postgraduate Studies, International Medical University, Malaysia

1705 hrs **SALT@HOME: a new household salt intake assessment methodology and qualitative insight on salt reduction strategies**
Siti Madihah Binti Muhammad Royani, Ulaganathan V, Lim SY, Baskaran Gunasekaran and Lailatul M
Department of Food and Nutrition, Faculty of Applied Sciences, UCSI University, Malaysia

1725 hrs **Perceptions, barriers, and enablers on the salt reduction policy in the out-of-home sectors in Malaysia (MyOH): From the outlook of street food vendors, caterers, and consumers**
Zainorain Natasha Binti Zainal Arifen, Hasnah H, Suzana S, Zaliha H, Viola M, You YX, Zahara AM, Hazreen AM, Chia YC, Feng JH, Brown MK and MacGregor GA
Centre for Healthy Ageing and Wellness, Faculty of Health Sciences, Universiti Kebangsaan Malaysia

1745 hrs **Development of local food-based dietary recommendations using linear programming approach for urban poor undernourished children aged 48 to 71 months old in Seremban, Malaysia**
Miow Yee Xuen, Gan WY, Fahmida U, Lim PY, Geeta A and Siti Nur' Asyura A
Department of Nutrition, Faculty of Medicine & Health Sciences, Universiti Putra Malaysia

1805 hrs **The association between body composition, anthropometry, and depression with sarcopenia among community-dwelling older people in Kelantan: A cross-sectional study**
Nur Syakirah Arissa Mohd Salleh and Divya V
Department of Dietetics, School of Health Sciences, Universiti Sains Malaysia

1825 hrs **Coffee Break/Poster Viewing**

End of Day 1

DAY 2 WEDNESDAY, 5 JULY, 2023

0800 hrs **Poster Viewing/Trade Exhibition**

NUTRITION UPDATE 1
Chairpersons: Gan Wan Ying, Universiti Putra Malaysia
Noor Atiqah Aizan Abdul Kadir, Universiti Malaysia Sabah

0900 hrs **Associations of dairy consumption at breakfast with nutrient intake in Malaysian children: Results from the South-East Asian Nutrition Surveys II (SEANUTS II)**
Nadja Mikulic, Lee B, Khouw I, Yeo GS, Wong JE, Nik Shanita S, Ruzita AT, Poh BK and Singh-Povel C, on behalf of the SEANUTS II Malaysia Study Group
Expert Team Nutrition Asia, FrieslandCampina, Singapore

0910 hrs **Development of a serial mediation model of lifestyle factors for improving health-related quality of life among urban-poor Malaysian children**
Joseph Cheah Mun Hong, Chin YS, Hazizi AS and Lim PY
Department of Nutrition, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

0920 hrs **"GROWEAT" home gardening programme increased vegetable consumption, preferences, and willingness to try vegetables among urban poor children in Kuala Lumpur, Malaysia: A randomised controlled trial**
Mok Kai Ting, Tung SEH, Satvinder K, Chin YS, Mohammad Yusoff M and Ulaganathan V
Department of Food Science and Nutrition, Faculty of Applied Sciences, UCSI University, Malaysia

0930 hrs **Factors associated with double burden of malnutrition (DBM) among Dayak communities in Sarawak**
Yolanda Anak Salleh, Cheah WL, Law LS and Stephen J
Department of Community Medicine and Public Health, Faculty of Medicine and Health Sciences, University of Malaysia Sarawak

0940 hrs **Using experiential learning to prepare future nutritionists to use digital technology in health and nutrition promotion**
Lee Siew Siew, Cheng SH, Lim YS, Chew SK and Tan JM
School of Biosciences, Faculty of Science and Engineering, University of Nottingham Malaysia

1000 hrs **Coffee Break/Poster Viewing/Trade Exhibition**

KEYNOTE LECTURE 2
Chairperson: Ms Norrani Eksan
Senior Director for Food Safety and Quality Division, Ministry of Health Malaysia

1030 hrs **Food security policies and action plan of Malaysia**
YBhg Datuk Lokman Hakim Ali
Secretary-General, Ministry of Agriculture and Food Security Malaysia

SYMPOSIUM 3: Nutrition of Older Persons
Chairperson : Norimah A. Karim
Nutrition Society of Malaysia

1100 hrs **Implementing virtual falls prevention using exercise-nutrition intervention during COVID-19 pandemic for older persons, does it work?**
Chan Yoke Mun
Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

Addressing nutritional needs of sarcopenia in older adults
Hanis Mastura Yahya
Faculty of Health Sciences, Universiti Kebangsaan Malaysia

Tube feeding in severe dementia – Is there evidence?
Alan Ch'ng Swee Hock
Department of Medicine, Seberang Jaya Hospital, Penang, Malaysia

Factors associated with sarcopenia among older adults with low socioeconomic status in Kelantan
Divya Vanoh
School of Health Sciences, Universiti Sains Malaysia

INVITED LECTURE 3
Sponsored by Herbalife Malaysia
Chairperson: Mohd Ismail Mohd Noor
Universiti Kebangsaan Malaysia

1230 hrs **The role of nutrition in preventive healthcare: A comprehensive approach for healthcare and wellness transformation**
Rimbawan
Faculty of Human Ecology, Universitas Institut Pertanian Bogor, Indonesia

LUNCH SYMPOSIUM 2
Sponsored by dsm-firmenich
Chairperson: Loh Su Peng
Universiti Putra Malaysia

1315 hrs **Maternal nutrition – Reducing risk of preterm births with DHA**
Avril Soh
dsm-firmenich, Singapore

1400 hrs **Poster Viewing & Trade Exhibition**

INVITED LECTURE 4
Sponsored by BENEO-Institute
Chairperson**:** Rokiah Don
Nutrition Society of Malaysia

1430 hrs **Scientific update on metabolic improvement aspects with Palatinose™ (isomaltulose)**
Sangeetha Shyam
Department of Biochemistry & Biotechnology, Human Nutrition Unit, Rovira i Virgili University, Spain

SYMPOSIUM 4: Community Lifestyle Intervention Programme
Chairperson : Satvinder Kaur A/P Nachatar Singh
UCSI University, Malaysia

1515 hrs **Translational and reverse-translational "chrono-nutrition" research in Japan**
Yu Tahara
Graduate School of Biomedical and Health Sciences, Hiroshima University, Japan

PERSUADE: A peer-led community-based intervention to aid nutritional and lifestyle behavioural changes
Amutha Ramadas
Jeffrey Cheah School of Medicine & Health Sciences, Monash University Malaysia

Community Feeding Programme for Orang Asli: An approach for a better tomorrow
Mohammad Affendy Bin Mohd Akhir
Kelantan State Health Department, Gua Musang, Malaysia

Nutrition intervention programmes for adults and school children to combat obesity in Kuala Lumpur and Putrajaya
Muhammad Asyraf Bin Ismail
Federal Territory Health Department, Kuala Lumpur

NUTRITION UPDATE 2
Chairpersons: Roseline Yap Wai Kuan, Nutrition Society of Malaysia
Yong Heng Yaw, International Medical University

1645 hrs **The development and effectiveness of a mobile phone-based nutrition education intervention on lactating mothers for the prevention of stunting among infants in Kelantan – An anthropometric outcome**
Norshafawati Abdul Azimi, Tengku Alina TI, Hafzan Y, Zabidi Azhar MH, Kueh YC, Surianti S, Puspawati M, Bibi Nabihah AH and Hamid Jan JM
Programme of Nutrition and Dietetics, School of Health Sciences, Universiti Sains Malaysia

1655 hrs **Exploring the experience of Malaysian consumers using diet-related health apps to support healthier food purchase: A qualitative study**
Lim Sook Yee, Ulaganathan V, Liow PK, Goh JMM, Gunasekaran B and Salvamani S
Department of Food Science and Nutrition, Faculty of Applied Sciences, UCSI University, Malaysia

1705 hrs **Exploring the intrahousehold food allocation and decision-making power of urban poor caregivers with under-five children in Kuala Lumpur**
Chek Lok Poh, Gan WY, Chin YS and Norhasmah S
Department of Nutrition, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

1715 hrs **Secular trends in energy availability in Malaysia: A joinpoint regression analysis of FAO's food balance sheet data from 1961 to 2020**
Syed Mahfuz Al Hasan
Clinical Research Support Center, Kagawa University Hospital, Japan

1725 hrs **Mindful eating and obesity among senior high school students in Depok, Indonesia**
Gunarti Y, Anita B, Zul A, Sunarti, Miranti G, Syofia N, Choirunnisa ZNL and Muhammad Nur Hasan Syah
Nutrition Study Programme, Universitas Pembangunan Nasional Veteran Jakarta, Indonesia

1735 hrs **Perceived neighbourhood environmental, physical activity and physical fitness in relation to overweight/ obesity among urban poor adolescents in Kuala Lumpur, Malaysia**
Janice Tay Ee Fang, Tung SEH, Satvinder K, Gan WY, Che'Ya Nik and Tan CH
Department of Food Science and Nutrition, Faculty of Applied Sciences, UCSI University, Malaysia

PRIZE GIVING AND CLOSING CEREMONY
Chairperson: Mahenderan Appukutty
Nutrition Society of Malaysia

1745 hrs **Young Researchers' Symposium and Best Undergraduate Poster Prizes**

1830 hrs **End of Conference**

Conference Information

REGISTRATION COUNTER

Registration Counter is located at the **Foyer, Grand Hibiscus Ballroom, Level 3 (Residences Building), Swiss-Garden Hotel Bukit Bintang, Kuala Lumpur**.
Opening hours of the Registration Counter:

- 4th July 2023: 7:45 am – 4:00 pm
- 5th July 2023: 8:30 am – 12:00 noon

SCIENTIFIC SESSIONS

All scientific sessions shall be held in the **Grand Hibiscus Ballroom, Level 3 (Residences Building), Swiss-Garden Hotel Bukit Bintang.**

POSTER PRESENTATIONS

Scientific poster presentation shall be held at **Lotus 2 & 3, Level 2 (Residences Building), Swiss-Garden Hotel Bukit Bintang** and the opening hours are as follows:

- 4th July 2023: 8:00 am – 6:00 pm
- 5th July 2023: 8:00 am – 6:00 pm

TRADE EXHIBITION

The trade exhibition is located at **Grand Hibiscus Foyer (Level 3 - Residences Building) & Grand Lotus Foyer (Level 2 - Residences Building), Swiss-Garden Hotel Bukit Bintang.**
Opening hours:

- 4th July 2023: 8:00 am – 6:00 pm
- 5th July 2023: 8:00 am – 5:00 pm

OFFICIAL LANGUAGE

The official language of the conference is **English**.

CERTIFICATE OF ATTENDANCE

E-Certificate of attendance will be given to all registered delegates. The certificates would be uploaded on the conference website within 30 days after the Conference (by 5th August 2023). Participants may download the certificate from the website following the instruction given on the website. Special certificates will be given to those who participated in the Young Researchers' Symposium, Nutrition Update sessions and Poster Presentations.

NAME BADGES

Registered delegates are to wear their name badges at all times during the Conference for identification and security purposes. Admission to all Conference sessions and meals is based on name badges.

LUNCH & COFFEE BREAKS

Lunch box will be served during the Lunch Symposium sessions on both days at the **Grand Hibiscus Ballroom.**

Morning and afternoon refreshments shall be served around the trade exhibition areas at the **Grand Hibiscus Foyer (Level 3 – Residences Building) & Grand Lotus Foyer (Level 2 – Residences Building), Swiss-Garden Hotel Bukit Bintang.**

NOTE FOR SPEAKERS:

Submission of slides and preview

Speakers of Day 1 sessions are requested to submit their presentation materials to the **Speaker Preview Room** during registration in the morning of Day 1. Speakers of Day 2 sessions are requested to submit their presentations before the end of Day 1.

Please inform the Conference Secretariat staff once you have submitted the presentation materials.

Speaker Preview Room is located at the **Secretariat Room – Lotus 1, Level 2 (Residences Building), Swiss-Garden Hotel Hotel Bukit Bintang**. The opening hours are as follows:

- 4th July 2023: 8:00 am – 6:00 pm
- 5th July 2023: 8:00 am – 5:00 pm

Please be present at the Grand Hibiscus Ballroom at least ***15 minutes*** prior to the start of your session and identify yourself to the secretariat staff.

NOTE FOR CHAIRPERSONS

Please be present at the Grand Hibiscus Ballroom at least ***15 minutes*** prior to the start of your session.

MOBILE PHONE

As a courtesy to all delegates and speakers, mobile phones and other electronic devices must be operated in silent/vibration mode throughout the Conference sessions. No telephone conversations are permitted in the session rooms.

WI-FI

WI-FI is available throughout the hotel. The password would be provided during the conference.

PARKING

For participants driving to the venue, you may park at the Swiss-Garden Hotel Bukit Bintang KL Basement Parking. Note that payment is by Touch n Go ONLY and make sure there is a minimum of RM30 in the card. Have your card validated at conference area and the parking fee is a flat rate of RM10.00 per day.

BREASTFEEDING ROOM

A dedicated breastfeeding room is not available at the hotel.
Note: We will discuss with the hotel to explore using one of the rooms for this purpose

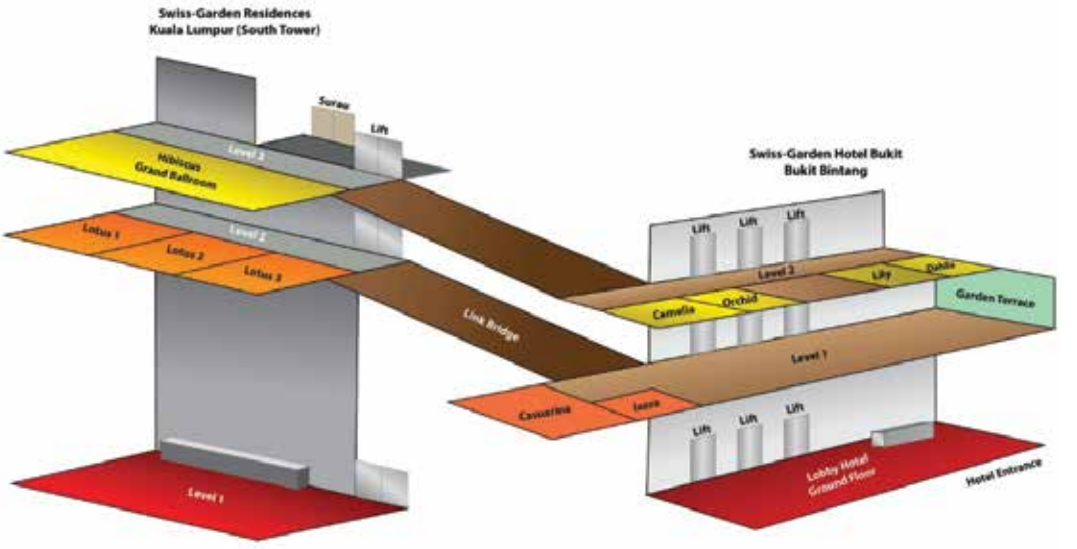
PRAYER ROOM

Surau is located at the **Level 3, Swiss-Garden Residences** (same floor as the Grand Hibiscus Ballroom).

LIABILITY

The Organising Committee will not assume any responsibility for accidents, losses or damages, as well as delays or modifications of the Conference programme.

Venue Direction Map



SWISS-GARDEN

Legend for Sponsors & Exhibitors

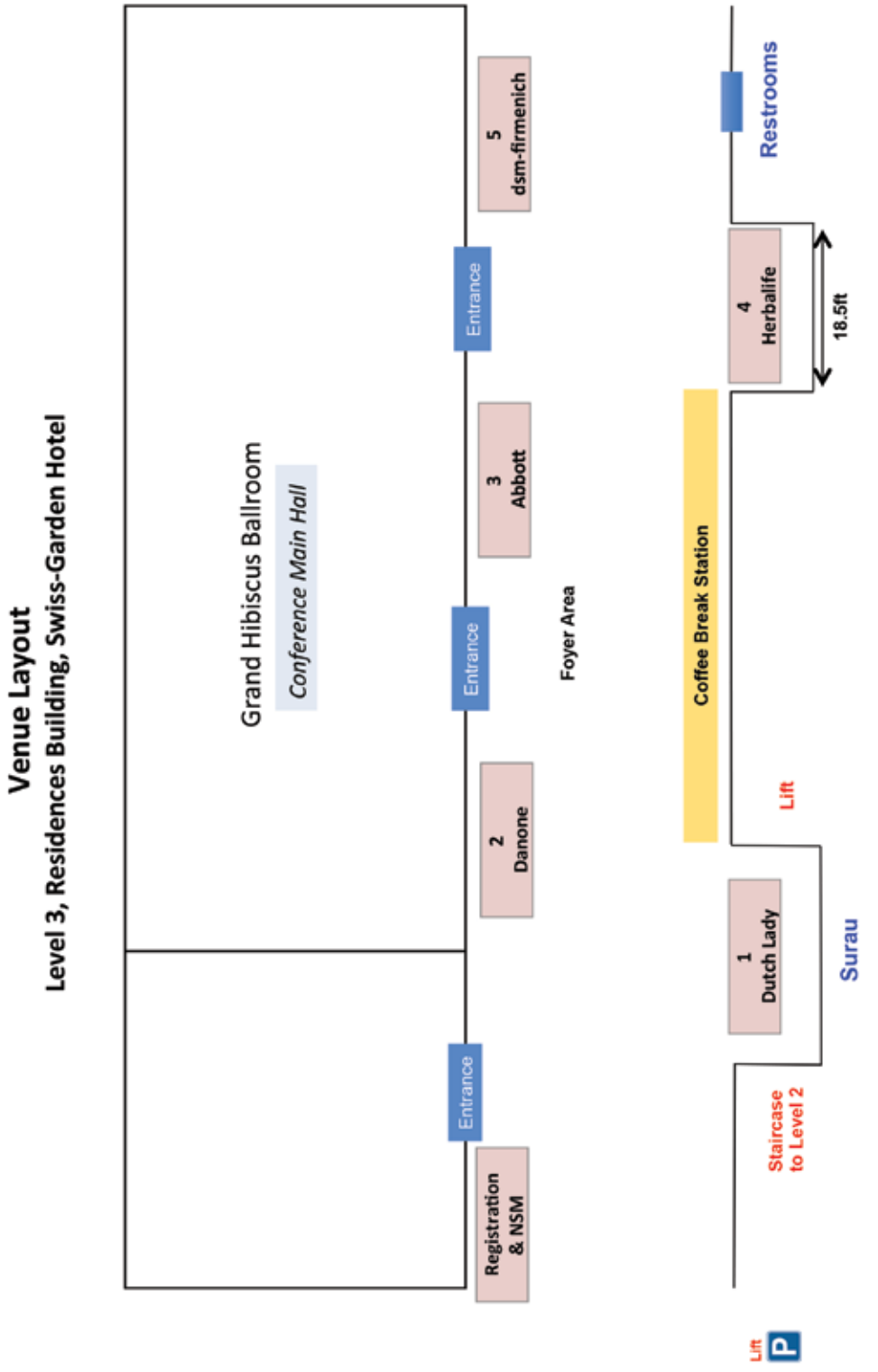
Booths at Foyer of Level 3 (Residences)

Booth No	Company name
1	Dutch Lady Milk Industries Berhad
2	Danone Specialized Nutrition
3	Abbott Laboratories (M) Sdn Bhd
4	Herbalife Malaysia
5	dsm-firmenich

Booths at Foyer of Level 2 (Residences)

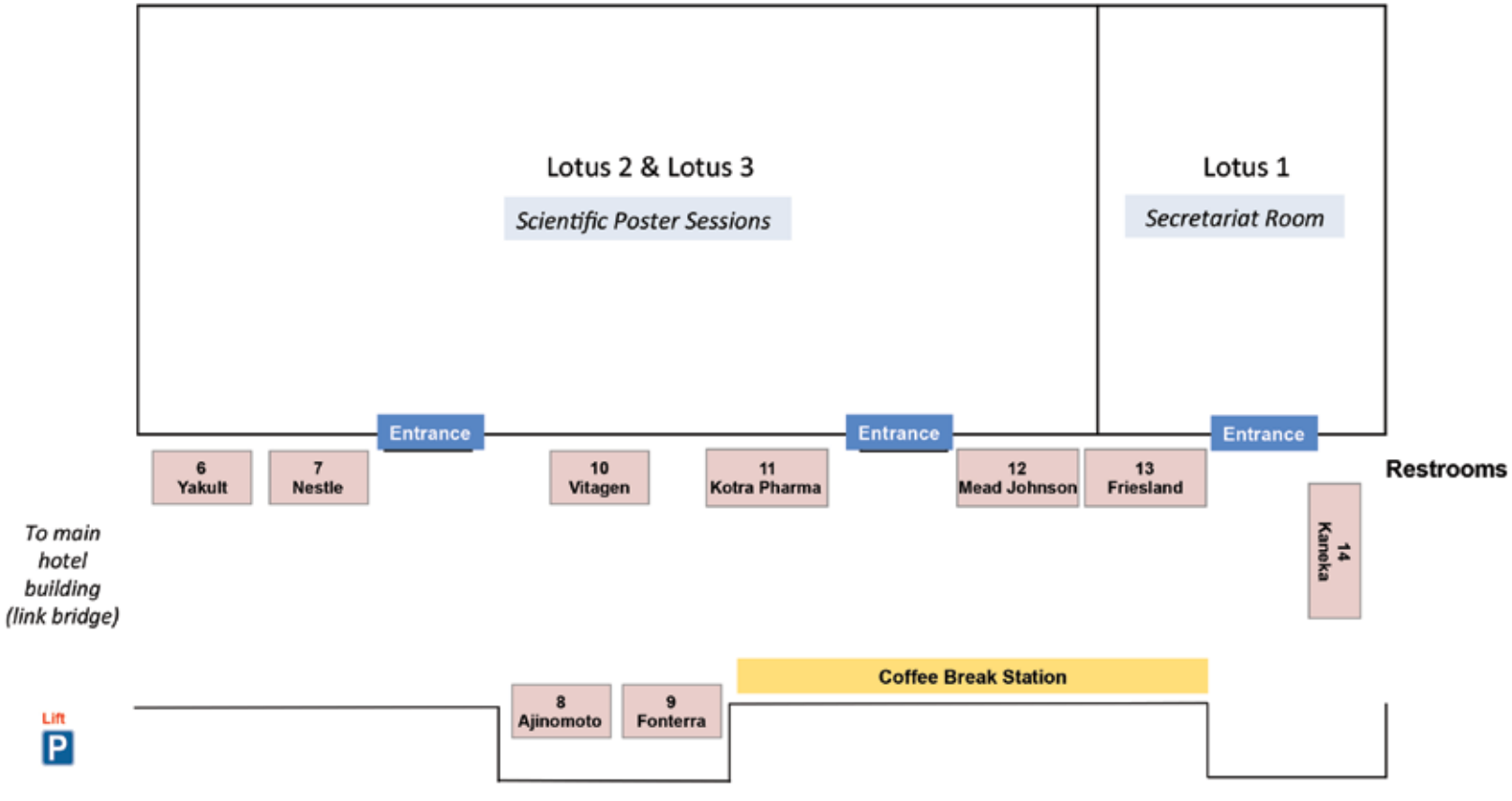
Booth No	Company name
6	Yakult (Malaysia) Sdn Bhd
7	Nestle Products Sdn Bhd
8	Ajinomoto (Malaysia) Berhad
9	Fonterra Brands (Malaysia) Sdn Bhd
10	Malaysia Milk Sdn Bhd (Vitagen)
11	Kotra Pharma (M) Sdn Bhd
12	Mead Johnson Nutrition (Malaysia) Sdn Bhd
13	FrieslandCampina Institute
14	Kaneka Corporation

Event Layout & Exhibitor Area Layout



Venue Layout

Level 2, Residences Building, Swiss-Garden Hotel




NSM
Award/
Prizes
2023

NSM Postgraduate and Undergraduate Prizes 2023

Two types of NSM Prizes are awarded under the Education Fund of the Nutrition Society of Malaysia, according to the Bye-Laws of the Society. The NSM Postgraduate Prize is awarded for a thesis accepted for a PhD or MSc degree whereas the Undergraduate Prize is awarded for a thesis accepted for a basic/first degree. Each prize comprises a cash award and a certificate, as follows: RM1,000 for a PhD thesis, RM750 for MSc thesis and RM500 for the undergraduate prize.

In 2023, NSM is awarding seven Postgraduate Prizes; three for PhD and four for MSc, with a total cash award of RM6,000. Nine undergraduates receive Undergraduate Prizes with a total cash award of RM 4,500. The total cash award for both categories of thesis prizes this year is RM10,500.

The recipients for the PhD thesis prize are:

1. **Dr Teoh Ai Ni**
   Circadian rhythm and its association with birth and infant outcomes: A prospective cohort study
   Supervisor: *Assoc Prof Dr Satvinder Kaur A/P Nachatar Singh*
   Co-supervisor(s): *Asst Prof Dr Normina Binti Ahmad Bustami, Dr Nurul Husna Mohd Shukri, Prof Dr Shigenobu Shibata*
   University: *Faculty of Applied Sciences, UCSI University, Malaysia*

2. **Dr Nurul Fatin Binti Malek Rivan**
   Identification of cognitive frailty, the mediator and its predictive value on adverse health outcomes among Malaysian older adults
   Supervisor: *Prof Dr Suzana Shahar*
   Co-supervisor(s): *Prof Dr Nor Fadilah Rajab, Prof Dr Devinder Kaur Ajit Singh, Prof Madya Dr Normah Che Din*
   University: *Faculty of Health Sciences, Universiti Kebangsaan Malaysia*

3. **Dr Zunura'in Binti Zahali**
   Association between vitamin D and obesity related adipokines with breast cancer occurrence among women patients in Kelantan
   Supervisor: *Prof Dr Hamid Jan Bin Jan Mohamed*
   Co-supervisor: *Prof Dr KNS Sirajudeen*
   University: *School of Health Sciences, Universiti Sains Malaysia*

The recipients for the MSc thesis prizes are:

1. **Ain Widad Binti Abdullah**
   Association between body composition, physical activity, complementary and alternative therapies (CATs) with depression symptoms among pregnant women in Terengganu
   Supervisor: *Assoc Prof Dr Wee Bee Suan*
   Co-supervisor: *Dr Rosliza Binti Yahaya*
   University: *Faculty of Health Sciences, Universiti Sultan Zainal Abidin, Malaysia*

2. **Rosmawati Binti Dora**
   Determination of salty taste threshold and acceptance of low salt soups among children
   Supervisor: *Assoc Prof Dr Hasnah Haron*
   Co-supervisor: *Prof Dr. Poh Bee Koon*
   University: *Faculty of Health Sciences, Universiti Kebangsaan Malaysia*

3. **Nor Syaza Sofia Binti Ahmad**
   Psychological distress as mediator in the relationship between food insecurity and academic performance among undergraduate students in UPM
   Supervisor: *Prof Dr Norhasmah binti Sulaiman*
   Co-supervisor: *Prof Dr Mohamad Fazli Sabri*
   University: *Faculty of Medicine and Health Sciences, Universiti Putra Malaysia*

4. **Nurul Syahidah Mohd Nazri**
   Prevalence of sarcopenia, empty nest, depressive symptoms and its association with diet quality among older adults with low socioeconomic status in Kelantan
   Supervisor: *Dr Divya Vanoh*
   Co-supervisor: *Dr Soo Kah Leng*
   University: *School of Health Sciences, Universiti Sains Malaysia*

The recipients for the Undergraduate thesis prizes are:

1. **Lee Chiu Ying**
   Knowledge and attitude on salt iodisation programme among Malaysian adults in Klang Valley, Malaysia
   Supervisor: *Dr Megan Chong Hueh Zan*
   Co-supervisor: *Assoc Prof Dr Tan Kok Leong*
   University: *School of Health Sciences, International Medical University, Malaysia*

2. **Qistina Binti Osmand**
   Association between physical activity and eating behaviour with weight change among Malaysian adults in the COVID-19 Pandemic
   Supervisor: *Dr Tan Seok Tyug*
   University: *Faculty of Health and Life Sciences, Management and Science University, Malaysia*

3. **Caleb Mok Jun Wen**
   Association of food environment and weight status in urban poor communities in Kuala Lumpur
   Supervisor: *Dr Vaidehi Ulaganathan*
   Co-supervisor: *Dr Serene Tung En Hui*
   University: *Faculty of Applied Sciences, UCSI University, Malaysia*

4. **Thien Chai Nei**
   Acceptance of grasshoppers and other insects as food and its influencing factors among adults in Kuching and Klang Valley
   Supervisor: *Dr Lim See Meng*
   Co-supervisor(s): *Prof Dr Poh Bee Koon, Assoc Prof Dr Abdoul Karim Toure*
   University: *Faculty of Health Sciences, Universiti Kebangsaan Malaysia*

5. **Fredrica Vun Li Ling**
   Dietary supplement intakes among adults in Kota Kinabalu before and during the COVID-19 pandemic: A cross-sectional study
   Supervisor: *Dr Khor Ban Hock*
   University: *Faculty of Food Science & Nutrition, Universiti Malaysia Sabah*

6. **Nur Syakirah Arissa Binti Mohd Salleh**
   Association between body composition and lipid profiles among UniSZA students aged 18 to 19 years old
   Supervisor: *Assoc Prof Dr Wee Bee Suan*
   University: *Faculty of Health Sciences, Universiti Sultan Zainal Abidin, Malaysia*

7. **Lee Le Zhen**
   Impact of COVID-19 on dietary intake, sleeping patterns and physical activity levels among Malaysian University students
   Supervisor: *Dr Cheng Shi Hui*
   University: *School of Biosciences, University of Nottingham Malaysia*

8. **Ng Jia Hui**
   Assessment of food security, dietary diversity and malnutrition in young children aged 2 to 6 years old from B40 families in Seremban
   Supervisor: *Assoc Prof Dr Gan Wan Ying*
   University: *Faculty of Medicine and Health Sciences, Universiti Putra Malaysia*

9. **Cheong Yi En**
   Effect of sacha inchi oil supplementation on blood lipid profile and blood pressure in middle age and elderly group population: An uncontrolled before-after study
   Supervisor: *Dr Soo Kah Leng*
   University: *School of Health Sciences, Universiti Sains Malaysia*

NSM Publication Prize 2023

The NSM Publication Prizes are aimed at encouraging and promoting local research publications in nutrition science among NSM members. Prizes are awarded by the Nutrition Society of Malaysia with financial support from Corporate Members of the Society. In 2023, two Corporate Members of NSM supported this initiative, namely Fonterra Brands (Malaysia) Sdn Bhd (C 1879) and Herbalife Malaysia (C 2195).

Fonterra sponsored prizes for two categories of NSM Publication Prizes for the year 2023. These are for two different fields of nutrition research, namely: (i) Maternal Nutrition and (ii) Mobility and Musculoskeletal Health and Nutrition. For each category, the intention was to provide 1 award each year, each to carry a cash prize of RM2,000 and a certificate by NSM.

Herbalife Malaysia offered to sponsor prizes for three categories of NSM Publication Prize in different fields of nutrition research, namely (i) Roles of Dietary Fibre in Health, (ii) Functional Foods and Healthy Ageing, and (iii) Physical Activity and Postprandial Metabolism Responses. For each category, the intention was to provide 1 award for each year, each to carry a cash prize of RM2,000 and a certificate by NSM.

NSM Publication Prize: Maternal Nutrition

For the category of maternal nutrition sponsored by Fonterra Brands (Malaysia) Sdn Bhd, 13 publications were submitted by seven members for consideration by NSM. The Selection Committee decided to award the prize to 1 applicant, with the following details:

Name of recipient:	***Nur Nadia binti Mohamed*** [L2194] Department of Community Medicine, School of Medical Sciences, Universiti Sains Malaysia
Publication:	Intergenerational transmission of obesity from mothers to their offspring: Trends and associated factors derived from the Malaysian National Health and Morbidity Survey (NHMS). *Nutrients 2022, 14(11):2186* https://doi.org/10.3390/nu14112186

NSM Publication Prize: Mobility and Musculoskeletal Health and Nutrition

For the category of Mobility and Musculoskeletal Health and Nutrition sponsored by Fonterra Brands (Malaysia) Sdn Bhd, three publications were submitted by three members for consideration by NSM. The Selection Committee decided to award the prize to 1 applicant, with the following details:

Name of recipient: ***Assoc Prof Dr Foo Leng Huat*** [L 1531]
Nutrition and Dietetics Programme, School of Health Sciences, Universiti Sains Malaysia

Publication: Assessments of sarcopenia and its associated factors in community-dwelling middle-aged and older Chinese adults in Kelantan, Malaysia.
Scientific Reports 2023, 13(1):7498
https://doi.org/10.1038/s41598-023-34668-w

NSM Publication Prize: Roles of Dietary Fibre in Health

For the category of Roles of Dietary Fibre in Health sponsored by Herbalife Malaysia, three publications were submitted by two members for consideration by NSM. The Selection Committee decided not to award the prize to these applicants.

NSM Publication Prize: Functional Foods and Healthy Ageing

For the category of Functional Foods and Healthy Ageing sponsored by Herbalife Malaysia, four publications were submitted by four members for consideration by NSM. The Selection Committee decided not to award the prize to these applicants.

NSM Publication Prize: Physical Activity and Postprandial Metabolism Responses

For the category of Physical Activity and Postprandial Metabolism sponsored by Herbalife Malaysia, two publications were submitted by two members for consideration by NSM. The Selection Committee decided to award the prize to 1 applicant, with the following details:

Name of recipient: ***Dr Yong Heng Yaw*** [L 1742]
Division of Nutrition and Dietetics, School of Health Sciences, International Medical University, Malaysia

Publication: High physical activity and high sedentary behavior increased the risk of gestational diabetes mellitus among women with excessive gestational weight gain:
A prospective study
BMC Pregnancy and Childbirth 2020, 20:597
https://doi.org/10.1186/s12884-020-03299-8

NSM Young Researchers' Symposium Prizes 2023

Winners of the Young Researchers' Symposium are awarded a certificate and the following cash prizes:

1st Prize – RM400
2nd Prize – RM300
3rd Prize – RM200
1 Consolation Prize of RM100

Prizes for 2023, totalling RM1,000 are provided by International Life Sciences Institute (ILSI) Southeast Asia Region.

NSM Poster Competition Prizes 2023

This poster competition is only for undergraduates. Winners are awarded a certificate and the following cash prizes:

1st Prize – RM200
2nd Prize – RM150
3rd Prize – RM100
7 Consolation Prizes of RM50 each

Prizes for 2023, totalling RM800 are provided by International Life Sciences Institute (ILSI) Southeast Asia Region.

List of Scientific Posters

Scientific posters have been grouped into the following themes:

A: Nutritional Status (various groups) & Community Interventions
B: Dietary Intake, Consumption Pattern & Disease
C: Nutrients & Other Components in Foods/Products
D: Clinical Nutrition/Intervention Trials
E: Food Science & Technology
F: Experimental Nutrition

The best 10 posters put up by undergraduates shall be awarded cash prizes!

Poster Presentation

Group A: Nutritional Status (various groups) & Community Interventions

A01 A comparison of circadian preferences and eating window on work days and free days among pregnant women in Kuala Lumpur, Malaysia
Alicia Raveena A, Satvinder K and Kok EY

A02 Relationship of *INSIG2* gene polymorphism and dietary and lifestyle factors with waist circumference among Malaysian adults
Aurelya NW, Vaidehi U, Lim SY and Baskaran G

A03 The relationship between food intake and physical activity with academic performance among adolescent girl students from low-income families
Azira S and Ruzita AT

A04 Validity of time-use diary in assessing movement behaviours of schoolchildren in Kuala Lumpur, Malaysia
Chong KM, Chia A, Poh BK, Nor Aini J, Denise K, Chong MFF and Wong JE

A05 Cardiorespiratory fitness predicts cardiometabolic risk markers among children aged 6 to 12 years: Findings from SEANUTS II Malaysia
Chan KS, Nor Farah MF, Koh DCL, Wong JE, Khouw I and Poh BK on behalf of the SEANUTS II Malaysia Study Group

A06 Association between physical activity and gross motor skills among preschoolers in peninsular Malaysia
Christine J, Koh DCL, Wong JE, Lee ST, Khouw I and Poh BK on behalf of the SEANUTS II Malaysia Study Group

A07 Parental perception of body weight, parental feeding practices, child eating behaviour, and body weight status among children with autism spectrum disorder
Eow SY, Gan WY, Hamidin A and Zalilah MS

A08 Factors influencing prevalence of stunting among children aged below five years in peninsular Malaysia
Ika Aida Aprilini M, Razinah S, Lim SM, Lee ST, Yeo GS, Jan Geurts MW and Poh BK on behalf of the SEANUTS II Malaysia Study Group

A09 Association between physical frailty, cognitive frailty and psychological problem among probable sarcopenia and sarcopenia community-dwelling older people in Kelantan
Keerthana SG, Divya V and Wan Rosli WI

A10 Maternal nutrition knowledge, infant feeding practices and linear growth of 6-12 months old infants in Kuala Lumpur and Putrajaya
Koh SY, Nurliyana AR and Satvinder K

A11 Association of chronotypes and appetitive traits with weight status among Malaysian young adults
Koh XM and Satvinder K

A12 Prevalence of abdominal obesity among adults ≥40 years old and the factors associated: Findings from National Health and Morbidity Survey (NHMS) 2019
Lalitha P, Chong CT, Azli B, Ahmad AZ and Shubash SG

A13 Social media-delivered lifestyle interventions among individuals living with diabetes and prediabetes: A scoping review
Lim GP, Jamuna RA, Badariah A, Quek KF and Amutha R

A14 Abstract removed

A15 A survey on knowledge, perception, attitude, and acceptance of plant-based diets among the public and nutritionists in Malaysia
Natasya Alia N, Ooi YBH and Khor BH

A16 Assessment of food security, dietary diversity and malnutrition in young children aged 2 to 6 years old from B40 families in Seremban
Ng JH and Gan WY

A17 Maternal feeding practices, appetitive traits and weight status of infants aged 0-6 months old in Kuala Lumpur
Ng J, Nurliyana AR and Satvinder K

A18 Vitamin D status and its associated factors among Malay female office workers in Kuala Lumpur during the COVID-19 pandemic
Nor Aini J, Nurul Nadiah S, Arimi Fitri ML, Zahara AM, Chin KY and Sameeha MJ

A19 An interactive web-based intervention to manage obesity-related behaviours in primary school children: A study protocol of the Copt Nutri Trail© Program
Norhasniza Y, Mohd Izwan M, Amirah I and Ruzita AT

A20 Prevalence of metabolic syndrome among urban-poor Malaysian women and its associations with serum 25(OH)D level, body composition, and household food security
Nur Amalin J, Chin YS, Norhasmah S, Juju NJ and Sukanya S

A21 Association between socioeconomic status (SES) and food neophobia among preschoolers in Terengganu
Nur Iffah Nadhirah NH and Sharifah Wajihah Wafa SSTW

A22 Assessment of nutritional status and food insecurity among children in Kota Kinabalu and Tawau, Sabah
Nur'ain Mardhiyah H, Chen A, Nur Batrisyia RA, Ooi YBH and Khor BH

A23 The relationship between nutritional status and DNA damage in women experienced infertility in Malaysia
Nurdina Afiqah Z and Razinah SMS

A24 Physical activity level and psychosocial status between breast cancer survivors and healthy women in Klang Valley
Nursrisabrina N, Nur Afifah MZ and Mohd Razif S

A25 Association between malnutrition indicators, nutritional determinants, and frailty among community-dwelling older adults in Malaysia
Nurul Fatin MR, Hanis Mastura Y, Suzana S, Devinder Kaur AS and Radin Nur Suhaida Radin MN

A26 Dementia and its associated risk factors among older adults with probable sarcopenia and sarcopenia in Kelantan
Nurul Syahidah N, Divya V and Thirumulu PK

A27 Assessment of antropometric and psychosocial status of elderly in Pontian, Johor
Hanis Mastura Y and Nurul Syahira Atiqah M

A28 Associations of socioeconomic, home food environment and personal factors with fruits and vegetables intake among primary school children in Selangor
Tuan Nur Khairunnajwa TR, Siti Khadijah A, Tengku Nur Inasa TAK and Nurzalinda Z

A29 Associations of sociodemographic factors, home food environment factors and physical activity level with body weight status among primary school children in Hulu Langat, Selangor, Malaysia
Siti Khadijah A, Tuan Nur Khairunnajwa TR, Tengku Nur Inasa TAK and Nurzalinda Z

A30 Abstract removed

A31 Association of sociodemographic factors and lifestyle factors with vitamin D status among hospitalised children aged 2-12 years in selected private hospitals in Seremban
Seow AJM and Gan WY

A32 Are maternal nutrition literacy and dietary diversity related to children's nutritional status – A study among food insecure households in Simunjan, Sarawak?
Tan BC, Cheah WL and Law LS

A33 Associations of socio-demographic factors, parental factors and children's factors with body weight status among primary school children living in selected low-cost flats in Kuala Lumpur
Tan DH and Chin YS

A34 Assessment of nutrition environment in University Malaysia Sabah: A cross-sectional study
Tan XC, Ooi YBH and Khor BH

A35 Activities and outcomes from the weight management intervention for adults in Klang Valley: Practitioner's perspective
Tatiana S, Hanif Farhan MR and Ruzita AT

A36 The relationship between parents' sociodemographic and the anthropometric status of children aged 13 and 14 years old in Kuala Lumpur
Thanusiya D and Ruzita AT

A37 Sociodemographic and dietary factors are associated with vitamin B12 status among Malaysian primary school children: Findings from SEANUTS II
Wan Siti Fatimah WAR, Siti Balkis B, Tang SF, Khouw I and Poh BK on behalf of the SEANUTS II Malaysia Study Group

A38 The H.E.A.T© (Healthy Eating, Active and Support) Programme to sustain healthy body mass index in young adults: The needs assessment survey
Wan Suria WY, Sameeha MJ, Mohd Izwan M and Ruzita AT

A39 Changes in lifestyle and psychological health of young adults during and after the COVID-19 lockdown in Malaysia: A longitudinal study
Wong SS and Gan WY

A40 Abstract removed

Group B: Dietary Intake, Consumption Pattern & Disease

B01 Dietary compliance of macronutrients, fruits and vegetables intake and associations with body mass index among women of reproductive age
Aina Wahida MZ and Marhazlina M

B02 Parental stress and appetitive traits in infants aged 6-12 months in Kuala Lumpur and Putrajaya
Anastasya Eunike W, Nurliyana AR and Satvinder K

B03 Assessment of dietary fatty acid intakes and nutritional status among children in Sabah: A cross-sectional study
Chen A, Nur Batrisyia RA, Nur'ain Mardhiyah H, Ooi YBH and Khor BH

B04 The association between maternal pre-pregnancy body mass index (BMI) and gestational weight gain with infant appetitive traits
Chew WM, Satvinder Kaur and Nurliyana AR

B05 Associations between socio-demographic, environmental and parental factors and child nutritional status with fast food consumption among children aged 7-11 years old in Selangor
Chong SH and Zalilah MS

B06 Appetitive traits and dietary diversity of infants aged 6 to 12 months in Kuala Lumpur and Putrajaya
Chong C, Nurliyana AR and Satvinder K

B07 Ultra-processed food consumption and its association with diet quality among young adults in Klang Valley
Chua SJM, Norimah AK, Tung SEH, Yang WY and Sangeetha S

B08 Association of sociodemographic factors and food purchasing behaviour with risk factors of non-communicable diseases (NCDs) among Malaysian adults from a selected supermarket in Bukit Jalil
Chua XC, Chong HZ and Kanimolli A

B09 Infant feeding behaviour and sleep as predictors of infant growth
Eman Hisham ME and Satvinder K

B10 Sleep quality, diet quality and weight status of young adults residing in Klang Valley: A comparative cross-sectional study between COVID-19-recovered patients and non-COVID-19 patients
Farha Ainin Sofia M and Tan ST

B11 Association between dairy products intake and body composition among UniSZa undergraduate students
Hadirah MK and Marhazlina M

B12 Factors associated with intermittent fasting practices among workers in selected ministries in Putrajaya, Malaysia
Siti Hajar Maisarah H and Hazizi AS

B13 Stress and nutrition: Uncovering differences in body mass index and daily food intake in stressed versus unstressed UniSZa students, Terengganu
Hilaliyah NA, Izzahfathiah J, Nik Nurul Alya H and Nur Qistina Hawani H, Abbe Maleyki MJ and Wong CY

B14 Awareness and knowledge of Malaysian healthy plate concept among Malaysian normal weight population with hypercholesterolemia: NHMS 2019
Khairul Hasnan A, Halizah MR and Ahmad Ali Z

B15 Validation and reliability of the chrononutrition profile questionnaire-pregnancy (CPQ-P) among pregnant women in Malaysia
Kok EY, Satvinder K, Nurul Husna MS, Nurliyana AR and Masaki T

B16 Maternal eating behaviours, feeding practices and appetitive traits of infants aged 1 to 6 months in Kuala Lumpur and Putrajaya
Kuan JY, Nurliyana AR and Satvinder K

B17 Consumers' perception on healthy food and its association with socio-demographic factors: A preliminary cross-sectional study in Bukit Jalil
Chong HZ, Arasu K and Lee J

B18 Does ultra-processed food consumption reduce dietary diversity among university students in Klang Valley, Malaysia?
Leong EQY, Sangeetha S, Norimah AK, Yang WY and Tung SEH

B19 Ultra-processed food consumption and its contribution to energy and macronutrients intake among university students in Klang Valley
Lim AWH, Sangeetha S, Norimah AK, Yang WY and Tung SEH

B20 An understanding of dietary protein trends in Malaysia: Can we shift towards planetary health diet?
Lim KH, Festo M and Goh EV

B21 Low quality perception and acceptance of suboptimal food among consumers in Selangor and Kuala Lumpur
Lim SM, Law HB and Lee SS

B22 Dietary intake and quality: Its association with chronotypes among young Malaysian adults
Lim YH and Satvinder K

B23 Association between socio-demographic factors, gestational factors and maternal chronotype with maternal appetitive traits in Kuala Lumpur
Liow JL, Satvinder K and Nurliyana AR

B24 The development of sensory attribute and nutrient content database for three to five years old children's food (PEaters Choice™)
Mohd Shah K, Nur Iman Najat SB, Nur Hana H, Mohd Razif S, Masne K and Nik Shanita S and Hasnah H

B25 Dietary supplement consumption and quality of life among adults in peninsular Malaysia
Nerosha Nair G, Lim SM and Lee SS

B26 Factors associated with emotional eating among Malaysian university students
Norsyasya Diyana MN and Gan WY

B27 Dietary iron intake of children aged 8 to 12 years old in Kampung Pahu Pinawantai, Ranau, Sabah
Nur Ameera Farhana MS and Ooi YBH

B28 Association of *Á Posteriori* dietary pattern and nutritional status among children in Sabah: A cross-sectional study
Nur Batrisyia RA, Nur'ain Mardhiyah H, Chen A, Ooi YBH and Khor BH

B29 Do food environment and food choice motives influence food preferences? A study of international students in Universiti Putra Malaysia
Nurunnisa KE, Norhasmah S and Gan WY

B30 Consumer food purchase behaviour at different types of retailers in urban poor areas of four Southeast Asian countries: Findings from SEAOFE study
Sameeha MJ, Cut Novianti R, Elaine QB, Sirinya P, Cheah YK, Che Aniza CW, Anis Munirah S, Shashidharan S, Teeranong S, Natjera T, Adila S, Hafizah J, Ma Rica Sidney M, Poh BK, Thow AM and Helen T

B31 Abstract removed

B32 The prevalence and associated risk factors of gestational diabetes mellitus in the northern region of Malaysia
Sulhariza Husni Z, Zalilah MS and Geeta A

B33 Study on the association between the amount and type of protein intake and body mass index (BMI) among undergraduate health science students in Kelantan
Shan CL and Hafzan Y

B34 Association between sensory behaviour (smell/taste) and food neophobia among preschoolers in Terengganu, Malaysia
Siti Nur Aslinda O and Sharifah Wajihah Wafa SSTW

B35 Perception and acceptance of plant-based alternative to chicken among Malaysian consumers
Tan XY and Cheng SH

B36 Dietary supplementation use among women of reproductive age in Klang Valley
Tang WQ and Lee SS

B37 Individual components of paediatric metabolic syndrome and association with breakfast consumption frequency among children aged 6.0-12.9 years old in peninsular Malaysia
Teh KC, Wee LH, Khouw I and Poh BK on behalf of the SEANUTS II Malaysia Study Group

B38 Exploring gut microbiota diversity in gestational diabetes mellitus: Insights from clinical, lifestyle, and dietary perspectives in Malaysian pregnant women
Thubasni K, Vinod RMT, Umadevi P, Jayanthi T and Amutha R

B39 Abstract removed

B40 The interaction effects of food security and diet quality on weight change among working women of reproductive age during the endemic phase of COVID-19
Wiksa Virijo V and Tan ST

B41 Environmental factors, body mass index (BMI) status and food purchasing behaviour from a selected supermarket in Bukit Jalil
Chong HZ, Arasu K and Yap KX

B42 Frequent eating-out is associated with increased risk of poor diet quality among primary schoolchildren: Findings from SEANUTS II Malaysia
Yeo GS, Lee ST, Nik Shanita S, Wong JE, Khouw I and Poh BK on behalf of the SEANUTS II Malaysia Study Group

Group C: Nutrients & Other Components in Foods/Products

C01 Physicochemical properties and glycaemic index of chocolate energy bars prepared with guar gum and high polyphenols cocoa powder
Ainul Mufidah MH and Napisah H

C02 HMG-CoA reductase inhibitory activity, antioxidant and antiatherosclerotic potential of Basella alba leaf extract
Baskaran G, Shamala S, Mohd Yunus S and Vaidehi U

C03 Abstract removed

C04 Effects of LED treatments on the growth and nutritional contents of lettuce (*Lactuca sativa*) in a hydroponic vertical farming system
Koh MX and Singh A

C05 Elucidating the mechanisms of combination therapy using palm vitamin E and commercial anti leukemic drug (cytarabine) in cell-based models of acute myeloid leukaemia
Nabiha I, Siti Rahma AH, Ammu KR and Abdul Aziz B

C06 The effects of *urtica dioica* on benign prostatic hyperplasia (BPH) markers- a systematic review and meta-analysis
Narshima A, Surabhi Singh Y, Pooja P and Kavitha M

C07 Anti-proliferative activity *polygonum minus* water extract on human adenocarcinoma colon cancer cell lines (Ht-29)
Nor Azrina AL, Mohd Adzim KR, Norhayati AH and Norhaslinda R

C08 Anti-diabetic properties of phenolic-rich extract from stingless bee (*Heterotrigona itama*) honey, *in vitro*
Cheng MZSZ, Norhasnida Z, Ooi DJ, Chan KW, Norsharina I, Nur Akmal I and Norhaizan ME

C09 Entomophagy practices among insect eaters in Malaysia – A qualitative study
Nurul Hafizah MAA, Sameeha MJ and Poh BK

C10 Glycaemic response of a vegetarian and non-vegetarian meal and effects on perceived satiety
Shaliza Amierra S and Ramlah G

C11 Nutritional health and importance of coconut milk fats
Saif A, Hamdan A and Aminah A

C12 The phytochemicals and antioxidant interaction of *Moringa oreifera* when combined with selected medicinal plants
Samyuktha R, Yong PH and Ng ZX

C13 Nutritional composition and sensory evaluation of jackfruit plant-based mixed mushroom patties and chicken patties
Haw SY and Siti Raihanah S

C14 TRF as an adjuvant enhances dendritic cell vaccine efficacy and inhibits tumour progression and microenvironmental interaction in a mouse model of breast cancer
Sitti Rahma AH, Nabiha I and Ammu Kutty R

C15 Prebiotic potential of banana peel on the growth of *Lactobacillus spp.*
Tan CY and Mohd Redzwan S

C16 Anti-inflammatory effects of palm tocotrienol rich-fraction in RAW 264.7 macrophages
Azman AS, Aini MAM, Norisam I, Iran N and Hafid SRA

C17 Evaluating the effects of combined TRF and cytarabine treatment on cell proliferation and gene expression in the Kasumi-6 human acute myeloid leukaemia (AML) cell line
Azani SA, Hafid SRA, Aini MAM, Norisam I and Iran N

C18 Anti-inflammatory effect of tocotrienol rich fraction on A549 lung epithelial cancer cells stimulated with IL-1β
Samsudin SHN, Aini MAM, Norisam I, Iran N and Hafid SRA

Group D: Clinical Nutrition/Intervention Trials

D01 Relationship between knowledge, attitude, training, perspective and willingness to adopt nutrigenetic and nutrigenomic among nutritionists and dietitians
Goh SM, Vaidehi U, Lim SY and Baskaran G

D02 Consumer's trust, delivery method, perceived risk and benefits on the intention to adopt personalised nutrition service in Malaysia
Liau CW, Vaidehi U, Lim SY and Baskaran G

D03 Abstract removed

D04 Abstract removed

D05 Association between micronutrient density index, *FTO* gene polymorphism and body fat percentage status of Malaysian adults: The role of nutrigenetics
Stevinni W, Vaidehi U, Baskaran G and Lim SY

D06 Association of physical activity intensity with risk and survival of nasopharyngeal carcinoma: A hospital based matched case control study
Vaidehi U, Lye MS, Mirnalini K, Loh SP and Baskaran G

Group E: Food Science & Technology

E01 The development of a plant-based patty from split gill mushrooms and lablab beans
Divya JM and Azam-Ali S

E02 The anti-diabetic properties of cooled instant red rice
Noor Atiqah Aizan AK, Yanty Noorzianna AM, Ooi YBH and Azrina A

E03 Physicochemical characteristics, sodium content and sensory evaluation of selected commercialised soy sauces with no sodium labelling in Malaysia
Nur Huda A and Hasnah H

E04 Changes in growth and phytochemicals of pak choi (*Brassica rapa* subsp. *Chinensis*) and mustard (*Brassica juncea*) under combined ratios of red, green and blue LEDs in a hydroponic vertical farming system
Yau BYY and Singh A

Group F: Experimental Nutrition

F01 Carnosine-iron oxide magnetic nanoparticles inhibit HCT-116 cells growth by inducing apoptosis, autophagy and necroptosis
Hu FC, Hsieh LC, Chen YT, Hsieh S, Wu CC and Hsieh SL

F02 Abstract removed

F03 Cuttlefish melanin suppresses cell growth by inducing apoptosis of human colorectal cancer cells
Lai SY, Huang YW, Hou CY, Shih MK and Hsieh SL

F04 Effect of *Gynura bicolor* water extract on inflammatory response of intestinal cells induced by 5-fluorouracil
Siew KR and Wu CC

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1. Alarcon PA, et al. Clin Pediatr (Phila) 2003;42(3):209-17. 50% is based on calculated value.
2. Van Vught AJ et al. Br J Nutr (2013); 109, 1031-1039. 3. Van Summeren MJ et al. Br J Nutr (2008); 100, 852-858.

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1 Gardener et al. The clinical content of preconception care: nutrition and dietary supplements. Am J Ob Gyn. 2008;199 (6 suppl B):S345-56. https://www.who.int/health-topics/micronutrients#tab=tab_1 **2** Beluska-Turkan et al. Nutritional gaps and supplementation in the first 1000 days. Nutrients. 2019;11(12):10.

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*Reference: Mokhtar N, Jaafar NM, Chan S, et al IDDF2018-ABS-0203
Modulation of intestinal dysbiosis in patients with constipation-predominant irritable bowel syndrome using lactobacillus-containing cultured milk drink Gut 2018;67:A70.
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*Thomsen AB, et al. Eur J Clin Nutr 2004
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Abstracts

Keynote Lecture 1

From "sick care" to wellness – Healthy nutrition is key

Tee ES

Nutrition Society of Malaysia

The Health White Paper (HWP) was recently published by the Ministry of Health to highlight the need to reform the nation's health system towards better health and well-being of the people. The HWP highlights that in the last 2 decades, the health status of the people has been declining. The health system, particularly the public healthcare system, is said to be overstretched, overburdened, and dated. One of the country's main health challenges is the rising burden of non-communicable diseases (NCDs) driven by lifestyle-related risk factors such as physical inactivity, tobacco use, substance abuse, harmful use of alcohol and an unhealthy diet. Other challenges faced by health authorities are a lack of awareness, delays in diagnosis and high proportion of undiagnosed NCDs especially among the lower socio-economic groups. The high cost of treatment and management of NCDs and long-term complications are of great concern. In addition, NCDs also cause losses in economic productivity estimated at nearly 1% of gross domestic product (GDP)

To address these challenges, the HWP has proposed that major changes are needed. The 2nd pillar of the propose health system reform focuses on advancing health promotion and disease prevention. The HWP envisions a paradigm shift from 'sick care' towards a system that supports the population to stay healthy. The health system needs to be reformed towards facilitating healthy living for all ages, increasing evidence-based preventive practices, regular screenings, and self-monitoring; and strengthening the capacity of healthcare services in promotive and preventive care. The HWP calls for forging a 'whole of nation' approach, with greater collaboration and partnership between government entities, non-profit organisations, the private sector, community groups and individuals to address the range of factors that drive health outcomes.

The Nutrition Society of Malaysia (NSM) is of the view that such paradigm shift is long overdue and is the only way towards healthy generation of Malaysians. To realise the shift to promotive and preventive health care, the NSM further advocates that promoting healthy nutrition across all stages of the life cycle is one of the key approaches. The theme of the NSM conference this year highlights this. Recognising that healthy nutrition is the cornerstone to good health, NSM believes in improving lives through nutrition. Equally important is being physically active and going for regular health check-ups.

The NSM urges that various strategies and actions need to be undertaken to achieve what is envisioned in the HWP. The strategies and programmes outlined in the National Plan of Action for Nutrition (NPAN) Malaysia must be activated and systematically implemented. Sufficient resources must be provided to enable these to be implemented. This includes sufficient man power in the form of adequate number of capable, well-trained nutritionists, as well as dedicated funding to implement these activities. The Allied Health Professions Act 774 has recognised that nutritionists are the key professionals tasked with implementing the programmes and activities in NPAN III, in the promotion of nutritional wellbeing of the population as well as to prevent and control nutrition-related diseases of various identified

target groups. However, nutritionists cannot work alone; we must advocate nutrition to our allies and have their support eg professionals in the agriculture, education, social welfare and other relevant disciplines. To succeed in shifting from 'sick care' to wellness, we must form strategic alliances with all stakeholders: government, academia, professional bodies and private sector to build a system that supports the population to stay healthy.

Acknowledgement: Parts of the abstract and presentation have been extracted from the Health White Paper of the Government of Malaysia.

https://moh.gov.my/index.php/pages/view/7313?mid=1738

Symposium 1: Maternal, Infant and Young Children

Optimising gestational weight gain for the prevention of gestational diabetes mellitus: A web/smartphone-based lifestyle intervention for pregnant women in Malaysia

Zalilah MS[1], Yong HY[2] and Chan YM[1]

[1]Faculty of Medicine and Health Sciences, Universiti Putra Malaysia
[2]Division of Nutrition and Dietetics, School of Health Sciences, International Medical University, Malaysia

About 1–28% of all pregnancies are complicated by gestational diabetes mellitus (GDM) with the prevalence in the low- to middle-income countries is relatively higher than in the high-income countries. Gestational weight gain (GWG), independently or in combination with pre-pregnancy BMI, has been shown to exert influence on the development of GDM. Optimising GWG through interventions that focus on lifestyle behaviours (diet and physical activity) is feasible to reduce the risk of GDM. In recent times, the use of digital health-applications in health promotion is increasingly important as the coverage is wide, time-saving and cost-effective. Such applications have been used in management of all forms of diabetes, including GDM. This pilot project is a collaborative effort of Universiti Putra Malaysia and Ministry of Health (MOH), funded by the World Diabetes Foundation and with partnership with various stakeholders. This presentation will discuss the three (3) phases of the project – Phase 1 (Development of materials) and Phase 2 (Training of health professionals) of the project have been completed while Phase 3 (Implementation of life-style program) is currently on-going. The aim of the life-style program is to utilize web and smartphone-based health and nutrition education for managing GWG by pregnant women receiving ante-natal care at selected health clinics of MOH in Peninsular Malaysia. Expected outcomes and outputs as well as challenges of the project will also be presented. Evaluation data and lessons learnt from this pilot project will be used to improve the web and smartphone-based lifestyle intervention for future management of GWG by pregnant women and subsequently addressing GDM.

Tackling nutritional challenges among children in Malaysia: Insights from three studies on eating habits, physical activity, food environment, and behaviour intervention

Poh BK on behalf of the SEANUTS II Malaysia, ToyBox Study Malaysia and SEAOFE Study teams

Centre for Community Health Studies (ReaCH), Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Kuala Lumpur

Eating habits, physical activity, and food environment all impact nutritional status of children. This presentation aims to share findings from three studies on nutritional status, meal patterns, physical activity, food environment, and healthy behaviour interventions among young children in Malaysia. The South East Asian Nutrition Surveys II (SEANUTS II) conducted in Peninsular Malaysia found that malnutrition rates vary across age groups, with undernutrition more prevalent in younger children (9-23% stunting; 8-36% underweight) and overweight/obesity more prevalent among older children (29.7% in 7-12 years old). Concerning meal patterns, 34.1% of children skipped breakfast at least once a week, mainly due to no appetite (39.7%), oversleeping (35.5%), and "no time to eat" (23.3%). Most children had lunch (80.2%) and dinner (76.1%) daily, and many also reported eating between meals, including morning tea (36.0%), afternoon tea (36.1%), and supper (21.9%). About 40.4% of children experienced food insecurity. Based on age-specific physical activity guidelines from WHO 2019 and 2020, only 38.3% of children aged 0.5-12.9 years met physical activity recommendations, while 39.2% met sedentary behaviour guidelines. Hence, healthy behaviour interventions are vital to improve overall nutritional status. ToyBox Study Malaysia is a kindergarten-based family-focused intervention that targets key behaviours related to energy balance, which has had a positive impact on preschoolers' weight status. The intervention has since been digitised as e-Toybox, an online learning platform that provides preschool teachers and childcare providers with nutrition education that they can implement in class. Furthermore, the food environment influences dietary behaviours and intake of the community, including children. The South East Asia Obesogenic Food Environment (SEAOFE) Study indicates that improved understanding of retail food environment, consumers' and retailers' perspectives on factors influencing their food retail-related decisions, can help improve existing national-level policies and actions that influence food retail. Identifying obesogenic food environments and promoting access to healthy foods are essential components in addressing public health concerns regarding the double burden of malnutrition. Early intervention can improve long-term health outcomes and mitigate the negative impacts of malnutrition on individuals and communities.

Innovation using sticker book for nutrition education in children

Sharifah Wajihah Wafa SSTW[1], Ahmad Faezi AR[2], Nor Mazlina AB[3], Nor Ratna M[4], Nurnadia AA[4] and Nurul Fatihah Hanim G[4]

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A healthy, balanced diet is the most important part of health care at any age, meeting the body's nutritional needs and preventing diseases. Various methods are used to promote healthy eating in children, such as healthy eating talks, nutrition counselling, interactive games, quizzes and others. Such programmes are "one-offs" and do not have ongoing guidance to ensure children follow the recommended practices. This makes implementing this type of healthy eating promotion less impactful in terms of energy, time, and costs. The Fun and Healthy Eating Sticker (FHES) book, an innovative nutrition education tool, is used as a guide to enhance the effectiveness of healthy eating education activities for children. The study evaluated the effectiveness of the FHES book in improving eating habits in children following the i-MaCHeL (Interactive Malaysian Childhood Healthy Lifestyle) intervention programme (n=230) with respect to control groups undergoing standard nutrition activities at school (n=230). The dietary intake of the two groups was assessed using a three-day food record at each time point throughout the study period (baseline, 3 months, and 9 months). Parents from the intervention group completed a set of questionnaires before and after using the sticker book. Although the results show improvement in fish, milk, fruit and vegetable intake at 3 and 9-month time points in the intervention group, no significant differences were found between the groups. In the study, parents reported changes in the eating habits of their children after they used the sticker book; more children consumed vegetables (11% vs 4%), fish (47% vs 43%), chicken/meat/egg (51% vs. 36%), milk (25% vs 13%) and plain water (89% vs 84%) every day compared to before the intervention. More than 90% of the parents agreed that the FHES book is interesting, easy to use, helps them understand and monitor their children's daily eating patterns, and motivates them to eat healthily every day. The study provides evidence that innovation using sticker books for nutrition education in children can be implemented in the school setting with the improvement of several food items intake. Collaboration with nutritionists and teachers demonstrated a promising channel for the wide-scale dissemination of sticker books as a nutrition education tool at the school level.

Update on maternal, child and adolescent nutrition – Findings of NHMS 2022

Ahmad Ali Z, Mohd Shaiful Azlan K, Lim KK and Noor Ani A

Institute for Public Health, National Institute of Health, Ministry of Health Malaysia, Selangor, Malaysia

In 2022, the Institute for Public Health, Ministry of Health Malaysia has conducted two national surveys on maternal and child health (MCH) also known as NHMS 2022: MCH and Adolescent Health Survey (NHMS 2022: AHS). The NHMS 2022: MCH involved a total of 1029 Enumeration Blocks (EB) consisting of 13,832 Living Quarters (LQ). A total of 25,413 respondents were interviewed with an overall response rate of 74.9%. While, NHMS 2022: AHS involved a total of 240 randomly selected schools with 33,523 adolescents with an overall response rate of 89.0%.

The study revealed the prevalence of early initiation of breastfeeding within 1 hour among children born in the last 24 months was 64.3% which has been plateauing since 2006. However, the prevalence of continuing breastfeeding until 2 years old has increased from 39.4% (NHMS 2016) to 50.6% (NHMS 2022). The prevalence of children received minimum meal frequency was 78.6%. In terms of minimum dietary diversity, a marked improvement is as seen from 46.0% (NHMS 2016) to 64.3% (NHMS 2022). In terms of nutritional status, the prevalence of low birth weight (LBW) in Malaysia increased from 9.7% (NHMS 2016) to 10.9% (NHMS 2022). The prevalence of stunting among children aged 0-59 months remained high at 21.2%, and the prevalence of underweight and wasting has been steadily increasing since the year 2015 with the current prevalence of 15.3% and 10.1% respectively, while the prevalence of anaemia (6-59 months) was 46.5%. Based on the findings, health

promotion initiative needs to be enhanced by multi-agencies via educating and encourage caregivers in providing a variety of healthy foods for children starting at 6 months old, attending routine health screening and monitoring children's growth at home.

In relation to dietary behaviours of adolescent (13-17 years), 2.5% reported being hungry most of the time or always in the past 30 days because there was not enough food at home. The consumption of fruits at least twice daily was 37.3% and vegetables at least thrice daily were 27.1% in the past 30 days. Only 16.1% reported fruits and vegetables consumption at least five times daily in the past 30 days. Consumption of carbonated drinks at least once daily in the past 30 days was reported at 32.4%, while 10.6% consumed food from fast food restaurants for at least three days in the past seven days. Milk/milk product consumption at least twice daily was reported at 23.2%, while 48.8% drank plain water less than six glasses per day in the past 30 days. The prevalence of stunting and thinness among adolescents were 6.8% and 8.3%, respectively while the prevalence of overweight was 16.2% and obesity was 14.3%. Prevalence of being physically active for a total of at least 60 minutes daily for five days or more in the past seven days was 21.4% and 27.0% of adolescents reported active transportation to school. In addition, 66.7% of adolescents had spent at least three hours on a typical or usual day in sitting activities. In view of the above findings, it is recommended that a multi-approach school-based nutrition and physical activity intervention be strengthened in order to motivate behaviour modification for improving healthy eating and lifestyle amongst adolescents.

Invited Lecture 1

Sustainability healthy diet – nourishing a better planet

Rolf B

Global Expert Team Nutrition, Royal FrieslandCampina, Netherlands

The growing world population in combination with climate change has forced the world to rethink its behaviour. It has sparked the discussion amongst nutritionists on what to consider when composing diets bearing in mind the planetary boundaries without losing sight of practical implications consumers face. The definition of sustainable diets formulated by FAO illustrates the multiple dimensions to consider: "dietary patterns that promote all dimensions of individuals' health and wellbeing; have low environmental pressure and impact; are accessible, affordable, safe and equitable; and are culturally acceptable". Several approaches are considered to (partly) quantify this definition. A too narrow approach might result in a conclusion that is unwanted. A one-dimensional approach using standard LCA's, for instance, does not reflect the function of food. The function of food is not simply mass based but is to provide nutrients and maintain or improve human health. The presentation will point out potential pitfalls and stress the importance to properly include nutritional value when balancing the various dimensions of a sustainable diet.

Lunch Symposium 1

Anaemia screening of young children in Malaysia: The latest findings of Ironstrong Study

Muhammad Yazid J[1], Hasim S[2], Ho BK[3], Lee WK[4], Low AC[5], Nik Kazim NHR[6] and Taher SW[7]

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[2]Klinik Kesihatan Endau, Johor
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[4]Klink Kesihatan Luyang, Sabah
[5]Danone Specialized Nutrition, India South East Asia
[6]Klinik Kesihatan Wakaf Bahru, Kelantan
[7]Klink Kesihatan Simpang Kuala Kedah

The study aimed to assess the prevalence, profile, and factors associated with being at risk of anaemia among Malaysian children aged ≥ 6 to ≤ 36 months, using a non-invasive haemoglobin assessment. This was a cross-sectional study among out-patient Malaysian children, who were randomly selected from the five maternal -and-child health clinics. At risk of anaemia was defined as total haemoglobin <12 g/dL, measured using the Masimo Rad-67™ Rainbow (Masimo Corp., Irvine, CA, USA) a non-invasive screening device for total haemoglobin. Chi-square and multiple logistic regression were used to assess the profiles and factors associated with being at risk of anaemia, using R-Studio (version 4.0.0). The study comprised of 1201 participants, of whom 30% (95%CI: 28–33) were being at risk of anaemia which is comparable with 2019 WHO reported prevalence of anaemia (24.6%) in children age 6-59 months. Children of 6-12 months (AOR=1.81, 95%CI: 1.33-2.46), Asian-Malay race (AOR=1.59, 95%CI: 1.09-2.34), from Klang district (AOR=2.93, 95%CI: 1.80-4.87) and from Pasir Mas district (AOR= 2.51, 95%CI: 0.96-7.25) were associated with higher odds of being at risk of anaemia compared to children >12-36 months, Asian-Chinese race and Alor Setar city, respectively. However, weight for age (AOR=0.89, 95%CI: 0.79-0.99) had a negative association with being at risk of anaemia. Due to increasing prevalence of anaemia among children in Malaysia, strategies to reduce anaemia will require a different approach. More proactive detection of anaemia using a non-invasive approach could be one of the key preventative strategies to identify anaemia risk among young children in Malaysia. There is a need for more community education and awareness on anaemia, including nutrition education, as well as targeted community screening to enable early detection and prompt treatment of anaemia cases.

Symposium 2: Food Environment & Nutrition

Use nutrition information on food labels to empower consumers make informed food choices

Norlida Z

Food Safety and Quality Division, Ministry of Health Malaysia

Ministry of Health enacted the Food Act 1983, followed by Food Regulations 1985 with main objectives of protecting the public against health hazards in food and fraud in the preparation, sale and use of foods. An important regulation enacted is on food labelling, which provides clear and concise requirement about food product information including product's name, expiry date, ingredients listing, net weight, and manufacturer's information. Regulations for mandatory nutrition labelling and claims have been enacted and enforced in 2003. All these information on food labels can be utilised to empower consumers to make informed food choices of pre-packaged foods.

Nutrition labelling describes the nutrient content of the food product by declaration of the nutrients in table form, commonly known as a nutrition information panel (NIP). Nutrition claims regulations permits manufacturers to highlight the nutritional value and properties in the food that meet the requirements. The primary objective of nutrition labelling and claims is to describe the nutritional qualities of a food product factually and informatively, thereby assisting the consumer in making better food choices when planning their daily meals.

As an extension to the mandated back or side nutrition information panel (NIP), summary of nutrition information on the front-of-pack nutrition labelling (FOP-NL) offers a quick guide to inform consumers about the nutrition content of different products. There are two FOP-NL systems in Malaysia, namely Energy Icon and Healthier Choices Logo (HCL), introduced in 2012 and 2017 respectively. These icons are to be promoted in conjunction with the nutrition label as additional ways to communicate nutrition information through food labels, as well as to encourage food industries to produce healthier food options to be available in the market.

This presentation highlights the availability of various food and nutrition information on food labels that can be used by consumers to assist them in making healthier food choices. The nutritionists are encouraged to share this information to inform the consumers, and to encourage them to use the information to help them in choosing food products based on nutritional properties rather than on price or branding.

The role of nutritionist in promoting edible garden (Sabah success story)

Susilia S

Pahang State Health Department, Kuantan, Malaysia

In 2021, only 64% of the new cases receiving food baskets in *Program Pemulihan Kanak-Kanak Kekurangan Zat Makanan* have shown an increment in body weight. Among these

children, 66% come from hardcore poor families, 29% from poor families and 4% from B40 families. Therefore, the edible garden initiatives have been aimed to promote self-sustaining food availability at household scale among these families.

The head of Family Nutrition Unit in Sabah State Health Department has been appointed to coordinate The Edible Garden Initiatives. Series of training, jointly organized with relevant government agencies and NGOs, have been conducted for volunteer coordinators from 25 districts. As a motivation, the initiatives started off in the form of a state level competition. Winners have been awarded with farming equipment and supply of fertilizer as incentives. Established gardens in health clinics have been utilized as training centres for the family of food basket recipients and anaemic antenatal mothers.

133 volunteer coordinators from 25 districts have been trained at the state level trainings. Many more have been trained at each community level. A total of 35 edible garden project sites have been started all over the state. 22 edible garden project sites have taken part in the state level edible garden competition. Assessment criteria have covered a variety of sustainable food production system such as hydro pot, hydroponic, fertigation and conventional technique. Emphasis have been given on using recycled materials to reduce labour, water usage and other resources. Main harvest focused on foods for sources of carbohydrate, protein, fibres, vitamins and minerals.

Edible garden initiatives at house hold scale have proven high potential in bridging the gap between national food security action plan and the actual food crisis among the vulnerable community. Edible garden initiatives provide actionable alternative to a self-sustaining food production to increase affordability, availability, as well as quality and safety. Thus, contributing to improved nutritional status among malnourished children and women at reproductive age.

Relative validity and reliability of a diet quality index for Malaysian adults: Preliminary findings of the Malaysian Healthy Diet Online Survey (MHDOS)

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Malaysian Healthy Diet Online Survey (MHDOS) is an on-going nationwide online diet survey that aims to measure diet quality of Malaysian adults aged 18-59 years. Based on self-reported information on food quantity, quality, and variety, the survey derives a Diet Score, where a higher score reflects greater compliance with the Malaysian Dietary Guidelines (2020). This study aims to examine the validity and reliability of the Diet Score as an indicator of diet quality among Malaysian adults. A total of 316 participants from 13 states and 3 federal territories of Malaysia answered the MHDOS, and also underwent

an interviewer-administered, single 24-hour diet recall (24hDR), and then repeated the MHDOS within a two-week period. The mean Diet Score was 48.8 out of a possible 100, with higher scores observed among participants from the oldest age group category (50-59 years), Chinese, and those who were physically active. The MHDOS demonstrated moderate to good reliability, with intraclass correlation coefficients ranging from 0.51-0.78 for different components and 0.78 for the total Diet Score. Comparison of median food group intakes estimated from the MHDOS and 24hDR resulted in Spearman correlation coefficients ranging from 0.18-0.38, (all p<0.01). For energy-adjusted nutrients, a higher Diet Score was positively correlated with higher intake of total fibre, vitamin C, thiamine, riboflavin, niacin, sodium, potassium, calcium, phosphorus, and iron (p-trend<0.05). A higher Diet Score was also associated with higher intake of vegetables, fruits, milk and milk products, and fluids (p-trend<0.05). Our preliminary findings suggest that the Diet Score is a reproducible measure and associated with better nutrient and food group intake compared to 24hDR. The Diet Score is valid as an indicator of diet quality among Malaysian adults. Future studies are needed to examine the predictive validity of this Diet Score in a larger sample size.

Promoting education for food sustainability in Japanese schools: Investigating nutrition teachers' efforts for effective implementation

Wafaa A

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With a growing global interest in achieving sustainable development goals (SDGs), addressing issues related to food sustainability has become a subject of great importance. Education is seen as a strategic influence in this matter since it plays a significant role in raising awareness and transforming perceptions, values, and attitudes. More importantly, schools are increasingly being recognized as an ideal setting with the potential to positively influence future generations to instil and maintain sustainable behaviours. This study aimed to explore how food sustainability education is promoted in Japanese schools. The study investigated the educational practices and implementation methods applied by Japanese nutrition teachers to effectively communicate the importance of sustainable food practices to Japanese students. The study adopted the qualitative approach for data collection. A number of (13) face-to-face interviews were conducted with expert nutrition teachers in (4) different cities within Osaka prefecture during 2021, each lasting approximately 30 minutes. The study found that nutrition teachers were primarily concerned with two major food sustainability issues: 1) reducing food waste, especially that resulting from school lunch meals, and 2) encouraging the consumption of seasonal and local vegetables. To address the first point, nutrition teachers have used lunchtime guidance to draw students' attention to the problem of food loss and its various negative consequences, while emphasizing the importance of appreciating nature's blessings and the efforts of those who participated in the process of producing food. Furthermore, to achieve the second goal, the lunch meal was planned, prepared to visually manifest seasonal foods in daily fresh meals. The study concluded that nutrition teachers developed and implemented a unique educational approach, which uses the school lunch as effective teaching material to improve students' awareness of sustainable food practices. Implementing such a non-cognitive method may foster sustainable daily life practices among Japanese school students in the long run.

Invited Lecture 2

Optimising nutritional needs for optimal growth in children and adolescents

Hamid Jan JM

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Malaysia is currently facing a triple burden of malnutrition, which poses significant nutrition challenges across all age groups, especially among children. This is characterized by a high prevalence of stunting in children, anemia in pregnancy, and obesity among young adults. Cohort studies have demonstrated the crucial role of early life nutrition in protecting current and future generations from nutritional diseases. Optimum nutrition, starting as early as during the periconception period (3 months before pregnancy) and throughout the first 1000 days of life, may promote optimal growth in children. Healthy children are more likely to grow normally into healthy adolescents and adults. The adolescence period, between ages 10 to 19, is a unique stage of human development and an important time for establishing the foundations of good health. Therefore, appropriate nutritional interventions should be implemented among at-risk reproductive age women, young children, and adolescents as strategies to achieve optimal growth and prevent chronic diseases in later life. Early intervention not only benefits the current generation but also future generations.

Young Researchers' Symposium

Haemoglobin, HbA1c and nutritional status of urban B40 pregnant mothers: A prospective cohort study

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The current efforts of reducing the prevalence of anaemia have been widely practised among the primary healthcare facilities in Malaysia, such as prenatal iron supplementation and nutrition education. Although there have been several studies on anaemic status generally among pregnant women, none have been conducted specifically among urban B40 pregnant women in Malaysia. This study aims to determine the maternal haemoglobin,

HbA1c level, and dietary intake among B40 pregnant women. This was a prospective cohort study in which eligible pregnant women were recruited from the Maternal and Child Health (MCH) clinic in Kuala Lumpur, Malaysia. Pregnant women were visited during enrolment, 1st follow-up (16-19 weeks) and 2nd follow-up (24-26 weeks). Routine assessments of haemoglobin, HbA1c and 24-hour dietary recall were obtained for each follow-up in this study. A total of 62 pregnant women were recruited in this study. Most were Malay, aged 19 to 38 years old and 48% had normal pre-pregnancy BMI. None of the pregnant women was anaemia at baseline. However, 16% and 32% of pregnant women experienced mild anaemia during 1st and 2nd follow-up respectively. About 5% had moderate anaemia at 2nd follow-up. Only 61% of them are taking daily haematinic supplements provided by the antenatal clinic at 1st follow-up, and it was improved to 71% at 2nd follow-up. About 86% of the pregnant women had HbA1c levels <5.7% at enrolment and the percentage increased to 94% at 1st and 2nd follow-up. At enrolment and follow-ups, it is estimated that most of them consumed excessive fat intake and adequate protein. Only 1.6% achieved the recommended daily iron intake during pregnancy. It is difficult to achieve recommended iron intake from dietary intake; therefore, prenatal supplement plays a very important role to increase and maintain the level of haemoglobin throughout the pregnancy.

SALT@HOME: a new household salt intake assessment methodology and qualitative insight on salt reduction strategies

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The study aims to investigate a practical approach to estimate dietary salt intake, sodium and identify the sources of salt intake in population compared to a 24-h urine collection involving 100 households. The study also aimed to conduct a comprehensive qualitative study assessing household salt reduction strategies. Salt@Home estimates salt intake from three core principles: (i) salt, (ii) processed food and (iii) eating outside. Factors associated with salt reduction strategies were evaluated using a qualitative approach that included in-depth interviews and thematic analysis. There was strong agreement between the two assessment methods, (k=0.823(95%CI, 0.500-0.886), p<0.001). Top three subthemes of knowledge on salt intake were (i) high salt consumption, (ii) relationship between excessive salt consumption and (iii) health issues, fast foods and proceed food; attitude were (i) amount of salt intake, (ii) importance of salt reduction, and (iii)good to reduce salt intake; and practices were (i) flavouring enhancer-MSG, (ii) not aware of other alternative enhancer, and (iii) always eating out. Top three theme of purchase behaviour and actions towards reducing salt intake were (i) reduce their salt intake, (ii) had some knowledge on nutritional labels, and (iii) had the willingness to start using salt substitutes; and barriers to salt reduction were:(i) family and friends taste's preferences, (ii) lack of taste in low salt meals, and (iii) non-availability and high cost of low salt items. The top three motivations of salt reduction were: i) self-awareness, ii) doctor or experts, and iii) self-awareness and finally goal of salt reduction was identified via home-prepared meal and to achieve life-time health maintenance as well as reducing junk food consumption. Salt@Home require no laboratory analysis, and the information needed is simple and understandable by non-professionals. Low salt intake can be achieved by emphasizing self-autonomy and behavioural change in salt reduction in their daily diet

Perceptions, barriers, and enablers on the salt reduction policy in the out-of-home sectors in Malaysia (MyOH): From the outlook of street food vendors, caterers, and consumers

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The objective of this study was to explore the perspectives, barriers, and enablers of salt reduction policy in out-of-home sectors in Malaysia among street food vendors, caterers, and consumers. A qualitative study involving focus group discussions (FGDs) and in-depth interviews (IDIs) was conducted, recorded and transcribed verbatim. An inductive thematic analysis approach was employed to analyze the data. A total of 22 FGDs and two IDIs were conducted face-to-face. Four interviews were conducted online. A total of 25 street food vendors, 25 caterers and 76 consumers of various eateries, recruited from the five zones in Malaysia. Participants perceived that salt intake among Malaysians through out-of-home food sectors was high, and that a policy was needed to address this. The barriers and enablers towards the policy were classified into (1) the price of salt, natural flavour enhancers and salt substitutes, (2) availability of low and high salt food products, (3) knowledge among the out-of-home sectors, (4) food quality, (5) monitoring and enforcement on salt content in the out-of-home sectors, (6) awareness and knowledge among the consumers, (7) consumers' acceptance, and (8) willingness among the out-of-home sectors and consumers. Salt intake was perceived as high and eight themes has been identified as barriers and enablers that could be used as evidence for the development and implementation of a multifaceted policy, through education and awareness, promotion and recognition of healthy food vendors, price factors of low and high salt foods and healthier ingredients, and through health monitoring and enforcement on the out-of-home sectors.

Development of local food-based dietary recommendations using linear programming approach for urban poor undernourished children aged 48 to 71 months old in Seremban, Malaysia

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It could be challenging to meet the nutritional needs of young children while maintaining their intake of local and culturally appropriate foods. Using linear programming (LP)

approach to optimize their diet can be an effective strategy to include local and culturally acceptable foods. This cross-sectional study aimed to develop affordable and realistic food-based dietary recommendations (FBR) to improve dietary adequacy of urban poor undernourished children aged 48 to 71 months old from low-income households in Seremban district, Malaysia. Dietary intake of 83 undernourished children was assessed using a non-consecutive 3-day 24-hour dietary recall. FBR were developed by LP approach using World Health Organization Optifood software. Comparing to the Recommended Nutrients Intakes (RNI) of Malaysia, niacin (93%), folate (30%), calcium (30%), and zinc (55%) were not achieved by most of the children. Folate was considered as an absolute problem nutrient whereas adequacy levels of vitamins A, B6, B12, C, calcium, iron, and zinc were difficult to be achieved even when the diet was optimised. The identified top five locally available nutrient-dense foods that would fill these nutrient gaps were chocolate malted milk, full cream milk, chicken egg, mustard greens, and cauliflower. The recommended FBR were 3 servings of grains, 1 serving of fruits, 2 servings of vegetables (of which included 1 serving of vitamin C-rich vegetables), 2 servings of meat, fish and eggs (of which included 1 serving of eggs), 1 serving of legumes, nuts and seeds, and 2 servings of fluid milk every day. Findings indicate that there is a need to implement a healthy, balanced, affordable and culturally acceptable FBR for undernourished children from low-income households in order to fill the identified nutrient gaps.

The association between body composition, anthropometry, and depression with sarcopenia among community-dwelling older people in Kelantan: A cross-sectional study

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Sarcopenia, characterized by progressive muscle atrophy commonly expedited by aging, is a damaging condition affecting the geriatric population in Malaysia. It has been linked to various factors including physical and psychosocial aspects, which may cause an increment in the institutionalization rate. Thus, this study aims to investigate the association between body composition, anthropometry, and depression with sarcopenia among community-dwelling older adults in Kelantan, Malaysia. A total of 174 older adults aged 60 years and above participated in the study spanning from February to April 2023. Anthropometric [weight, height, body circumference (waist, arm, calf), body mass index (BMI), and waist-hip ratio (WHR)], depression (measured by Geriatric Depression Scale), and sarcopenic parameters (muscle strength measured by handgrip strength, muscle mass presented as skeletal muscle index (SMI), and muscle performance measured by short physical performance battery) were assessed and the latter was defined according to the 2019 Asian Working Group for Sarcopenia. The prevalence of sarcopenia and severe sarcopenia among older adults aged 68±6.3 years old residing in Kelantan were 8.0% and 16.1% respectively, with no significant difference between gender. All three body circumferences, BMI, WHR, percentages of fat mass (FM) and fat-free mass (FFM), and SMI were found to be associated with sarcopenia (all $p<0.01$). Sarcopenic older adults were found to have lower BMI [21.6(4.1)], WHR [0.85(0.1)], calf circumference [30.9(1.9)], waist circumference [78.3(11.6)], FFM [26.8(9.9)], and SMI [6.3(1.1)] compared to normal, pre-sarcopenic and severely sarcopenic older adults. Further analysis found no association between the presence of depressive symptoms and sarcopenia. In conclusion, almost one-third of the community-dwelling study population was sarcopenic with significant associations with body composition and anthropometry. These findings may be beneficial in improving sarcopenia assessment and management for the government and stakeholders alike.

Nutrition Update 1

Associations of dairy consumption at breakfast with nutrient intake in Malaysian children: Results from the South-East Asian Nutrition Surveys II (SEANUTS II)

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Children require adequate nutrient intake for their rapid biological and physical growth, and breakfast is essential to provide sufficient nutrients. This study investigated the prevalence of dairy consumption at breakfast among Malaysian children and explored its association with nutrient intake at breakfast and throughout the day. Using the dataset of the South-East Asian Nutrition Surveys II (SEANUTS II), 2438 Malaysian children aged 2 to 12 years were included. Questionnaires and a one-day 24-hour recall were used to collect sociodemographic and nutrient intake data. Descriptive analysis and Wilcox's robust tests with robust post-hoc tests were used for data analysis. Most children had breakfast (98%, n=2390), but only 37% of them consumed dairy at breakfast, with younger children more likely to consume dairy than older children (p<0.001). Among children who consumed dairy at breakfast, the median dairy intake was 0.9 servings, accounting for 75% of their total daily dairy consumption of 1.2 servings. Children in all age groups who consumed dairy at breakfast had a ~3- and ~6-fold higher intake of calcium and vitamin D, respectively, at breakfast compared to those who did not (p<0.001). Moreover, breakfasts with dairy were associated with better daily diet quality, as reflected in higher daily intakes of several important nutrients, including vitamins A, B_1, B_2, B_{12}, C, D, β-carotene, iron, calcium, potassium, and phosphorus (p<0.001), and a lower intake of sodium (p<0.001). Additionally, 83% of children who had breakfast did not meet the recommended daily dairy intake of two servings per day. These findings highlight the importance of promoting dairy consumption at breakfast among Malaysian children to improve nutrient intake at breakfast and in the overall diet, indicating that breakfast is an important meal contributor to the overall diet quality. More information about children in Thailand, Indonesia, and Vietnam will be included in future analysis.

Development of a serial mediation model of lifestyle factors for improving health-related quality of life among urban-poor Malaysian children

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Health-related quality of life (HRQoL) is a subjective perception of an individual's overall well-being related to their health status, whereby the urban-poor children are vulnerable to poor HRQoL due to their unhealthy lifestyle and scarce resources. This study aimed to investigate the interrelationships between nutrition knowledge, attitude and practice (KAP), dietary intake, physical activity, body composition, and HRQoL among urban-poor Malaysian children. A total of 408 children who lived at 10 selected *Program Perumahan Rakyat* (PPR) flats in Kuala Lumpur were recruited through cluster sampling in this cross-sectional study. Nutrition's KAP, physical activity and HRQoL were assessed by a set of standardized self-administered questionnaire; dietary intake was assessed by using 1-day 24-hour dietary recall, and body composition was measured using InBody 270s Body Impedance Analyzer. Multiple linear regression analysis was conducted to determine the predictors of HRQoL. Mediation analysis was performed to determine the interrelationships between these factors and HRQoL. Majority of the urban-poor children were at risk of impaired HRQoL (58.3%), with a mean score of 65.0±18.5. Multiple linear regression analysis showed that higher nutrition attitude, nutrition practice, physical activity, lunch intake, and muscle-to-fat ratio, as well as lower supper intake and fast-food intake predicted better HRQoL of the children (R^2=0.33, F(9,398)=21.32, p<0.001). Further, mediation analysis showed that nutrition attitude and nutrition practice serially mediating the relationships between nutrition knowledge and HRQoL, with a significant indirect effect (B=0.14, p=0.01). In conclusion, higher physical activity, lunch intake, muscle-to-fat ratio, and lower supper and fast-food intake predicted higher HRQoL, while nutrition attitude and nutrition practice serially mediated the relationships between nutrition knowledge and HRQoL. These findings have important implications for the development of effective interventions as it provides insights on nutrition intervention that focus on knowledge without intervening attitude and practice may not have significant impact on the HRQoL among children's population.

"GROWEAT" home gardening programme increased vegetable consumption, preferences, and willingness to try vegetables among urban poor children in Kuala Lumpur, Malaysia: A randomised controlled trial

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Vast evidence found that garden-based nutrition education programmes successfully promoted an increase in children's vegetable consumption. However, the effect of these programmes at home setting, particularly among the urban poor families remain unknown. As urban poor children are more vulnerable to low vegetable consumption at home, the "GrowEat" intervention aimed to assess the effectiveness of home-based gardening

nutrition programme in improving vegetable consumption, preferences, and willingness to try vegetables among urban poor children. A 3-month cluster randomised controlled trial was conducted among 9-12 years children residing in low-cost PPR flats in Kuala Lumpur, Malaysia. Weekly gardening and nutrition education were provided to the intervention group (IG; n=70), but no intervention was provided to the control group (CG; n=55). Children's vegetable consumption was assessed using a 2-days 24-hour dietary recall, while the vegetable preferences and willingness to try vegetables were assessed using questionnaires. Data were collected at 3-timepoints (baseline, post and 3-months follow-up). Higher vegetable consumption was observed among the IG at post intervention (Δ: +0.77, p<0.001) and during follow-up (Δ: +0.41, p=0.004). Nevertheless, the IG's vegetable consumption at follow-up phase still fall short of the national recommended guidelines (1.30 servings). There was a significant increase in vegetable preferences (Δ: +2.67, p=0.013) and willingness to try vegetables (Δ: +1.88, p=0.004) in the IG. No significant mean differences were observed over time in the CG. In conclusion, the "GrowEat" home gardening nutrition intervention was efficacious in improving vegetable consumption, preferences, and willingness to try vegetables among urban poor children over 3-months. The findings necessitate the implementation of a randomised controlled trial, emcompassing a larger sample size with extended duration to further evaluate the effectiveness and sustainability of the programme as a strategy to improve vegetable consumption among urban poor children.

Factors associated with double burden of malnutrition (DBM) among Dayak communities in Sarawak

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The increasing trend of stunting in children and obesity in adults in Malaysia is alarming. The coexistence of contrasting forms of malnutrition accentuates the occurrence of household-level double burden malnutrition (DBM). This study aimed to determine prevalence of household-level DBM and its associated factors among the Dayak communities in Sarawak. This cross-sectional study included 216 mother-child pairs selected through multistage random sampling from four divisions in Sarawak. Demographic and socioeconomic characteristics; and food insecurity information were collected using an interviewer-administered questionnaire. Two days 24-hour dietary recall were conducted to compute Healthy Eating Index (HEI). Height and weight were measured following standard guidelines. Household with an overweight/obese mother (OM) with either an underweight child (UC), stunted child (SC) or wasted child (WC) is classified as DBM. Simple and multiple binary logistic regression analysis were performed during data analysis. In this study, about 24.5% of the Dayak mother-child pairs were identified to be having DBM. OM paired with SC was observed in 13.4% households, OM paired with WC in 11.1% households, and OM paired with UC in 9.0% households. Recipients of government or non-governmental financial aid (AOR=3.132, 95% CI=1.330, 7.377, p=0.009) and the mother whose spouses had primary education or lower (AOR=3.259, 95% CI=1.091, 9.734, p=0.034) were significantly associated with increased risk of DBM. Mothers with secondary education or lower (AOR=0.070, 95% CI=0.018, 0.274, p<0.001) and households with higher monthly non-food expenses (AOR=0.999, 95% CI=0.998, 1.000, p=0.016) were less likely to experience DBM. Further studies are essential to better understand the DBM situation, especially from the educational and financial aspects, that will help in proposing effective but culturally sensitive interventions among Dayak communities in Sarawak.

Using experiential learning to prepare future nutritionists to use digital technology in health and nutrition promotion

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The use of technological innovation for nutrition and health promotion has grown rapidly, especially since the outbreak of the COVID-19 pandemic. However, the current teaching formats and content on digital technology are still largely lacking, especially in the nutrition curricula. Future nutritionists may receive little training in the effective use of digital technology for health and nutrition. Therefore, this project aims to examine the impact of experience-based learning methods on the competency of using digital technology in health and nutrition promotion in undergraduate nutrition students. More specifically, the project aims to increase the students' competency in digital creation, information literacy, and/or social media communication in health and nutrition promotion. Students were taught one session on digital creation. Then the students were required to complete at least four out of seven self-study sessions on information literacy and social media communication. Students were divided into two main groups and assigned two different assignments: (1) create and implement a virtual digital educational game or (2) make two posts on social media to raise awareness or educate the target group about nutrition and health. Data from module evaluations and pre-and post-tests showed significant learning outcomes, with over 80% of the students who self-reported that the pedagogy increased their competency in information literacy and social media communication. Numerous positive feedback has been received from the students, in particular, students were now very much confident to create a digital educational game or make social media posts to promote health and nutrition in the near future. These teaching and learning experiences show that students can develop digital competency in nutrition and health promotion through sound pedagogical approaches. Similar projects can be implemented and evaluated in undergraduate nutrition programs within the academic setting to train future nutritionists to effectively use digital technology in health and nutrition promotion.

Keynote Lecture 2

Food security policies and action plan of Malaysia

YBhg Datuk Lokman Hakim A

Secretary-General, Ministry of Agriculture and Food Security Malaysia

The keynote address focuses on the policy and action plan related to food security in Malaysia. Malaysia is an upper-middle-income country in Southeast Asia that has made significant strides in achieving food security over the past few decades. However, challenges remain, particularly in the areas of rural poverty, climate change, and food waste. In response to these challenges, Malaysia has developed a comprehensive food security policy that seeks to promote sustainable food production, enhance food accessibility and affordability, and reduce food waste. This policy is supported by a detailed action plan that outlines specific steps that the government, private sector, and civil society will take to achieve these goals. Key components of the action plan include promoting sustainable

agricultural practices, improving food distribution and marketing systems, enhancing food safety and quality standards, and increasing public awareness of food security issues. While significant progress has been made in implementing these policies and programs, much work remains to be done to ensure that all Malaysians have access to safe, nutritious, and affordable food.

Symposium 3: Nutrition of Older Persons

Implementing virtual falls prevention using exercise-nutrition intervention during COVID-19 pandemic for older persons, does it work?

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Falls is one of the most common and serious problems among the older persons. Evidence on the effectiveness of lifestyle interventions to ameliorate risk of falls were mainly focus on exercise, while role of nutrition is less clear. The much-needed effort to develop effective interventions is further hampered by the global coronavirus disease (COVID-19) pandemic as stay-at-home restrictions prompted by the public health pandemic decreased levels of physical activity and diet quality worldwide, worsened physical functioning and fall outcomes of older persons. We aimed to examine the effectiveness of an online (virtual) multi-component exercise and nutrition intervention on risk of falls among community dwellers. A total of 102 apparently healthy community dwellers with mean age of 66 years old were randomised to either nutrition-exercise intervention (n=48) or wait-list control (n=54) groups. Intervention respondents participated in a 45–60-minute virtual exercise sessions and nutrition intervention, bi-weekly for 12 weeks. Compared with the control group, the nutrition-exercise group performed consistently better in Timed Up and Go (–1.25 seconds; 95% CI, –1.45 to –0.44), 30-second chair stands (2.02 stands; 95% CI, 1.15 to 2.58), hand grip strength (1.72 kg; 95% CI, 1.24 to 2.45) and skeletal muscle index (1.85 kg/m^2; 95% CI, 1.23 to 2.14). No serious intervention-related adverse events were reported, with the respondents well-liked the program. Our study confirmed a virtual nutrition-exercise intervention is effective in improving risk of fall, physical performance, skeletal muscle mass, overall muscle strength and lower extremity muscle strength among home-bound community-dwellers during pandemic.

Addressing nutritional needs of sarcopenia in older adults

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Sarcopenia is an age-related progressive loss of skeletal muscle and muscle strength that is described as a combination of low muscle quality and physical performance. It is a growing public health problem among community-dwelling older adults worldwide and was associated with chronic diseases, falls, poor quality of life, disability, and mortality. Age, lower rates of obesity, hypertension, and malnutrition are among the confounding factors of sarcopenia. The risk of sarcopenia increases among older adults with nutritional risk or malnourished. The global prevalence of sarcopenia ranges from 9.9% to 40.4%. The latest study in Malaysia reported the prevalence of sarcopenia at 33.6% among community-dwelling older adults, higher than in other neighbouring Asian countries. The prevalence of sarcopenia among older adults with type 2 diabetes mellitus and long-term care homes was 28.5% and 47% respectively. Diet quality which includes a high intake of proteins, vitamin D, vitamin E, vitamin K, magnesium, phosphorus, potassium, iron, and omega-3 among older adults has been shown to preserve muscle mass. In most intervention studies, dietary supplementation in combination to exercise has shown greater improvements in muscle mass, muscle strength, and physical performance. Early screening to identify individuals at risk of malnutrition is important to prevent the onset of sarcopenia among older adults. The food-based or whole-diet approach is suggested to be one of the strategies for the intervention or treatment of age-related losses in muscle mass and strength.

Tube feeding in severe dementia – Is there evidence?

Ch'ng ASH

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The use of tube feeding in persons with severe dementia has long been a topic of debate among medical professionals. This talk will explore the existing evidence on tube feeding in severe dementia, including its impact on clinical outcomes such as survival, quality of life, and complications. The presentation will discuss the ethical implications of tube feeding in dementia, including issues related to autonomy, decision-making capacity, and end-of-life care. By the end of this presentation, attendees will gain a deeper understanding of the evidence and controversies surrounding tube feeding in severe dementia and be better equipped in providing individualized treatment plans for patients.

Factors associated with sarcopenia among older adults with low socioeconomic status in Kelantan

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Poverty is one of the risk factors of sarcopenia due to poor diet quality and limited access to proper health care. Thus, the current study aimed to determine the factors associated with sarcopenia in one of the poorest states in Malaysia (Kelantan). A total of 293 older people aged 60 years and above were recruited from poor household in five districts in Kelantan

namely Kota Bahru, Machang, Tumpat, Pasir Mas and Bachok. Data of sociodemographic, medical problems, anthropometry, body composition, physical fitness test, dietary intake, depressive symptoms, social support, anorexia of ageing, cognitive function and food security were collected. Sarcopenia were assessed using the Asian Working Group of Sarcopenia (AWGS) 2019. Univariate analysis were done using the Chi-Square and Kruskal Wallis tests while regression analysis was done using the binary logistic regression with age, gender and educational years as confounding factors. Findings revealed that men had higher prevalence of sarcopenia (56.9%) and severe sarcopenia (58.2%). Hypertension was also reported to be higher in sarcopenia (61.5%) than severe sarcopenia (36.4%). Those with sarcopenia had higher prevalence of obesity (35.4%) and greatest waist circumference (87.0±17.0cm) as compared to severe sarcopenia. Cognitive function scores for each domain, hand grip strength and short physical performance battery (SPPB) were lowest in the severe sarcopenia group. Both sarcopenia and severe sarcopenia groups had poor adherence to most of the macro and micronutrients except carbohydrate and sodium. Regression analysis revealed that body mass index (BMI), saturated fatty acid food and cognitive function scores were the factors associated with sarcopenia. Increasing body mass index, higher intake of food rich in saturated fatty acid and lower cognition predisposes the risk of sarcopenia. Thus, early screening for sarcopenia must be accessible to older people with low socioeconomic status to prevent functional dependency.

Invited Lecture 3

The role of nutrition in preventive healthcare: A comprehensive approach for healthcare and wellness transformation

Rimbawan

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One crucial aspect to transform “sick-care” to “healthcare and wellness” is by increasing the role of healthy nutrition in promoting health and well-being. Nutrition plays a pivotal role in preventing and managing various chronic diseases such as obesity, diabetes, cardiovascular diseases, and certain cancers, which are major contributors to the escalating healthcare costs. This paper discusses the potential benefits of a preventive approach that focuses on promoting healthy eating habits, adequate nutrient intake, and proper hydration as essential components of a proactive healthcare strategy. The paper also highlights the importance of nutrition education and awareness programs to empower individuals with the knowledge and skills to make informed choices about their dietary habits and lifestyle. Furthermore, the paper examines the role of healthcare professionals, policymakers, and other stakeholders in promoting healthy nutrition as a key pillar of the “healthcare and wellness” paradigm. It underscores the need for collaborative efforts among healthcare providers, policymakers, food industry, and communities to create an enabling environment that promotes healthy nutrition choices and facilitates behaviour change. In conclusion, the transformation from “sick-care” to “healthcare and wellness” requires a comprehensive approach that prioritizes healthy nutrition as a fundamental aspect of preventive healthcare. By integrating nutrition-focused strategies into healthcare policies and practices, we can empower individuals to take charge of their health, reduce the burden of chronic diseases, and ultimately lower healthcare costs. Emphasising the importance of healthy nutrition is crucial in creating a more sustainable and effective healthcare system for the nation.

Lunch Symposium 2

Maternal nutrition – Reducing risk of preterm births with DHA

Avril Soh

dsm-firmenich, Singapore

Globally, preterm birth is the leading cause of death in children below the age of five and many preterm babies who survive suffer from lifelong consequences. Nutrition during pregnancy is one of the factors affecting the risk of preterm birth. There is now strong evidence that maternal intake of omega-3 long chain polyunsaturated fatty acid, such as DHA, can be helpful in preventing births. In this presentation, Avril will share the latest evidence on DHA and preterm births, as well as the latest recommendations by international bodies. She will also touch on the importance of sustainable sources of omega-3s.

Invited Lecture 4

Scientific update on metabolic improvement aspects with Palatinose™ (isomaltulose)

Sangeetha S

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Isomaltulose (IMU), like sucrose, is a disaccharide with monomers, glucose, and fructose. However, unlike sucrose, the monomers in IMU are linked by an alpha-1,6-glycosidic bond. This bond is more slowly hydrolyzed in comparison to the alpha-1,2 glycosidic bond in sucrose, making IMU a slow-release, low glycaemic sugar. We have previously reviewed the chemical and physiological properties of IMU in relation to its health effects. Over time, accruing evidence for the health benefits of IMU has led to its use in several health foods, particularly in the area of sports and diabetes nutrition. We have confirmed the low glycaemic index (GI=37±5) of IMU in Malaysian adults and observed that it was tolerated and perceived well by Malaysian participants in single oral bolus doses of up to 25g.

In this scientific update, evidence for the effect of substituting sucrose with IMU on body weight management, glycaemic or insulinaemic response, and novel cardiovascular risk factors will be collated. The update will highlight the potential mechanisms of action that could explain these effects, with a specific focus on the effect of IMU on gut hormones (incretins). Emerging evidence suggesting novel applications of IMU for improved cognitive performance will also be presented. Finally, experimental results of IMU substitution in Malaysian desserts will be shared.

Symposium 4: Community Lifestyle Intervention Programme

Translational and reverse-translational "chrono-nutrition" research in Japan

Tahara Y

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The biological clock (circadian clock) is an important mechanism for maintaining homeostasis in our body. Disruptions in the circadian clock can lead to various diseases, such as obesity and hypertension. Keeping the clock healthy is not only important for health, but also for overall well-being. Chrono-nutrition can be studied from two aspects: regulating the biological clock through diet and nutrition, and eating in accordance with the rhythms of absorption and metabolism controlled by the clock. Nutrients that have been reported to regulate the biological clock include carbohydrate, protein, caffeine, polyphenols, omega-3 fatty acid, ornithine, and serine, etc. Circadian clock causes a higher postprandial blood glucose level in the evening than morning. To prevent postprandial blood glucose spikes during dinner, it is important to consider the contents of breakfast, lunch, and snacks throughout the day, as well as applying the second meal effect. Consuming protein in the morning, when it tends to be lacking, is recommended for maintaining muscle mass. In this talk, I would also like to introduce an observational study using the AI-based food-log app "Asken" for the chrono-nutrition study. From the big data accumulated in this app, to lose weight, it is effective to reduce carbohydrates during dinner. People with a morning chronotype tend to eat more breakfast, less dinner, and consume more potassium, dietary fiber, and vitamin K throughout the day compared to those with an evening chronotype. It was also found that morning chronotypes prefer Japanese-style breakfast. In addition, the eating habits of people with sleep disturbances were also revealed. We are currently conducting reverse translational research by discovering new phenomena using such big data and then moving on to animal experiments and even elucidating mechanisms. In addition, I would like to introduce the Japan Chrono-Nutrition Society (JCNS), which is celebrating its 10th anniversary in this year.

PERSUADE: A peer-led community-based intervention to aid nutritional and lifestyle behavioural changes

Amutha R, Muhammad Daniel AM, Saleem PI, Quek KF and Khalid Abdul K

Jeffrey Cheah School of Medicine & Health Sciences, Monash University Malaysia

Peer-led programs have been shown to be beneficial for individuals with chronic diseases such as metabolic syndrome (MetS), which require long-term intervention and social support. However, there is a lack of evidence on the effectiveness of peer-led behavioral change programs to address the growing prevalence of MetS among Malaysians. This study aimed to develop a structured peer-led intervention for Malaysians with MetS addressing nutrition and lifestyle behavioural risk factors. This study was conducted in three phases. Phase 1 included evidence synthesis and a cross-sectional study to identify modifiable risk factors for MetS in this population. Subsequent Phase 2 focused on developing a community-specific peer-led intervention (PERSUADE), and the feasibility of PERSUADE was assessed in the third phase. The study found that the overall prevalence of MetS was

32.2% (*N*=481). Low physical activity and quick finishing of meals were associated with increased odds of MetS. These findings and the outcomes of evidence synthesis were used to develop a 12-week PERSUADE program, which was implemented by four peer groups comprising 48 peers (median age=46 years). The program resulted in significant overall increases in total carbohydrate intake and glycemic load, but also significant reductions in total energy and fat intake. Physical activity also showed a significant improvement. While there were only marginal improvements in anthropometric and vital metabolic parameters, the peers attended all sessions with high satisfaction with the content (93.3%) and peer leadership (more than two-thirds). Content satisfaction was correlated with a reduction in body fat content and triglyceride, while peer leadership was only correlated with a reduction in triglyceride. This study was the first to develop and test the feasibility of a community-based peer-led intervention for MetS in Malaysia. The PERSUADE program supported the adoption of the peer-based framework, although there is a need to assess the long-term impact of such interventions in local community settings. The findings from this study also provide direction for other researchers to develop various other intervention models in Malaysia.

Community Feeding Programme for Orang Asli: An approach for a better tomorrow

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The Orang Asli in Malaysia is a heterogeneous people with unique socio-cultural and psycho-socio-cognitive differences. This community is formed by three major groups namely the Senoi, Proto-Malay and Negrito. The Senoi represents 55.21% of the total number of Orang Asli population in the north and south of Peninsular Malaysia, the Proto-Malay inhabit the southern parts and represents almost 41.77% meanwhile the Negrito is mostly found inhabiting the northern and eastern parts and represents 3.02% of Orang Asli population in the country. They obtain food by hunting, farming, gathering, picking, rearing and buying. Several studies had revealed that underweight and stunting Orang Asli children were found in one-third to three quarters of the population groups. Insufficient access to food, inadequate maternal and child care and poor water or sanitation and inadequate health services are immediate causes of childhood malnutrition among Orang Asli children. Thus, under the Government Transformation Programme (GTP) 2.0, Low Income Household (LIH), Community Feeding Programme has been identified for implementation and coordinated by Malaysia's Performance Management and Delivery Unit (PEMANDU). There are 49 active Community Feeding Centers as of the year 2022, located in three states namely Perak, Pahang and Kelantan. These centres are run by local volunteers who have been trained by Ministry of Health Malaysia to provide nutritious complementary food, food basket, provision of ready to use therapeutic food (RUTF) and conducting community empowerment activities. Community Feeding Programme is an effective method to solve moderate and serious undernutrition problem in the community. This presentation will highlight the approach conducted by Ministry of Health Malaysia to improve and sustain the nutritional status of Orang Asli children, the challenges in conducting this programme and potential future interventions that could be utilised by all stakeholders for a better future of the Orang Asli community in Malaysia.

Nutrition intervention programmes for adults and school children to combat obesity in Kuala Lumpur and Putrajaya

***Muhammad Asyraf I* and Nor Azah A**

Health Department of Kuala Lumpur & Putrajaya

National Health Morbidity Survey (NHMS) 2019 showed that overweight and obesity prevalence among adults in Kuala Lumpur was 30.4% and 19.0%, respectively, while overweight in Putrajaya was 37.7% and obesity was 25.6%. The prevalence of children with overweight and obesity (5–17 years old) in urban areas in Malaysia was 15.4% for overweight and 15.3% for obese. Generally, overweight and obesity are linked with various health issues, mainly non-communicable diseases. Nutrition Branch of Kuala Lumpur and Putrajaya Health Department came out with an initiative program for the target group to control and reduce the prevalence. Trim & Fit Program (T&F) was initiated for overweight and obese adult workers in various government and private institutions. A specific module has been developed with a combination of nutrition, physical activities, and a psychological approach. In 2023, there are eight groups of T&F program currently being run, estimated to end by November 2023. For school children, *Celik Nutrisi* (CN) was designed for primary school and Nutri-4-Teen (N4T) was targeted for secondary school, both for students who are in the overweight and obese category. CN and N4T modules are being designed, with collaborative activities with the Kuala Lumpur Education Department and the Putrajaya Agriculture Department. Students were involved in a football and netball academy and competed among CN and N4T schools. Body image consultation and motivation also being introduced in N4T activities to boost enthusiasm and self-confidence level. Advocating for nutrition and a healthy lifestyle is really challenging and should be addressed by various professions with holistic intervention strategies, to have a significant outcome in reducing the uptrend of overweight and obesity in Kuala Lumpur and Putrajaya, as planned in National Plan of Action for Nutrition of Malaysia (NPANM) III 2016–2025.

Nutrition Update 2

The development and effectiveness of a mobile phone-based nutrition education intervention on lactating mothers for the prevention of stunting among infants in Kelantan – An anthropometric outcome

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Stunting and other health issues can be prevented during the first "1000 days," which is a crucial window of opportunity. There are well-established short- and long-term health

benefits for mothers and new-borns associated with breastfeeding, which are accessible to almost all women. Interventions in mobile health (mHealth), such as web-based or online teaching or smartphone applications, have shown promise in promoting breastfeeding initiation, sustaining breastfeeding, and possibly altering health behaviours. This six-month quasi-experimental intervention targets breastfeeding mothers and their infants with a mobile phone-based nutrition education programme (MiNd). This study is divided into three phases; (i) Phase 1 - development of MiNd intervention modules, (ii) Phase 2 - evaluation of the effectiveness of MiNd intervention, and (iii) Phase 3 - explore the perceptions and experiences of mobile health intervention. Pre- and post-intervention assessments of anthropometry, dietary consumption, food security, mental health, and knowledge, attitude, and practise (KAP) of breastfeeding were made. Data were analysed by using SPSS version 26.0 and thematic analysis. At the end of this study, 124 lactating mothers and their infants were involved (intervention group=69; control group=55). Overall, time has a considerable impact on these outcome factors with $p<0.05$, but the difference between the groups were not obviously seen from one another. The changes in weight and BMI for age between the intervention and control groups were the same. The changes in length [$F(1,122) = 5.062$, $p<0.05$] and head circumference for age [$F(1,122) = 5.018$, $p<0.05$] were different across the intervention and control groups. In the future, we can advise that the intervention period be extended to more than 6 months in order to more clearly demonstrate the differences between the groups. This is the first in-depth mobile phone-based nutrition intervention study in Malaysia that focuses on lactating mothers and infant growth. The findings will be useful in modulating health intervention programme to prevent stunting and other health issues nationwide.

Exploring the experience of Malaysian consumers using diet-related health apps to support healthier food purchase: A qualitative study

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The usage of diet-related health apps may encourage consumers to buy healthier food. The rapid growing health apps prove their effectiveness and efficiency in the interventions. However, little is known about the factors that affect the consumers' satisfaction in continuously using health apps for healthier food purchase behavioural changes. The objective of this study was to explore the consumers' experience of using diet-related health apps to support healthier food purchase behavioural. A total of 20 participants (25.1±3.92 years old) that have experienced using diet-related health apps, participated in the semi-structured interview. This study revealed two subthemes, which were user-related factors and app-related factors. The user-related factors such as the user's motivation, knowledge and awareness of using the health app while the app-related factors such as motivated and demotivated features influenced the user's experience engaging with the health app. A total of 90% of the users have greater motivation after using the health app, the users would tend to increase app engagement to practice the behavioural change. In addition, all of the users were able to obtain the nutritional knowledge provided by the health apps to motivated them to practice healthier food purchasing behaviour. Diet-related health app was found to be a useful and convenient tool to support the user's healthier behaviour change with relevant nutrition knowledge provided. The study makes both practical and theoretical contributions to the literature on consumer engagement to apps.

Exploring the intrahousehold food allocation and decision-making power of urban poor caregivers with under-five children in Kuala Lumpur

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Food allocation within a household plays a crucial role in determining the quality and quantity of food individuals receive, particularly in families with children. The decision-making power of caregivers in allocating food within the household has a significant impact on children's nutritional status. This qualitative study explored the intrahousehold food allocation (i.e., food purchase, preparation, cooking and serving to children in a household) and the decision-making power on the intrahousehold food allocation of urban poor caregivers. This study recruited 27 primary caregivers of children aged 3–5 years old residing in eight randomly selected public low-cost flats in Kuala Lumpur. Based on the children's nutritional status, the caregivers were divided into two groups: families with undernourished children (FWUC) (n=12) and families with well-nourished children (FWWC) (n=15). One-to-one in-depth interviews were conducted with the caregivers to gather information regarding the process and control over food allocation at home. Thematic analysis was performed on the transcribed interviews, and themes were compared between the two groups. Results found that the caregivers in both groups would usually prepare, cook and serve food to children at home. However, fathers were typically responsible for food purchases, although they were not the primary caregivers. In terms of decision-making power, caregivers from both groups perceived that they had control over intrahousehold food allocation. However, caregivers from FWWC group tended to make joint decisions with family members when purchasing, preparing and cooking foods at home, while this was less common in the FWUC group. In conclusion, this study highlights the importance and potential of caregiver's intrahousehold power over food allocation, particularly in families with undernourished children. These findings were then incorporated into a newly developed intervention program known as the Positive Deviance Nutrition Program (PoDeN) aiming to address childhood undernutrition through empowerment of caregiver's decision-making in food allocation.

Secular trends in energy availability in Malaysia: A joinpoint regression analysis of FAO's food balance sheet data from 1961 to 2020

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This research aimed to analyze the secular trends and significant changes in energy and macronutrient availability at the national level in Malaysia from 1961 to 2013. This study used databases derived from the FAO's old (1961-2013) and new (2010-2020) food balance sheets. We used joinpoint regression analysis with the data-driven Bayesian method for analysing the trends model. The annual percentage change (APC) was computed for each segment of the trends. Moreover, we calculated the average annual percent change as a summary measure of the trends over the period from 1961 to 2020. Energy availability (kcal/day/person) in Malaysia increased by 24.5% from 1961 (2418kcal/day/person) to 2020 (3010kcal/day/person) with an average increase of 0.4% per year. The energy availability

trend in Malaysia was mostly influenced by the availability of carbohydrates which changed by only 3.8% from 1961 (447g/day/person) to 2020 (430g/day/person). However, energy share from carbohydrates decreased by 0.41% per year and reached 57% of total energy availability in 2020. Energy share from fat showed an increased trend during the 1960s, 1970s, and 1980s. Overall, the fat energy increased by 0.9% per year (Credible interval: 0.7% to 1.1%) from 1961 (18.3%) to 2020 (32.0%). Since 2012, fat energy availability in Malaysia started to increase (APC=1.7) again after a reduced and stable trend. Protein's energy share increased by 0.5% per year (Credible interval: 0.3% to 0.8%) from 1961 to 2020. Since the mid-2000s, protein energy showed a decreasing trend (APC=0.2). The structural change in energy availability in Malaysia was mostly influenced by carbohydrate availability. However, during the 1970s, 1980s, and 2010s, energy from carbohydrates showed a slower reducing trend while energy from fat showed a marked increasing trend in Malaysia. These structural changes in carbohydrates and fat availability can be linked to the increasing overweight and obesity trend in Malaysia.

Mindful eating and obesity among senior high school students in Depok, Indonesia

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In the past decade, there has been a significant increase in obesity in Indonesia, particularly among high school students. Adolescents are easily influenced by external factors and may experience changes in body shape and weight gain due to not paying attention to their energy and nutrient intake and output. This study aimed to investigate the relationship between mindful eating (ME) and obesity among high school students in Depok City. A total of 60 students were sampled in this study, selected by systematic random sampling. Data was collected using a questionnaire on respondent characteristics, and mindful eating data was collected using the Mindful Eating Questionnaire (MEQ) with a Likert scale of 1-4. Obesity status was determined using body mass index (BMI) for age, with obesity categories grouped into obese and non-obese (including normal and underweight). It was found that 23.3% were obese, with more in boys than girls. Meanwhile, based on the level of ME category, the majority were in the low category (56.7%). There was a significant relationship between the level of ME and the incidence of obesity in high school students, where 100% of students with obesity experienced low levels of ME. Therefore, efforts are needed to increase ME. ME can increase individual awareness of hunger and fullness and make individuals make choices regarding when, what, and how much to eat. In addition, it can be useful for selecting nutritious foods, reducing eating rate, and focusing while eating.

Perceived neighbourhood environmental, physical activity and physical fitness in relation to overweight/obesity among urban poor adolescents in Kuala Lumpur, Malaysia

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Perceived environmental factors along with individual lifestyle behaviour such as being physically active and fit are among the primary determinants of overweight/obese (OW/OB). This study aimed to determine the relationship between perceived neighbourhood environment, physical activity level (PAL), and physical fitness level (PFL) with OW/OB risk among urban poor adolescents in Kuala Lumpur, Malaysia. A cross-sectional study was carried out among 219 urban poor adolescents aged 10-17 years old from eight People Housing Programme in Kuala Lumpur, Malaysia. Physical Activity Neighbourhood Environmental Survey (PANES), Physical Activity Questionnaire for Older Children (PAQ-C), and modified Harvard Step Test were used to assess neighbourhood build environment, respectively. Adolescents' body weight and height were measured, and body mass index (BMI)-for-age (BAZ) was determined. A total of 39.3% of the adolescents were OW/OB. Parents generally perceived their neighbourhood environment supports physical activity with good access to transit (2.8±1.2), but high crime (2.1±1.0) and traffic safety issues (2.2±0.8). More than half of the adolescents (55.7%) have low PAL, although the majority (50.2%) had acceptable PFL. Significant differences were observed whereby OW/OB adolescents had lower PANES scores (p=0.015) and fitness scores (p=0.007) than non-overweight/obese (NOW/OB) adolescents. No significant difference was found for PAL (p>0.05). The binary logistic regression analysis showed that adolescents were less likely to be OW/OB when there is greater environmental support for physical activity (OR=0.49, 95%CI=0.25-0.95) and physically fit (OR=0.98, 95%CI=0.97-0.99) after controlling for adolescent's age and sex. The existence of the relationship between PFL and PANES with OW/OB among urban poor adolescents in this study highlights the importance of an activity-friendly neighbourhood environment and physical fitness in overweight and obesity prevention. A more comprehensive study is needed to investigate the causal relationship between perceived environmental factors and physical fitness with OW/OB through a longitudinal approach.

Poster Presentations

Group A: Nutritional Status (various groups) & Community Interventions

A01 A comparison of circadian preferences and eating window on work days and free days among pregnant women in Kuala Lumpur, Malaysia

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Misalignment between circadian preference and eating patterns on work days and free days may lead to negative symptoms and adverse outcomes for both the maternal and neonatal health, highlighting the criticality of maintaining alignment for optimal outcomes. The aim of the study was to determine the association between circadian preferences (i.e. preferred sleep and wake time, actual sleep and wake-up time and the discrepancy between the preferred and actual timing) with eating window during work days and free days among 368 pregnant women from 12 government antenatal clinics in Putrajaya and Kuala Lumpur. The Chrono nutrition Profile Questionnaire-Pregnancy (CPQ-P) was administered to capture circadian preferences and chrono-eating patterns. All the data was analysed using SPSS. The study subjects were predominantly Malay (84.8%), with mean age of 31.8±4.6 years and with tertiary education (81.0%). They were in their second and third trimester and had no health complications. The actual wake-up time was 6:39±1:09, actual sleep time was 18:36±8:36, preferred sleep time was 21:45±1:51, preferred wake time was 6:45±1:38. In terms of eating patterns, work day eating window was averaged at 12.46±1.71 hours, and free days eating window was 10.55±2.16 hours. Multiple linear regression analysis showed that there was a significant association between work day eating window with preferred sleep time (=0.91, p<0.001), actual sleep time (=-0.54, p<0.001), actual sleep time (=-0.26, p=0.001), eating window misalignment (=-0.33, p<0.001) and evening latency misalignment (=-1.038, p<0.001). Besides that, freedays eating window had significant association with actual wake time (=-0.19, p=0.019). These findings emphasise that the discrepancy and misalignment between circadian rhythm during workdays and free days can affect eating habits of pregnant women. Therefore, further studies should be conducted to explore the potential metabolic health implications during pregnancy due to these discrepancies.

A02 Relationship of *INSIG2* gene polymorphism and dietary and lifestyle factors with waist circumference among Malaysian adults

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This cross-sectional study aimed to investigate the relationship between INSIG2 gene polymorphism and dietary and lifestyle (physical activity, smoking, and alcohol consumption) factors specifically with waist circumference measurement among Malaysian adults by partial correlation. 3-days 24hr dietary recall, self-administered questionnaires adapted from the Global Physical Activity Questionnaire (GPAQ) for physical activity, Global Adult Tobacco Survey (GATS) for smoking, and Alcohol Use Disorder Identification Test (AUDIT) for alcohol consumption, and anthropometry measurement (waist circumference) were assessed in 213 Malaysian adults aged 18-64 years. INSIG2 gene polymorphism was identified through a buccal swab method for genotyping analysis. Statistical analysis showed significant association between age (p<0.001), gender (p<0.001), occupational status (p=0.042), ethnicity (p<0.001), and marital status (p<0.001) with waist circumference. Out of all the sociodemographic variables, only gender showed an association with energy intake (p=0.021), protein (p=0.001), and PA level (p=0.022). Association in current smoking were seen in gender (p<0.001), occupational status (p=0.013), ethnicity (p=0.038), marital status (p=0.005), and monthly household income (p=0.043). Alcohol consumption showed an association with age (p=0.015), gender (p=0.002), ethnicity (p<0.001), marital status (p<0.001), and academic qualification (p=0.004). Only ethnicity was identified to be associated with rs7566605 (p<0.001), rs17587100 (p<0.001), and rs17047764 (p<0.001). There was a significant positive correlation between energy (p=0.038) and protein (p=0.025) intake, smoking (p=0.002), and alcohol consumption (p=0.036) with waist circumference. No association was found between INSIG2 gene polymorphism with waist circumference. After controlling for ethnicity, occupational status, and monthly household income, partial correlation test showed positive relationship between energy intake (p=0.025), alcohol consumption (p=0.033), smoking (p=0.011), and smoking*INSIG2 rs7566605 (p=0.029) with waist circumference. The findings of this study implied that smoking contributes to abdominal obesity traits via interactions with genetic variants through various biological pathways.

A03 The relationship between food intake and physical activity with academic performance among adolescent girl students from low-income families

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Proper diet and regular physical activity positively impact adolescents' academic achievement. However, due to urban poverty, insufficient food intake may impact diet quality. Some adolescents also engage in less physical activity, which could affect their cognitive performance. Therefore, this study was conducted to find the relationship between food intake and physical activity with academic performance among adolescent girl students from low-income (B40) families. This study involved three schools in the Federal Territory of Kuala Lumpur which were purposely selected for this study. This study was executed using a questionnaire that consisted of five parts, (1) socio-demographic information, (2) physical activity level (PAQ-A), (3) academic achievement, (4) anthropometry measurement and (5) 24-hour diet recall. The finding showed that 59.4% of the adolescent girls have normal BMI-for-age z-score, 4.7% were underweight, 17.2% were overweight and 18.8% were obese. Only energy, protein and sodium intake achieved the Recommended Nutrient Intake for Malaysia (RNI) for energy and nutrient intake. It also found that most had low physical activity levels, with a mean score of 2.88. Further analysis showed that there was significant relationship between age (x^2=28.034, p<0.001), monthly household income (x^2=4.681, p<0.05) and physical activity level (x^2=7.111, p<0.05) with academic performance of adolescent girl students but not for food intake (p>0.05). In a nutshell, this study found that the academic performance of adolescent girl students from B40 families

had a relationship with their socio-demographics such as age and household income, and physical activity level. Therefore, those who plan nutrition interventions should consider the factors mentioned to help improve the academic performance of students specifically from low-income families.

A04 Validity of time-use diary in assessing movement behaviours of schoolchildren in Kuala Lumpur, Malaysia

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Childhood obesity is a growing trend in Malaysia and has a negative impact on health outcomes. Accurate assessment of children's movement behaviours is crucial for informing interventions that promote healthy lifestyles. My E-Diary for Activities and Lifestyle (MEDAL) is a web-based diary developed to collect time-use data from Asian schoolchildren. This study aims to determine the validity of self-reported time spent in movement behaviours on MEDAL against objective accelerometer measurements. A total of 63 Malaysian children (52.3% girls), aged 10-11 years, self-reported daily activities in MEDAL and wore an Actigraph accelerometer on their non-dominant wrists for four days, including a weekend day. The activities were further classified into sleep, sedentary behaviour (SB), light physical activity (LPA), and moderate-to-vigorous physical activity (MVPA) based on Chandler *et al.* (2015) cut-points. Spearman correlation, Wilcoxon signed-rank tests, and intraclass correlation coefficient (ICC) were used to compare self-reported movement behaviour in MEDAL with accelerometer-measured data. Overall, self-reported median time spent in sleep, SB, and MVPA were over-reported (0.1–3.3 hours) while LPA was under-reported (1.6-3 hours) on average days, weekdays, and weekend days (p<0.001) except for SB on weekend days (p>0.05). Weak to moderate correlations were found between self-reported and accelerometer-measured sleep (r=0.414-0.438, p<0.001), SB (r=0.364-0.425, p<0.05), and LPA (r=0.300-0.344, p<0.05) on average days, weekdays, and weekend days while MVPA was constant (0 hours), so Spearman correlation could not be computed. Agreement was poor for SB (ICC=0.42, 95%CI 0.06-0.65) and LPA (ICC=0.19, 95%CI -0.14-0.50) but there was moderate agreement for sleep (ICC=0.52, 95%CI -0.01-0.75). In conclusion, children aged 10-11 years can self-report their movement behaviours in MEDAL, although there may be over-reported and under-reported compared to accelerometer estimates. We opine that MEDAL is a valuable tool to assess movement behaviours of urban children in Malaysia, but it necessitates careful interpretation.

A05 Cardiorespiratory fitness predicts cardiometabolic risk markers among children aged 6 to 12 years: Findings from SEANUTS II Malaysia

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Cardiorespiratory fitness (CRF) is a key indicator of the functioning of the cardiovascular and metabolic systems and has been associated with better cardiometabolic and cardiovascular health in adults. However, the association between CRF and cardiometabolic risk (CMR) markers is not well understood in children due to limited studies available. Thus, the present study aimed to assess association between CRF and CMR markers among children aged 6 to 12 years. This study is part of South East Asian Nutrition Surveys (SEANUTS II) Malaysia, which was a nationwide, cross-sectional study. A sub-sample of 236 children (mean age = 9.5±1.7, 53% female) with CRF and CMR data was included in this analysis. Body weight and height were assessed and categorised using WHO 2007 BMI-for-age Z-score. CRF was indicated by predicted peak oxygen uptake (VO_2 peak) by using 15-meter shuttle run test. CMR markers included waist circumference (WC), mean arterial pressure (MAP), high-density lipoprotein (HDL), triglyceride (TG), and fasting blood glucose (FBG), while percentage body fat (PBF) was measured using bioelectrical impedance technique. Association between CRF and CMR markers was determined by regression modelling. Overall, one-third of children (33%) were categorised as overweight and obese. Mean VO_2 peak was 43.1±3.3 ml/kg/min, with no differences between gender. Boys were found to have significantly higher MAP and FBG, but lower TG, compared with girls. Increased CRF was associated with lower WC, MAP, TG and PBF, and higher HDL levels. After adjusting for age and sex, variability of outcomes explained by CRF was highest for WC (41%), followed by PBF (36%), MAP (20%), TG (14%) and HDL (10%). In conclusion, having good CRF ensures favourable cardiometabolic profile among children aged 6 to 12 years. Future efforts should be focused on encouraging children to be more physically active to enhance their CRF level, and consequently their CMR profile.

A06 Association between physical activity and gross motor skills among preschoolers in peninsular Malaysia

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Involvement in regular physical activity (PA), particularly moderate to vigorous intensity physical activity (MVPA), is often associated with increased health benefits. Participation in PA is also known to be beneficial for development of gross motor skills (GMS) among young children. However, scarce information is available on such studies among Malaysian preschoolers. This cross-sectional study, which aimed to assess PA levels of Malaysian preschoolers aged 3-6 years and associations between PA and GMS development, is part of South East Asian Nutrition Surveys II (SEANUTS II) Malaysia. A total of 933 preschoolers (mean age=4.84, SE=0.04 years; 53.4% boys) from urban and rural areas of Peninsular Malaysia were included in this analysis. Information on sociodemography, PA, and GMS development were parent-reported. Associations between PA and GMS development were analysed using complex samples logistic regression. Overall, majority of preschoolers had ≥180 min/day of total PA (81.9%) and ≥60 min/day MVPA (70.3%), while 66.7% meet age-appropriate PA guidelines. A higher percentage of preschoolers aged 5-6 years (72.3%) meet PA guidelines compared to 3–4-year-olds (62.1%) (p<0.05). One in ten preschoolers had possible developmental delay of GMS while 9.7% of preschoolers were in monitoring zone. Preschoolers with total PA ≥180 min/day had lower odds of GMS delay (OR 0.34, 95%CI 0.177,0.645), when compared with those who had total PA <180 min/day. No significant associations were found for MVPA and meeting PA guidelines with GMS development. Our findings suggest that preschoolers who had more PA are less likely to

have GMS developmental delay. Future studies can explore associations of PA and GMS development with other potential factors such as cognitive development, social, cultural, and environmental factors. Intervention programmes should focus on promoting active lifestyle among children to enhance their motor skills and physical development.

A07 Parental perception of body weight, parental feeding practices, child eating behaviour, and body weight status among children with autism spectrum disorder

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Children with Autism Spectrum Disorder (ASD) often face nutritional challenges and difficulties living independently, highlighting the crucial role of parents in promoting healthy feeding practices and eating behaviours in addition to monitoring their body weight status to ensure optimal nutritional status. This study aimed to determine the discrepancy between parental perception of children's body weight status and their actual body weight status and the association between parental feeding practices, child eating behaviours, and body weight status among children with ASD. This cross-sectional study recruited 224 children aged 2-7 years (2-5 years: *n*=115; 5-7 years: *n*=69), from an autism intervention centre in Kuala Lumpur, Malaysia. Parental perception of child's weight, parental feeding practices, and child eating behaviors were obtained through a questionnaire, and children's weight and height were measured by the researcher under centre staff's supervision. Parents of children aged 5-7 years were more likely to underestimate their child's weight status (75.4%) compared to parents of children aged 2-5 years (23.9%). Misperception of weight was 48.2%, with 87.5% and 85.8% of childhood overweight and obesity being underestimated, respectively. Multiple linear regression analyses showed that perceived parent weight and perceived child weight positively predicted obesity while slowness in eating negatively predicted obesity among children with ASD. The misperception of weight among the parents of children with ASD was high. Training and tools on accurate measurement of children's body weight status should be provided to parents to allow early detection and intervention on unhealthy weight status among children with ASD.

A08 Factors influencing prevalence of stunting among children aged below five years in peninsular Malaysia

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Undernutrition in children hinders their physical growth and mental development. Various factors including sociodemography, sanitation and hygiene practices along with parental factors are associated with childhood stunting. This cross-sectional study aimed to identify the risk factors for stunting among children aged 6 to 59 months in Peninsular Malaysia. This study is part of the South East Asian Nutrition Surveys II (SEANUTS II) Malaysia. A total of 859 children (50.8% boys, 49.2% girls) with mean age of 35.2±15.5 months from four regions (Central, East Coast, Northern and Southern) of Peninsular Malaysia were

included in the analysis. Children's height was measured, while data on socioeconomic status, sanitation facilities, and personal hygiene were collected through questionnaires completed by parents. Some 12.3% of children are stunted, with higher proportions in boys (13.3%), children below two years of age (12.4%), rural areas (14.1%), with low household income (13.4%) and household sizes of 5 or more (13.3%). Most children and their mothers practiced good hygiene (77.5-95.5%) and had appropriate sanitation facilities at home (88.1-99.1%). Stunting was significantly associated with low birth weight (OR=2.84, 95%CI=1.54, 5.21), low maternal height (OR=2.66, 95%CI=1.39, 5.10), lower maternal education (OR=2.06, 95%CI=1.22, 3.47) and parental tobacco smoking (OR=1.64, 95%CI=1.02, 2.64). In conclusion, the risk factors for stunting in children below five years of age in Peninsular Malaysia are low birth weight, maternal short stature, lower maternal education level, and tobacco smoking parents. Thus, it is imperative to ensure girls receive adequate nutrition for optimal health and have a healthy gestational weight gain during pregnancy. Additionally, educating parents on the effects of tobacco smoking is important to promote children's overall health and well-being.

A09 Association between physical frailty, cognitive frailty and psychological problem among probable sarcopenia and sarcopenia community-dwelling older people in Kelantan

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Sarcopenia is a geriatric syndrome characterised by a reduction in muscle mass, muscle strength and physical performance, which may cause frailty and psychological problems in older people. Thus, this study aimed to determine the association of sarcopenia with frailty and psychological problem among older people residing in the community. This study is the screening phase of an ongoing larger study. A total of 161 subjects aged 60 years and above were recruited. Probable sarcopenia and sarcopenia status was identified using the revised Asian Working Group for Sarcopenia (AWGS 2019) guideline. Physical frailty was determined using the five Fried frailty phenotype while cognitive frailty is the presence of physical frailty and mild cognitive impairment assessed using Montreal Cognitive Assessment (MoCA). Psychological problem was determined using the 21-item Depression Anxiety Stress Scales (DASS). Chi-square test was used to identify the association of sarcopenia with both the frailty domains and psychological problem. The overall prevalence of probable sarcopenia and sarcopenia were 87.0% and 13.0 % respectively. The prevalence of probable sarcopenia (57.9%) and sarcopenia (85.7%) was significantly higher in men (p-value=0.014). Functional limitation was significantly higher among the probable sarcopenic patients (38.6%) as compared to sarcopenic patients (4.8%). Diabetes was reported to be higher in the probable sarcopenia group (31.7%) as compared to sarcopenic patients (9.5%). However, no significant association was found between sarcopenia status with frailty domains and psychological problem. Probable sarcopenic patients have higher risk of functional limitations and diabetes which may increase their risk of developing sarcopenia when lifestyle intervention and screening are not done earlier. Although frailty and psychological problems are not significant in this study, these factors are known determinants of sarcopenia which must be targeted during an intervention programme. Probable sarcopenia when detected earlier, can be reversed to the robust.

A10 Maternal nutrition knowledge, infant feeding practices and linear growth of 6-12 months old infants in Kuala Lumpur and Putrajaya

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Linear growth retardation or stunting is the most predominant form of childhood undernutrition. Stunting in the first 1000 days of life could have a lasting negative impact on health and wellbeing. This study aimed to determine the associations between maternal nutrition knowledge, infant feeding practices, and linear growth of infants aged 6-12 months in Kuala Lumpur and Putrajaya. This cross-sectional study was conducted on 229 mothers with infants aged 6-12 months. Socio-demographic background, anthropometric measurements, infant feeding practices, and maternal nutrition knowledge, were assessed through questionnaires. Infant's length was obtained from child health records. Length-for-age z-score (LAZ) was calculated using WHO Anthro software and classified based on WHO child growth standards. Infant and Young Child Feeding Index (ICFI) was used to assess infant feeding practices. The mean percentage score of maternal nutrition knowledge was 77.9% (*SD*=7.99), while the mean ICFI total score was 6.73 (*SD*=1.40). The mean LAZ was -0.62 (*SD*=1.08), and the prevalence of stunting was 10.9%. Infant's age (r=-0.146, p=0.028), maternal height (r=0.310, p<0.001), and birth weight (r=0.370, p<0.001), were significantly associated with LAZ. The total ICFI score was positively associated with LAZ (r=0.162, p=0.014). Among the five ICFI components, bottle-feeding (p=0.030) and dietary diversity (χ^2=17.723, p<0.000) were significantly associated with LAZ status, while breastfeeding, food group frequency, and meal frequency, were not associated with LAZ status (p>0.05). There was also no significant association between maternal nutrition knowledge and LAZ of infants (p>0.05). Multivariate analysis indicated that birth weight (B=0.850, p<0.001), maternal height (B=0.045, p<0.001), infant's age (B=-0.076, p=0.009), gender (B=-0.253, p<0.047), and total ICFI score (B=0.094, p=0.048), were significant contributors of linear growth of infants. Appropriate feeding practices, are therefore, crucial to ensure healthy linear growth of infants. Future research should explore the barriers in translating nutrition knowledge into feeding practices among mothers.

A11 Association of chronotypes and appetitive traits with weight status among Malaysian young adults

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Overweight and obesity have been a global issue to be solved in various aspects. Chronotypes and appetitive traits have shown their respective association with weight status, which may contribute to the current problem. This study aimed to determine the association between chronotypes and appetitive traits with weight status among Malaysian young adults aged 18 to 30 years old. This cross-sectional study recruited 208 respondents with a mean age of 23.24±2.91 years old using online and physical recruitment via convenience sampling. The prevalence of overweight and obesity were 8.7% and 24.5%, respectively. Morningness-Eveningness Questionnaire (MEQ) and Adult Eating Behaviour Questionnaire (AEBQ) were used to assess the chronotypes and appetitive traits. 80.3% of the respondents were with intermediate chronotype, followed by evening-type (11.5%) and morning-type (8.2%). Kruskal-Wallis test and Spearman correlation test were used in this study. No significant association was found between MEQ score, food approach score, food avoidance score

and body mass index (BMI) (p>0.05). Emotional Over-Eating (EOE) showed significant and positive correlation (r=0.169, p=0.015) whereas Slowness in Eating (SE) showed significant and inverse correlation (r=-0.184, p=0.008) with BMI respectively. There was a significant and positive correlation between food approach score and food avoidance score (r=0.143, p=0.046). This study revealed that chronotypes were not associated with weight status, however, among appetitive traits, EOE and SE were associated with weight status, which may be the focus of future studies in order to develop weight management interventions.

A12 Prevalence of abdominal obesity among adults ≥40 years old and the factors associated: Findings from National Health and Morbidity Survey (NHMS) 2019

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Abdominal obesity (AO) is defined as excessive fat accumulation in the abdominal region. It is closely associated with increased risk of mortality, morbidity, disability, poor quality of life and metabolic syndrome. The objective of this study is to determine the prevalence of AO among adults ≥40 years old and the factors associated. Data for 5658 respondents in this study were drawn from NHMS 2019, a nationwide cross-sectional study conducted among adults ≥18 years old in Malaysia. Respondents were recruited using stratified cluster sampling, covering urban and rural areas from all states in Malaysia. The data collection period was from July until October 2019. Information on socio-demographic characteristics was collected by interviewer-administered questionnaires. AO was assessed using waist circumference and classified according to cut-off values; ≥90cm for men and ≥80cm for women, based on the WHO (2000) recommendation. BMI was calculated by weight (kg) divided by the square of height (m^2) and categorised according to WHO 1998 guidelines (underweight <18.5kg/m^2, normal 18.5 – <24.9 kg/m^2, overweight ≥25.0 – 29.9 kg/m^2 & obese ≥30.0 kg/m^2). Descriptive and multiple logistic regression analyses using complex samples were performed for data analysis in SPSS Version 21. Statistical significance was set at p<0.05. The findings showed that a total of 3788 of the respondents (67%) experienced AO. Among the respondents with normal BMI, 34.6% of them had abdominal obesity. Regression analysis showed that adults aged 60-69 years old [aOR=1.94 (95% CI: 1.40, 2.70)], of Indian ethnicity [aOR=2.41 (95% CI: 1.24, 4.66)], Sarawak natives [aOR=1.92 (95% CI: 1.04, 3.56)], females [aOR=3.58 (95% CI: 2.71, 4.71)], married [aOR=2.16 (95% CI: 1.38, 3.37)], widow(er)/divorcee [aOR=2.28 (95% CI: 1.32, 3.93)] and unemployed/ retirees [aOR=1.22 (95% CI: 0.94, 1.58)] were significantly associated with an increased risk of abdominal obesity. Findings from this study indicate effective interventions to combat AO among older adults need to be intensified, targeting the factors identified.

A13 Social media-delivered lifestyle interventions among individuals living with diabetes and prediabetes: A scoping review

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Social media has become a popular channel for delivering healthcare knowledge and promoting lifestyle modification to combat various chronic diseases. However, there is a

lack of synthesised evidence on social media-delivered lifestyle interventions for managing and preventing diabetes. This scoping review aims to elucidate recently reported lifestyle interventions delivered on social media for individuals with diabetes and prediabetes. Systematic database searches were conducted on Ovid Medline, Embase, Cochrane Center for Controlled Trials, PubMed, Scopus and Web of Science to source peer-reviewed articles published between 2012-2022. Reference lists of the included publications were also manually searched. Twelve studies were included in this review. A team of multidisciplinary healthcare professionals coordinated most interventions, lasted for six months (6 of 12 studies; 6 months duration), and used a combination of videos, texts, images or audio to deliver the educational materials. The glycosylated haemoglobin (HbA1c) level improved in most of the studies, followed by self-care activities measuring and fasting plasma glucose. The dietary intakes were only assessed in two interventions among the individuals with prediabetes and showed promising improvements. This scoping review provides a holistic overview of the recent designs of lifestyle interventions for diabetes management and prevention on social media. This is essential for various healthcare professionals and stakeholders to formulate and implement population-based, cost-effective interventions in combating diabetes using social media.

A14 Abstract Removed

A15 A survey on knowledge, perception, attitude, and acceptance of plant-based diets among the public and nutritionists in Malaysia

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Plant-based diets emphasise consuming more plant foods while minimising the intake of animal foods. Recently, plant-based diets have gained popularity due to their potential health benefits. Several studies have explored the perception and attitude of plant-based diets among the public and healthcare professions, but none have been conducted in Malaysia. Therefore, this study aimed to assess the knowledge, perception, attitude, and acceptance of plant-based diets among the public and nutritionists in Malaysia. A validated questionnaire was administered online for data collection. A total of 264 respondents consisting of 228 public and 36 nutritionists were recruited. Most public (72.8%) and nutritionists (63.9%) had a moderate level of knowledge about plant-based diets, and sex was associated with knowledge level (p=0.011). Most respondents agreed with health (47.3%) and ethical, environment, and animal welfare (35.3%) aspects of plant-based diets, while they had neutral perceptions on well-being (27.3%), convenience (34.8%), cost (26.5%), and implementation barriers (32.6%) of plant-based diets. Ethnicity was associated with perception and attitude toward plant-based diets (p=0.034). Most respondents (55.3%) expressed interest in adopting plant-based diets, and age (p=0.025) and ethnicity (p=0.020) were associated with acceptance of plant-based diets. There was an association of perception and attitude with acceptance of plant-based diets (p<0.001) while knowledge was not associated with acceptance of plant-based diets (p=0.204). Most nutritionists believed that plant-based diets are likely to be beneficial for the prevention and treatment of various diseases and sometimes recommended plant-based diets in their practice (47.2%). However, concern for nutrient inadequacy (47.6%) has been cited as the main barrier to promoting plant-based diets. Most nutritionists reported “quite confident” (33.3%) and “somewhat confident” (33.3%) in planning nutritionally adequate plant-based diets. In conclusion, the public and nutritionists in Malaysia had a moderate level of knowledge of plant-based diets, but they exhibited positive perceptions and attitudes towards these diets.

A16 Assessment of food security, dietary diversity and malnutrition in young children aged 2 to 6 years old from B40 families in Seremban

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Low-income households face significant challenges with food insecurity, malnutrition, and poor dietary diversity. Dietary diversity is an essential indicator in assessing the nutrients adequacy from daily consumption and it is influenced by various factors. The dietary diversity of 2 to 6-year-old children in Malaysia is not well understood. Therefore, this cross-sectional study aimed to investigate the determinants of dietary diversity and its association with growth status among 2 to 6-year-old children from B40 families in Seremban. This study recruited 245 children from 10 randomly selected Taska KEMAS and 30 randomly selected Tabika KEMAS. A caregiver's self-administered questionnaire was used to obtain information on socio-demographic background and food security status. Children's weight and height were measured by the researcher. A 3-day 24-hour dietary recall was obtained through phone call interviews to assess dietary diversity score (DDS) of the children. Results showed that 53.9% of the respondents were food insecure, with a high prevalence of underweight (23.3%), stunting (29.4%) and wasting (23.3%). The prevalence of overweight and obesity was 4.5% and 1.2%, respectively. The mean DDS of children was 6.34±0.64, out of a possible score of 9. One in five (20.0%) children fell into the lowest tertile of DDS. Mother's age (p=0.027) and monthly household income (p=0.029) were significantly associated with DDS, but there was no significant association between food security and DDS. DDS was significantly correlated with HAZ of children (p=0.027). However, no significant associations were found between DDS with WAZ, WHZ and BAZ (p>0.05). In conclusion, this study highlights the high prevalence of undernutrition and food insecurity among young children from B40 families, emphasising the importance of promoting a diverse diet to combat childhood malnutrition.

A17 Maternal feeding practices, appetitive traits and weight status of infants aged 0-6 months old in Kuala Lumpur

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Maternal feeding practices and infant's appetitive traits are early life factors that may contribute to the development of childhood obesity. This study aimed to determine the association between maternal feeding practices, infant's appetitive traits and weight status. A total of 212 mothers with infants aged 1 – 6 months old from 5 government maternal and child health clinics in Kuala Lumpur participated in this cross-sectional study. Mothers answered questionnaires on maternal feeding practices, feeding to soothe and baby's eating behaviour via face-to-face interview. Infant's weight and length were obtained from child health records. Weight-for-length z-score (WLZ) was assessed using WHO Anthro software. Majority of the mothers were Malay (74.1%) and had tertiary education (78.3%). The mean WLZ of the infants was 0.08±1.18. The prevalence of overweight/obesity among the infants was 15.1%. There was no difference between maternal feeding practices (exclusive breastfeeding, feeding mode) and infant's weight status (p>0.05). There was no association between feeding to soothe and infant's WLZ (p>0.05). For infant's appetitive traits, there was a positive association between enjoyment of food (r=0.144, p=0.036), general appetite

(r=0.175, p=0.011), and infant's WLZ. Satiety responsiveness (r=-0.158, p=0.022) and slowness in eating (r=-0.138, p=0.045) were negatively associated with infant's WLZ. Food responsiveness was not associated with infant's WLZ (p>0.05). General appetite, enjoyment of food, and ethnicity, were found to be significant predictors of infant's WLZ (F=6.017, p=0.001). Higher general appetite (B=0.237, p=0.005) and enjoyment of food (B=0.097, p=0.034) were associated with higher WLZ in the infants, while being Malay was associated with lower WLZ (B=-0.596, p=0.003). This shows that, appetitive traits, such as general appetite and enjoyment of food, may either increase the risk of obesity or protective against undernutrition. A longitudinal study is needed to be certain of the negative or positive impacts of appetitive traits on growth.

A18 Vitamin D status and its associated factors among Malay female office workers in Kuala Lumpur during the COVID-19 pandemic

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Urban Malay female office workers are susceptible to vitamin D insufficiency due to limited sunlight exposure and clothing choices. Movement control orders during the COVID-19 pandemic may affect their vitamin D levels. This study aims to determine the prevalence of vitamin D insufficiency among Malay female office workers residing in Kuala Lumpur before and during the COVID-19 pandemic and its associated factors. A total of 105 Malay female office workers (mean age = 36 years) who had vitamin D screening between March and July 2019 (pre-pandemic) were invited to participate in a follow-up study conducted from August to December 2021 (during the pandemic). Participants completed online questionnaires about sun exposure and dietary vitamin D. Weight, height, and body fat percentage were measured, and serum 25-hydroxyvitamin D (25OHD) levels were determined using an enzyme-linked immunoassay. Significant increases were observed in body weight (60.0 (19.0) kg *vs.* 62.8 (20.5) kg), BMI (24.4 (7.7) kg/m^2) *vs.* 26.0 (8.0) kg/m^2), and body fat percentage (35.1% (6.3) *vs.* 37.3% (8.5)) during the pandemic. The sun exposure index score decreased from 0.7 (0.6) to 0.3 (1.1), while vitamin D supplement intake increased from 0.6 μg/d to 1.8 μg/d during the pandemic. Despite a significant increase in serum 25OHD levels during the pandemic (34.5 (11.9) nmol/L *vs.* 41.8 (11.7) nmol/L), the majority of participants (90.5% pre-pandemic and 89.5% during the pandemic) were vitamin D insufficient. Before the pandemic, sun exposure and dietary vitamin D intake were associated with participants' vitamin D levels. However, dietary vitamin D intake emerged as the sole predictor during the pandemic. These findings highlight the importance of adequate dietary vitamin D intake in maintaining optimal vitamin D status, especially during periods of limited sun exposure, such as the COVID-19 pandemic. Therefore, public health awareness of good vitamin D sources is warranted.

A19 An interactive web-based intervention to manage obesity-related behaviours in primary school children: A study protocol of the CoPT Nutri Trail© Programme

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The school community, namely teachers, parents, and canteen operators, plays a crucial part in the school-based intervention, a possible approach to preventing childhood obesity. Empowering them with a nutrition guide and knowledge via a web-based module will enhance their ability to change diet-related behavior among obese children. Thus, this study aims to determine the efficacy of the CoPT Nutri Trail©, a web-based intervention designed for canteen operators, parents, and teachers to guide diet-related behaviors in obese children. CoPT Nutri Trail© has been designed in 3 phases using Design and Development Research (DDR). Each stage integrates the health-promoting school framework, technology acceptance model, and logic model to support developing and evaluating the intervention's efficacy. A quasi-experimental study has been proposed in the efficacy study. A total of 40 obese parent-child dyads were selected from two primary schools and assigned to the intervention and control groups. The intervention group (IG) was exposed to the CoPT Nutri Trail© activities. The nine topics in the teacher's module related to nutrition and physical activity focus on educating children in practicing healthy habits. The module for canteen operators focuses on preparing healthy meals to be served in schools. Parents also received guidance on preparing healthy meals, exercising regularly, and keeping track of their children's BMI. Children in the control group (CG) continued with existing health-related activities. Changes in BMI z-score, body fat, waist circumferences, dietary intake, physical activity, screen time, psychosocial aspect, parental knowledge, and practice, were assessed at baseline (P1) and 3 months post-baseline (P2). Mixed ANOVA between-within interaction was used to determine the interaction effect between (IG) and (CG) and time (P1) and (P2). In conclusion, interactive web-based activities via CoPT Nutri Trail© will have a strong potential for effective strategies to guide school community engagement and participation in the obesity-related behavior change programme. Therefore, the CoPT Nutri Trail© programme can be one of the strategies for combating the dual burden of malnutrition in Malaysia.

A20 Prevalence of metabolic syndrome among urban-poor Malaysian women and its associations with serum 25(OH)D level, body composition, and household food security

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Metabolic Syndrome (MetS), nutrition-health-related problems as well as food insecurity are getting attention nowadays, especially among those who are of low socio-economic status. Some researchers use an integrated approach intervention to solve this problem because they found that the problem shares similar factors and has a complex relationship.

However, there is limited research investigating the severity of MetS in urban-poor women and its association with other nutrition-health-related problems and food security. Hence, the present study aims to determine the prevalence of MetS and associations of serum 25(OH) D level, body composition and household food security with MetS among Malaysian women living at selected low-cost flats in Kuala Lumpur. This cross-sectional study was conducted among 67 Malaysian women living at selected Low-Cost flats in Kuala Lumpur, Malaysia. A 10ml of fasting blood sample of participated women was collected for the MetS components and serum 25(OH) D levels assessments, and their waist circumference and blood pressure were measured to determine their MetS risk as well as body composition measurement using InBody 270. Also, they were interviewed about their household food security experiences. The results show that a majority of Malay women (92.5%) with an average age of 40.6 ± 6.4 years participated in this study. Almost half of them (47.8%) were having MetS, 41.8% of them were experienced food insecurity, 83.6% of them have insufficient Vitamin D, 73.1% of them were overweight and obese and 74.6% of them had abdominal obesity. Overweight and obesity were significantly associated with MetS (χ^2=13.251, p<0.05). Despite only one significant association of MetS being found, the prevalence of vitamin D insufficiency, and household food insecurity remained high among urban poor Malaysian women. The present study suggests that an integrated intervention approach is necessary and relevant to improve overall issue.

A21 Association between socioeconomic status (SES) and food neophobia among preschoolers in Terengganu

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Food neophobia is defined as an attitude toward foods that includes reluctance to eating and avoidance of trying new foods, resulting in restricted eating patterns. Food neophobia is most common between the ages of two and six. It will gradually decrease during childhood and adolescence. Methods: This study was cross-sectional design. The purpose of this study was to determine the association between socioeconomic factors and food neophobia among preschoolers in Terengganu. A total of 470 preschoolers aged 5 to 6 years old that were born in the year of 2017 and 2018 and living in Terengganu were recruited as participants. Data on sociodemographic, food neophobia were collected using questionnaires through Google Form. This research will help to explain the association between participating in this study. The sociodemographic status among the participants showed that 29.1% of the participants were 5 years old (n=137) and 333 participants (70.9%) were 6 years old. Majority of them were female (n=239, 50.9%) and male (n=231,49.1%). All of the participants were Malay (n=470,100%). 96.8% of the parents are married (n=455).61.7% of the participants were living in urban areas (n=290). Majority of the fathers and mothers studied up to a lower education level (n=268; 57%). Most of the family had income lower than RM4,850 (n=95;75.4%). Majority of participants' parents were working (n=340; 72.3%). The data showed that 51.3% of the participants experienced food neophobia (n=241) and from that, there were 116 males and 125 females, while 48.7% of the participants were not having food neophobia (n=229) with 115 of them males and 114 of them females. In this study, there was a significant association between residence area and food neophobia among preschoolers in Terengganu (χ^2=6.373, p=0.012). However, there was no significant association between other SES characteristics Conclusion: This finding indicated that socioeconomic status has an impact on food neophobia. More research on food neophobia in children and its association to socioeconomic status is required.

A22 Assessment of nutritional status and food insecurity among children in Kota Kinabalu and Tawau, Sabah

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Malaysian children are experiencing a triple burden of malnutrition (undernutrition, overnutrition and micronutrient deficiencies), and food insecurity could be one of the potential factors. This study evaluated the relationship between food insecurity and nutritional status among children in Sabah. Children aged between 5 to 12 years were recruited from Kota Kinabalu and Tawau, and most of them were from households with low-income (71.6%). Children's height, weight, and body mass index (BMI) were assessed, and their dietary intake was assessed using a 24-hour diet recall. Food insecurity was assessed using Household Food Insecurity Access Scale. Out of 197 children, 16.2% children were stunted, 8.1% children were underweight, and 24.9% children were overweight or obese. Most of the children had moderate food insecure (36.5%), followed by food secure (34.5%), and severe food insecure (28.9%). There was a trend that more children from Tawau experienced severely food insecure (54.4%) than children from Kota Kinabalu (p=0.054). More children having mothers with secondary education (66.7%) had food insecure (p=0.011). Similarly, more children from low-income households (70.9%) experienced food insecurity (p=0.021). There were significant differences in energy (p=0.007), carbohydrate (p<0.001), and thiamine (p=0.030) intakes across household food insecurity categories, with the lowest energy, carbohydrate, and thiamine intakes were reported by children with moderate food insecure. More children with moderate food insecure (49.5%) also did not meet the recommended carbohydrate intake (p<0.001). More children (56.3%) with moderate food insecure were stunted (p=0.021), whereas BMI-for-age was not significantly associated with household food insecurity (p=0.328). In conclusion, household food insecurity was associated with selected nutrient intakes and stunting among children in Sabah. Further study is required to explore the food group consumption based on their household food insecurity category.

A23 The relationship between nutritional status and DNA damage in women experiencing infertility in Malaysia

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Results from previous studies show that dietary intake and the level of DNA damage play an important role in the risk of infertility. However, there are only few data that examines the relationship between these two factors and the risk of infertility among women. This case-control study was conducted to determine the relationship between nutritional status and DNA damage with the risk of infertility among 102 infertile female subjects and 102 control female subjects at Hospital Canselor Tuanku Mukhriz (HCTM). Both groups were matched in terms of age, gender, and marital status. Sociodemographic data and dietary intake for 7 days were obtained from interviews using questionnaires. Anthropometric measurements including weight, height, Body Mass Index (BMI) and body fat percentage were conducted. Data analysis using multivariate tests showed that an increase in one unit of BMI increased

the risk of infertility in women by 1.15 times [Adjusted OR=1.147 (95% CI= 1.059-1.243)] (p<0.01). Meanwhile, high intake of folic acid reduced the risk of infertility in women by 1.0% [Adjusted OR=0.990 (95% CI= 0.981-1.000)] (p<0.05). Likewise, high selenium intake also reduced the risk of infertility in women by 3.0% [Adjusted OR=0.972 (95% CI= 0.949-0.996)] (p<0.05). In conclusion, risk factors which include BMI as well as intake of folic acid and selenium have a significant relationship with the risk of infertility in women. Therefore, healthy lifestyle practices need to be improved to reduce the risk of infertility in women.

A24 Physical activity level and psychosocial status between breast cancer survivors and healthy women in Klang Valley

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Cancer treatment might extend survival, but it possibly also results in decreased physical activity, and poor quality of life, which may hamper breast cancer survivors' ability to recover to levels similar to that before cancer diagnosis. A cross-sectional study was conducted to compare physical activity level and psychosocial status between breast cancer survivors and healthy women, aged 18 to 65 years. Subjects' sociodemographic data and breast cancer survivors' clinical characteristics were collected. Physical activity level was assessed using International Physical Activity Questionnaire (IPAQ) short form and quality of life was assessed using European Organization for Research and Treatment of Cancer Quality of Life Questionnaires (EORTC QLQ–C30). Perceived Stress Scale-10 (PSS-10) was used to measure perceived stress of the subjects. All assessments were interviewer-administered. A total of 60 women (30 breast cancer survivors and 30 healthy women) were included in this study using a purposive sampling method. Breast cancer survivors were recruited among patients who have follow-up appointments at the Hospital Canselor Tuanku Muhriz and the cancer support centre. Meanwhile, healthy women were recruited from selected housing areas in Klang Valley. This study found that, compared to healthy women, breast cancer survivors demonstrated significantly higher MET scores (4194.1±2698.4 MET/ week) (p<0.05). Breast cancer survivors were also found to experience lower physical functioning (84.0±19.2) and social functioning (85.6±21.8) compared with healthy women i.e., 95.3±6.3 and 98.3±5.1 respectively, (p<0.05). The survivors also had significantly more problems with constipation symptom (7.8±14.3) compared with healthy women (1.1±6.1) (p<0.05). Interestingly, the perceived stress scores were comparable between the two groups (p>0.05). In conclusion, breast cancer survivors tend to be more physically active compared with healthy women. However, they have less physical and social functioning as well as stronger symptoms of constipation compared to healthy women. The similar perceived stress scores between both groups indicate that the survivor group might have benefited from the physical activity that they have engaged with.

A25 Association between malnutrition indicators, nutritional determinants, and frailty among community-dwelling older adults in Malaysia

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Frailty is a common geriatric syndrome characterized by decreased physical functioning, increased vulnerability to adverse health outcomes, and nutritional deficiencies. This study examined malnutrition indicators and nutritional determinants associated with frailty among community-dwelling older adults in Malaysia. In this cross-sectional study, participants were selected through purposive sampling and interviewed for sociodemography, health status, depression, functional performance, food intake using a structured dietary history questionnaire, activity lifestyle and disability. Anthropometric and frailty assessments based on Fried's criteria were assessed. From a total of 1000 participants (73.18 ± 5.41 years), 13.9%. 72.5% and 13.6% were categorised as robust, pre-frail and frail, respectively. Participants with obesity (Adj OR = 3.219; 95% CI: 1.415 – 7.324; $p<0.05$) and high waist circumference (Adj OR = 1.032; 95% CI: 1.006 – 1.058; $p<0.05$) had a higher risk of frailty after controlling for confounding factors and energy intake. Low intake of energy (Adj OR = 0.971; 95% CI: 0.948–0.995; $p<0.05$), protein (Adj OR = 0.987; 95% CI: 0.976–0.998; $p<0.05$), carbohydrate (Adj OR = 0.976; 95% CI: 0.963 – 0.990; $p<0.05$), fibre (Adj OR = 0.884; 95% CI: 0.794 – 0.985; $p<0.05$) and riboflavin (Adj OR = 0.239; 95% CI: 0.091 – 0.630; $p<0.05$) increased the risk of frailty. After controlling the energy intake, carbohydrate (Adj OR = 0.983; 95% CI: 0.969 – 0.998; $p<0.05$) and fibre intake (Adj OR = 0.950; 95% CI: 0.848 – 1.065; $p<0.05$) remained significantly associated with frailty status. This study indicates that older adults with abdominal obesity and who had a lower intake of energy, carbohydrate and fibre are at higher risk of frailty. These findings underscore the importance of addressing malnutrition and nutritional determinants in preventing and managing frailty among older adults residing in Malaysian communities.

A26 Dementia and its associated risk factors among older adults with probable sarcopenia and sarcopenia in Kelantan

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Sarcopenia has been found to increase the risk of dementia among older adults. The current study aimed to investigate the prevalence of dementia and its associated factors among older adults with probable sarcopenia and sarcopenia in Kelantan. This is a cross-sectional study that has been conducted among 160 older adults in five districts in Kelantan including Kota

Bharu, Pasir Mas, Tumpat, Bachok and Machang. Subjects' sociodemographic, medical history, anthropometry, body composition, cognitive assessment, functional status and psychological status were obtained. Sarcopenia and probable sarcopenia were screened using Asian Working Group Sarcopenia 2019 (AWGS). The prevalence of dementia was 65.0% among those with probable sarcopenia and 66.7 % among sarcopenic subjects. Most of the subjects with dementia were significantly older (68.1±5.3 versus 67.5±5.5), of Malay ethnicity (62.9%), had lower income (91.3%) and was currently unemployed (64.8%). Univariate analysis revealed that there was a significant association between dementia with high blood pressure (p=0.019) and functional limitation (p<0.001). Binary logistic regression further demonstrated that subjects with high blood pressure were 6.1 times more likely to exhibit dementia than those with normal blood pressure (95%CI: 1.548, 24.164; p-value=0.010). Thus, early screening of sarcopenia is essential to identify and reduce the potential risk factors of dementia. Early diagnosis and prevention of sarcopenia as well as its associated risk factors are important to protect against dementia.

A27 Assessment of anthropometric and psychosocial status of elderly in Pontian, Johor

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United Nations stated Malaysia was expected to become an aging country by 2030 when 15% of its population is aged 60 and above. The aging process can lead to changes in body composition and affect the psychosocial status of the elderly. Therefore, this study was conducted to assess the anthropometric and psychosocial status of the elderly in Pontian, Johor. A cross-sectional study was conducted to assess the anthropometric and psychosocial status among elderly in Pontian, Johor. Subjects aged 60 years and above were selected through a convenient sampling method and were interviewed for sociodemography, depression status through the geriatric depression scale (GDS-15), functional status from the Instrumental Activities Daily Living (IADL) and Activities Daily Living (ADL) questionnaire and social network status from the Lubben Social Network Scale-6 (LSNS-6) questionnaire. In addition, anthropometric measurements such as weight, height, mid-upper arm circumference (MUAC), waist circumference (WC) and calf circumference (CC) were carried out. A total of 106 elderly (68±7 years) participated in this study. 38.7% of the subjects were categorized as normal weight, 26.4% were overweight, 29.2% were obese and 5.7% were underweight. The average body mass index (BMI) of the elderly in this study was 26.0±8.5 kg/m^2 which is in the overweight category. Functional status measured from IADL was positively correlated (p<0.05) with weight, height, and BMI. Additionally, MUAC, WC, CC were positively correlated (p<0.001) with IADL. Weight, height, MUAC, WC and CC were positively correlated with social network status at p<0.05. This meant individuals with high IADL and LSNS-6 scores had a good anthropometric status. However, depression status was inversely correlated (p<0.05) with WC. In conclusion, the anthropometric and psychosocial status of the elderly in Pontian, Johor were at the baseline level of malnutrition which requires observation. Therefore, through this basic information, intervention measures that are important to the elderly can be planned so that the anthropometric and psychosocial status of the elderly can be improved.

A28 Associations of socioeconomic, home food environment and personal factors with fruits and vegetables intake among primary school children in Selangor

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Socioeconomic, home food environment and personal factors play crucial roles in influencing the fruits and vegetables intake among the children in Malaysia. Majority of the children in Malaysia did not consume adequate servings of fruits and vegetables, especially children aged 10 to 12 years old. This cross-sectional study was conducted in 10 primary schools to determine the associations of socioeconomic, home food environment and personal factors with fruits and vegetables intake among primary school children in Selangor. A total of 205 participants aged 10 to 12 years old (mean age of 11.1±0.8 years with 54.1% males and 45.9% females) with their parents participated in this study. Data collection was conducted through a self-administered questionnaire which were filled by parents to assess socio-demographic and socioeconomic factors, parental feeding practices, parental modelling and availability of fruits and vegetables while parenting styles, personal factors and the frequencies of fruits and vegetables intake answered by the children. A total of 99.5% of the children did not consume adequate servings of fruits and vegetables with the average serving sizes being 1.0±0.1 per day. High food restriction was associated with high intake of fruits (r= 0.159, p= 0.023) meanwhile high availability of fruits and vegetables (r=0.197, p=0.005; r= 0.220, p= 0.002) and personal factors (preferences; r=0.203, p= 0.004; r= 0.298, p= 0.000 and self- efficacy; r=0.216, p=0.002; r=0.354, p=0.000) were associated with high intake of fruits and vegetables among the primary school children. Therefore, the results indicated that the home food environment and personal factors should be urgently addressed because it may influence the intake of fruits and vegetables among the children and thus, it influenced their health and growth development.

A29 Associations of sociodemographic factors, home food environment factors and physical activity level with body weight status among primary school children in Hulu Langat, Selangor, Malaysia

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Thinness, underweight and overweight problems among children have consistently shown rising numbers and these issues need more attention for improvement. Factors associated with body weight status among primary school children are still inconsistent in local context. This cross-sectional study aimed to determine factors associated with body weight status among primary school children in Hulu Langat, Selangor. This study involved 168 (49.4% males and 50.6% females) respondents with mean age of 10.88±0.74 years old. Multi-stage sampling was done to select 10 primary schools in Hulu Langat. A self-administered questionnaire consisted of 5 sections (socio-demographic factors, food availability, family meal frequency, parental beliefs, attitudes, and practices regarding child feeding and physical activity level) were used. Results from school's SEGAK assessment showed that

26.8% of the respondents were obese and 15.5% were overweight. 79.8% of the respondents reported 'sometimes' in the item on availability of sugar-sweetened beverages at home. The mean score of the home availability of fruits and vegetables was 2.03±0.52 out of a total of 4. Furthermore, 45.8% of the respondents had more than 7 times of family meal per week. Parental perceived feeding responsibility (3.85±0.89) and monitoring (3.99±0.85) domains showed the highest mean scores. Majority of the respondents (69.6%) had moderate physical activity level. Results further revealed that home availability of sugar-sweetened beverages (p= 0.041), concerns about child weight (r=0.272, p<0.001),perceived child weight (r=0.266, p<0.001), perceived parent weight (r=0.157, p= 0.042), monitoring (r=0.233, p= 0.002), restriction on food (r=0.154, p= 0.046) and pressure to eat (r=-0.269, p<0.001) were significantly correlated with BAZ. More health promotions related to healthy home food environment are required to increase the awareness of its impact on childhood obesity.

A30 Abstract removed

A31 Association of sociodemographic factors and lifestyle factors with vitamin D status among hospitalised children aged 2-12 years in selected private hospitals in Seremban

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Vitamin D deficiency is a prevalent health issue that is estimated to affect one billion people worldwide, including Malaysia. Despite vitamin D status among Malaysian has been increasingly studied over the last decade, scant research attention has been given to hospitalised children. Hospitalised children may have underlying infections that can contribute to low vitamin D levels. Therefore, this cross-sectional study aimed to investigate the associations of sociodemographic factors and lifestyle factors with vitamin D status among children aged 2-12 years in selected private hospitals in Seremban. A total of 161 hospitalised children with a mean age of 5.70±3.23 years old were recruited conveniently from two selected private hospitals in Seremban. An online self-administered questionnaire was completed by parents to obtain the children's information on sociodemographic characteristics, physical activity level, sunlight exposure and skin phototype. Weight and height of the children were self-reported by their parents. Further, 1 mL of venous blood was drawn from the children by paediatrician and sent to accredited laboratory to assess vitamin D status. Findings showed that the mean serum 25(OH)D levels of the hospitalised children was 73.99±29.39 nmol/L, with 19.9% were suffering from vitamin D deficiency or insufficiency (≤50 nmol/L). Moreover, 21.7%, 8.7% and 20.5% were stunted, underweight and overweight/obese, respectively. Approximately two-third of the children (65.8%) had low physical active level. The mean hours of sun exposure was 1.91±1.53 hours/ week. Bivariate results showed that age (χ^2=29.584, p<0.001) and BMI-for-age (χ^2=7.006, p=0.030) were significantly associated with vitamin D status. Nevertheless, there were no associations found between physical activity level, sunlight exposure, skin phototype, height-for-age and weight-for-age with vitamin D status (p>0.05). In conclusion, findings suggest that vitamin D deficiency and insufficiency were prevalent among hospitalised children in this study, particularly those aged 7-12 years old.

A32 Are maternal nutrition literacy and dietary diversity related to children's nutritional status – A study among food insecure households in Simunjan, Sarawak?

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Child's malnutrition is one of the public health issues, especially among food insecure household. The purpose of this study is to determine the maternal nutrition literacy and dietary diversity and their relationship with children's nutritional status from food-insecure households in Simunjan District, Sarawak. This cross-sectional study involved a total of 171 women aged 15 – 49 years old with at least one child aged 2–12 years old. Food insecurity status, maternal nutrition literacy and dietary diversity were determined by using a standardised and validated questionnaire through interview, while child weight and height were measured. Univariate data analysis using IBM SPSS version 26.0 was used. Prevalence for household food insecure, individual food insecure and child hunger were 70.8%, 15.2% and 14.0% respectively. Majority of the respondents had poor nutrition literacy (57.9%, n=99), and mostly (82.5%, n=141) had poor dietary diversity. The main nutritional problems for children aged 24–59 months was underweight (17.9%) and stunted (17.9%), while for children aged 60–144 months were overweight and obese (27.5%). Maternal nutrition literacy was associated with stunting status of the children (p=0.032), while maternal dietary diversity was associated with underweight status of the children (p=0.043). However, no association was found between the maternal nutrition literacy and dietary diversity with the others malnutritional conditions of children (wasted, thinness and overweight/ obese); and between maternal nutrition literacy and dietary diversity. Efforts in improving maternal nutrition literacy and diet diversity should be carried out more at the community level.

A33 Associations of socio-demographic factors, parental factors and children's factors with body weight status among primary school children living in selected low-cost flats in Kuala Lumpur

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The presence of thinness, overweight, and obesity directly contributes to the morbidity and mortality rates among children. Previous studies have documented a significant prevalence of thinness, overweight, and obesity among primary school children. However, the factors contributing to these conditions, particularly among primary school children in low-cost flats in Kuala Lumpur, remain unclear. Hence, this cross-sectional study aimed to determine the factors associated with body weight status among primary school children in selected low-cost flats in Kuala Lumpur. A total of 100 primary school children from 10 randomly selected low-cost flats in Kuala Lumpur participated in the present study. A self-administered questionnaire was used to obtain information on socio-demographic background, parental factors, and children's factors. Height and weight of participants

were measured by the researcher using SECA 213 stadiometer and InBody 270s Body Composition Analyzer, respectively. Results showed that the prevalence of overweight and obesity (17.0%) was higher than thinness and severe thinness (11.0%). Higher maternal BMI (r=0.308, p=0.002), pressure and restriction for weight control (r=-0.212, p=0.034; r=0.340, p=0.001), maternal authoritative and authoritarian styles (r=0.213, p=0.033; r=0.231, p=0.021), and depression of child (r=0.218, p=0.029) were positively significantly correlated with higher BMI-for-age z score (BAZ) of primary school children living in low-cost flats. Further analysis on multiple linear regression showed that higher maternal BMI (β=0.052, p=0.019), and pressure to eat (β=-0.313, p=0.033), frequently pack or purchase of food delivery from western restaurants (β=0.146, p=0.047), and depression of child (β=0.040, p=0.026) contributed toward higher BAZ of the children. In conclusion, the present findings showed over-nutrition was more prevalent than under-nutrition among primary school children living in low-cost flats. Health intervention programmes should consider the significant factors and involve both children and their parents, especially in low-cost flats.

A34 Assessment of nutrition environment in University Malaysia Sabah: A cross-sectional study

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University students generally have poor dietary quality and tend to practice poor eating habits including skipping meals, inadequate consumption of vegetables, fruits, and fish, high intake of high-fat foods, and low physical activity levels. These dietary habits could be influenced by the nutrition environment in universities that either encourages or discourages healthier lifestyles. Therefore, this study was carried out to assess the nutrition environment of University Malaysia Sabah (UMS). This cross-sectional study was conducted in all food establishments located in UMS on-campus hostel, library cafe, and cafe from all faculties, centres, and institutes. An assessment tool adapted from healthy cafeteria guidelines by the Ministry of Health, Malaysia with scores ranging from 0 to 23 was developed to assess the healthfulness of these establishments. A cut-off score of 80% was considered “healthy”. Thirty-four food establishments were included in this study. High-fibre cereal choices were not offered by any of the food establishments and only 58.8% of food establishments offered non-fried/fatty cereals choices. Although only 15% of food establishments offered vegetables as main dishes for ≥20% of the total dishes, all establishments served vegetables with healthy cooking methods. Only six establishments sold fruits and all establishments did not have ≥ 50% of low-fat choices for animal protein dishes. Plant proteins were available in 20.9% of the establishments and none of the establishments offered dairy and dairy products. Moreover, the present study showed that the score was significantly different by the type of food establishments (p=0.006). Establishments with a combination of ala-carte and mixed rice dishes recorded the highest score compared to ala-carte or mixed rice food establishments. In conclusion, there is a compelling need to improve the nutrition environment by increasing the provision of high fibre cereals, vegetables, fruits, and dairy products, as well as reducing availability of high-fat foods.

A35 Activities and outcomes from the weight management intervention for adults in Klang Valley: Practitioner's perspective

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Weight management intervention is known as one of the approaches to help reduce overweight and obesity prevalence worldwide. It is crucial to understand which activities can contribute to the intervention's success. Hence, this study aims to explore the activities and its positive outcome in weight management intervention. An in-depth interview using a semi-structured questionnaire was conducted among practitioners in Klang Valley to gather the relevant information. This study selected practitioners with at least one year of experience in handling weight management interventions. Ten practitioners were chosen from different background such as nutritionist, dietitians, and fitness instructors. Nvivo 12 plus software was used to sort and organise the themes after transcribing the interview session. The result from the thematic analysis showed that four main activities could give an effect on a weight management intervention such as (i) nutrition and physical activities; (ii) screening and monitoring; (iii) motivation and spirituality; and (iv) task and challenge. Practitioners found that apart from being able to manage their weight, these activities give a good effect on the participants, including (i) showing a positive self-changing, (ii) being able to influence their surrounding; and (iii) manage to save their cost, especially for food and health treatment. Practitioners also found that combinations of those activities can give the participants a better outcome, especially if the participants committed to the intervention. In conclusion, these findings demonstrate that having various activities can increase the intervention's effectiveness. Future planner should therefore seek to address this issue by including these activities in the interventions.

A36 The relationship between parents' sociodemographic and the anthropometric status of children aged 13 and 14 years old in Kuala Lumpur

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Childhood overweight and obesity are increasing worldwide, with the fastest increases in low- and middle-income countries. There is an urgent need to address childhood obesity, a global health priority, as disparities in prevalence are widening and progress in prevention is poor. To tackle childhood obesity, we must look at the bigger picture and consider all factors contributing to obesity, not just diet and exercise. Parents can play an essential role in preventing and treating childhood obesity. Family-targeted interventions to treat childhood obesity may be effective, although it is unclear what the long-term effects of these interventions are. Therefore, this study was conducted to identify the relationship

between the sociodemographic status of parents and the anthropometric status of their 13- and 14-year-old children in Kuala Lumpur, Malaysia. This cross-sectional study involved 144 children aged 13 and 14 who were overweight and obese. Subjects were selected using purposive sampling in Kuala Lumpur. Data collection was done face-to-face at school for the anthropometric measurement of the study subjects. The study subjects at school reported information on parents' sociodemographic status. The average body mass index and waist circumference measurement were 27.74± 5.19 kg/m2 and 90.93±10.72` cm each. There was no significant correlation between education level, employment status, and parents' monthly income with body mass index. There was a weak relationship rs=0.21 and significant differences between education level and their child's waist circumference measurement. This study's results proved a correlation between the level of parental education and the waist circumference of the study subjects. This study implies that parents should focus on their children's eating patterns regardless of education level. This study can be expanded and continued further by involving all overweight and obese children in Malaysia with a large sample size so that the data obtained can be a reference for the population of parents who have overweight and obese children in entire Malaysia.

A37 Sociodemographic and dietary factors are associated with vitamin B_{12} status among Malaysian primary school children: Findings from SEANUTS II

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Vitamin B_{12} is important for children's growth, deoxyribonucleic acid synthesis, and formation and maturation of blood cells. Insufficient intake of this essential micronutrient can lead to vitamin B_{12} deficiency. However, data on B_{12} status among children in Malaysia is lacking, emphasising the need to assess the current situation. This cross-sectional study which was part of South East Asian Nutrition Surveys II (SEANUTS II) Malaysia, aims to explore prevalence of vitamin B_{12} deficiency and factors associated with vitamin B_{12} status among primary school children in Peninsular Malaysia. A total of 337 children aged 6 to 12 years participated in this study. Questionnaires were used to determine sociodemographic profiles and child eating habits. Anthropometric measurements included weight and height. Dietary intake was assessed using 24-hour dietary recall. Blood samples were taken and tested for serum vitamin B_{12} and haemoglobin concentration. Using body mass index-for-age z-score, 10.1% and 33.8% children were categorised as thin/very thin and overweight/obese, respectively. Mean serum vitamin B_{12} and haemoglobin concentration were 567.2±212.5 pmol/L and 132.9±9.1 g/L, respectively. Vitamin B_{12} deficiency and vitamin B_{12} deficiency anaemia prevalence were both 0% while prevalence of low vitamin B_{12} was 0.9%. Results showed no significant differences between serum vitamin B_{12} and haemoglobin concentration among household income groups at p=0.239 and p=0.914, respectively. Multiple linear regression model determined that significant factors associated with vitamin B_{12} status include children aged 10-12 years (p<0.001), fathers with secondary educational level and below (p<0.05), intake of vitamin C (p<0.05), and children who take supplements or vitamins (p<0.01). In conclusion, although prevalence of vitamin B_{12} deficiency in school-aged children in Peninsular Malaysia was non-existent, vitamin B_{12} status was affected by sociodemographic and dietary factors. Future studies should include additional vitamin B_{12} biomarkers to determine status accurately, such as serum methylmalonic acid and plasma homocysteine.

A38 The H.E.A.T© (Healthy Eating, Active and Support) Programme to sustain healthy body mass index in young adults: The needs assessment survey

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The H.E.A.T© (Healthy Eating, Active and Support) programme is a programme to prevent overweight and obesity. The study's objective is to understand the needs for developing an overweight and obesity prevention H.E.A.T© module and to explore the topics and activities required. The H.E.A. T© programme needs assessment was done by interviewing the implementer and user groups. The implementer group consisted of 8 trained health staff, while the user group consisted of 8 members of the public. The interview involved approximately 10 questions and took 15-20 minutes. The inclusion criteria for the implementer group are health staff at Health Clinics in selected FELDA settlements and experience in weight management and healthy lifestyle programmes. The inclusion criteria for the user group are young Malaysian adults aged 18 to 35 years with normal Body Mass Index (BMI) (18.5-24.9kg/m²) and living in selected FELDA settlements in Bentong District. The need assessment results revealed six important topics to be included in the module which are (1) nutrition, (2) lifestyle and physical activity, (3) motivation and awareness, (4) mental health, (5) stress management, (6) support groups, self-discipline and monitoring. Activities recommended for nutrition include talks, exhibitions, food displays, cooking demonstrations, healthy supermarket tours, individual nutrition counselling and group discussion. For lifestyle and physical activity, recommendations were group activities, interactive games, group exercise session and video. Activities recommended for motivation, awareness, mental health and stress management were group activities, sharing experiences, listening to music and singing, and nature therapy such as jungle tracking, hiking and jogging. Lastly, group activities and checklists monitoring could be carried out for support groups, self-discipline and monitoring. In conclusion, the overweight and obesity prevention module is essential, with six diverse topics and activities identified to attract young adults to sustain healthy BMI.

A39 Changes in lifestyle and psychological health of young adults during and after the COVID-19 lockdown in Malaysia: A longitudinal study

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The implementation of COVID-19 lockdown has led to significant changes in daily routines, social interactions, and mental well-being. This longitudinal study aimed to assess lifestyle and psychological changes of young adults during and after the COVID-19 lockdown in Malaysia. A total of 230 young adults (17.8% males and 82.2% females) with a mean age of 22.6 years (*SD*=1.5) completed an online survey at two time points: during lockdown (July to August 2021) and after lockdown (July to October 2022). The survey collected data on sociodemographic background, food security, physical activity, chronotype, night eating, Internet addiction, social media use, sleep quality, meal consumption, depression, anxiety, and stress, body image perception, and self-reported body weight and height.

Results showed that 53.9% of the respondents gained weight with an average weight gain of 2.82±2.42kg, while 30.9% lost weight with an average weight loss of 2.34±3.27kg. The mean body weight increased significantly from 54.38±10.38kg during lockdown to 55.18±10.72kg after lockdown (p=0.001). Furthermore, there were significantly increased in physical activity, morning chronotype, night eating behaviour, and snacking behaviour, but decreased in internet addiction, depression, anxiety and stress scores after the COVID-19 lockdown as compared to during the COVID-19 lockdown (p<0.05). In conclusion, this study provides insights on the impact of COVID-19 on weight change (especially weight gain) as well as lifestyle and psychological well-being of young adults, highlighting the need for interventions to promote healthy lifestyles and psychological well-being in this population.

A40 Abstract Removed

Group B: Dietary Intake, Consumption Pattern & Disease

B01 Dietary compliance of macronutrients, fruits and vegetables intake and associations with body mass index among women of reproductive age

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Consumption of nutrients according to dietary guidelines helps to ensure optimum nutrient intake and prevent malnutrition. Malnutrition among vulnerable population such as women at reproductive age could lead to the inter-generational malnutrition. Hence, this cross-sectional study aimed to determine the compliance of macronutrients, fruits, and vegetables intake to the dietary guidelines and their associations with body mass index (BMI) among women of reproductive age. A total of 107 women aged 15-49 years old (mean=32.5±6.9) were recruited using convenience sampling. Participants were required to fill in a set of questionnaires consisting of sociodemography and 24-hour dietary recall (24DR). The 24DR was taken for 2 days (1 weekday and 1 weekend day), then macronutrients, fruits and vegetables intake were compared with the Recommended Nutrient Intake (RNI) 2017 and Malaysian Dietary Guidelines (MDG) 2020. Body weight and height were measured using calibrated stadiometer and weighing scale. Findings showed that there were 44.9%, 85.0%, and 49.5% of participants who complied to national dietary guidelines for carbohydrate, protein, and fat, respectively. Only 4.7% and 15.0% complied to fruits and vegetables intake recommendations, respectively. There were 6% who were underweight, 34.6% normal, 34.6% overweight, and 25.2% obese. Chi-Square analysis revealed that there was a significant association between carbohydrate intake compliance with BMI (p=0.008). Meanwhile, there was no association between protein, fat, fruits, and vegetables intake compliance with BMI (p>0.05). In order to increase population compliance to dietary guidelines, more initiatives and health promotion programmes should be advocated mainly aimed at increasing awareness on the latest MDG as well as the importance of adherence to the guidelines.

B02 Parental stress and appetitive traits in infants aged 6-12 months in Kuala Lumpur and Putrajaya

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Appetitive traits in children are shaped by feeding practices in the early years, and parental stress may lead to poor appetitive traits development in children. This study aimed to determine the association between parental stress and appetitive traits of infants aged 6 to 12 months in Kuala Lumpur and Putrajaya. This cross-sectional study was conducted on 174 mothers with infants aged 6 to 12 months in five selected government maternal and child health clinics in Kuala Lumpur and Putrajaya. Parental stress was assessed using Parental Stress Scale and appetitive traits (food responsiveness, enjoyment of food, emotional overeating, desire to drink, satiety responsiveness, slowness in eating, emotional undereating, food fussiness) were assessed using Child Eating Behaviour Questionnaire. Data were analysed using SPSS version 25. The mean parental stress score was 34.47 (*SD*=7.44). Parental stress was positively associated with satiety responsiveness (r=0.228, p=0.003) and slowness in eating (r=0.166, p=0.034). Mother's age was negatively associated with infant's emotional overeating (r=-0.151, p=0.047). Infant's age was positively associated with, food responsiveness (r=0.206, p=0.006), enjoyment of food (r=0.223, p=0.03), satiety responsiveness (r=0.267, p<0.001), and emotional undereating (r=0.201, p=0.008). Monthly household income category was found to be associated with emotional undereating (χ^2=6.405, p=0.041). Infant's age was found to contribute to enjoyment of food (B=0.083, p=0.001), satiety responsiveness (B=0.063, p=0.015), emotional undereating (B=0.095, p=0.006), and food fussiness (B=-0.060, p=0.021). Mother's age (B=-0.030, p=0.030) and educational level (B=0.361, p= 0.027) were found to predict emotional overeating. Parental stress was found to predict satiety responsiveness (B=0.024, p=0.004) and food fussiness (B=0.017, p=0.042) among the infants. Therefore, it is important for parents, especially mothers, to learn to manage their stress effectively so as to increase their ability to support healthy appetitive traits development in their infants.

B03 Assessment of dietary fatty acid intakes and nutritional status among children in Sabah: A cross-sectional study

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Dietary fatty acids play a pivotal role in the growth and development of children. However, there is scarce research on dietary fat intake among children in Sabah. Therefore, this study aimed to assess the dietary fatty acid intakes among children in Sabah and determine its association with nutritional status. This study recruited 199 children aged 5 to 12 years from Kota Kinabalu and Tawau. Anthropometric measurements included weight, height, and body mass index, while dietary intakes were assessed using a 24-hour dietary recall, which was used to determine dietary fatty acid intakes. The total fat intake was 29.5±7.0% of total energy intake, with 27.1% of children having total fat intakes below the recommendation while 17.6% of children exceeded the recommendation. Most children (77.4%) exceeded the recommendation for saturated fatty acid intake while only 43.2% of children met the recommended intake for monounsaturated fatty acids (MUFAs). For polyunsaturated fatty acids (PUFAs), 65.8% and 28.6% of children had omega-3 PUFAs and omega-6 PUFAs intake below the recommendation, respectively. Children from Tawau had lower intakes of total fat (p=0.011), MUFAs (p=0.005), and omega-6 PUFAs (p=0.008),

but greater intakes of omega-3 PUFAs (p=0.001), eicosapentaenoic acid (EPA, p=0.001), and docosahexaenoic acid (DHA, p=0.007) than children from Kota Kinabalu. Children from families with high household incomes had lower intakes of omega-3 PUFAs (p=0.033), EPA (p=0.034), and DHA (p=0.020), but a greater intake of trans fatty acids (p=0.009). More children who did not meet the recommendation of dietary omega-3 PUFAs intakes were overweight (26.1% vs. 20.0%) and underweight (10.4% vs. 1.5%) than children who achieved the recommendation (p=0.034), while other fatty acids were not associated with nutritional status. In conclusion, most of the children in Sabah did not meet the fatty acid recommendations and omega-3 PUFAs were associated with a better nutritional status.

B04 The association between maternal pre-pregnancy body mass index (BMI) and gestational weight gain with infant appetitive traits

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Suboptimal growth among children including stunting, wasting and overweight is getting more prevalent in Malaysia. In-utero exposure to an adverse nutritional environment has been suggested to affect offspring appetite which will further affect the growth of offspring. The aim of this study was to determine the association between maternal pre-pregnancy body mass index and gestational weight gain with infants' appetitive traits up to 6 months in Kuala Lumpur and Putrajaya. A questionnaire consisting of sociodemographic profile, anthropometric measurement of mothers and infants as well as Baby Eating Behaviour Questionnaire (BEBQ) was used to collect data in the government mothers and child clinics. IBM SPSS Statistics version 21.0 was used to analyse the data collected. A total of 277 mother-infant dyads were included in the study. Majority of the mothers were obese (39.4%) before conception and had excessive gestational weight gain (38.6%). Among that, more than 50% of the overweight and obese mothers had excessive gestational weight gain. The infants' mean age was 3.50±0.11 months with most of them having a healthy birth weight (95.5%). The average infants' appetitive traits scores were all rated above average (≥2.50) by the mothers except for slowness in eating (2.49±0.05). Multiple linear regression analysis showed a significant association between maternal pre-pregnancy body mass index and infants' food responsiveness (p<0.05, β=0.133, 95% CI 0.001 to 0.055). Besides, it also showed a significant association between excessive gestational weight gain with infants' enjoyment of food (p<0.05, β=0.166, 95% CI 0.023 to 0.301). In conclusion, maternal factors in terms of pre-pregnancy body mass index and gestational weight gain appeared to exert an influence on infants' food responsiveness and enjoyment of food but more studies are needed to determine the underlying mechanism.

B05 Associations between socio-demographic, environmental and parental factors and child nutritional status with fast food consumption among children aged 7-11 years old in Selangor

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Frequent fast food consumption among children can lead to overweight and obesity as fast foods are high in calories and low nutrient dense. There is limited published information on factors associated with fast food consumption among children. Therefore, this cross-

sectional study examined fast food consumption and its associated factors among children in Selangor. A total of 221 children aged 7-11 years old from 6 randomly selected primary schools in Petaling Perdana, Gombak and Hulu Langat participated in this study. A self-administered questionnaire including socio-demographic characteristics, exposure to fast food advertising, home food availability, parental stress, attitude towards fast foods, fast food consumption and 2-days dietary record of children was completed by parents. Height and weight of children were obtained from SEGAK record of each school. The mean age of children was 9.41±1.35 years. There were 47.1% males and 52.9% females, with 38.5% of the children were Chinese, 37.1% of Malay and 24.4% of Indian. The mean days per week of fast food consumption among children was 3.21±1.64 days, where 45.7% of the children consumed fast foods for more than 3 days. Factors that were significantly associated with fast food consumption among children were child's age (x^2=7.485, p=0.006), ethnicity (x^2=8.171, p=0.017), maternal education level (x^2=6.016, p=0.049) exposure to fast food advertising (r=0.344, p<0.001), home food availability (r=-0.306, p<0.001), attitude towards fast foods (r=0.319, p<0.001), BMI (x^2=17.614, p<0.001) and diet quality (x^2=12.898, p=0.002). In conclusion, more than one third (45.7%) of the children consumed fast foods for more than 3 days. Thus, future intervention is needed to promote a healthy diet among children.

B06 Appetitive traits and dietary diversity of infants aged 6 to 12 months in Kuala Lumpur and Putrajaya

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The first two years of life is an important period for growth and development. This study aimed to determine the associations between socio-demographic background, appetitive traits and dietary diversity of 6 to 12 months old infants in Kuala Lumpur and Putrajaya. This cross-sectional study of mothers and infants was conducted through a face-to-face interview at selected government maternal and child health clinics from September to December 2023. Socio-demographic background, infants' appetitive traits (food responsiveness, enjoyment of food, emotional over-eating, desire to drink, satiety responsiveness, slowness in eating, emotional under-eating, food fussiness) and dietary diversity of infants were obtained through questionnaires. A total of 177 mothers with infants aged 6 to 12 months were recruited in this study. Higher enjoyment of food (r=0.160, p=0.034), higher satiety responsiveness (r=0.195, p=0.009), and higher emotional under-eating (r=0.226, p=0.003), were associated with higher dietary diversity score among the infant. The prevalence of meeting the dietary diversity recommendation (consumed ≥ 5 food groups) was higher among older (10 to 12 months) old (52.5%) than younger (6 to 9 months old) (29.3%) infants (χ^2=9.161, p=0.002). Mothers' age, ethnicity, educational level, working status, monthly household income, infants' gender, food responsiveness, emotional over-eating, desire to drink, slowness in eating and food fussiness, were not significantly associated with the dietary diversity score of the infants (p>0.05). Multivariate analysis showed that infants' age (B=0.333, p<0.001) and emotional under-eating (B=0.059, p=0.036) were significant predictors of dietary diversity of the infants. Therefore, socio-demographic background and appetitive traits, specifically age and emotional under-eating, are important determinants of dietary diversity in 6 to 12 months old infants. Future research should examine cultural and societal factors associated with infant feeding practices, and a longitudinal study is required to determine the long-term effects of sociodemographic factors and appetitive traits on dietary diversity from infancy to childhood.

B07 Ultra-processed food consumption and its association with diet quality among young adults in Klang Valley

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The increased production of processed food items by food industries has been linked to the increased consumption of ultra-processed food (UPF). UPF has been reported to contain high fat, added sugar and salt which is associated with poor diet quality and health-related outcomes. The information on how UPF is associated with diet quality is limited especially among young adults in Malaysia. The objective of this study was to determine the association between UPF consumption and diet quality among university students in Klang Valley. Convenience sampling was used to recruit 79 university students in this cross-sectional study. An online questionnaire was used to assess sociodemographic information, anthropometric measurement and two-day 24-hour diet recall (one weekday and one weekend-day) was self-administered by the participants. The dietary intake was first analysed using Nutritionist Pro Software. Subsequently, foods were classified according to their processing level by referring to the NOVA classification. The Malaysian Healthy Eating Index (MHEI) was utilised to evaluate the participant's diet quality. The percentage contribution of UPF to the total energy intake among the participants was 35% with almost all the participants (97%) consuming at least one UPF during weekdays or weekend. Fast food, bread, and sugar-sweetened beverages were the most consumed UPF. Using MHEI, most participants (95%) had poor diet quality, with another 5% classified under the diet needs improvement group, and none had good diet quality. The individual component scores were relatively low; for vegetables (1.7±2.1/10), fruits [0.0(0.0)/10], fish and seafood (1.7±3.2/10), legumes [0.0(0.0)/10], milk and milk products [0.0(0.0)/10]. The inverse association between UPF consumption (en%) and diet quality (score 0 to 10) did not reach statistical significance (r=-0.131, p=0.250). Nutrition intervention is required to promote healthy eating to improve diet quality in young adults. Further investigations are necessary to better understand the relationship between UPF intake and diet quality.

B08 Association of sociodemographic factors and food purchasing behaviour with risk factors of non-communicable diseases (NCDs) among Malaysian adults from a selected supermarket in Bukit Jalil

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The all-time rising prevalence of NCDs in Malaysia is attributed to modernisation of diet and lifestyle among Malaysians. The objective of this study was to determine the association between sociodemographic factors and food purchasing behaviour with risk factors of non-

communicable diseases among Malaysian adults from a selected supermarket in Bukit Jalil. In this cross-sectional study, 161 participants were recruited using convenience sampling method. Participants were required to complete online questionnaire including sociodemographic information and information on risk factors of NCDs. Their weekly purchased grocery receipts were also collected to classify the purchase according to NOVA food classification. Statistical analysis was done to determine the association between the variables. Majority of participants were female (67.7%), Chinese (95.0%) and completed their tertiary education level (81.4%). Majority of the participants reported to be healthy with no risk factors of NCDs. Based on the NOVA food classification, the highest purchase was for Group 1: minimally processed and unprocessed food purchased (57.4%) i.e., eggs and fresh chicken, followed by Group 4: ultra-processed food (31.8%) such as potato chips and instant noodles. In his study, no association was found between food purchasing behaviour and sociodemographic factors (age, gender, educational level, household income) with NCDs risk factors. Further study to evaluate food purchasing behaviour over time and risk factors of NCDs can be conducted to evaluate impact of ultra-processed food and health.

B09 Infant feeding behaviour and sleep as predictors of infant growth

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Inadequate nutrition and sleep have been linked to poor physical development. The existing research has been largely focused on childhood, overlooking the critical period of infancy, particularly between 3 to 7 months, where growth faltering predominantly occurs. The aim of this study was to investigate the association of infant feeding behaviour and sleep with infant growth in Kuala Lumpur, Malaysia. A total of 174 mothers with infants aged 1 to 6 months were recruited from government maternal and child health clinics. Infant sleep was scored using the Brief Infant Sleep Questionnaire - Revised (BISQ-R), while infant feeding behaviour information was gathered using a 24-hour feeding record via face-to-face interview. The anthropometric measurements were conducted and converted to weight-for-age, length-for-age, weight-for-length, and BMI-for-age z scores. Results revealed that underweight, stunting, and wasting was found in 10.3%, 11.5%, and 4.4% of infants respectively, while 11.5% were at risk of overweight. Exclusive breastfeeding was practised by 52.3% of mothers. Total BISQ-R scoring revealed a mean score of 71.10±9.52, suggesting that infants exhibited favourable sleep patterns, more positive perception of infant sleep, and parent behaviours that promote healthy sleep. No significant differences were found between feeding modes and infant sleep or growth outcomes. Multivariate analysis demonstrated that parent behaviour around infant sleep was significantly associated with the infant's length-for-age z score (β=0.055, p=0.023). However, no association was found with the other growth outcomes (weight-for-age, weight-for-length, and BMI-for-age). The results indicate that fostering positive parent behaviour that promote healthy sleep among infants may contribute to positive length growth. These findings offer important baseline data for future research and suggest that interventions aimed at promoting healthy infant sleep may positively impact infant growth. Further longitudinal research is needed to confirm these findings and identify causal links between infant sleep and growth.

B10 Sleep quality, diet quality and weight status of young adults residing in Klang Valley: A comparative cross-sectional study between COVID-19-recovered patients and non-COVID-19 patients

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The COVID-19 pandemic may have impacted individuals' sleep quality, diet quality, and weight status. Therefore, this study aimed to compare the sleep quality, diet quality, and weight status of COVID-19-recovered patients and non-COVID-19 patients residing in Klang Valley. Sleep quality was evaluated using the Pittsburgh Sleep Quality Index (PSQI), while diet quality was assessed through the use of the Diet Quality Questionnaire (DQQ). Body weight before the pandemic was self-reported, whereas current height and weight were measured using the SECA 213 portable stadiometer and the TANITA electronic scale, respectively. In addition, young adults were also required to report their COVID-19 diagnostic status based on their registered status on MySejahtera. This cross-sectional study involved 271 young adults in Klang Valley, wherein 43.2% (n=117) of the respondents were COVID-19-recovered patients. No significant difference in the PSQI score (t=1.031, p=0.303) was observed between COVID-19-recovered patients (7.65±3.30) and non-COVID-19 patients (8.06±3.28). In regard to diet quality, the Food Group Diversity Score (FGDS) attained by COVID-19-recovered patients (6.10±2.15) was also comparable to that of non-COVID-19 patients (6.55±2.27) (t=1.627, p=0.105). Interestingly, emerging findings also revealed that slightly more than half of the respondents (n=157, 57.9%) gained weight due to the pandemic. Further analysis using Pearson's Correlation showed that there were no interaction effects between sleep quality, diet quality, and weight status of young adults regardless of their COVID-19 diagnosis status (COVID-19-recovered patients: r=-0.032, p=0.733 and non-COVID-19 patients: r=-0.057, p=0.481). Efforts should be made to raise public awareness of the importance of having good sleep quality, good diet quality, and healthy body weight.

B11 Association between dairy products intake and body composition among UniSZa undergraduate students

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Previous literature reported the beneficial role of dairy products in managing body composition and metabolic health. Yet, only few studies were done among Malaysian young adult population. Therefore, this study aimed to investigate the association between dairy product intake and body composition among Universiti Sultan Zainal Abidin (UniSZA) undergraduate students. A total of 222 students (male=42.8%, female=57.2%) aged between 18 to 25 years were selected into this cross-sectional study through convenience sampling. Data on sociodemographic characteristics and dairy product intake were

collected using a set of questionnaire which included food frequency questionnaire (FFQ). Body composition was measured using a calibrated Bioelectrical Impedance Analysis (BIA) scale. Median (IQR) of total dairy product intake was 0.0029 (0.01) serving/day [male=0.0029 (0.01) female=0.0029 (0.01)]. Only 2.7 % of the students achieved the recommended milk and dairy products intake of 2 servings per day by Malaysia Dietary Guidelines (MDG) 2020. According to body mass index, there were 39 (17.6%) students who were underweight (male=28.2%, female=71.8%), 91 (41.0%) normal (male=40.7%, female=59.3%), 64 (28.8%) overweight (male=51.6%, female=48.4%), and 28 (12.6 %) obese (male=50.0%, female=50.0%). 18.9% students were obese according to body fat percentage category (male=38.1%, female=61.9%). Spearman correlation test revealed that there was no significant association between dairy product intake and body composition ($p>0.05$). In the future, more health awareness programmes are needed to encourage optimum dairy product intake among young adults especially university students, not only to promote better health but also to prevent noncommunicable diseases.

B12 Factors associated with intermittent fasting practices among workers in selected ministries in Putrajaya, Malaysia

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Intermittent fasting (IF) is commonly practised as a method for weight loss. However, previous studies have also found that IF was associated with changes in eating behaviour and a reduction in physical activity. This cross-sectional study aims to determine the factors associated with IF practices among workers in selected ministries in Putrajaya, Malaysia. A self-administered questionnaire was used to gather information on sociodemographic background, body weight status, IF practices, eating disorder symptomatology, food cravings, and physical activity level. A total of 120 workers from three ministries, with a mean age of 37.03±7.37 years old (practising IF) and 38.11±7.81 years old (not practising IF), were recruited. The total number of respondents practising IF was 30 (25.0%), with the majority (46.7%) practising time-restricted feeding, averaging 14.83±2.52 fasting hours per day. The mean body mass index for those practising IF was 26.02±3.69 kg/m^2, with 43.3% classified as overweight and 10.0% as obese. Those not practising IF had a similar mean body mass index of 26.26±5.64 kg/m^2. The mean total score for eating disorder symptomatology in the practising IF group was 2.20±1.30, with binge eating behaviour recording the highest mean frequency of 4.47±3.89 days. Additionally, 53.3% of this group reported experiencing overeating episodes for 1-9 days within the past 28 days. In the non-practising IF group, the mean total score for eating disorder symptomatology was 1.47±1.30. The mean food craving score was 89.63±32.20 in the practising IF group, while it was 96.83±45.22 in the non-practising IF group. More than half of the respondents in both practising (56.7%) and non-practising IF (52.2%) groups reported a high level of physical activity. Among the subscales of eating disorder symptomatology, only "Restraint" was associated with IF (p=0.010). No association was found between sociodemographic factors, body weight status, eating disorder symptomatology, food cravings, physical activity level, and IF (p>0.05). Future studies should target a larger sample size to obtain a better understanding of IF practices and its associated factors among Malaysians.

B13 Stress and nutrition: Uncovering differences in body mass index and daily food intake in stressed versus unstressed UniSZa students, Terengganu

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Stress may adversely affect health through direct biological and indirect behavioural changes in young adults during their university life. This cross-sectional study aimed to examine the differences in body mass index (BMI), and daily food and nutrient intake among UniSZA students according to their stress levels. A total of 221 eligible students aged 18-29 years were purposely recruited into this study. Data were collected using validated self-administered Malay-language questionnaires: 1) sociodemography, DASS-21 questionnaire, and semi-quantitative Food Frequency Questionnaire, and anthropometry. Data were analysed using independent samples t-test and Mann-Whitney U test. Overall, 39% of UniSZA students experienced stress, while 26% and 18% were overweight and obese, respectively. Average daily energy intake (TEI) for male and female students was 2,992±1,063 kcal and 2,352±1,002 kcal, respectively. Approximately 88% of the students met the recommended daily intake of protein (10-20% TEI), while 37% and 70% did not meet the recommended intake of carbohydrates (50-65% TEI) and fat (25-30% TEI, respectively. The top 10 foods consumed daily were rice (97%), chicken (68%), table sugar (57%), green leafy vegetables (44%), candy/chocolate (30%), chicken eggs (29%), tea (19%), marine fish (18%), apple (16%), and condensed milk (13%). The t-test revealed significantly higher year of degree education (2.16±1.13 years vs. 1.71±0.98 years, p=0.003) and BMI (24.31±6.27 kg/m² vs. 22.58±4.73 kg/m², p=0.021) among stressed students compared to their peers. Stressed students consumed more pizza (Z=2.16; p=0.031), sausage/hotdog/frankfurter (Z=2.35; p=0.019), chicken/meat balls (Z=2.10; p=0.035), cake (Z=2.95; p=0.003), peanut butter (Z= 2.37; p=0.018), and bean sprouts (Z=2.31; p=0.021) than their peers. However, comparison among stressed and unstressed students revealed no significant differences in energy, carbohydrates, protein, fat, sodium, and sugar intake. Stressed students had higher tendency to consume fast foods compared with unstressed students. A more detailed study is warranted to determine the personal food behaviours of stress eaters.

B14 Awareness and knowledge of Malaysian healthy plate concept among Malaysian normal weight population with hypercholesterolemia: NHMS 2019

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In Malaysia, the prevalence of overall raised blood cholesterol among adult population was 38.1% as reported in National Health and Morbidity Survey (NHMS) 2019. This study aimed to assess the awareness and knowledge of Malaysian Healthy Plate Concept (MHPC) among hypercholesterolemic normal weight adult population in Malaysia. MHPC which emphasises Quarter-Quarter-Half concept is a quick visual technique that helps to identify whether a meal is healthy and follows the concept of balanced, moderation and variety

to combat non-communicable diseases. The data were collected from a cross-sectional study using the two-stage stratified random sampling design in the NHMS 2019 by face-to-face interview questionnaire using tablet among Malaysians aged 18 years old and above. The prevalence of awareness, i.e. 'ever heard' or know about MHPC, and knowledge among those with awareness who able to elaborate the MHPC among hypercholesterolemic normal weight adult population were analysed using complex sample frequencies by IBM SPSS Statistic (Ver.28.0) software. The overall prevalence of awareness of MHPC among normal weight Malaysian adults with hypercholesterolemic was 19.7%. The prevalence of awareness of MHPC was higher among those who lived in urban (20.3%), female (26.8%), received tertiary education level (35.0%) and had a household income in quintile 5 (29.7%). From the one-fifth who were aware of the MHPC, only 79.9% correctly elaborated the concept. People who lived in cities (82.9%), females (81.2%), have a tertiary education level (86.7%) and have a household income quintile 2 (87.7%) were more likely to be aware and knowledgeable about the MHPC. The findings showed that awareness and knowledge about MHPC among Malaysian were lacking, especially among hypercholesterolemic adults. Therefore, action is needed to promote, conduct advocacy and raise awareness of the MHPC through various nutrition related activities and practise this concept at every meal, whether at home or eating out.

B15 Validation and reliability of the chrononutrition profile questionnaire-pregnancy (CPQ-P) among pregnant women in Malaysia

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During pregnancy, physiological changes can affect eating and sleeping habits, which may have negative consequences for maternal and foetal health. To better understand these changes, it is essential to develop a reliable questionnaire that addresses lifestyle habits such as snacking and daytime napping. This study aimed to test the validity and reliability of the Chrononutrition Profile Questionnaire-Pregnancy (CPQ-P) among a sample of pregnant women. A total of 399 pregnant women in their second trimester onwards were recruited from government maternity clinics in Kuala Lumpur and completed a self-administered online questionnaire. Content validity was conducted with an expert panel consisting of 4 members. Exploratory factor analysis (EFA) using varimax rotation was conducted to determine the construct validity. Internal consistency was determined by Cronbach's alpha coefficient (CAC), while the test-retest reliability was conducted using intraclass correlation coefficient (ICC). The questionnaire had an appropriate content validity index of 0.91. The EFA of CPQ-P retained 21 items in a six-factor structure and explained overall variances by 65.76%. The 21 items in CPQ-P showed fair to excellent test-retest reliability (ICC: 0.42 to 0.98), except weekend dinner time (ICC=0.119) and weekday last eating event time (ICC=0.05). The overall CAC for CPQ-P was 0.612 indicating moderate to good internal consistency. The CPQ-P is a valid and reliable tool for assessing lifestyle habits during pregnancy. The questionnaire can be used to identify areas where pregnant women may need additional support or intervention to promote healthy behaviours and reduce the risk of adverse maternal and foetal outcomes.

B16 Maternal eating behaviours, feeding practices and appetitive traits of infants aged 1 to 6 months in Kuala Lumpur and Putrajaya

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Childhood obesity has become a global public health issue. Maternal obesogenic eating behaviours and feeding practices may lead to unhealthy appetitive trait development in infancy, which may track into poor eating habits in childhood. This cross-sectional study aimed to determine the association between maternal eating behaviours, feeding practices and appetitive traits of infants in Kuala Lumpur and Putrajaya. A total of 240 mothers with infants aged 1-6 months were recruited. Sociodemographic background, maternal eating behaviours (emotional eating, external eating, restraint eating), feeding practices (feeding mode, feeding to soothe, introduction to solid foods), and infant's appetitive traits (food responsiveness, enjoyment of food, satiety responsiveness, slowness in eating, general appetite), were obtained through questionnaires. Higher maternal emotional eating was associated with higher infant's food responsiveness (r=0.298, p<0.001), satiety responsiveness (r=0.179, p=0.005), and slowness in eating (r=0.135, p=0.036). Higher maternal external eating was associated with higher infant's food responsiveness (r=0.287, p<0.001), satiety responsiveness (r=0.155, p=0.016), slowness in eating (r=0.216, p=0.001), and general appetite (r=0.203, p=0.002). Maternal restraint eating was positively associated with infant's satiety responsiveness (r=0.227, p<0.001). Food responsiveness was lower among formula-fed (M=13.80, SD=4.61) compared to breast-fed (M=18.04, SD=5.39) and mixed-fed (M=17.40, SD=6.03) infants (p<0.001). Feeding to soothe was associated with infant's food responsiveness (r=0.499, p<0.001), satiety responsiveness (r=0.178, p=0.006), slowness in eating (r=0.246, p<0.001), and general appetite (r=0.271, p<0.001). Multivariate analysis showed that feeding to soothe was a significant contributor towards infant's food responsiveness (B=0.21, p<0.001), satiety responsiveness (B=0.03, p=0.007), slowness in eating (B=0.05, p=0.008) and general appetite (B=0.03, p<0.001). Maternal emotional eating (B=0.10, p=0.002), restraint eating (B=0.06, p=0.002), and external eating (B=0.08, p=0.011), were predictors of infant's food responsiveness, satiety responsiveness, and slowness in eating, respectively. Therefore, feeding practices, specifically feeding to soothe, and maternal eating behaviours, play an important role in the development of infant's appetitive traits.

B17 Consumers' perception on healthy food and its association with socio-demographic factors: A preliminary cross-sectional study in Bukit Jalil

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The present day of obesogenic environment together with low health awareness among the population have led to unfavourable food choices and an increasing obesity and heart diseases crisis in Malaysia. As healthy food plays a huge role in improving health, the objective of determining consumers' perceived personal preferences, food pricing, nutritional value and availability on healthy food could be of a great source to understand the thoughts processes of people when shopping for grocery. Nonetheless, demonstrating the association between gender and socio-economic levels with the perceived factors are vital to develop a

more specific intervention to positively impact on eating behaviours. This study aimed to assess consumers' perception on healthy food based on personal preferences, food pricing, nutritional value, and food availability and its association with socio- demographics factors. In this cross-sectional study, perception on healthy food was assessed using a questionnaire composed of six questions concerning personal preferences, seven concerning food pricing, seven about nutritional value, and five regarding food availability. Participants (n=161) were recruited from the Urban Marketplace, Pinnacle Sri Petaling in Bukit Jalil for this study. Majority of the participants (76%) made decision on their daily food choices based on their judgement on how healthy the food is. They were much willing to opt for healthy food for its nutrient values (88.2%) regardless of its availability (64%). However, more participants perceived fresh food products as more expensive than processed food products (35.4%). There was no significant association between gender on the perception of healthy food in terms of all four levels of value dimensions. However, males reported a significantly greater disagreement in perceiving quality of fresh food products as high as compared to females (p<0.037). Secondly, significant associations were found between socio-economic levels in perceiving food availability (r=17.8) and quality of fresh food (r=24.7), and on the perception of healthy food product attractiveness (r=10.7), careful use of preservatives (r=13.1) and frequency to purchase pre-prepared meals (r=11.3). Nearly all participants perceived healthy food as the main important source for overall good health and were much willing to opt for its nutrient values regardless of the pricing and availability when shopping for groceries. This mannerism is especially seen through different levels of wealth rather than gender.

B18 Does ultra-processed food consumption reduce dietary diversity among university students in Klang Valley, Malaysia?

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Ultra-processed food (UPF) is highly processed, which can be detrimental to health. High consumption has been linked to an increased risk of unhealthy dietary patterns and reduced diet diversity. University students, who often have imbalanced diets and improper eating habits, may particularly be high consumers of UPF due to the convenience of these foods. It is unknown if the inclusion of UPF displaces main food groups from the diet hence lessening the diet diversity. Hence, this study aimed to determine the association between UPF and diet diversity among university students in Klang Valley. A cross-sectional study was conducted using an online questionnaire via snowball sampling. An online self-administered questionnaire was used to collect information on sociodemographic, anthropometry, and dietary intake (two days 24-hour dietary recall). UPF consumption was determined using NOVA classification, and Dietary Diversity Score (DDS) was determined using the Food and Agriculture Organization's DDS. Most participants consumed at least one UPF (97%) daily, and the energy contributions from UPF was 34.7%. Participants reported consuming fast foods, factory-produced bread (white or wholemeal), and sugar-sweetened beverages. The average DDS among participants was relatively low (3.31 out of 9 food groups), with only 1 subject achieved a high DDS. The most commonly consumed food groups among participants were cereals, flesh meat and fish, and fruits and vegetables, while consumption of other food groups were comparably low. Participants with lower DDS showed a trend for higher UPF consumption, although no significant association was found between UPF consumption and dietary diversity (UPF consumption vs dietary diversity,

p=0.534). Further well-powered research is needed to verify if UPF consumption displaced food groups to lower dietary diversity.

B19 Ultra-processed food consumption and its contribution to energy and macronutrients intake among university students in Klang Valley

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Due to the globalisation of the food industry, ultra-processed foods (UPFs) consumption has increased rapidly every year in countries including Malaysia. UPFs consumption is linked to non-communicable diseases (NCDs) and university students are likely to be high consumers of UPFs. However, limited data is available on the extent and nutritional impact of UPF consumption in Malaysia, especially among university students. Thus, we aimed to determine UPF consumption, and describe its percentage contribution to energy, total sugar, salt, and fat intakes among university students in Klang Valley. We also compared UPF consumption between weekdays and weekends. A cross-sectional study was performed among 79 university students in Klang Valley. A self-administered online questionnaire was used to collect data on participants' socio-demographic and 2-days (weekday and weekend) 24-hour dietary recall. UPF and nutrient intakes were derived from the dietary recall using NOVA classification. UPF consumption was defined using the NOVA classification and nutrient intakes was analysed using Nutritionist Pro™ with the Malaysian and Singaporean databases. Average fat, sugar and salt intake were met/ exceeded the dietary recommendations. Most participants (97%) consumed at least once UPF (NOVA group 4) on either weekday or weekend. The UPF contribution to energy, total sugar, salt, and fat intakes were 35%, 58%, 34%, and 35%, respectively. No significant difference in energy contribution from UPF between weekday and weekend was found (33% vs 36%; p=0.423). UPF consumption among university students in Klang Valley was high. However, the highest contribution to energy, salt and fat intakes came from NOVA Group 3 (processed food), while Group 4 (UPF) contributed the most to sugar intakes. Further research with larger sample size should be implemented to investigate the nutritional impact of UPF.

B20 An understanding of dietary protein trends in Malaysia: Can we shift towards planetary health diet?

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The Planetary Health Diet is a reference diet proposed by the EAT-Lancet Commission with the goal of addressing the negative effects of the current global food system on human health and the environment. It is suggested that a worldwide shift towards this diet confers to both improved human health conditions and environmental sustainability. In this study,

the aim is to determine whether Malaysia can transition towards this reference diet by evaluating the country's dietary protein supply trends, its deviation from EAT-LANCET recommendations and its degree of import dependence. Two sets of Food Balance Sheets: 1981 to 2010 - old FAO methodology; 2011 to 2020 - new FAO methodology were utilised to gather data on protein sources outlined by the planetary health diet. Data on food and protein supply quantity were used to measure changes in the Malaysian diet from 1981 to 2020 and its gap from the reference diet. Data on Import, Export and Production quantity were used to calculate import dependency. Results show that during the review period, protein contribution from animal sources had a greater increase (+89.1%) compared to plant sources (+40.9%). Among them, poultry (+400.9%) and egg (+101.8%) observed the biggest significant changes. Supply of animal-based protein was also constantly in excess (+300%) while plant-based protein never met recommendations (-80%). This was attributed to the high import reliance of legumes (±100%) and nuts (+553%). Overall, the current dietary protein supply in Malaysia does not support the country's transition towards the Planetary Health Diet as it is highly composed of animal-based protein while the availability of plant-based protein is insufficient to meet demands. A collective effort would be required in order to improve the dietary pattern of the population.

B21 Low quality perception and acceptance of suboptimal food among consumers in Selangor and Kuala Lumpur

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Suboptimal foods are defined as physically imperfect foods that deviate from normal visual, temporal or peripheral standards without compromising quality or safety. They are one of the major contributors to food wastage worldwide. However, few studies have been conducted on suboptimal food in Malaysia. The aim of this study was to investigate the quality perception and acceptance of suboptimal food among consumers in Selangor and Kuala Lumpur. In this cross-sectional study, a total of 414 consumers aged 18 to 59 years living in Selangor and Kuala Lumpur with experience of buying food from grocery shops or supermarkets were recruited between September and November 2022. Online questionnaires were used to collect sociodemographic data, perceptions of quality and acceptance of suboptimal food. Acceptance of suboptimal food that deviated from the visual dimension (apples with brown spots) was the lowest (9.9%), compared to the temporal dimension (milk approaching "the best-before" date; 10.0%) and the peripheral dimension (biscuits that have packaging damage and are partially broken; 14.4%). The proportion of consumers choosing suboptimal food was lower in the supermarket (2.5%) than at home (20.4%), suggesting that the acceptance of suboptimal food was lower at the point of purchase than at the point of consumption. Consumers perceived suboptimal food as unattractive and should be consumed quickly, with suboptimal food with temporal deviation (suboptimal milk) perceived as the lowest quality. Non-Malays and those with a middle household income (RM4850-RM10959) were more likely to accept suboptimal foods (p<0.05). Consumers on vegan or vegetarian diets were more likely to discard suboptimal foods than those on flexitarian or varied diets (p<0.001). In conclusion, consumers in Selangor and Kuala Lumpur have low acceptance of suboptimal food and suboptimal food was perceived as unappealing and should be consumed quickly.

B22 Dietary intake and quality: Its association with chronotypes among young Malaysian adults

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Chronotypes may alter individuals' habitual dietary intake by influencing their food choices. Poor food choices can arise when the sleep-wake cycle of an individual is dysregulated. The objective of this cross-sectional study was to determine the association between chronotypes with dietary intake and quality among young adults. A total of 100 young adults (38% males, 62% females) aged 18 to 30 years old participated. The chronotype profile was assessed using Morningness-Eveningness Questionnaire (MEQ) meanwhile dietary intake was assessed using single 24-hour dietary recall. Diet quality was evaluated using the New Standardised Malaysia Healthy Eating Index (S-MHEI). Sociodemographic characteristics, weight, height and food intake were self-reported. Descriptive statistic and Pearson correlation were used. Majority of the respondents' chronotypes were intermediate (71%), followed by eveningness (20%) and morningness (9%). On average, the respondents did not meet the Recommended Nutrient Intakes (RNI) for energy and carbohydrate intake. Most of the respondents (77%) consumed sufficient protein while 84% of them had excessive fat intake. There was no significant association between chronotypes with total energy intake (r=0.105, p=0.301), energy contribution from protein (r=-0.037, p=0.716), carbohydrate (r=0.127, p=0.208) and (r=-0.082, p=0.418) fat. Furthermore, more than half of the respondents (57%) had poor diet quality with a mean score of 48.27±11.07. Low consumption of whole grains (0.24 serving), fruits (0.44 serving), fish (0.37 serving), legumes and nuts (0.04 serving) as well as milk and milk products (0.38 serving) were found among young adults. There was no significant association between chronotypes and diet quality (r=-0.036, p=0.721) among Malaysian young adults. This study depicts a growing concern of low diet quality and high fat intake among Malaysian young adults in Malaysia. Longitudinal studies are warranted to further explore the role of meal and sleep timing to diet quality among adults in Malaysia.

B23 Association between socio-demographic factors, gestational factors and maternal chronotype with maternal appetitive traits in Kuala Lumpur

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One of the factors such as maternal eating behaviours during pregnancy has been found to play a role in the pregnancy outcome and the development of the children. However, the impact of maternal chronotype on maternal eating behaviour is not well studied. A cross-sectional study was conducted to: i) determine the socio-demographic factors, gestational factors, maternal chronotype, and maternal appetitive traits; ii) determine the association between maternal chronotype with maternal appetitive traits; iii) determine the association of socio-demographic factors and gestational factors with maternal appetitive traits among pregnant women aged 19-39 in Kuala Lumpur. Chronotype and appetitive traits were assessed using Morningness-Eveningness Questionnaire (MEQ) and Dutch Eating Behaviour Questionnaire (DEBQ), respectively. IBM SPSS Statistics version 21.0

was used to analyse the data collected. A total of 111 pregnant mothers with a mean age of 31.25±3.55 years participated. The majority of the respondents were "morning" type and "intermediate" type, both have the same amount of respondents (48.6%). Only 2.7% of respondents were "evening" type. There was no significant mean eating behaviours difference among chronotype groups ($p > 0.05$). Multiple linear regression analysis showed a positive relationship between weight during pregnancy with emotional eating (B=0.258, p<0.05), whereas a negative relationship existed between maternal age with emotional eating (B=-0.347, p<0.05). Moreover, there was a negative relationship between maternal ethnicity (B=-0.256, p<0.05) and age (B=-0.249, p<0.05) with external eating. A positive relationship was found between maternal pre-pregnancy BMI (B= 0.284, p<0.05), education level (B=0.239, p<0.05) and diabetes mellitus status (B= 0.231, p<0.05) with restrained eating behaviour. In conclusion, further research is necessary to investigate the association between maternal chronotype with appetitive traits. These findings may be helpful for health professionals to educate pregnant women about how their sleep/wake cycle and eating behaviours might be factors in the pregnancy outcomes.

B24 The development of sensory attribute and nutrient content database for three to five years old children's food (PEaters Choice™)

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Picky eating among children can be a challenge for parents, as they often have limited food preferences and refuse to eat familiar and new foods. In Malaysia, the prevalence of picky eaters among children under the age of five varied from 30 to 50%. This issue may result in malnutrition and inadequate nutrient intake over the years. The aim of this study is to develop a sensory and nutrient content database to be used as part of the intervention module (PEaters ChoiceTM) for picky eaters' families. A total of nine trained sensory panellists evaluated 50 types of food (chosen from 178 foods) that are often eaten by picky eaters using Qualitative Descriptive Analysis® (QDA). The sensory attributes evaluated are sour, sweet, bitter, umami, and salty, as well as the texture of hardness, crispness, moistness, fatty mouthfeel, and cohesiveness of mass. According to the findings which uses principal component analysis, the taste of food typically consumed by picky eaters were summed up by two factors: 1) rich in saltiness and umami; and 2) rich in sweetness and sourness. As for texture, the food consumed by picky eaters can be summarised by two characteristics: 1) high hardness and crispness with low moisture; and 2) high mass cohesiveness. In addition, a correlation was also obtained between sweet taste and sugar; saltiness and sodium and fat; umami taste and protein, fat and sodium; and fatty mouthfeels with fat and protein. This sensory database with nutrient content is expected to help picky eaters explore the taste and texture of food by introducing other foods that have more or less similar taste and texture. Thus, in turn, can help picky eaters expand their food repertoire and increase their nutrient consumption.

B25 Dietary supplement consumption and quality of life among adults in peninsular Malaysia

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Dietary supplements are products used to only supplement the diet to improve the quality of life. However, there are only a few studies available to support this statement. Therefore, this study aimed to investigate the association between dietary supplement use and quality of life in adults. A cross-sectional study was conducted among adults aged 18 to 59 years old in Peninsular Malaysia. Data collection was conducted using an online questionnaire which included sociodemographic data, dietary supplement patterns use, and the 36-item Short Form Health Survey questionnaire (SF-36). A total off 288 adults (aged 30 ± 1 years) were recruited for this study. Most subjects consumed one type of dietary supplement (90.4%), spent less than RM100 to purchase dietary supplements (77.4%), took a capsule/bottle/ sachet of the dietary supplement (94.4%), took the dietary supplement daily (46.2%) and consumed dietary supplements for more than 6 months (44.7%). In addition, most subjects consumed vitamin C (26%), multivitamins (13.9%), chicken essence (5.6%), bird's nest broth (4.8%) and vitamin B complex (4.8%). The reasons for consuming supplement were to improve overall health (47.6%) and recommendation from family members/relatives/ friends (27.1%). The mean SF-36 showed that the subjects who took food supplements had a high overall quality of life. The results of this study show a significant association between the amount and frequency of supplement consumption and quality of life among adults aged 18-59 years in Peninsular Malaysia.

B26 Factors associated with emotional eating among Malaysian university students

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Emotional eating, characterised by the desire to eat in response to various emotions without experiencing physical hunger, is recognised as a problematic eating behaviour. This cross-sectional study aimed to determine factors associated with emotional eating among Malaysian university students, by using convenience sampling. This study included 624 respondents (24.4% male and 75.6% female) with a mean age of 22.27±3.03 years old. An online self-administered questionnaire using Google Form that was disseminated publicly through email and social media platforms such as WhatsApp, Facebook and Instagram were used to obtain information regarding socio-demographic background, emotional eating, night eating, sleep quality, physical activity, psychological distress, gaming disorder, smartphone addiction, social media addiction and self-reported weight and height. Results showed the prevalence of emotional eating was 55.9% with a mean score of 35.00±11.08, ranging from 13 to 65. One in four of the respondents were overweight and obese (25.6%) and 22.9% were physically inactive. The prevalence of night eating was 12.8% and 75.3% were classified as poor sleepers. Moreover, 8.8%, 16.7% and 4.5% of the respondents experienced extremely severe depression, anxiety and stress, respectively. The prevalence of internet gaming disorder was only 1.3%, while 12.0% were smartphone-addicted and 24.8% were social media-addicted. Age (χ^2=6.583, p=0.037), years of study (χ^2=10.433,

p=0.037), anxiety (χ^2=13.050, p=0.011), smartphone addiction (χ^2=3.987, p=0.046) and social media addiction (χ^2=22.308, p<0.001) were significantly associated with emotional eating. However, no significant associations were found between night eating, sleep quality, physical activity, depression, stress and internet gaming with emotional eating in this study. In conclusion, mental health related intervention programmes and nutrition educations are required to promote healthy eating and lifestyle among university students.

B27 Dietary iron intake of children aged 8 to 12 years old in Kampung Pahu Pinawantai, Ranau, Sabah

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Iron is an essential micronutrient for the physical and neurological development of children. This cross-sectional study in Kampung Pahu Pinawantai, Ranau, Sabah aims to determine the association of iron intake with cognitive performance and sociodemographic factors relative to dietary iron intake of children aged 8 to 12 years. Convenience sampling was used for selecting respondents with a total of 20 respondents recruited. Respondents (males, n=12, 60%; females, n=8, 40%) had a mean age of 9.65±1.69 years. A validated interviewer-administered questionnaire was used for the collection of the dietary habits from the food frequency questionnaire (FFQ), 24-hour diet recall, and socio-demographic data (age, gender, household income, and ethnicity). Cognitive performance was assessed using Draw a Person Test (Rehrig & Stromswold, 2017). FFQ and 24-hour diet recall were used to assess the dietary iron intake of the children. The study indicated that there was no correlation between the dietary iron intake of children with cognitive performance (r_s=0.040, p-value=0.868). There was no association between iron intake and socioeconomic factors such as parents' level of education (χ^2=12.211, p-value=0.429). Thus, the study indicated there is no significant correlation between dietary iron intake of children and cognitive performance and socioeconomic status does not influence dietary iron intake of the children.

B28 Association of *Á Posteriori* dietary pattern and nutritional status among children in Sabah: A cross-sectional study

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The double burden of malnutrition, characterised by the co-existence of both undernutrition and overnutrition among children, remains a public health concern in Malaysia. Dietary intake plays an important determinant of nutritional status among children, and *á posteriori* dietary patterns derived using statistical modelling reflect the dietary behaviour of the target population. Therefore, this study aimed to examine the relationship between *á posteriori* DP and nutritional status among children in Sabah. This cross-sectional study recruited 199 children between 5 and 12 years old from Kota Kinabalu and Tawau. Anthropometric measurements included body weight, height, and body mass index, while dietary intake was assessed via a 24-hour dietary recall, which was used to derive DP through principal component analysis. Three dietary patterns were identified, namely "Fish dietary pattern", "Fruits dietary pattern", and "White Rice dietary pattern". The "Fish dietary pattern" was associated with household income (p=0.003), with more children from families with

low household income adhering to the "Fish dietary pattern", while no association was found for other two dietary patterns. More children from Tawau adhered to the "Fish dietary pattern" than children from Kota Kinabalu (p<0.001). Children adhering to the "Fish dietary pattern" had greater energy (p<0.001), carbohydrate (p<0.001), and protein (p<0.001) intakes while children adhering to the "White Rice dietary pattern" had greater energy (p=0.008) and carbohydrate (p<0.001) intakes. "Fish" and "Fruits" dietary patterns were not associated with nutritional status, while the "White Rice dietary pattern" was associated with overweight or obese (p=0.018), with more children adhering to this DP were overweight or obese (32.3%) compared to children who were not adhering to this dietary pattern (16.0%). Three dietary patterns were identified among children from Sabah and the "White Rice dietary pattern" was associated with overweight or obese.

B29 Do food environment and food choice motives influence food preferences? A study of international students in Universiti Putra Malaysia

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While international students are recognised as valuable contributors to the economy, limited research exists on the food environment, food choice motives (FCM), and preferences among this population. The aim of this study was to determine food environment (FE), food choice motives (FCM) and their contributions to food preferences of international students in Universiti Putra Malaysia. A total of 619 respondents completed the FE, FCM and Food Preferences questionnaires. Firstly, respondents were asked to rate the availability, accessibility, and affordability by using a seven-item Food Environment questionnaire. Each item in the questionnaire was associated with a unique keyword related to one of these factors. Then, respondents' nine components of food choice motives (health, price, convenience, mood, sensory appeal, natural content, weight control, familiarity and ethical concerns) were assessed. The final section of the questionnaire involved rating six food groups (animal products, starch, dairy, fruit, snacks, and vegetables). A comprehensive list of 77 food items was provided for respondents to rate based on their preferences. Pearson's/Spearman correlation and multiple linear regression assessed contributions between FE, FCM, and food preferences. A significant majority (94.7%) faced challenges with food availability. Health (17.39±4.61) rated as the primary food choice motive, whereas ethical concern (6.69±2.64) was found to have the least impact. Additionally, fruits were classified as highly liked food preference. Significant statistical contributions were observed between food availability (σ=0.182, p<0.001) and animal food preferences. Ethical concern (β=0.265, p<0.001) emerged as the most significant contributor among the food choice motives to vegetable preferences, while all components of food choice motives contributed to preferences across all six food categories. This study indicates that ethical concern, despite being the least significant among other food choice motives, remains a significant predictor of vegetable food preferences. Further research is needed to investigate deeper into this relationship.

B30 Consumer food purchase behaviour at different types of retailers in urban poor areas of four Southeast Asian countries: Findings from SEAOFE study

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Modifying the food retail environment to promote healthy food is essential to reduce the prevalence of non-communicable diseases worldwide. It is unclear what the average consumer buys from different retailers in different countries. This study aims to explore consumer's food purchase behaviour in various types of retailers in four Southeast Asian countries. Retail stores, which is within 1-4 km radius from the urban poor communities were selected in the study. Convenience sampling was used to get the respondents, through intercept. A self-administered questionnaire was used to collect data from the respondents. A total of 630 respondents were recruited in Indonesia, 814 in Malaysia, 1218 in Philippines and 998 in Thailand. On average, respondents spent IDR 2,172,492, RM 335.27, PHP 4610 and THB 4277 per month on groceries respectively in four different countries. The top 3 food items bought monthly were rice, fish and seafood and meat and chicken for Indonesia, Malaysia and Philippines, whereas dry goods, fish and seafood and meat and chicken for Thailand. In Indonesia, vegetables, herb and spices and soybean products were bought in traditional stores. In Malaysia, the highest item bought in hypermarket was instant noodles, bread in supermarket and convenience store and eggs in traditional stores. In Philippines, noodle was the highest item bought in hypermarket, bread in both supermarket and convenience stores and herb and spices in traditional stores. In Thailand, water, tea/ coffee/herbal infusion, and sugar sweetened beverages were the most frequently bought items in convenience stores. In conclusion, food purchase in different types of retailers varies in different Southeast Asian countries. Further studies to determine the availability of healthy and unhealthy food in these retail food environments will be useful to relate with consumer purchases and improve population diets.

B31 Abstract removed

B32 The prevalence and associated risk factors of gestational diabetes mellitus in the northern region of Malaysia

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Gestational diabetes mellitus (GDM) occurs when a pregnant woman develops glucose intolerance in the second and third trimesters. GDM adversely affects the health of the woman and her offspring and increases ensuing medical expenses. This study aimed to investigate the prevalence and risk factors associated with GDM. A total of 1315 antenatal records of mothers with singleton pregnancies from eight health clinics of a district in the northern region of Peninsular Malaysia who delivered from 1st January 2016 to 31st December 2017 were analysed retrospectively. Socio-demographic, anthropometric, obstetrical, biochemical, clinical and iron supplementation data were extracted from the records. Comparisons of continuous variables between groups were examined using the t-test and analysis of variance (ANOVA). The chi-square (χ^2) test was used for categorical variables to check for correlations between variables. All covariates were tested in the multivariate binary logistic regression to identify the factors associated with GDM risk. The prevalence of GDM in the northern region of Malaysia was 17.8%. Maternal age, maternal height, history of GDM and unchanged haemoglobin level from booking to second trimester were significantly associated with GDM. The risk of GDM was increased by 3.27 (95% CI: 2.07, 5.16) times among women with a history of GDM, 2.50 (95% CI: 1.34, 4.68) times in women aged ≥35 years and women with unchanged haemoglobin from booking to the second trimester (95% CI: 1.17, 5.19) and 1.75 times among women with a short height of <1.50 m (95% CI: 1.06, 2.90). The findings support the importance of universal screening of GDM in all pregnant women to ensure optimal care for better pregnancy outcomes.

B33 Study on the association between the amount and type of protein intake and body mass index (BMI) among undergraduate health science students in Kelantan

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The study was carried out to assess the protein intake patterns and their association with BMI status among undergraduate health science students at Universiti Sains Malaysia Health Campus, Kelantan. Maintaining a healthy body weight is crucial due to the rising trend of overweight and obesity among adults, particularly young adults, both in Malaysia and around the world. Nowadays, there are many trending dietary practices that emphasize different amounts and proportions of macronutrients mostly protein intake. This cross-sectional study involved 79 undergraduate health science students. The subjects' socio-demographic, anthropometric, and dietary information were gathered. The dietary data were obtained using the Food Frequency Questionnaire adapted from the Malaysian Adults Nutrition Survey (MANS) 2014 conducted by the Ministry of Health (MoH) Malaysia and added with several additional food items which were milk substitutes. The questionnaire was distributed through social media (WhatsApp group). Almost half of the subjects (46.8%) did not meet the recommended protein intake by RNI 2017 (0.8g/kg) while 17.7%

of subjects had a high protein intake exceeding 1.4g/kg. More subjects (77.22%) consumed more animal-based protein than plant-based protein. There was no significant association between the amount (p=0.257, p>0.05) and type of protein intake (p=0.055, p>0.05) and BMI status among undergraduate health science students in University Sains Malaysia Health Campus. A more comprehensive study involving a larger sample size is necessary to assess the need for the formation of appropriate interventions to promote adequate protein intake among adults, especially university students.

B34 Association between sensory behaviour (smell/taste) and food neophobia among preschoolers in Terengganu, Malaysia

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According to a report from 2019 UNICEF, Malaysia has a high risk of double burden among children, including stunting, and obesity, that may be due inadequate food intake. This issue can be linked with food neophobia, which is a reluctance to try new foods. Since childhood eating habits reflect adult eating habits, it is important to understand the sensory behaviour elements related to this condition. The study was a cross-sectional study involving 450 preschoolers in 24 selected preschools under the Ministry of Education (MOE) in eight districts of Terengganu, aged 5 and 6 years. The parents were asked to fill in the consent form, and answer online questionnaires on Google Forms, that consisted of three sections: socio-demography, Child Food Neophobia Scale (CFNS), and Child Sensory Profile 2 - Caregiver Questionnaire (CSP2-CQ). Associations between the sensory behaviour (smell/taste) and food neophobia were estimated using Pearson Chi-square test. This study found that 55.6% (n=250) of participants had food neophobia, while 44.4% (n=200) did not have food neophobia. More than half of the participants (83.8%, n=377) had atypical sensory behaviour, while the remaining 73 preschoolers (16.2%) displayed typical sensory behavior. The findings showed that there was no significant association between the two variables, x (1, N=450) = 3.67, p>0.05, 2 where children who had food neophobia were more likely to have atypical sensory behaviour. To summarize, this study may increase awareness of the public regarding sensory behaviour and food neophobia among preschoolers, and a more healthy and knowledgeable community will be produced in future.

B35 Perception and acceptance of plant-based alternative to chicken among Malaysian consumers

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The environmental problems related to livestock production and meat consumption had been increasing in the past century. This raises the awareness of consumers and causes them to change their dietary pattern to a more plant-based diet. However, perceptions of Malaysian consumers, especially among meat eaters, on the plant-based alternatives (PBAs) developed to mimic chicken remains unclear. Therefore, the objective of this

study was to evaluate the consumers' sensory profile, prevalence, and acceptability of five PBAs. Participants (n=46) were asked to taste and rate a chicken nugget (control) and five PBAs using a five-point hedonic scale and a check-all-that-apply question. The questionnaire also included an open-ended comment question for the participants to provide their thoughts about PBAs. The hedonic scores and sensory properties of all PBAs varied greatly with the control (p<0.001). The PBA associated with an aftertaste, off-flavour, fatty and nutty properties were disliked by the participants and were rated lowest. Most participants believed that PBAs that successfully mimicked the texture and flavour of chicken could attract more people to consume while some participants believed that PBAs were environmentally friendly and healthy. The findings suggested improvements such as increasing fibre content, vitamins, and minerals fortification, replacing salt and sugar with spices and use of gelling agents were necessary for the food manufacturers to produce healthier PBAs with a closer texture and flavour to chicken. Future studies should also focus on PBAs produced with different ingredients and involve consumers following vegan or vegetarian diet for a better understanding on the PBAs' acceptance among Malaysian.

B36 Dietary supplementation use among women of reproductive age in Klang Valley

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Dietary supplement use is rising worldwide. Whilst supplement use has been associated with improved nutrition and health, the proper use of supplements is a concern. The safety of certain supplements among women of reproductive age (WRA) is a concern. In Malaysia, few studies have investigated the prevalence of dietary supplement use among Malaysian WRA. Therefore, this study aims to describe the pattern of dietary supplement use and determine the factors, awareness and attitude associated with supplement use among WRA in Klang Valley, Malaysia. This was a cross-sectional study in which participants were recruited online via several platforms including the university's email, instant messaging, social media, and networking applications. The questionnaire comprised three parts: (1) sociodemographic background, (2) dietary supplement intake, and (3) awareness and attitudes toward dietary supplements. A total of 127 participants were recruited and 74% of them reported taking dietary supplements with 12.6% taking three types and 14.2% taking more than three types of dietary supplements. Vitamin C was the most consumed supplement, but folic acid and iron was the least frequently consumed supplement. Awareness of dietary supplements was low. However, no significant association was found between sociodemographic factors, awareness, attitude, and supplement use. The study provides insights into supplement usage patterns and preferences among WRA and highlights the need for improved education and awareness regarding dietary supplements.

B37 Individual components of paediatric metabolic syndrome and association with breakfast consumption frequency among children aged 6.0-12.9 years old in peninsular Malaysia

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Metabolic syndrome (MS) has five components, which are a cluster of risk factors that increases the risk of cardiovascular diseases and type 2 diabetes. This study seeks to identify association of MS components with breakfast consumption frequency among children aged 6.0-12.9 years in Peninsular Malaysia. This cross-sectional study, involving 348 children, is part of South East Asian Nutrition Surveys II (SEANUTS II). Blood pressure and waist circumference were measured, and venous blood profile of fasting blood glucose, triglyceride and high-density lipoprotein cholesterol (HDL-C) were assessed. Cut-off values from International Diabetes Federation 2007 guidelines were used in determining MS components. Mean age was 9.5±1.7 years, and 54.9% of the children were girls. One-fifth of children (20.4%) had one MS component, with most (87.3%) having abdominal obesity. Some 6.9% of children had two MS components, with the most observed combinations being abdominal obesity and low HDL-C (41.7%), and abdominal obesity and elevated triglyceride (33.3%). Only 1.4% of children had three MS components, and the only combination observed was abdominal obesity, elevated triglyceride and low HDL-C (100%). More than half the children (61.8%) had breakfast every day in a week, while nearly one-tenth of children (7.8%) had none or only once a week. Binary logistics regression when adjusted for age, sex and ethnicity, showed breakfast consumption frequency of 4-5 times (OR: 0.24, 95%CI: 0.09-0.68), and 6-7 times (OR: 0.24, 95%CI: 0.10-0.57) in a week were factors that protect against having MS components. In conclusion, breakfast consumption frequency was associated with MS components, whereby more frequent consumption of breakfast lowered the odds of acquiring MS components. This study affirms the importance of breakfast among children, stressing the need to address the breakfast skipping trend among children and adolescent.

B38 Exploring gut microbiota diversity in gestational diabetes mellitus: Insights from clinical, lifestyle, and dietary perspectives in Malaysian pregnant women

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Gestational Diabetes Mellitus (GDM) poses significant maternal and fetal health risks. Recent research has suggested a potential link between GDM and alterations in gut microbial composition. This study aimed to investigate the differences in gut microbiota between pregnant women with and without GDM in Malaysia and explore associations with clinical, lifestyle, and dietary intake factors. A cohort of pregnant women, including GDM patients and controls, provided faecal samples at two-time points: the second trimester (T0) and the third trimester (T1). Microbial richness and community composition were assessed using alpha and beta diversity measures. Specific taxa were analysed for relative abundance. Clinical, lifestyle, and nutrient intake data were collected through

validated questionnaires. The results revealed intriguing patterns in the gut microbiota of women with GDM compared to controls, emphasising the role of the gut microbiota in GDM pathogenesis. At T1, the GDM group exhibited significantly lower microbial diversity, indicating reduced richness during late pregnancy. Beta diversity analysis showed similar community composition between groups, but specific taxa differed. Notably, *Lachnospiraceae ND3007* and *Victivallis* were less abundant in the GDM group at T0 and T1, respectively. Associations between gut microbiota and clinical, lifestyle, and diet factors emerged, suggesting potential dietary and exercise influences. In the control group at T1, Omega-3 PUFA intake correlated positively with *Bacteroides* and negatively with *Roseburia*. In the GDM group at T0, vigorous physical intensity correlated positively with specific genera. Gravida and parity were positively associated with the *Victivallis* genus in the GDM group at T0. The potential links between GDM, gut microbial dysbiosis, and various factors suggest important implications for nutrition interventions, which aim to improve maternal health outcomes in GDM. Further research specific to the Malaysian context is warranted to elucidate underlying mechanisms and develop targeted nutritional strategies for GDM management.

B39 Abstract removed

B40 The interaction effects of food security and diet quality on weight change among working women of reproductive age during the endemic phase of COVID-19

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The repercussions of COVID-19 have jeopardised food security and diet quality of Malaysians. This cross-sectional study aims to investigate the interaction effects of food security and diet quality on weight change among working women in Klang Valley during the endemic phase of COVID-19. Working women of reproductive age (18-49 years old) were recruited using a combination of convenience and purposive sampling. They were required to self-report their socio-demographic background, and pre-pandemic weight (kg). Meanwhile, body height and current body weight (as of July-September 2022) were measured using a SECA stadiometer and TANITA weighing scale, respectively. Food security was assessed using the Food Insecurity Experience Scale (FIES); the diet quality was determined with the Diet Quality Questionnaire (DQQ) for Malaysia. The prevalence of food insecurity among working women was 35.7%, mostly attributed to mild food insecurity (22.8%). With regard to diet quality, the majority of the working women (82.5%) achieved the Minimum Dietary Diversity for Women (MDD-W). The top 3 most consumed healthy food groups were grains, white roots, tubers and plantains (97.7%) followed by meat, poultry and fish (95.1%) and eggs (73.8%). More than half of those working women (64.3%) put on weight since the onset of the pandemic with an average weight gain of 4.36±3.19kg. Findings of two-way ANOVA revealed that the absolute weight change was not significantly different (F=1.275, p=0.260) by food security status even though the magnitude increased with the increasing severity of food insecurity. However, working women who failed to achieve the MDD-W had significantly higher (F=8.184, p=0.005) weight gain (4.01±0.74kg) compared to those who did (1.35±0.56kg). No significant interaction effect (F=0.456, p=0.500) was observed between food security status and diet quality on weight change. Healthy eating should be promoted among working women to better regulate their body weight. Emerging findings shall contribute to achieving Sustainable Development Goals 2 (End Hunger) and 3 (Good Health and Wellbeing).

B41 Environmental factors, body mass index (BMI) status and food purchasing behaviour from a selected supermarket in Bukit Jalil

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Malaysia has the highest prevalence of obesity and overweight in the Association of Southeast Asian Nations (ASEAN), with 50.1% of Malaysian adults being affected, as reported in the National Health and Morbidity Survey 2019. One key area to explore is the factors that influence food purchasing behaviour, as food choices play a crucial role in health outcomes. Environmental factors and body weight status are among the factors that may influence food purchasing behaviour. Thus, this study aims to investigate how these two factors affect food purchasing behaviour in Malaysian adults, shedding light on the drivers behind this critical public health issue. This cross-sectional study assessed the environmental factors and association of food purchasing behaviour with Body Mass Index (BMI) status from a selected supermarket in Bukit Jalil. A total of 154 subjects were recruited using convenience sampling. The International Medical University Nutrition Environmental Survey for Stores (IMUNES-S) was used to evaluate the selected supermarket. The BMI of the subjects were measured using a stadiometer and weighing scale. The purchased food items were categorised using the NOVA classification system, only unprocessed/minimally processed foods (U/MPFs) and ultra-processed foods (UPFs) were focused. A chi-square test was used to analyse the association between BMI status and food purchasing behaviour of U/MPFs and UPFs. There was no significant association between BMI status and food purchasing behaviour of U/MPFs ($p = 0.284$) or UPFs ($p = 0.195$). The studied supermarket provides a good amount of healthier food options, with moderate pricing and high quality items. More than half of the healthier food items were purchased in certain food groups based on the evaluation of IMUNES-S. The study concludes that BMI status is not significantly associated with food purchasing behaviour. A supportive nutrition environment might encourage healthy food purchases.

B42 Frequent eating-out is associated with increased risk of poor diet quality among primary schoolchildren: Findings from SEANUTS II Malaysia

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Eating-out, which refers to eating foods that are prepared outside, is a common practice that is linked with higher intakes of energy and fat, but lower fibre. Thus, this study aims to investigate association between eating-out with diet quality among primary schoolchildren. This cross-sectional study was conducted among 1389 children who participated in South East Asian Nutrition Surveys (SEANUTS II) Malaysia, representing 2.22 million children aged 6.0-12.9 years in Peninsular Malaysia. Eating-out was determined using Child Food Habit questionnaire. A triple-pass 24-hour dietary recall was interviewer-administered to assess dietary intake. Malaysian Healthy Eating Index (M-HEI) was used to determine diet quality. Total M-HEI score of 46 marks or lower indicates high risk of poor diet quality.

Overall, around 55.2% of children had high risk of poor diet quality with mean score of 44.6±0.4. Approximately one-fifth of children (19.6%) ate out at least 4 times a week. Children with frequent eating-out occasions (≥4 times per week) tended to have higher intakes of energy, protein, fats, and sodium (p<0.05). Children with frequent eating-out had lower total M-HEI scores (41.7) compared to their counterparts who had eaten out less than once a week (45.6) or 1-3 times per week (45.1) (p<0.05). Children with eating-out less than once a week scored higher M-HEI in food groups such as fruits, fat, and sodium, but lower in poultry/meat/egg (p<0.05). The odds of being at high risk of poor diet quality doubled (aOR: 2.039, p<0.001) among children who frequently ate out as compared to those who ate out less than once a week. In conclusion, eating-out at least four times in a week was associated with poor diet quality with higher energy and macronutrients intake among Malaysian primary schoolchildren. Therefore, effective interventions that focus on shaping healthier eating-out behaviours are needed to improve their diet quality.

Group C: Nutrients & Other Components in Foods/Products

C01 Physicochemical properties and glycaemic index of chocolate energy bars prepared with guar gum and high polyphenols cocoa powder

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Guar gum is a type of hydrocolloid and soluble fibre that able for lowering the glycaemic response of foods. Catechins, flavonol glycosides, anthocyanins, and procyanidins are the main polyphenols that can be found in cocoa beans and chocolate products. Guar gum can be used in thickening and stabilizing additives besides lowering the glycaemic index (GI) and glycaemic load (GL) of chocolate products. This study aimed to determine the physicochemical properties and GI of chocolate energy bars prepared with 0.5 %, 1.0 %, 1.5 guar gum and for the control (without guar gum and high polyphenols cocoa powder). It is revealed that there were significant differences between groups for the ash, moisture, fat, and protein content (p<0.05). However, there was no significant differences between groups for the energy value, crude fibre, carbohydrate contents, hardness, fracturability, pH and colour (p>0.05). For the GI evaluation, ten healthy volunteers with normal BMI, aged between 19 and 40 and normal fasting blood glucose completed the four sessions with a 3-day washout period. Test foods were given to the participants after an overnight fasting of at least 10 hours. Blood from finger pricks were drawn at 0, 15, 30, 45, 60, 90 and 120 min. The control chocolate energy and chocolate energy bars with 0.5 % guar gum were in the category of high GI while chocolate energy bars with 1.0 % and 1.5 % guar gum were classified as medium GI. Nonetheless, no statistically significant difference existed between groups (p>0.05). The GL for all chocolate energy bars were high as the GL for control energy bars was 48.82 ± 0.44, whereas the GL for all chocolate energy bars prepared with 0.5 %, 1.0 % and 1.5 % guar gum were of 55.13 ± 0.65, 39.04 ± 0.34 and 43.26 ± 0.82, respectively. It is worth noting that the high GL results for all the tested samples could be due to the low percentage of guar gum and type of ingredients used in the product formulation that gave less effect as predicted.

C02 HMG-CoA reductase inhibitory activity, antioxidant and antiatherosclerotic potential of Basella alba leaf extract

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Hypercholesterolemia is the major risk factor that leads to atherosclerosis, which is the primary cause of death in world population. Nowadays, alternative treatment using medicinal plants gained much attention since the treatment using synthetic drug, statins, lead to adverse health effects, especially liver and muscle toxicity. Thus, the focus of this study was on *Basella alba* leaf extract; its phytocomponents, toxicity, antioxidant, anti-inflammatory, hypocholesterolemic and anti-atherosclerotic properties. In this study, 25 medicinal plants extracts were screened for anti HMG-CoA reductase activity. *B. alba* leaf extract showed the highest inhibitory effect, about 74%. Therefore, *B. alba* was examined in order to investigate its phytochemical components. GC-MS/MS analysis detected 25 compounds while RP-HPLC revealed the presence of naringin, apigenin, luteolin, ascorbic acid and α-tocopherol. The toxicity evaluation of *B. alba* leaf extract using cytoxicity test against Vero and WRL-68 cell lines, acute and subchronic toxicity test in rats confirmed that *B. alba* extract is non-toxic and can be utilised as alternative therapeutic agent. *B. alba* extract exhibited high antioxidant activity in inhibiting radicals like DPPH, nitric oxide and ferric ions. Anti-inhibitory activity of *B. alba* extract on hyaluronidase, xanthine oxidase and lipoxygenase enyzmes demonstrated a desirable anti-inflammatory activities. Twenty New Zealand white rabbits were divided into 5 groups and fed with normal diet, 2% high cholesterol diet (HCD), 2% HCD + 10 mg/kg simvastatin, 2% HCD + 100 mg/kg *B. alba* extract and 2% HCD + 200 mg/kg *B. alba* extract, respectively. The treatment with *B. alba* extract significantly lowered the elevated levels of TC, TG, LDL, livers enzymes (ALT and AST) and muscle enzyme (CK) and increased the level of HDL and antioxidant enzymes (SOD and GPx). *B. alba* extract significantly suppressed the aortic plaque formation. This is the first *in vivo* study on *B. alba* that suggests its potential as an alternative therapeutic agent for hypercholesterolemia and atherosclerosis.

C03 Abstract removed

C04 Effects of LED treatments on the growth and nutritional contents of lettuce (*Lactuca sativa*) in a hydroponic vertical farming system

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LED-integrated hydroponic vertical farming system (HVFS) may tackle the food security challenges arising from growing urban population, while the high antioxidant content in vegetables may reduce the risk of cardiovascular disease (CVD). Therefore, this study aims to explore the impacts of various LED treatments on the growth, yield and antioxidant properties of Butterhead lettuce (BL) and Italian lettuce (IL) grown in HVFS. Three LED

combinations were used: 77% red, 14% green, and 9% blue lights (77R:14G:9B); 7% red, 41% green and 52% blue lights (7R:41G:52B); 25% red, 67% green and 8% blue lights (25R:67G:8B). Seedlings were transplanted onto HVFS with 12:12 light-dark cycle at 12 days after sowing (DAS). Electrical conductivity (EC) ranged from 0.878ppm-2.061ppm. pH was maintained at 6.0-6.6. Completely randomised design was adapted with three replications for each LED treatment that was fixed. Our study found that BL exhibited greater growth, yield, anthocyanin and chlorophyll content, while IL had higher Vitamin C. Leaf area, antioxidant activity, phenolic and flavonoid content were similar between cultivars. Lettuce grown under 77R:14G:9B treatment had produced significantly (P<0.001) taller plant height (21.2cm). Significantly (p<0.001) highest yields were produced under 77R:14G:9B and 25R:67G:8B treatments, with recorded weights of 49.173g and 46.433g respectively. Additionally, phytochemicals analysis reported that 25R:67G:8B treatment generated significantly highest phenolic (p<0.001) and flavonoid (p=0.003) contents. Vitamin C accumulation was significantly (p=0.037) higher under 25R:67G:8B than 7R:41G:52B treatment, while accumulation under 77R:14G:9B treatment was not significantly different from them. Interestingly, the three treatments did not induce significant difference in leaf area, antioxidant activity, chlorophyll and anthocyanin contents. Therefore, it can be concluded that LED treatment with a higher proportion of red light (77R:14G:9B) was more important for lettuce growth and yield, whereas treatment with a higher proportion of green light (25R:67G:8B) was more important for phenolic compounds, flavonoids and Vitamin C accumulation.

C05 Elucidating the mechanisms of combination therapy using palm vitamin E and commercial anti leukemic drug (cytarabine) in cell-based models of acute myeloid leukaemia

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Acute myeloid leukaemia (AML) is a malignant disease of the bone marrow in which hematopoietic precursors are arrested in an early stage of development. The main treatment for most types of AML is chemotherapy, along with a targeted therapy drug. Other treatment may involve stem cell transplant. Tocotrienol were proven to demonstrate high antioxidant performance in chronic myeloid leukaemia (CML) hence we chose to test it with AML. In this study, we used single isomers of palm tocotrienol (gamma and delta tocotrienols) and the mix fraction called tocotrienol-rich fraction (TRF) with combination therapy of leukemic drug, cytarabine to produce synergistic effect in treatment of AML. The single and combination group were tested for cell viability using water soluble tetrazolium (WST) assay. Results showed that TRF was highly effective in inhibiting cell growth of THP 1, HL 60 and Kasumi 6 at different cell percentage (p<0.05). The best inhibition was found in Kasumi 6 with TRF treatment followed by HL 60 and THP 1. For combination study, the best inhibition was also found in Kasumi 6 with combination treatment (p<0.05). We also examined caspase 3, caspase 8 and caspase 9 activity using commercial kit. The results

showed all caspases activity in Kasumi 6, THP 1 and HL 60 were significantly increased compared with control group in 72 hours of incubation. The invasion of the cells treated with TRF and cytarabine was significantly inhibited compared with that in the control cells by caspases assay. The expression of MIG-6 gene, a tumour suppressor gene was upregulated while the expression of API-5, an apoptosis inhibitor gene was down-regulated in all three AML cell lines treated with the various forms of T3 with or without cytarabine. The highest effects were observed in AML cells treated with δ-T3 followed by combination of cytarabine and TRF, TRF and lastly cytarabine alone. In the Next Generation Sequencing (NGS) analysis, the highest fragments per kilobase of exon per million mapped fragments (FPKM) was used to compare the gene expression levels under different experimental conditions. The highest FPKM value was observed in the HL-60 cells treated with the combination of cytarabine and TRF, followed by HL-60 treated with cytarabine alone. A higher FPKM value observed in the combination group may indicate that there were more genes and interactions involved. Results from the NGS study also showed many key genes essential for cell viability were differentially regulated (oncogenes and tumour suppressor genes).

C06 The effects of *Urtica Dioica* on benign prostatic hyperplasia (BPH) markers – A systematic review and meta-analysis

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Benign prostatic hyperplasia (BPH) - a condition in men with the enlarged prostate gland. According to the National Institute of Health, 50% of men aged >50 years showed evidence of BPH. One of the interventions for patients with BPH is the use of nettle (*Urtica dioica*). The use of nettle showed significant reduction in the BPH markers such as International Prostate Symptomatic Score (IPSS), maximum urinary flow (Qmax), post void residual volume, and prostate specific antigen. The evidence on the effects remains mixed. Hence, the objective of the study was to study the effect of *Urtica dioica* on BPH markers. A comprehensive search was conducted on PubMed, Web of Science, EBSCO, Science Direct and SCOPUS databases from year 2000-2023. The selection of articles followed PRISMA guidelines. After an extensive literature search a total of 604 articles were retrieved, after removal of duplicates using COVIDENCE software and matching the eligibility criteria nine articles were included for the systematic review & meta-analysis. Joanna Briggs Institute (JBI) critical appraisal tool was used to assess the methodological quality of included articles. All the included articles reported high JBI score. *Urtica dioica* was reported to be significant for IPSS, SMD:0.55 (CI: 0.15-0.96); $p<0.00001$. However, no impact was reported for post void residual volume SMD:0.05 (CI: -0.08-0.17); $p=0.45$ and Qmax SMD: -0.11(Cl: -0.71-0.49); $p=0.73$. The effect of *Urtica dioica* on BPH is mediated via reduced lower urinary tract symptoms.

C07 Anti-proliferative activity *Polygonum minus* water extract on human adenocarcinoma colon cancer cell lines (Ht-29)

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Polygonum minus belongs to the family *Polygonaceae* and known as *kesum.* It has been used for the medicinal traditional practice due to its pharmaceutical benefit. Previous studies show the bioactive compounds found in *Polygonum minus*; flavonoid which indicates the potential value in the treatment of cancer. Colorectal cancer is a type of cancer in which cells in the colon or rectum grow out of control. Therefore, this study was aimed to examine antiproliferative activity of *Polygonum minus* water extract on HT-29 colon cancer cell lines. The *Polygonum minus* water extraction was analysed for anti-proliferative activity by the tetrazolium salt reduction (MTT) assay and IC_{50} values was determined. Cell morphology and fluorescence double staining of treatment cells were determined using a light inverted microscope and acridine orange/propidium iodide staining. The results showed that *Polygonum minus* water extract possessed IC_{50} values at 35mg/ml±0.03 after 72 hours treatment. The anti-proliferative effect was observed on the cell apoptotic changes by reducing the cell size, cell density and presence of fragmentation and apoptotic bodies at 24, 48 and 72-hours treatment. In conclusion, *Polygonum minus* water extract has shown the anti-proliferative activity on HT-29 cell lines.

C08 Anti-diabetic properties of phenolic-rich extract from stingless bee (*Heterotrigona itama*) honey, *in vitro*

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Stingless bee (*Heterotrigona itama*) honey (SBH) has recently gained much attention for its several health benefits, including the blood-glucose-lowering activity attributed to its phenolic content. However, the high amount of sugar in honey may hinder direct analysis of its mechanisms of effects. Hence, this study aimed to determine the *in vitro* antioxidant and anti-diabetic properties of SBH and its phenolic-rich extract (PRE), in which the latter was obtained through solid-phase extraction (SPE). PRE yielded relatively higher total phenolic and flavonoid contents compared to SBH. The high-performance liquid chromatography (HPLC) phytochemical profile of PRE indicated the present of gallic acid, epicatechin, chlorogenic acid, myricetin, syringic acid, and quercetin. Data from antioxidant assays (FRAP, DPPH and ABTS radical scavenging assay) showed that PRE has higher antioxidant activity than SBH (p<0.05). The results from carbohydrate metabolic enzyme (α-amylase and α-glucosidase) inhibitory assays suggested that PRE exhibited significantly (p<0.05) higher anti-diabetic activities than SBH. PRE also has good glucose uptake stimulating and reactive oxygen species (ROS) scavenging effects in 3T3-L1 adipocytes and L6 muscle

cells. Overall, PRE from SBH exhibited high potential in ameliorating intracellular oxidative stress, which could moderate diabetes mellitus.

C09 Entomophagy practices among insect eaters in Malaysia – A qualitative study

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Entomophagy, the practice of eating insects, has not been extensively studied in Malaysia. This research aims to investigate the types of insects consumed, factors influencing consumption, methods of consumption, frequency of consumption, and obstacles faced by insect eaters in Malaysia. Participants were Malaysians and have been eating insects in the last one year. An interview guide was used to interview insect eaters in Malaysia using an online platform. Snowball sampling was used to recruit participants until data saturation was reached. Interview was audio recorded and transcribed verbatim. Thematic analysis was used to analyse the data. A total of twelve participants across ethnicities and religions from Kelantan, Selangor, Sabah and Sarawak were interviewed using in-depth interview method. Grasshoppers and sago worms were the most commonly consumed insects reported in this study. Factors influencing insect consumption included curiosity, desire to try new cultures, influence from family and friends, sustainability of protein source and limited food options. Grasshoppers were typically found in paddy fields (Kelantan), while sago worms were found in *'Rumbia'* trees (Sabah). Grasshoppers were commonly available during rainy and paddy harvest seasons, while sago worms were prevalent during hot season. Participants purchased insects from markets, online platforms or captured the insects themselves. The preparation methods varied, with deep frying being the most popular cooking method. Insects were usually consumed as side dishes or snacks based on individual preferences. Insect consumption frequency ranged from weekly to yearly or lifetime. Seasonality, availability, and cost were the main obstacles to regular insect consumption while religious laws and readiness were the common barriers to trying new types of insects. In conclusion, entomophagy practices in Malaysia are diverse due to the variety of cultures, ethnicities and religions in Malaysia. Further studies are needed to explore the potential of insects as a source of protein in Malaysia.

C10 Glycaemic response of a vegetarian and non-vegetarian meal and effects on perceived satiety

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Vegetables and vegetarian or plant-based protein foods such as tofu are low glycaemic index foods. It is of health interest to discern whether similar, balanced, carbohydrate rich mixed-meals only varying in the type of protein food (vegetarian/plant-based or non-vegetarian) would elicit different glycaemic responses. This study aimed to compare the glycaemic response of a vegetarian (rice, tofu, cabbage mushroom soup, cashews) and non-vegetarian mixed meal (rice, chicken, cabbage mushroom soup, cashews) as well as perceived satiety of these meals. Standard recipes and serving size of the mixed-meals were used in all glycaemic response trials. The glycaemic response testing protocol was in line with recommended methods and used a random, cross-over design. Fasting and postprandial capillary blood glucose were measured in glycaemic response trials. Incremental area

under the curve (iAUC) for blood glucose was calculated using the trapezoidal method. The study participants' perceived self-reported satiety scores were quantified from ratings on a Visual Analogue Scale (VAS) at identical time-points of blood glucose measurements in the glycaemic response trials. Study results showed that the glycaemic response of the vegetarian mixed meal was 10% lower than that of the non-vegetarian meal but this did not reach statistical significance (Wilcoxon signed-rank test; $p>0.05$). The study participants' perceived satiety scores after consumption of the vegetarian and non-vegetarian mixed-meals were similar. Scores for perceived hunger were significantly lower after consumption of vegetarian mixed-meals compared to non-vegetarian mixed-meals. In conclusion, vegetarian and non-vegetarian mixed meals served in the amounts that are typically consumed in Malaysia were similar in their effect on blood glucose levels and satiety.

C11 Nutritional health and importance of coconut milk fats

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Coconut milk is the white, oil-in-water emulsion extracted from fresh coconut flesh with or without added water. The composition of coconut milk depends on the amount of water used for the extraction, affecting significantly physicochemical properties. Therefore, the aim of this study was to determine the fat content with fatty acids profile of coconut milk and their nutritional health. Samples were obtained from three locations in Hulu Langat (Banadar Baru Bangi, Hentian Kajang and Kajang) in Malaysia. Fat content was measured by Mojonnier method and fatty acids profile peaks were separated by gas chromatography (GC) model Shimadzu GC 2010 with Flame Ionization Detector (FID) at 230 °C injection temperature. Results of the study showed that Malaysian coconut milk contained significantly lower ($p<0.05$) fat content (15.4%) than the other tropical coconut milk samples from Philippine, Thailand and Sri Lanka. The coconut milk had higher amount of butyric acid (C4), caproic acid (C6) and lauric acid (C12) with mean values of 247.08, 152.77 and 245.66 mg/ 100g, respectively. Furthermore, it had the higher amount of all long chain fatty acids (LCFAs) except linolelaidic-tans (C18:2n6t), eicosenoic-cis (C20:3n3) and erucic acid (C22:1n9). Lauric acid is known to be an antiviral and antibacterial that destroys a wide variety of disease-causing organisms. Thus, it can be concluded that *coco* is a source of fat that may help protect the body from infections and viruses. However, because of coconut milk's high content of saturated fatty acids, it is still seen as a food that should be consumed in moderation.

C12 The phytochemicals and antioxidant interaction of *Moringa oreifera* when combined with selected medicinal plants

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Moringa oreifera is a traditional medicinal plant commonly used in Indian cuisine with anti-inflammatory, anti-cancerous, blood sugar regulation, and menstrual regulation properties.

Past functional plant studies mostly focussed on single plant activity, creating research gaps in understanding the health effects of plant mixtures in different diets. This study aimed to (i) quantify the phytochemicals and antioxidant activity in six local medicinal plants, namely *M. oreifera, Angelica sinensis, Auricularia auricula judae, Dioscorea polystachya, Glycyrrhiza uralensis and Morus alba*(ii) compare and identify the types of biological activity interaction (synergistic, additive, or antagonistic) in different 1:1 combined plant extract. Each medicinal plant was extracted for their phytochemicals with water solvent and freeze drying. Four phytochemicals (total phenolic content (TPC), flavonoid content, tannin (tannin), polysaccharides) and antioxidant activity (ferric reducing antioxidant power (FRAP) and DPPH radical scavenging) were quantified via colorimetric methods. The types of activity interaction were determined via synergism equations. Pearson correlation and regression analyses were performed to establish relationships between phytochemicals and antioxidant activity. For single plant activity, *M. alba* showed the highest antioxidant activity (FRAP and DPPH) while *M. oreifera* depicted the highest phytochemical content (TPC, tannin, TFC). The highest polysaccharide content was detected in *D. polystachya*. Among the combined plant extracts, *M. oreifera* when combined with either *M. Alba* or *A. judae* (SE value 1.8) showed synergistic antioxidant activity. In general, plant antioxidant activity showed antagonistic trend at lower concentrations while higher concentrations tend to yield synergistic effect. For phytochemicals, majority of the plant combination showed antagonistic effect with a few plant combinations displaying synergistic effect. Both FRAP (r=0.542 p<0.001) and DPPH (r=0.542 and r=0.5, p<0.001) were positively correlated with TPC. The current finding showed that *M. oleifera* when combined with *A. sinensis, M. alba and D. polystachya and A.A. judae* could yield synergistic antioxidant effects.

C13 Nutritional composition and sensory evaluation of jackfruit plant-based mixed mushroom patties and chicken patties

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In recent years, there has been a growing preference for plant-based meat alternatives to reduce animal meat consumption and expand consumer options. Jackfruit mixed mushroom patty is one of the meat alternatives that has been produced, however, there is a lack of extensive research comparing their nutritional composition and sensory evaluation with chicken patty. Thus, this study aims to determine the nutritional composition and sensory evaluation of jackfruit plant-based mixed mushroom patties and chicken patties. The patties' nutritional composition was analysed using the AOAC method and a sensory evaluation was conducted for both patties. The study found significant differences (p<0.05) between jackfruit plant-based mixed mushroom patties and chicken patties. Jackfruit patties had higher moisture, ash, dietary fibre, and total available carbohydrate content, but lower fat and protein compared to chicken patties. Besides, there was also a significant difference between jackfruit plant-based mixed mushroom patties and chicken patties in terms of flavour, juiciness, aroma, and overall acceptance (p<0.05); while there was no significant difference (p>0.05) between jackfruit plant-based mixed mushroom patties and chicken patties in terms of their appearance, texture, and tenderness. Consumers may take some time to fully embrace jackfruit and mushroom-based plant patties as they only showed moderate acceptance (with a rating of 7.47±0.52) compared to the high level of liking (with a rating of 8.07±0.88) that they showed for chicken patties. In summary, jackfruit plant-based mixed mushroom patties are gaining popularity as meat alternatives that resemble meat in appearance and texture. They are a good source of protein, have low-fat content, and provide about 50% of the recommended daily fibre intake per patty.

C14 TRF as an adjuvant enhances dendritic cell vaccine efficacy and inhibits tumour progression and microenvironmental interaction in a mouse model of breast cancer

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Dendritic cells (DCs) are immune cells that can present antigens to T-cells and stimulate immune responses. Tocotrienol-rich fraction (TRF) from palm oil has been reported to have anti-cancer and immune-enhancing effects. In this study, TRF was used as an adjuvant to enhance the effectiveness of DC vaccines in treating mouse mammary cancer. The results of the study revealed that early treatment significantly improved the prognosis of the mice with cancer. They also found that the tumours in the animals that were treated at the G1 stage had lower volume compared to those in the other groups. Interferon-gamma (IFN-γ) and interleukin-12 (IL-12) productions showed the highest level in the group exposed to the earliest vaccine therapy and combination with TRF. Similar pattern for tumour inhibition was observed in other groups. Furthermore, PD-1 and PD-L1 were found to be significantly down-regulated in the early treatment groups, compared to the delay treatment groups. The higher interactions of cell surface proteins (PD1 and PD-L1) elevated the progression of tumours in the tumour microenvironment. Therefore, early treatment inhibited the interaction of cell surface proteins in the tumour microenvironment. In conclusion, TRF can be used as an adjuvant to enhance tumour-specific immune response induced by DC-based vaccines in a syngeneic mouse model of breast cancer. Earlier treatment modality exposure to the mouse model warranted the best inhibition in tumour-bearing mice and increased higher anti-tumour immune response. Hence, DC-based vaccines together with TRF as an adjuvant may be clinically useful as a new immunotherapeutic approach towards cancers.

C15 Prebiotic potential of banana peel on the growth of *Lactobacillus spp.*

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Banana peel is considered as agricultural waste and discarded without being fully utilised. This study aims to assess the prebiotic potential of banana (dessert banana and plantain) peel on the growth of probiotic *Lactobacillus spp.* using an *in vitro* experimental model. This study used two different banana peels, which are dessert banana peel and plantain peel as samples. The samples were oven-dried, homogenised and the total sugar content was determined by using the Anthrone method. Subsequently, different media were made by substituting the carbon source with banana peel powders, glucose, and inulin. These media were later fermented with probiotic *Lactobacillus spp.* extracted from a probiotic drink. The growth performance of *Lactobacillus spp.* (log CFU/mL, final pH, mean growth rate constant and mean generation time) was accessed following 24 hours of incubation. The supplementation of banana peel powder and plantain peel powder in the media improved the growth rate and generation time of the bacteria as the media had significantly higher amount of *Lactobacillus spp* compared to others. Both banana peel

powder and plantain peel powder supplemented media had significantly low pH, indicating intense metabolic activity of the bacteria utilising the peels. The *Lactobacillus spp.* growth promoting property of dessert banana peel and plantain peel as carbon source is due to the presence of fructooligosaccharides. Fructooligosaccharide is more favourable to bacteria due to its lower degree of polymerisation (<10). Thus, bacteria take a shorter time to ferment fructooligosaccharide. From these findings, the banana peel are important functional ingredients for the food industry due to their potential prebiotic and fermentable properties.

C16 Anti-inflammatory effects of palm tocotrienol rich-fraction in RAW 264.7 macrophages

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Tocotrienols (TRF) are powerful antioxidants that have potential anti-inflammatory properties. A widely utilised mouse macrophage cell line called RAW 264.7 was used in this study. These cells, resembling macrophages, are frequently employed in inflammation and immune system research. The objective of this study was to investigate the effects of tocotrienols on the inflammatory response in RAW 264.7 macrophage cells stimulated with lipopolysaccharide (LPS). Cell viability and proliferation were assessed using the MTT assay and the iCELLigence real-time cell analyser (RTCA). Nitric oxide (NO) detection and quantification were performed using the Griess assay. Additionally, ELISA assays were conducted to measure the release of inflammatory cytokines such as interleukin 6 (IL-6) before and after tocotrienol treatments. The results demonstrated that TRF concentrations ranging from 4 to 25 ng/mL exhibited no toxicity and increased cell viability. Moreover, higher TRF concentrations led to a reduction in NO production in stimulated RAW 264.7 macrophage cells. Interestingly, different concentrations of TRF inhibited the proliferation of RAW 264.7 cells stimulated with 10 ng/mL of LPS. This suggests that increasing the concentration of tocotrienols could potentially inhibit or mitigate the effects of LPS, resulting in a decrease in the pro-inflammatory response. Furthermore, the treated TRF group showed decreased levels of the pro-inflammatory cytokine IL-6 compared to the control. These findings support the potential anti-inflammatory properties of TRF. Further studies are warranted to evaluate the effects of TRF in animal models.

C17 Evaluating the effects of combined TRF and cytarabine treatment on cell proliferation and gene expression in the Kasumi-6 human acute myeloid leukaemia (AML) cell line

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Acute myeloid leukemia (AML) is a prevalent form of acute leukemia in adults that affects the blood and bone marrow. It is characterised by the malignant growth of bone marrow cells at an early stage of development, causing a halt in the progression of hematopoietic

precursors. This study aimed to gain insights into AML pathogenesis and identify potential therapeutic targets using the Kasumi-6 human cell line. We investigated the effects of palm tocotrienol isomers (δ-T3 and γ-T3) and tocotrienol-rich fraction (TRF) in combination with the commercial leukemia drug, cytarabine, for the treatment of AML. Cell viability was assessed using a water-soluble tetrazolium (WST) assay. The results indicated that TRF effectively inhibited the proliferation of Kasumi 6 cells (p<0.05), while the combination treatment of TRF and cytarabine showed slightly lower cell viability. The gene expression of PD1, PDL1, and caspase 9 was evaluated using a commercial kit. After 72 hours of treatment, the expression of PD1, PDL1, and caspase 9 was observed in Kasumi 6 cells. Expression of PD1 and PDL1 was downregulated in δ-T3, γ-T3, and cytarabine treatment, while caspase 9, an apoptosis-inducing enzyme, was upregulated. Notably, cytarabine exhibited the highest upregulation of caspase 9, followed by cytarabine with TRF, δ-T3, γ-T3, and finally, TRF alone. These findings suggest that the regulation of these genes could lead to the elimination of cancer cells, offering a potential therapeutic outcome for AML.

C18 Anti-inflammatory effect of tocotrienol rich fraction on A549 lung epithelial cancer cells stimulated with IL-1β

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It has been discovered that tocotrienols possess cytotoxic effects associated with the induction of apoptosis in numerous cancers. This study aimed to investigate the anti-inflammatory effect of tocotrienol-rich fraction (TRF) on A549 cells at different concentrations. A549 cells were treated with TRF ranging from 5-20 μg/mL and stimulated with interleukin 1 beta (IL-1β) for 24 hours. RTCA iCELLigence was performed to determine the effects of different IL-1β concentrations on cell viability, and total ribonucleic acid (RNA) was extracted from all samples for RT-PCR analysis. Inflammatory cytokine IL-6 levels in TRF-treated samples were measured using an ELISA assay. The results revealed that the optimal concentration of IL-1β to stimulate A549 cells was 10 ng/mL. Treatment with different concentrations of TRF attenuated the expression of COX-2 in the presence of IL-1β. The band intensity decreased with increasing concentrations of TRF, indicating a reduction in COX-2 expression. Moreover, the level of IL-6 in A549 cells decreased as the concentration of TRF increased, demonstrating the inhibitory effect of TRF on IL-6 production, an inflammatory marker. These findings suggest that TRF possesses anti-inflammatory effects that target the cyclooxygenase pathway. Therefore, tocotrienols can be considered as an alternative anti-inflammatory agent in the prevention of cancers in the future.

Group D: Clinical Nutrition/Intervention Trials

D01 Relationship between knowledge, attitude, training, perspective and willingness to adopt nutrigenetic and nutrigenomic among nutritionists and dietitians

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Nutritional genomics has the potential to manage and prevent diseases by including genetic and nutrition factors; however, this approach is still at its infancy especially among the service providers. This study aimed to determine the relationship between knowledge, attitude, training, perspective and willingness to adopt nutrigenetic and nutrigenomic among nutritionists and dietitians in Malaysia. A quantitative survey was used in this cross-sectional study as an instrument to collect the data including sociodemographic background, knowledge of genetic, nutrigenetic, and nutrigenomic, attitude towards nutrigenetic and nutrigenomic, training of nutrigenetic and nutrigenomic, perspectives towards nutrigenetic and nutrigenomic; and willingness of adoption. In this study, the results showed that 59.4% of participants had high knowledge in genetics, nutrigenetics and nutrigenomics while most of the participants showed a positive attitude (78.2%) and high perspective (67.8%) towards nutrigenetics and nutrigenomics. However, only 6.3% of participants had high exposure to training. The willingness to adopt nutrigenetic and nutrigenomic among nutritionists and dietitians was 52.7%. There was significant difference in attitude across ethnicity (F=6.236, p<0.001). Training was significantly difference between age (t=-3.35, p=0.001), across education (F=6.951, p=0.001), and occupation (F=6.791, p<0.001). Knowledge (r=0.221 and 0.218) and attitude (r=0.337 and 0.336) showed a positive weak correlation with willingness whereas training (r=0.416 and 0.424) and perspective (r=0.540 and 0.544) showed a positive moderate correlation with willingness. In conclusion, nutritionists and dietitians recognize the importance of advanced studies to acquire knowledge in nutrigenetics and nutrigenomic. Only by acquiring the necessary knowledge and training can they accurately translate nutrigenetics and nutrigenomic into clinical practice.

D02 Consumer's trust, delivery method, perceived risk and benefits on the intention to adopt personalised nutrition service in Malaysia

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Personalised nutrition is an approach that uses personal information to develop a nutritional advice or services that is tailored to the individual personally. This study aimed to determine the factors that influence the intention to adopt personalised nutrition services among consumers in Malaysia. A cross-sectional study was conducted among 279 adults aged 18 years old and above in Malaysia. A structured questionnaire was used

to assess factors that influenced participants' intention to adopt personalised nutrition services: i) trust in information provider, ii) trust in service regulator, iii) trust in service provider, iv) delivery of personalised nutrition services, v) perceived risk and benefit. SPSS software version 21 was used to analyse the descriptive statistics and correlation of the factors that influence participants' intention to adopt personalised nutrition services. The results showed that trust in information provider ($r_{partial}$=0.313, p<0.001), trust in service regulator ($r_{partial}$=0.283, p<0.001), trust in service provider ($r_{partial}$=0.253, p<0.001), delivery of personalised nutrition services ($r_{partial}$=0.147, p=0.014), and perceived risk ($r_{partial}$=0.155, p=0.010) and benefit ($r_{partial}$=0.149, p=0.013) significantly predicted the intention to adopt personalised nutrition services after controlling for the participants' age. Moreover, there was a significant difference between participants' intention to adopt PN service and their age (F=2.935, p=0.034). These findings may help governments, healthcare professionals, as well as nutritionists and dieticians to plan and develop effective PN services that will benefit all Malaysians and improve the risk of developing chronic diseases in the future.

D03 Abstract removed

D04 Abstract removed

D05 Association between micronutrient density index, *FTO* gene polymorphism and body fat percentage status of Malaysian adults: The role of nutrigenetics

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This study aimed to investigate the association between micronutrient density index (MDI), FTO gene polymorphisms (rs8050136, rs1421085, and rs17817449), and body fat percentage (BF%) among Malaysian adults. This cross-sectional study recruited a total of 213 study subjects aged 18-65 years. Socio-demographic data were collected using questionnaire, BF% were assessed using Omron KARADA Scan Body Composition and Scale (HBF-375). The dietary intake was assessed using a 3-day diet recall and further MDI was calculated. Genetic data were collected following the consent of study subjects, utilising buccal swab to collect genetic samples from saliva, using ORAcollect DNA Oragene OCR-100 saliva kit. The samples then went through genomic DNA extraction and SNPs were quantified using Ilumina Infinium Assay (iScan). The results showed that there are significant differences in MDI across age, gender, occupational status and monthly household income (χ^2 (df=2) = 20.08, p<0.001, χ^2(df=2) = 2919.00, p<0.001, χ^2 (df= 2) = 3876.00, p<0.015, χ^2 (df=2) = 8.91, p<0.012). All the socio-demographic parameters (age p=0.001, gender p=0.019, occupational status p=0.003, ethnicity p=0.001, marital status p=0.001, monthly household income p=0.048) were significantly associated to BF% status, except for highest academic qualification. MDI was significantly associated with BF% (Crude OR: 1.52, 95% CI 0.96, 2.42, p=0.072). There was no significant correlation between the

FTO SNPs rs8050136 (CC 60%, AC 32%, AA 8%), rs1421085 (TT 60%, TC 32%, CC 8%), and rs17817449 (CC 60%, AC 32%, AA 8%) with BF%. Iron density index was significantly associated with BF% (Adjusted-OR: 4.70, 95% CI 1.07, 20.55, p=0.040). In multiple logistic regression iron density index showed a direct significant association with high body fat percentage after adjusting for occupational status, monthly household income, and highest academic qualification (AOR: 4.26, 95% CI 1.02, 17.86). No interactions were observed between the genes and MDI in association to body fat percentage status of Malaysian adults. Therefore, further investigations are still necessary in various genetic variations on obesity, association between various dietary nutrients intake and genetic variation on obesity for effective management tools of personalised nutrition on obesity for various socio-economic background.

D06 Association of physical activity intensity with risk and survival of nasopharyngeal carcinoma: A hospital based matched case control study

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Across countries, different types of methodologies were used to measure PA, making strong conclusions on association between physical activity (PA) and risk of nasopharyngeal carcinoma (NPC) difficult. A prospective hospital based matched case-control study was conducted among 300 histologically confirmed NPC cases and 300 cancer free controls recruited from public hospitals in Malaysia. Total intensity of PA among cases was significantly higher than controls (5118.0 vs. 4180.0 MET-minutes/weeks). Most of the study subjects met the World Health Organization (WHO) recommendations (85.3% among cases and 83.7% among controls). Most of cases and controls showed high level of PA (65.0% each). A majority of study subjects engaged with work related PA (73.0% of cases and 69.0% of controls) and travel related PA (78.0% of cases and 76.3% controls). Only 38.3% of cases and 40.0% of controls were involved with recreational related PA such as exercising or playing sports. The proportion of cases involved with vigorous PA was significantly higher compared to control (58.3% vs. 46.0%; χ^2=9.11, p=0.002). Multivariable analysis shows that engaging with vigorous PA increased the risk of NPC independently and significantly by 58% (AOR=1.68, 95% CI=1.09, 2.60) compared to those subjects that did not engaged with vigorous PA after adjusting for confounding factors. The overall survival of NPC was 63.7% with 79.3% complete remission. Physical activity showed no significant association with NPC survival. It is hypothesized that exercise with higher PA intensity decreases T and B cell and suppresses natural killer cell cytotoxicity, which is the important marker for human immune system, hence increasing risk of malignancy. Despite the existence of a plausible biological mechanism between vigorous PA and NPC risk, the impact of PA upon NPC risk is not conclusive and this should not be a reason for not recommending physical activity to stay healthy.

Group E: Food Science & Technology

E01 The development of a plant-based patty from split gill mushrooms and lablab beans

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With a growing movement towards incorporating more plant-based foods into diets for better health, the avoidance and reduction of meat-based products is occurring. Through producing plant-based foods resembling meat-based products, people can continue eating "meat" while living a healthy lifestyle through their diets. Hence, producing plant-based foods of high nutritional value that are flavourful, nutritious and cheap for consumers are necessary. Split gill mushrooms and lablab beans are underutilised crops that can be used in plant-based, meat-like products. Both foods are high in protein and several minerals contributing to an individual's daily nutritional requirements. Split gill mushrooms contain dietary fibre which when incorporated into plant-based products contributes to daily fibre requirements. The study aims to investigate the potential of increasing the utilization of split gill mushrooms (Schizophyllum commune). The mushrooms and beans underwent a preparation process forming a plant-based patty. The preferred thickness of each patty by consumers of 10, 15 and 20g was tested. Afterward, experimentation with three different proportions of mushrooms to beans as patty treatments of 75% mushroom with 25% bean, 50% mushroom with 50% bean and 25% mushroom with 75% bean was done through another sensory evaluation. Proximate analysis was done on the dried mushrooms and dried lablab beans. The nutritional values and cost analysis of the three patty treatments were determined. Treatment 1 comprising of 75% mushroom and 25% lablab bean was the most preferred patty treatment by consumers as well as the most nutritious. In comparison to current plant-based alternatives on the market, all three treatments are cheaper to produce with the Harvest Gourmet brand being the exception to having a similar price to the patty treatments. In conclusion, it is possible to produce a healthy alternative to meat-based products that are preferred by consumers, affordable and use mainly local ingredients.

E02 The anti-diabetic properties of cooled instant red rice

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Cooling of cooked starch products is known to cause starch retrogradation. This process decreases the content of available carbohydrates by producing resistant starch. Foods modified to contain more resistant starch, as in this research context via cooling, may alter the postprandial glycemic response. The consumption of low glycaemic index (GI) foods has been reported as an effective mitigation strategy to prevent the upsurge in blood glucose in people suffering from Type 2 diabetes. In this research, we prepared the cooled instant red rice by using the quick-cooking process which is the freeze-thaw-drying process. Red

rice is precooked and then frozen, thawed, and dried at 50°C and 95°C. Whereas the uncooled red rice (control) was precooked and dried at 50°C and 95°C where the freezing and thawing steps were omitted. Next, we evaluated and compared the anti-diabetic properties of cooled and uncooled instant red rice via α-amylase inhibitory activity and lipase inhibitory activity. Further, we measured the total monomeric anthocyanin content (TMAC) in the instant red rice sample. Interestingly, we found out that cooled instant red rice showed significantly higher α-amylase inhibitory activity (47.61±0.41%), lipase inhibitory activity (20.78±0.30%), and TMAC (3.97±0.40 mg/100 g extract) when compared to uncooled instant red rice (p<0.05). The results on the anti-diabetic properties of locally made cooled instant red rice suggest its potential use as an innovative food product that combines dietary need satisfaction with disease management attributes that should benefit people suffering from Type 2 diabetes.

E03 Physicochemical characteristics, sodium content and sensory evaluation of selected commercialised soy sauces with no sodium labelling in Malaysia

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Soy sauce is one of the widely used condiments in Malaysia and is high in sodium content. If taken in excessive amounts, it can lead to non-communicable diseases such as hypertension, heart disease, and stroke. This study was conducted to evaluate the physicochemical characteristics, sodium content and sensory evaluation of selected commercial soy sauces that do not have sodium labeling in Malaysia. A total of 25 soy sauce samples were used in this study. Each type of soy sauce had a significant difference (p<0.05) in its physicochemical properties except for the pH value. The results of the study found that the sodium content in light soy sauce was the highest (5766.50±968.37mg/100g), followed by salty soy sauce (5511.00±461.35mg/100g), dark soy sauce (4151.25±2383.96mg/100g) and sweet soy sauce (3289.09± 589.14mg/100g). Sweet soy sauce showed the highest viscosity (145.78cP) followed by dark soy sauce (86.01cP), salty soy sauce (43.28cP), and light soy sauce (7.19cP). The results for the colour showed that sweet soy sauce had the highest value for brightness (L* = 2.48), while the redness and yellowness values were the highest in light soy sauce (a* = 1.34 and b* = 1.57). The sensory evaluation showed that sweet soy sauce had the highest score for overall acceptance compared to other samples (p<0.05). The results of this study found that all the studied physicochemical characteristics showed significant differences (p<0.05) with the overall consumer acceptance of the selected soy sauce samples. Majority of the sensory evaluation subjects preferred sweet soy sauce which had lower sodium content compared to other types of soy sauce. Although sweet soy sauce had the lowest sodium content, it is a high-sodium food product (3289mg/100g). Therefore, it is recommended that sodium content information should be included in all soy sauce products available in the Malaysian market so it can help consumers to make smarter choices.

E04 Changes in growth and phytochemicals of pak choi (*Brassica rapa* subsp. *Chinensis*) and mustard (*Brassica juncea*) under combined ratios of red, green and blue LEDs in a hydroponic vertical farming system

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Hydroponic vertical farming system (HVFS) is proven to resolve the world's food insecurity issues caused by urbanisation and reduce the incidence of cardiovascular disease. Integrating light-emitting diodes (LEDs) in HVFS could maximise crop yield and nutritional quality as the LED wavelengths can be matched with the photosynthetically active radiation for plant growth and yield. The study aims to compare the morphological changes and phytochemical content of pak choi and mustard grown under different red, green and blue LED ratios in HVFS. Three LED treatments: 25R:67G:8B (25% red, 67% green, and 8% blue light), 77R:14G:9B (77% red, 14% green, and 9% blue light) and 7R:41G:52B (7% red, 41% green, and 52% blue light) with a photosynthetic photon flux density of 80±50 $\mu molm^{-2}s^{-1}$, 12-hour photoperiod and 27±1°C were employed for comparison. Treatment included factorial combinations of crops (pak choi and mustard) and LED treatments in a completely randomised design with three replications. Nine seedlings from each crop were transplanted into the HVFS 19 days after sowing for each LED treatment. Three replicates were randomly chosen for parameter measurements at 2,3 and 4 weeks after transplanting (WAT) and harvested at 4WAT for phytochemical analysis. Results showed that highest plant height, leaf number, and dry weight were observed in 77R:14G:9B pak choi (19.63cm; 9leaves; 1.24g) and mustard (31.50cm; 12leaves; 6.20g). Leaf area and fresh weight in 77R:14G:9B pak choi (38.37cm^2; 56.70g) and 25R:67G:8B mustard (122.33cm^2; 172.60g) were significantly (P<0.05) higher than 7R:41G:52B treatment. Anthocyanin and flavonoid content in 7R:41G:52B pak choi and chlorophyll content in 77R:14G:9B pak choi were the highest compared to mustard under the same light quality. Therefore, we conclude that 77R:14G:9B and 25R:67G:8B treatments enhanced the growth and yield of pak choi and mustard, whereas 7R:41G:52B treatment increased the phytochemical accumulation of pak choi; no significant changes in mustard. It is recommended to cultivate pak choi under higher R and G proportions with lower B proportion for higher yield and phytochemical content.

Group F: Experimental Nutrition

F01 Carnosine-iron oxide magnetic nanoparticles inhibit HCT-116 cells growth by inducing apoptosis, autophagy and necroptosis

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Colorectal cancer is a global health threat, and the search for effective anti-cancer bioactive compounds is an urgent priority. Carnosine, a dipeptide widely found in mammals and fish, can enhance its physiological activity through nanotechnology. This study investigates the anti-cancer effects of carnosine-iron oxide magnetic nanoparticles (C-Fe_3O_4-NPs) on cell growth and mechanism in human colorectal cancer HCT-116 cells. The HCT-116 cells were treated with 5, 10, 15, or 40 mM C-Fe_3O_4-NPs for 96 hours to detect changes in cell viability, apoptosis (including Bcl-2-associated X protein (Bax) and increase B-cell lymphoma-2 (Bcl-2), caspase 3,8,9 mRNA expression and apoptosis level), autophagy (including beclin-1, phosphoinositide 3 kinase III (PI3K III), microtubule-associated protein 1B light chain 3 (LC 3) mRNA expression and autophagy level), and necroptosis (including mixed lineage kinase domain like protein (MLKL) mRNA expression, adenosine triphosphate (ATP) and reactive oxygen species (ROS) level). The results showed that >5 mM C-Fe_3O_4-NPs significantly decreased the cell viability of HCT-116 cells in a dose-dependent manner. >10 mM C-Fe_3O_4-NPs significantly upregulated Bax and caspase 3, 8, and 9 mRNA expression while downregulating Bcl-2 mRNA expression, thereby inducing apoptosis in HCT-116 cells. Additionally, >15 mM C-Fe_3O_4-NPs significantly decreased beclin1, PI3K III, and LC 3 mRNA expression, thereby inducing autophagy in HCT-116 cells. >5 mM C-Fe_3O_4-NPs elevated ROS levels, ATP levels, and MLKL mRNA expression, thereby leading to necroptosis of HCT-116 cells. These results showed that C-Fe_3O_4-NPs, particularly >15 mM, effectively inhibited colorectal cancer cell growth by inducing apoptosis, autophagy, and necroptosis. Therefore, this indicates the potential of C-Fe_3O_4-NPs as an anti-cancer of bioactive compounds for therapy in colorectal cancer.

F02 – Abstract removed

F03 Cuttlefish melanin suppresses cell growth by inducing apoptosis of human colorectal cancer cells

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The cuttlefish-processing industry generates large amounts of by-products such as cuttlefish ink could be sources of bioactive compounds providing health benefits. Cuttlefish melanin (CM) was extracted from cuttlefish ink, a by-product of cuttlefish. CM had various biological activities including antioxidant, anti-inflammatory, anti-diabetes, and anti-bacterial effects. However, the anti-cancer properties and its detailed regulation mechanism were still unclear. Therefore, this study aims to evaluate CM's anti-cancer properties by the apoptosis mechanism in human colorectal cancer cells (HCT-116 cells). HCT-116 cells were treated with different concentrations of CM (50, 150, and 250 μg/mL) for 48 hours. The cell viability, the levels of apoptosis, and the apoptosis-related mRNA expressions (Bcl-2-like protein 4 (Bax), B cell lymphoma 2 (Bcl-2) Caspase-3, Caspase-8, Caspase-9, Poly (ADP-ribose) polymerase (PARP)) were examined. The results showed that 50, 150, and 250 μg/mL CM decreased the cell viability (reduced by 16, 32, and 48%, respectively). 150 and 250 μg/mL CM increased the levels of apoptosis. Furthermore, all concentrations of CM increased the mRNA expression of Bax while reducing the mRNA expressions of Bcl-2 and PARP. Moreover, 250 μg/mL CM increased the mRNA expression of caspase-3 and caspase-9. Overall, CM had an anti-cancer effect by inducing apoptotic cell death in HCT-116 cells. This indicates the potential of CM as an anti-cancer supplement for developing functional food.

F04 Effect of *Gynura bicolor* water extract on inflammatory response of intestinal cells induced by 5-fluorouracil

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Hóng Fèng Cài Gynura bicolor (Roxb. and Willd.) DC; *G. bicolor* is commonly used as a dietary vegetable and traditional herbal medicine in Malaysia, Taiwan, and the Far East. 5-fluorouracil (5-FU) is a chemotherapy medicine to treat cancer. However, the effect of *G. bicolor* water extract (GBWE) on the inflammatory response of intestinal cells induced by 5-FU is unknown. To investigate the effect of GBWE on inflammation and its mechanism, rat IEC-6 epithelium cells were pretreated with 25, 50, or 100 μg/mL GBWE combined with 0.5 μM 5-FU for 48 hours. The cell viability, inflammatory response, oxidative stress, and NF-κB signaling activation were analyzed after 5-FU combined GBWE treatment. Our results showed that cell viability was significantly lower in the combination of GBWE and 5-FU group than in the control group, and the same phenomenon was observed in the morphological examination. Furthermore, the combination of 50 or 100 μg/mL GBWE with 0.5 μM 5-FU significantly reduced reactive oxygen species (ROS) and thiobarbituric acid reactive substances (TBARS) compared with the 5-FU group (p<0.05). When IEC-6 cells treated with 25, 50, or 100 μg/mL GBWE combined with 0.5 μM 5-FU reduced TNF-α, IL-6, IL-1β, NO and PGE_2 levels, indicating that GBWE suppressed the 5-FU induced inflammatory response. Additionally, GBWE also reduces the NF-κB translocation to the nucleus and binding to DNA. These results demonstrate that GBWE can reduce inflammation and oxidative stress by reducing NF-κB signaling activation in IEC-6 cells under 5-FU treatment.

Notes

A Nation-Wide Community Nutrition Promotion Programme Since 2002

Achievements of NMM

Aimed to promote greater awareness of healthy eating and active living among Malaysians, it is a strategic partnership between three professional bodies, namely, **Nutrition Society of Malaysia (NSM), Malaysian Dietitians' Association (MDA), Malaysian Society of Body Composition (MSBC)**. Corporate company support and partnership from 2008 enabled more educational materials and activities and greater outreach to the community.

Family Carnivals

- Organised 12 major fun-filled carnivals and 3 virtual fairs

School & Kindergarten Roadshows

- Visited 160 primary schools and provided healthy eating and active living messages
- Visited 175 kindergartens and conducted interactive nutrition activities

Publications for Public

- Published 15 practical nutrition guidebooks, 5 recipe books and 1 mini-booklet

Educational Materials for School Children & Preschoolers

- Published comic book and activity book for primary school children
- Published DVD and worksheets for preschoolers

Educational Press Articles

- Published over 102 articles in English, Bahasa Malaysia & Chinese newspapers

Mass Media Promotions

- Disseminated messages through radio, television & website

Visit our website to obtain more information on educational materials from the Nutrition Month Malaysia programme. We also welcome feedback/queries. To reach us, please contact:

Chairman, Nutrition Month Malaysia
Email: president@nutriweb.org.my
Website: www.nutritionmonthmalaysia.org.my

or

VersaComm Sdn Bhd,
Nutrition Month Malaysia Secretariat
Tel: (03) 5632 3301/5637 3526

Nutrition Month Malaysia **@nutritionmonth_malaysia**

NSM Nutrition Roadshows 2.0

A Nutrition Promotion Programme of the Nutrition Society of Malaysia

Improving Lives through Nutrition

Focusing on

Healthy Eating ***Active Living***

Objectives

- inspire and empower the community with the knowledge and skills to practise healthy eating and active living
- foster community awareness on the importance of assessing their nutritional status regularly
- serve as capacity building and partnership platform for nutritionists in promoting optimal nutritional well-being of Malaysians

Two main approaches and activities

COMMUNITY OUTREACH ROADSHOWS

- *Nutrition Screening*
- *Individualised nutrition advice*
- *Dissemination of nutrition educational materials*
- *Cooking demonstration*

ONLINE NUTRITION PROMOTION

(Fb, IG & TikTok)

- *Nutrition Educational Information (Tips, Healthy Eating Reminders, NutriQuote)*
- *Healthy Recipe cards and Cooking demonstration by Nutritionist*
- *Interactive Activities (NutriFun Quiz)*
- *Special events & activities on Healthy Cooking & Active Living*

Improving Lives Through Nutrition
NSM Roadshows 2.0: Nutrition Promotion Programme
For more information: www.nutriweb.org.my

nsmnutritionroadshows2

Nutrition Society of Malaysia

IMPROVING LIVES *through* NUTRITION

As a professional organisation, we are guided by a simple belief – the more people understand food and nutrition, the better they can care for their health and well-being.

For that reason, we support the advancement of research, sharing practical insights and important discoveries for the benefits for all.

We also support the Government's efforts in promoting healthy nutrition in the society to combat nutrient deficiencies as well as diet-related chronic diseases in the country (e.g. obesity, diabetes, hypertension and coronary heart disease).

In caring for the community, we continuously disseminate practical nutrition information to the young and old alike, guiding them to discover the benefits of good nutrition and a healthy lifestyle.

We are committed to improve lives through nutrition. It's our way of serving Malaysians.

Established in 1985, the Nutrition Society of Malaysia (NSM) is a non-profit scientific organisation that facilitates networking among its 500 professional members and engages in the following scientific and community nutrition promotion activities to achieve its goal.

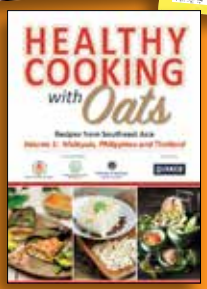
For more information, visit our website:
www.nutriweb.org.my

Our Activities

- Organise annual scientific conferences
- Conduct scientific update sessions
- Advice to government health & regulatory authorities & scientific bodies
- Research on specific community groups
- Lead the Southeast Asia Public Health Nutrition (SEA-PHN) Network
- Conduct nutrition promotion programmes in collaboration with other professional organisations and corporate companies
  - specific target groups especially women, infants and children (eg Healthy Kids, Mi-Care, MyNutriBaby, Positive Parenting)
  - community-based promotion programmes eg Nutrition Month Malaysia, Probiotics Education Programme
- Establish a comprehensive and authoritative website on nutrition for Malaysians

Our Major Publications

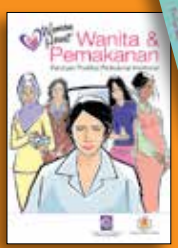
- Malaysian Journal of Nutrition
- Berita NSM (newsletter)
- Series of recipe books
  - Healthy Cooking with Oats. Recipes from SEA. Vol 1. Malaysia, Philippines, Thailand
  - Junior Chef Cookbook Vol 1. Let's Play Healthy Cooking.
  - Nutritionists' Choice Cookbook (Vol 1: Healthy Recipes for Your Little Ones. Vol 2: Resipi Untuk Seisi Keluarga)
  - Resipi Sihat, Pilihan Bijak (Vol 1 & 2)
- Various educational booklets and leaflets on dietary guidelines and specific foods
- Nutrition Month Malaysia booklets on healthy eating and active living (www.nutritionmonthmalaysia.org.my)



Junior Chef Cookbook Vol 1. Let's Play Healthy Cooking, Nutritionists' Choice Cookbook (Vol 1 & 2), Resipi Sihat, Pilihan Bijak (Vol 1 & 2), Healthy Cooking with Oats

Healthy Eating During Pregnancy & Lactation

Wonders of Whole Grains



Women@Heart *Wanita & Pemakanan* manual for professionals and leaflets for public

Malaysian Dietary Guidelines leaflets

Breastfeed with Confidence

Baby's First Bites

Healthy Spoonfuls for Toddlers