ASIA PACIFIC MATERNAL AND CHILD METABOLIC HEALTH CONFERENCE & INTEGRATED PLATFORM FOR RESEARCH IN ADVANCING METABOLIC HEALTH OUTCOMES OF WOMEN AND CHILDREN (IPRAMHO) INTERNATIONAL MEETING 2021

Integrated Platform for Research in Advancing Metabolic Health Outcomes of Women and Children (IPRAMHO)

08 & 09 January 2021
KK Women's and Children's Hospital, Singapore

Conference: Hybrid Meetings (via Webinars and at KKH)
Scientific Poster Exhibition: Auditorium Foyer (Training Centre), Women's Tower, Level 1, KK Women's and Children's Hospital

Jointly organised by:

IPRAMHO

KK Women's and Children's Hospital
SingHealth

SingHealth DukeNUS Academic Medical Centre
OBSTETRICS & GYNAECOLOGY

SingHealth DukeNUS Academic Medical Centre
PAEDIATRICS

Polyclinics
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Jointly supported by:

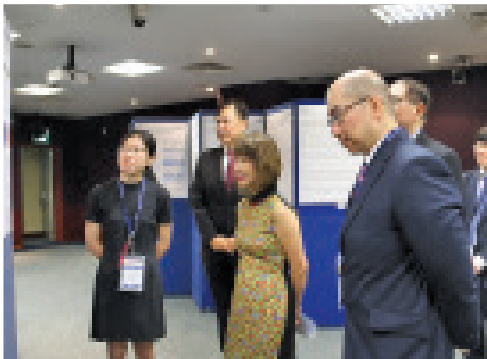
Obstetrical & Gynaecological Society of Singapore

College of Obstetricians & Gynaecologists, Singapore

PERINATAL SOCIETY OF SINGAPORE

ASIA PACIFIC DIABETES IN PREGNANCY CONFERENCE & IPRAMHO INTERNATIONAL MEETING 2020

Launch of the Perinatal Society of Singapore Guidelines on Physical Activity & Exercise in Pregnancy. 10 Jan 2020
(from left to right): Prof Tan Kok Hian, Prof Victor Samuel Rajadurai, Dr Amy Khor, Prof Alex Sia, A/Prof Tan Lay Kok and Dr Ivy Lim



Welcome Message

Dear Colleagues and Friends,

On behalf of the Organising Committee, I bid a warm welcome to all of you to the Asia Pacific Maternal & Child Metabolic Health Conference and Integrated Platform for Research in Advancing Metabolic Health Outcomes of Women and Children (IPRAMHO) International Meeting 2021, hosted at KK Women's and Children's Hospital (KKH), Singapore.

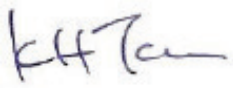
Diabetes, obesity and gestational diabetes mellitus (GDM) are a worldwide challenge. Asia-Pacific ethnicities are particularly prone to a particularly high prevalence of diabetes and GDM. This meeting brings together clinicians, nurses and allied healthcare professionals to discuss on diabetes, obesity and metabolic diseases for women and children in our Asia-Pacific region. The best preventive efforts start upstream from preconception and at conception in the womb to the early childhood years. The optimal strategy for Singapore's current 'War on Diabetes' must necessarily begin with effective battles against diabetes and obesity with lifestyle and obstetric and perinatal interventions at this early phase, using a life course approach.

We had a successful meeting in 2018 where the College of Obstetricians and Gynaecologists, Singapore Guidelines on the Management of Gestational Diabetes was launched. Through the meeting, we have also achieved and published the AOFOG MFM Committee Consensus of GDM screening. We launched the Perinatal Society of Singapore Optimal Perinatal Nutrition Guidelines and also published the Asia Pacific consensus in perinatal nutrition in 2019. In 2020, we launched the Perinatal Society of Singapore Guidelines on Physical Activity & Exercise in Pregnancy. This year 2021, we are focusing on the development of the Singapore Integrated 24-Hour Activity Guidelines for Children & Adolescents with strong support from various colleges and societies in Singapore. In line with RIE2025, these activities aim to translate our research findings for active dissemination and implementation to improve the health of women and children, enhancing early life-course moments from preconception onwards and optimising the potential of every child born in Singapore and our region.

For 2021, the conference on Day 1 will discuss maternal and child metabolic health in the morning session followed in the afternoon by IPRAMHO Education and Training Session (Track 1) and updates at Primary Care Health (Track 2). On Day 2, the programme will invite the Asia Pacific and regional experts to discuss and obtain consensus on the exercise and activity guidelines for children and adolescents (Child Health Track 3) as well as discuss about future research to address the current gaps in women's metabolic health in Asia-Oceania (Maternal Health Track 4). Asia Pacific experts from Malaysia, Thailand, Indonesia, Philippines, Myanmar, Vietnam, Hong Kong, Japan, China, India, Sri Lanka and Australia as well as practitioners and healthcare professionals from Singapore will present their studies at this Conference.

Due to the present COVID-19 situation, our conference will be a hybrid one with presentation talks conducted mainly through webinars. Nevertheless, together with the physical launch, there will be a scientific poster exhibition, under safe distancing measures on 8 January 2021 (Friday) at KKH. KKH is at the forefront of maternal & child health research and is home to research cohorts & programmes like GUSTO, S-PRESTO, NORA & IPRAMHO.

We are happy again for the strong support for past four years by members of several key organisations - Perinatal Society of Singapore (PSS), College of Obstetricians & Gynaecologists, Singapore (COGS), College of Paediatrics & Child Health Singapore (CPCHS), Obstetrical & Gynaecological Society of Singapore (OGSS), SingHealth Duke-NUS OBGYN Academic Clinical Programme and SingHealth Duke-NUS Paediatrics Academic Clinical Programme. We are also grateful for the support given by Exercise is Medicine Singapore (EIMS), SingHealth Duke-NUS Sport & Exercise Medicine Centre, the SingHealth Duke-NUS Diabetes Centre & Federation of Asia and Oceania Perinatal Societies (FAOPS). We thank the sponsors and also the support of the NMRC (National Medical Research Council)'s collaborative centre grant – Integrated Platform for Research in Advancing Metabolic Health Outcomes in Women and Children (IPRAMHO) involving KKH, SingHealth Polyclinics and National Health Group Polyclinics. We look forward to seeing you in person or virtually at this exciting the Asia Pacific Maternal & Child Metabolic Health Conference and IPRAMHO International Meeting! We thank everyone for the support and wish everyone a fruitful academic experience.



Professor Tan Kok Hian
Chairperson, Organising Committee
Lead, NMRC Integrated Platform for Research in Advancing Metabolic Health Outcomes of Women and Children (IPRAMHO)
Head & Senior Consultant, Perinatal Audit & Epidemiology Unit, KK Women's and Children's Hospital
Benjamin Henry Sheares Professor in OBGYN, Duke-NUS

Contents

SINGAPORE JOURNAL OF OBSTETRICS & GYNAECOLOGY

Official Journal of the Obstetrical & Gynaecological Society of Singapore

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ASIA PACIFIC MATERNAL & CHILD METABOLIC HEALTH CONFERENCE AND IPRAMHO INTERNATIONAL MEETING 2021 ORGANISING COMMITTEE & FACULTY

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Assoc Prof Ng Kee Chong
Assoc Prof Tan Hak Koon
Assoc Prof Chan Yoke Hwee

Co-Chairpersons:
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Assoc Prof Tan Lay Kok

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Dr Zhou Qiongjie, China
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Acknowledgments:
SMS Dr Janil Puthucheary, MOH
Prof Satoshi Kusuda, FAOPS

SCIENTIFIC PROGRAMME

Theme: *Optimal Metabolic Health for Women and Children*

DAY 1 – 08 JANUARY 2021, FRIDAY (Scientific Poster Exhibition at KKH Auditorium Foyer from 0800hrs to 1700hrs)	
0800	Registration
0825	Welcome Address *Prof Alex Sia, Chief Executive Officer, KK Women's and Children's Hospital, Singapore*
0835	Opening Remarks on Asia Pacific Collaboration for Maternal & Child Health *Prof Satoshi Kusuda, President Federation of Asia and Oceania Perinatal Societies*
0840	SYMPOSIUM I - CHILD METABOLIC HEALTH *Chairperson: Assoc Prof Chan Yoke Hwee, Chair, SingHealth Duke-NUS Paediatrics Academic Clinical Programme* *Co-Chairperson: Assoc Prof Tan Hak Koon, Chair, SingHealth Duke-NUS Obstetrics and Gynaecology Academic Clinical Programme*
0900	Who is the Metabolically Healthy/Unhealthy Child? *Adj Asst Prof Chua Mei Chien, Senior Consultant and Head, Department of Neonatology, and Director, KK Human Milk Bank, KK Women's and Children's Hospital, Singapore*
0920	Challenges and Obstacles to Successful Weight Management in Children and Adolescents *Adj Assoc Prof Oh Jean Yin, Senior Consultant and Deputy Head, Department of Paediatrics, KK Women's and Children's Hospital, Singapore*
0940	A Roadmap to Optimal Metabolic Health in Children – The Role of Maternal Health *Assoc Prof Fabian Yap, Senior Consultant and Head, Endocrinology Service, KK Women's and Children's Hospital and Prof Tan Kok Hian, Head, Perinatal Audit & Epidemiology and Senior Consultant, Maternal Fetal Medicine, KK Women's and Children's Hospital, Singapore*
1000	Q & A Session
1015	*Intermission*
1025	SYMPOSIUM II - PHYSICAL ACTIVITIES AND EXERCISE FOR CHILDREN *Chairperson: Dr Benny Loo Kai Guo, Consultant Paediatrician, General Paediatrics Service and Sports Medicine Service, KK Women's and Children's Hospital, Singapore* *Co-Chairperson: Adj Assoc Prof Benedict Tan Chi'-Loong, Senior Consultant and Chief of Sport and Exercise Medicine, Changi General Hospital, Singapore*
1030	Habitual Physical Activity of Children and Adolescents in Singapore *Prof Chia Yong Hwa Michael, Professor of Paediatric Exercise Science, Physical Education & Sports Science, National Institute of Education, Nanyang Technological University, Singapore*

SCIENTIFIC PROGRAMME

Theme: *Optimal Metabolic Health for Women and Children*

DAY 1 – 08 JANUARY 2021, FRIDAY (Scientific Poster Exhibition at KKH Auditorium Foyer from 0800hrs to 1700hrs)	
1050	Movement Behaviours in Young Singaporean Children *Assoc Prof Falk Mueller-Riemenschneider, Saw Swee Hock School of Public Health, National University of Singapore, Singapore*
1110	Sleep and Physical Activity in Children *Assoc Prof Teoh Oon Hoe, Senior Consultant and Head, Respiratory Medicine Service, and Deputy Head, Department of Paediatrics, KK Women's and Children's Hospital, Singapore*
1130	Exercising in Children and Adolescents - How to Do It Safely *Dr Chan Poh Chong, Senior Consultant and Head, Division of General Ambulatory Paediatrics and Adolescent Medicine, Department of Paediatrics, Khoo Teck Puat- National University Children's Medical Institute, National University Hospital, Singapore*
1150	Q & A Session
1200	*Intermission*
1215	LAUNCH OF THE SINGAPORE INTEGRATED 24-HOUR ACTIVITY GUIDELINES FOR CHILDREN AND ADOLESCENTS AT KKH AUDITORIUM IPRAMHO Initiatives for Maternal & Child Metabolic Health *Prof Tan Kok Hian, Organizing Chairperson, Asia Pacific Maternal & Child Metabolic Health Conference & IPRAMHO International Meeting 2021* *Lead, IPRAMHO, Singapore* CPCHS Initiatives for Child Metabolic Health *Assoc Prof Ng Kee Chong, President of the College of Paediatrics & Child Health of Academy of Medicine Singapore, Singapore* The Singapore Integrated 24-Hour Activity Guidelines for Children and Adolescents *Dr Benny Loo Kai Guo, Chairperson, Singapore Integrated 24-Hour Activity Guidelines for Children and Adolescents Workgroup* Opening Address by Guest of Honour *Dr Janil Puthucheary, Senior Minister of State for Health, Singapore*
1245	*Intermission*
1315	SYMPOSIUM III - IPRAMHO METABOLIC HEALTH INNOVATION AND TECHNOLOGY ADVANCE UPDATES *Chairperson: Assoc Prof Ang Seng Bin, Senior Consultant, Family Physician and Head, Family Medicine Service and Menopause Unit, KK Women's and Children's Hospital, Singapore* *Co-Chairperson: Assoc Prof Derrick Chan, Senior Consultant and Head, Neurology Service, KK Women's and Children's Hospital and Programme Director, SingHealth Duke-NUS Clinician-Innovator Development Programme, Deputy Director (Education), SingHealth MedTech Office and Director KK Research Centre, Singapore*

SCIENTIFIC PROGRAMME

Theme: *Optimal Metabolic Health for Women and Children*

DAY 1 – 08 JANUARY 2021, FRIDAY (Scientific Poster Exhibition at KKH Auditorium Foyer from 0800hrs to 1700hrs)	
1320	Innovation in SingHealth Duke-NUS Healthcare Cluster – Population Health Examples from Ophthalmology *Prof Wong Tien Yin, Professor of Ophthalmology and Medical Director & Senior Consultant, Singapore National Eye Centre and Deputy Group CEO (Research & Education), SingHealth and Vice Dean, Duke-NUS Medical School, Singapore*
1350	What Fitbit is Doing in the Area of Lifestyle for Health *Mr John Gillman, Director, Health Solutions for Fitbit APAC, Fitbit Singapore Pte Ltd*
1425	Q & A Session
	Intermission
1430	TRACK 1 - IPRAMHO EDUCATION SESSION: TRAINING PROGRAM FOR DOCTORS AND RESIDENTS ON MATERNAL METABOLIC HEALTH *Chairperson: Assoc Prof Tan Lay Kok, senior consultant obstetrician and gynecologist, Department of Obstetrics and Gynaecology, Singapore General Hospital, Singapore* *Co-Chairperson: Dr Serene Thain, Consultant Obstetrician and Gynaecologist, Department of Maternal Fetal Medicine, KK Women's and Children's Hospital, Singapore*
1435	Gestational Diabetes -The Role of Healthcare Workers (Global Perspective) *Prof Shakila Thangaratinam, WHO Collaborating Centre for Global Women's Health, UK*
1500	What Obstetricians Need to Know about MODY - Recognition, Diagnosis, Management & Implications (Endocrine) *Adj Assoc Prof Daphne Gardner, Senior Consultant, Endocrinology, Singapore General Hospital and adjunct Associate Professor with Duke-NUS Graduate Medical School and Director of Education, SingHealth-Duke Disease Centre for Diabetes, Singapore*
1530	*Intermission*
1540	Clinical Practice Pearls: Gestational Diabetes and Pre-existing Diabetes in Pregnancy - the Obstetrician's Perspective *Dr Tan Eng Loy, Senior Consultant, High Risk Pregnancy Clinic, the Gestational Diabetes Joint Clinic, and the Cardiac Obstetric Clinic at the SGH Centre for HIgh Risk Pregnancies (CHIRP), Singapore General Hospital, Singapore*
1600	Updates on the Management of Hypertension in Pregnancy *Dr Serene Thain, Consultant, Department of Maternal Fetal Medicine, KK Women's and Children's Hospital, Singapore*
1620	Key Findings of Singapore PREconception Study of Long-Term Maternal and Child Outcomes (S-PRESTO) *Dr Loy See Ling, Senior Research Fellow, Department of Reproductive Medicine, KK Women's and Children's Hospital, Singapore*

SCIENTIFIC PROGRAMME

Theme: *Optimal Metabolic Health for Women and Children*

DAY 1 – 08 JANUARY 2021, FRIDAY (Scientific Poster Exhibition at KKH Auditorium Foyer from 0800hrs to 1700hrs)	
1640	Q & A Session
1655	Closing Remarks
1700	-End of Programme-
1430	TRACK 2 – IPRAMHO PRIMARY CARE HEALTH *Chairperson: Assoc Prof Tan Ngiap Chuan, Clinical Associate Professor SingHealth Polyclinics, Director, Department of Research at SingHealth Polyclinics HQ, Vice-chair (Research), SingHealth-Duke NUS Family Medicine Academic Clinical Program (FM ACP), Singapore* *Co-Chairperson: Assoc Prof Tang Wern Ee, Senior Consultant and Director of the Clinical Research Unit, National Healthcare Group Polyclinics and Assistant Dean, Family Medicine, Lee Kong Chian School of Medicine, Singapore*
1435	Effect of an Enhanced Self-Determination Weight Reduction Intervention on Overweight Post-natal Mothers: A Pilot Randomised Controlled Trial *Dr Cherry Tan, SingHealth Polyclinics, Singapore*
1500	Primary Care Physicians Managing Postpartum Care - What are Their Barriers and Enablers? A Qualitative Research Study *Dr Poon Zhimin, Clinical Lecturer, Lee Kong Chian School of Medicine and Physician Faculty with the SingHealth Family Medicine Residency programme, SingHealth Polyclinics, Singapore*
1525	Importance of Follow-up of GDM Mothers Postpartum *Assoc Prof Ang Seng Bin, Senior Consultant, Family Physician and Head, Family Medicine Service and Menopause Unit, KK Women's and Children's Hospital, Singapore*
1550	*Intermission*
1600	SingHealth High Risk Metabolic Postnatal Surveillance (SHRIMPS): Nurse Navigator Transformative Care Model *Ms Asmira Bte Mohamed Rahim, Registered Midwife, KK Delivery Suite caring for the laboring mothers of high and low risk groups, KK Women's and Children's Hospital, Singapore*
1625	Health Education Materials and Resources for Women with History of Gestational Diabetes Mellitus *Assoc Prof Tang Wern Ee, Senior Consultant and Director of the Clinical Research Unit, National Healthcare Group Polyclinics and Assistant Dean, Family Medicine, Lee Kong Chian School of Medicine, Singapore*
1650	Influences of the Perinatal Diet on Maternal and Child Health: Insights from the Growing Up in Singapore Towards healthy Outcomes (GUSTO) study *Dr Lai Jun Shi, Senior Research Fellow, Singapore Institute for Clinical Sciences, Singapore*
1700	Closing Remarks
1710	*-End of Programme-*

SCIENTIFIC PROGRAMME

Theme: *Optimal Metabolic Health for Women and Children*

DAY 2 – 09 JANUARY 2021, SATURDAY (Track 3 – CHILD HEALTH)	
0900	ASIA PACIFIC CONSENSUS WORKSHOP ON INTEGRATED 24-HOUR ACTIVITY GUIDELINES FOR CHILDREN AND ADOLESCENTS *Opening by Chairperson: Dr Benny Loo Kai Guo, Consultant Paediatrician, General Paediatrics Service and Sports Medicine Service, KK Women's and Children's Hospital, Singapore* *Co-Chairperson: Adj Assoc Prof Benedict Tan Chi'-Loong, Senior Consultant and Chief of Sport and Exercise Medicine, Changi General Hospitall, Singapore Facilitators: Dr Terry Teo, IPRAMHO Assistant Manager, KK Women's and Children's Hospital, Singapore & Dr Elaine Quah, IPRAMHO Fellow, KK Women's and Children's Hospital, Singapore*
0905	Physical Activity, Sedentary Behaviour and Sleep Profiles and Their Transition in Children Aged 5.5 and 8 years – Findings from a Prospective Birth Cohort Study *Ms Natarajan Padmapriya, Research Associate, National University of Singapore, Singapore* Factors in the Successful Weight Loss Intervention among Overweight and Obese Filipino School Children *Dr Divina Cristy Redondo-Samin, Chair, Medical Nutrition and Weight Management Center, Premiere Medical Center, Nueva Ecija, Philippines* Prevention of Childhood Obesity - Limiting screen time and encouraging physical activity to prevent overweight and metabolic problems in school children. *Assoc Prof Azriyanti bt Anuar Zaini, Department of Paediatrics, University Malaya Medical Centre, KL Malaysia* The Development and Impact of Australian 24-hour Movement Guidelines for Children and Young People *Senior Prof Anthony Okely, Director of Research, Early Start, University of Wollongong, Australia*

SCIENTIFIC PROGRAMME

Theme: *Optimal Metabolic Health for Women and Children*

DAY 2 – 09 JANUARY 2021, SATURDAY (Track 3 – CHILD HEALTH)	
1000	Consensus Introduction: *Dr Benny Loo Kai Guo & A/Prof Benedict Tan Chi'-Loong* IPRAMHO Survey on Integrated 24-Hour Activity (I-24 Study) for Children & Adolescents: *Dr Elaine Quah, IPRAMHO Fellow, KK Women's and Children's Hospital, Singapore* Asia Pacific Consensus Statements Discussion: *Panel Members include: Dr Aman Bakhti Pulungan, President of Indonesian Pediatric Society, Indonesia; Dr Huynh Manh Nhi, Hospital for Traumatology and Orthopedics, Vietnam; Dr Nguyen Thuy Song Ha, University of Medicine Pham Ngoc Thach, Vietnam; Prof Luo Feihong, Department of Pediatric Endocrinology and Inborn Metabolic Diseases, Children's Hospital, Fudan University, China; Prof MCK Nair, Vice-Chancellor Kerala University of Health Sciences, India; Prof Ichiro Morioka & Assoc Prof Nobuhiko Nagano Nihon University, Japan; Prof Sachith Mettananada, University of Kelaniya, Sri Lanka; Dr Areekul Amornsriwatanakul, Mahidol University, Thailand; Assoc Prof Pongsak Noipayak, Vice President, Navamindradhiraj University, Thailand; Dr Divina Cristy Redondo-Samin, Philippines; Assoc Prof Azriyanti bt Anuar Zaini, Dept of Paediatrics, University of Malaya, Malaysia; Dr Thiyagar A/L Nadarajaw, Hospital Sultanah Bahiyah, Kedah, Malaysia; Prof Dr Muhammad Yazid Jalaludin, Head of Department of Paediatrics, Faculty of Medicine, University of Malaya, Malaysia; Assoc Prof Betty BUT Wain Man, Queen Elizabeth Hospital, Hong Kong; Dr Mya Sandar Thein, Yangon Children Hospital, Myanmar; Senior Prof Tony Okely, Faculty of Social Sciences and Director of Research at Early Start at the University of Wollongong, Australia; Prof Chia Yong Hwa Michael, NTU, Singapore; Mr Micheal Lim, KKH, Singapore; Dr Mohammad Ashik, KKH, Singapore; Dr Chan Poh Chong, NUH, Singapore; Dr Tan Ngiap Chuan, SingHealth Polyclinics; Dr Oh Jean Yin, KKH, Singapore Dr Teresa Tan, NUH, Singapore; A/Prof Falk Mueller-Riemenschneider, Berlin Institute of Health, Germany; Dr Natarajan Padmapriya, NUS, Singapore* Discussion on Collaborative Study - Asia Pacific Survey on Integrated 24-Hour Activity (I-24 Study) for Children & Adolescents
1300	*Intermission*
1330	Solving The Double Burden of Malnutrition in Indonesian Children *Prof Aman B Pulungan, Dept of Child Health, Faculty of Medicine Universitas Indonesia – Cipto Mangunkusumo General Hospital, Indonesia & President of Indonesian Pediatric Society, President of the Asia Pacific Pediatric Association* The Burden of Physical Inactivity Among Children and Adolescents in Sri Lanka *Prof Sachith Mettananda, Department of Paediatrics, Faculty of Medicine, University of Kelaniya, Sri Lanka* Child Obesity in Vietnam *Dr Huynh Manh Nhi, Hospital for Traumatology and Orthopedics, Vietnam and Dr Nguyen Thuy Song Ha, University of Medicine Pham Ngoc Thach, Vietnam* A Snapshot of Obesity and Type 2 Diabetes Mellitus in Hong Kong *Assoc Prof Betty But Wai Man, Department of Paediatrics, Queen Elizabeth Hospital, Hong Kong*

SCIENTIFIC PROGRAMME

Theme: *Optimal Metabolic Health for Women and Children*

DAY 2 – 09 JANUARY 2021, SATURDAY

(Track 3 – CHILD HEALTH)

	The Young Onset Clinical Features of Chinese Pediatric Type 2 Diabetes Warrants an Early Screening Strategy *Prof Luo Feihong, Director, Department of Pediatric Endocrinology and Inherited Metabolic Diseases, Children's Hospital of Fudan University, Shanghai, China*
	Subclass Distribution of Low-density Lipoprotein Triglyceride and the Clustering of Metabolic Syndrome Components in Japanese Children *Assoc Prof Nobuhiko Nagano, Department of Pediatrics and Child Health, Nihon University School of Medicine, Tokyo, Japan*
	Adolescent Obesity in Malaysia *Dr Thiyagar Nadarajaw, Head of Paediatric Department, Hospital Sultanah Bahiyah, Alor Setar & State consultant for Paediatric services in Kedah, Malaysia*
	Physical Activity Participation Among Thai Children and Its Relationship with Their Metabolic Health *Dr Areekul Amornsriwatanakul, Mahidol University, Thailand and A/Prof Pongsak Noipayak, Vice President, Navamindradhiraj University, Thailand*
	Childhood Overweight and Obesity: Current Challenges in Myanmar *Dr Mya Sandar Thein, Yangon Children Hospital, Myanmar*
	Metabolic Syndrome among Adolescents in Malaysia *Prof Dr Muhammad Yazid Jalaludin, Head of Department of Paediatrics, Faculty of Medicine, University Malaya, Malaysia*
	Influence of Physical Inactivity and Sedentary Lifestyle on the Developmental Health of Children in South India *Prof MCK Nair, Developmental Paediatrician & Vice-Chancellor Kerala University of Health Sciences, India*
	Infant of a Diabetic Mother – What is New? *Prof V Samuel Rajadurai, President, Perinatal Society of Singapore & Senior Consultant, Department of Neonatology KK Women's and Children's Hospital, Singapore*
1630	Closing Remarks *by Chairperson: Dr Benny Loo Kai Guo, Consultant Paediatrician, General Paediatrics Service and Sports Medicine Service, KK Women's and Children's Hospital, Singapore*
1645	*-End of Programme-*

SCIENTIFIC PROGRAMME

Theme: *Optimal Metabolic Health for Women and Children*

DAY 2 – 09 JANUARY 2021, SATURDAY (Track 4 – MATERNAL HEALTH)	
0900	IPRAMHO-INTERNATIONAL COLLABORATIVE STUDY NETWORK Opening and Introduction *Opening by Lead: Prof Tan Kok Hian, IPRAMHO Lead Investigator, KK Women's and Children's Hospital, Singapore & Prof Satvinder Singh, IPRAMHO Investigator, Australia* *Facilitators: Dr Ryan Lee, IPRAMHO Investigator, KK Women's and Children's Hospital, Singapore & Dr Ye Jiangfeng, IPRAMHO Fellow*
0915	New ADIPS guidelines for Type 1 and Type 2 diabetes in pregnancy *Assoc Prof Alexis Shub, Diabetes and Endocrine Clinic, University of Melbourne, Australia* Prevalence and Characteristics of GDM by Early Universal Screening in Siriraj Hospital *Assoc Prof Dittakarn Boriboonhirunsan, Faculty of Medicine Siriraj Hospital, Thailand* The Obstetrical VTE Prevention in China - Pregnancy-related Venous Thromboembolism and its Association with Organizational Factors *Prof Li Xiaotian, Professor and Vice-President of Obstetrics and Gynecology Hospital Fudan University, China* Implementation of a Checklist Protocol for Management of Hypertensive Disorders in Pregnancy in Mount Alvernia Hospital *Dr Tony Tan, Mount Alvernia Hospital, Singapore* Clinical and Metabolic Characteristics of Gestational Diabetes Diagnosed in Early Pregnancy *Dr Yoshifumi Kasuga, Keio University School of Medicine, Japan* Trends in Diabetes among Pregnant Women in Suburban Setup in Sri Lanka *Prof Tiran Daminda Dias, University of Kelaniya, Sri Lanka*
1115	IPRAMHO-INTERNATIONAL COLLABORATIVE STUDIES *Prof Tan Kok Hian, IPRAMHO Lead Investigator, KK Women's and Children's Hospital, Singapore* *Dr Ye Jiangfeng, IPRAMHO Fellow, KK Women's and Children's Hospital, Singapore*
1200	*Intermission*
1330	Maternal Metabolic Health in the Philippines *Assoc Prof Valerie T Guinto, University of the Philippines-Philippine General Hospital, Philippines* Practical Management of Hypertensive Disorders during Pregnancy in Tu Du Hospital, Vietnam *Dr Tran Thi Lien Huong (Scarlett), Tu Du O/G Hospital, Ho Chi Minh City, Vietnam*

SCIENTIFIC PROGRAMME

Theme: *Optimal Metabolic Health for Women and Children*

DAY 2 – 09 JANUARY 2021, SATURDAY (Track 4 – MATERNAL HEALTH)	
	Newborn Screening in India: Challenges in Implementation *Prof Milind R Shah, Naval Maternity & Nursing Home, India & Deputy Secretary General Asia Oceania Federation of Perinatal Societies* Other Panel Speakers include: *Dr Krishna Kumar, Hospital Tuanku Ja'afar Seremban, Malaysia* *Prof Swe Swe Myint, Central Women Hospital, Yangon, Myanmar* *Dr Herman Kristanto Indonesia* Discussion on the Next Steps in IPRAMHO-International Collaboration *Prof Tan Kok Hian, IPRAMHO Lead Investigator, KK Women's and Children's Hospital, Singapore* *Prof Satvinder Singh, IPRAMHO Investigator, Australia*
1530	-End of Programme-

COMMENTARY

The Life Course Approach to Healthcare for Obstetrics and Gynaecology and its Impact on Transgenerational Health

Kok Hian Tan
Department of Maternal Fetal Medicine, KK Women's and Children's Hospital

Obstetrics & Gynaecology (O&G or OBGYN) is the branch of medicine that specializes in the care of women during pregnancy and childbirth and in the diagnosis and treatment of diseases of the female reproductive organs. While OBGYN is considered one specialty, it comprises two distinct fields. Obstetrics (OB) involves care during pre-conception, pregnancy, childbirth, and immediately after delivery. Gynaecology (GYN) involves care of all women's health issues.

OBGYN doctors work closely with various specialties: e.g. in reproductive health with geneticists and endocrinologists; in fetal health & perinatal health with neonatologists and paediatricians; in healthcare of young female adolescent health with paediatricians; and in care of adult women and menopausal health with many other specialties including family health physicians.

There has been increasing interest in taking a life course approach to women's health and applying it to the clinical practice of OBGYN. (1-4) The 'Developmental Origins of Health and Disease (DOHaD)' hypothesis, a more recent term for the concept initially proposed and called 'Fetal Origins of Adult Disease'. (5-9) The concept postulates that exposure to certain environmental influences during critical periods of development and growth may have significant consequences on an individual's short- and long-term health. The developing fetus, if exposed to an adverse uterine environment (caused by insults such as poor or excessive nutrition or infections), responds by developing adaptations, that not only foster its immediate viability, but also affect its survival if a similar environment is encountered later in life, including resultant susceptibility to chronic diseases.

Life is a continuum from cradle to grave and each life stage affects the woman's health and wellbeing and that of the future generations. The life course approach to healthcare for Obstetrics and Gynaecology is proactive and preventive, and can make a great impact on the health of women, babies and children as well as transgenerational health, if implemented well. The life course concept recognizes the opportunity to prevent and control diseases at key stages of life from preconception through pregnancy, infancy, childhood and adolescence, through to adulthood. A life course approach aims at improving the effectiveness of interventions throughout a person's life especially in early years to enhance human potential and development. It evaluates the science of the developmental origins of health and disease. It focuses on a healthy start to life and targets the needs of people at critical periods throughout their lifetime. It promotes timely investments and implementation with a high rate of return for public health and the economy by addressing the causes, not the consequences, of ill health.

A clear example of life course application in OBGYN is in the area of metabolic health of mother and the child. The prevention and management of gestational diabetes mellitus (GDM) and obesity must start early (preconception, fetus in the womb, infant & child) rather than at a later stage of life to gain optimal preventive value and maximum leverage on quality of life. Optimal nutrition, physical activities and weight management before, during and after pregnancy have a strong influence in prevention and management of diabetes and obesity and on the well-being of mothers and development of infants. The need for optimal perinatal nutrition and optimal lifestyle at these critical stages is paramount to improve metabolic health.

The first thousand days - from conception to age 2 - is perhaps the most critical and has significant influence on long term health and development. The fetus and infant at these stages of development are most adaptable. They respond to a range of factors in the environment resulting in changes in their epigenetic makeup with lifelong effects including increased susceptibility to the adverse development of non-communicable diseases (NCDs) such as diabetes, obesity and hypertension in adulthood. This is known as the Developmental Origins of Health and Disease (DOHaD) which has been shown to be transgenerational in nature.

The burden is substantial and consequences will be huge if these are not addressed in the proactive preventive style of life course approach. Hypertension & pre-eclampsia in pregnancy accounted for about 5% of pregnant population while gestational diabetes incidence reached above 15%. Obesity and overweight in pregnancy are rising and constituted more than 30% of our local antenatal patients and excessive gestational weight gain is common for more than 25% of patients. Childhood obesity in Singapore hovers above 10%. (10-13) Poor understanding and application of the life course interventions will create a vicious cycle perpetuating worsening population metabolic health instead of a virtuous cycle.

The growing threat of NCDs can be mitigated by a life course approach with interventions at key stages from preconception through pregnancy, infancy, childhood and through to adulthood. The advantages of using a life course model to study adult health is that it is interdisciplinary and integrates social and medical interventions. It also allows synthesis of other models of health and chronic disease such as the fetal origins and adult lifestyle models. It requires education on transgenerational health and full collaboration and co-operation of all fields and specialties in medicine and outside medicine – whole of society approach, promoting transgenerational health.

Integrated Platform for Research in Advancing Metabolic Health Outcomes of Women and Children (IPRAMHO) is a Singapore National Medical Research Council (NMRC) funded joint collaborative pot centre grant awarded to KK Women's and Children's Hospital (KKH), SingHealth Polyclinics (SHP) & National Healthcare Group Polyclinics (NHGP). This is a unique collaborative centre grant where both Singapore public primary health care providers (SingHealth Polyclinics & National Health Group Polyclinics) have come together to work with KKH, the largest tertiary and main referral center for Paediatrics, Obstetrics and Gynaecology in Singapore, on collaborative metabolic health research in women and children, aligning with Singapore RIE2020 goals and also RIE2025 goal of developing human potential and promoting transgenerational health. IPRAMHO also led Asia Collaborative Study with GDM experts in Asia-Pacific region to promote evidence-based research and establishment of guidelines for the management of GDM and related lifestyle issues. IPRAMHO have also encouraged comparative analyses and practice sharing between different countries. (14-16)

National and regional guidelines & consensus are useful for enhancing education and lifestyle behavioural changes at critical life course stages and promoting transgenerational health. In 2018 IPRAMHO facilitated the College of Obstetricians and Gynaecologists, Singapore on the Guidelines on the Management of Gestational Diabetes which was launched. Through IPRAMHO international meeting in 2019, the collaborative group also achieved and published the AOFOG MFM Committee Consensus of GDM screening. IPRAMHO helped the launched the Perinatal Society of Singapore Optimal Perinatal Nutrition Guidelines and also published the Asia Pacific Consensus in Perinatal Nutrition in 2019. In 2020, the Perinatal Society of Singapore Guidelines on Physical Activity & Exercise in Pregnancy was launched and this year 2021, IPRAMHO facilitated a collaborative group nationally to launch the Singapore Integrated 24-Hour Movement Guidelines for Children & Adolescents. (17-22)

Just like life is a continuum, so is OBGYN care - a continuum. For optimal care and promotion of women's health, it behoves an OBGYN specialist to appreciate a life course approach to women's health and to apply it well to the clinical practice of OBGYN. OBGYN specialists need to work closely with primary care physicians, practitioners of various medical and surgical specialties, epidemiologists & public health practitioners, allied health, nursing; and population health, implementation science & improvement science practitioners to improve the transgenerational care of women and children. Together we should aspire to help translate our research findings effectively for active dissemination & implementation to improve the population health of women and children, enhancing early life-course moments preconception onwards and optimising the potential of every child born in Singapore and our region. This is also in line with RIE2025, where a key focus will be on improving prenatal and early childhood development and outcomes. (23)

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SINGAPORE INTEGRATED 24-HOUR ACTIVITY GUIDELINES FOR CHILDREN AND ADOLESCENTS

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Singapore Integrated 24-Hour Activity Guidelines for Children and Adolescents Workgroup

Supported by NMRC Integrated Platform for Research in Advancing Metabolic Health Outcomes of Women and Children (IPRAMHO)

Partnered with Exercise is Medicine Singapore (EIMS), Sports Medicine Association Singapore (SMAS), Perinatal Society of Singapore, Singapore Paediatric Society (SPS), The College of Family Physicians Singapore (CFPS) & Singapore Medical Association (SMA)

8 January 2021

Introduction

The 2017 National Population Health Survey revealed that the proportion of overweight children has increased from 11% in 2013 to 13% in 2017. (1) Studies on Singaporean children and adolescents have previously shown that they could only meet up to 40% of the recommended physical activity level and above 70% of adolescents exceeded more than 2 hours of electronic screen time daily. (2-3) However, a study published in 2015 by Ting et al involving 233 adolescents showed that none of the participants achieved the recommended 60 minutes of moderate-to-vigorous physical activity and engaged in excessive amount of sedentary behaviour. (4) Furthermore, screen time has increased due to the COVID-19 pandemic and introduction of home-based learning. (5-6) These developments have prompted healthcare professionals to provide guidance for Singaporean children and adolescents towards better health.

For children and adolescents, physical activity is encouraged for leisure (e.g. play, sports or planned exercise), as part of physical education or through transportation (e.g. walking, running and cycling) in the context of home, school or community settings. (7-8) Children and adolescents should have access to safe and equitable opportunities to participate in varied physical activities that are enjoyable and age- and ability-appropriate, either individually or in groups. (9-10)

Periods of sedentary behaviour and recreational screen time should be kept to a minimum. (11-12) These periods can be improved by setting boundaries (e.g. duration) or interrupted with regular breaks for physical activity. (13-14) Establishing a consistent bedtime routine is important to help children and adolescents achieve regular and adequate sleep time. (15-16)

Guideline Summary

Our objective is to provide guidance to encourage Singaporean children and adolescents to adopt a holistic approach towards integrating all types of activity within a daily 24-hour period. These activities (including light, moderate and vigorous physical activity, sedentary behaviour, sleep and eating activity) are closely inter-related in terms of health benefits and time consumption. It is equally vital to understand the importance of each type of activity and to organise these activities throughout a day (and night) schedule for the best health outcomes.

These guidelines to follow are for all healthy children and adolescents (aged 7 to 18 years old), irrespective of gender, cultural background or socioeconomic status. Children and adolescents with special needs or medical conditions should consult a qualified medical professional for additional guidance.

Evidences

Current national and international physical activity and movement guidelines for children and adolescents, including recommendations from the World Health Organization, were reviewed. Relevant evidence on this topic was searched electronically. Only results in English language were considered and the quality of the evidence was rated. We have presented the process using the GRADE Evidence to Decision framework (17) and this is included as a supplementary material. These guidelines are recommended for healthcare professionals providing holistic care of children and adolescents including educating, encouraging and promoting beneficial activities that, hopefully, will continue into their adulthood for a life-time of good health.

CONSENSUS STATEMENTS

1. For physical, mental and social health, children and adolescents should acquire a lifestyle that integrates regular physical activity, limited sedentary behaviour, adequate sleep and good eating habits within each 24-hour period.

Physical activity is essential for healthy growth and development in children and adolescents. (18) Research shows that regular physical activity improves aerobic fitness, body composition, metabolic risks, musculoskeletal health, mental health and academic results in children and adolescents. (18-21) Emergent evidence shows that prolonged sedentary behaviour, particularly unregulated and unrestrained screen time, is associated with a range of adverse health outcomes including obesity. (22-24) Sleep duration and quality impact child- and adolescent-health significantly as shorter sleep duration is associated with childhood obesity. (25-26) The challenge is to incorporate adequate physical activity, low sedentary behaviours and adequate sleep duration for the best health outcomes in children and adolescents. (27)

2. Accumulate at least an average of 60 minutes per day of moderate-to-vigorous intensity physical activity in a week, where more is better.

The premise of a healthy lifestyle includes regular physical activity participation. In children and adolescents, regular physical activity or physical sport participation is associated with lifelong health benefits. (18,28-30) Activities of all types and performed across all intensity levels, should be encouraged to promote habitual physical activity or active play and physical sports engagement and development of health-related and skill-related fitness. (28,30-32)

To achieve substantive health benefits, children and adolescents should aim to accumulate an average of 60 minutes or more of physical activity (including play, games, sports, physical education, planned exercise or transportation) per day in a week and most of these activities should be of at least moderate intensity. (18-19,29-30) For greater health gains, vigorous intensity activities should in incorporated where possible. (18-19,30)

3. Engage in muscle and bone strengthening exercises at least three times a week. This could be part of the daily minimum accumulation of 60 minutes of moderate-to-vigorous intensity physical activity.

Muscle and bone strengthening exercises should be incorporated into a child's physical activity regime. (19,29-30,33) These exercises range from weight-bearing activities, resistance exercise using body or light weights, or light impact exercises such as skipping, hopping or jumping. (33-34) The inclusion of these activities promotes strength gains, development of strong joints and healthy bones, which are vital for optimal growth and development. (33-35) Building an early foundation of good joint and bone health during childhood helps to prevent injuries, improve exercise performance and prevent the development of bone-related health issues in future. (34-35)

4. Engage regularly in a variety of light physical activities throughout the day.

Light physical activities can range from static (e.g. standing) to dynamic (e.g. slow walking). (36) Make every choice count - choose the more active option! (37) Light-intensity physical activity has health benefits too. (37-39) Stand and move about rather than sit. Take a walk, rather than drive. Take the stairs, rather than the lift or escalator. Encourage active play, rather than playing with screens. (37,40) Play outdoors, rather than indoors. (40) Setting a target of achieving an accumulated 12,000 steps per day also helps children and adolescents meet the daily physical activity recommendation. (31-32,41)

5. Limit recreational screen time as much as possible.

Recreational screen time activities include television viewing, computer, tablet or phone device use, physically inactive video games. (42-43) In children and adolescents, of all the sedentary activities, recreational screen time more than 2 hours daily is associated with the most adverse health outcomes. (23,43) The benefits of limiting this screen-based sedentary behaviour include reduced adiposity, improved motor and cognitive development and better psychosocial health. (23,44) Providers should address this behaviour by assessing the duration and use of recreational screen time and then suggest parenting strategies to limit use as much as possible. (23,42,44-45)

6. Build in regular breaks to move around during times of prolonged sitting or inactivity.

It is inevitable that there are times when children are remained seated for prolonged periods, be it during a classroom lesson or a long-distance trip. Prolonged sedentary behaviour is damaging to health, but when this is unavoidable, it is important to include regular breaks to encourage frequent movement and physical activity. While this contributes to a child's overall physical activity levels, (46) it is also beneficial for their mental and social health, (20) and these activity breaks help children to better concentrate in school. (47) Breaks need not be very long, but undertaking a few minutes of movement every 30-60 minutes of sedentary time, together with encouraging play during break times should help limit the impact of prolonged physical inactivity. (48)

7. Have regular sleep of at least 9 hours (for 7-13 years old), at least 8 hours (for 14-17 years old) and at least 7 hours (for 18 years old).

Sleep is a critical component of mental and physical health that is often sacrificed to make time for daytime activities. Achieving the number of recommended hours of sleep regularly is associated with better health outcomes in terms of attention, memory, learning, behaviour, emotional regulation, quality of life, mental and physical health. (49) Insufficient sleep increases the risk of accidents and injuries, especially during physical activity, and in the longer term is associated with obesity, hypertension, diabetes and depression. (49-52) Children 7 to 13 years old should sleep 9 to 12 hours, and teenagers 14 to 17 years old should sleep 8 to 10 hours and 18 years old should sleep 7 to 9 hours per 24 hours regularly. (49, 53)

8. Take the necessary precautions before, during and after exercise and see a doctor if you feel unwell during the exercise.

The benefits of physical activity outweigh its risks. Safety is key in minimising injuries during physical activities or in organized sports. This will ensure the child's well-being and continued participation in exercise and sports in the long term. (54) Use appropriate equipment and footwear for exercise or sport. Exercise in areas that are free of hazards like broken equipment and uneven surfaces. Avoid exercising outdoors in extremely hot and humid conditions. (55) Perform warm-ups before exercise and cool-down stretching post activity. (55) Ensure adequate hydration and apply protection against the sun and insects. (56-57)

For organised sports, understand and follow the rules of the game or sports. Practice the skills needed for the activities, like climbing, balancing and throwing, and adopt proper form and technique. (55) Ensure proper conditioning in fitness, strength and flexibility appropriate to the sports activities undertaken. (55,58) Do a variety of activities all year long and avoid specializing in a single sport at a young age. (58-59)

Avoid strenuous activities when unwell. (56-57) Take a rest if you experience any chest pain, breathlessness, palpitations, dizziness and seek medical attention if these symptoms are persistent. (60) If you have a pre-existing medical condition,

9. Have regular meals consisting of nutritionally-balanced foods and drinks to support daily activities, to optimise growth, maturation and development.

The social and ecological environment can strongly influence the dietary choices of the individual and their families. (61) Through parental modelling, a regular household eating routine provides opportunities for coordinated family meals and regulation of appetite, therefore affecting the overall diet quality of children and adolescents. (61-62) Consuming a nutritious breakfast as part of daily routine has also been associated with positive outcomes, including better diet quality and healthy body weight, and is strongly encouraged. (62)

Part of achieving a healthy eating pattern requires a conscious selection of food and drinks in age-appropriate portions that support a child's activity levels and growth. Suitable portions can be planned using visual aids, such as My Healthy Plate. A variety of foods across, and within, all food groups are required to meet nutrient requirements. (62-63) Nutritionally-balanced foods and drinks comprise all vegetables, fruits, whole grains, lean meats and poultry, seafood, legumes, unsalted nuts, low-fat dairy products and foods free of saturated and trans fats, prepared with limited solid fats (e.g. butter), sugars and refined starches. (64) Limiting consumption of added sugars, sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates, and sugar-sweetened beverages to not more than 10% of total energy intake can curb the risk of increased adiposity and overweight in children, as well as the formation of dental caries. (65-66)

10. Aim to achieve most or all recommendations on physical activity, sedentary behaviour, sleep and diet for the best results.

These recommendations on physical activity, sedentary and sleep behaviours are of comparable importance and meeting more of these recommendations will correspondingly improve the health indicators in physical, mental and social health. (67-68) Therefore, children and adolescents who can meet all recommendations (i.e. high moderate-to-vigorous intensity physical activity, low sedentary behaviour, high sleep, age-and-intensity appropriate diet) have the best health outcomes. (69-72)

Similar health outcomes can be achieved by meeting the same number of recommendations in various combinations. (67) This means that comparable health indicators can be achieved by meeting high moderate-to-vigorous physical activity and low sedentary behaviour, high sleep and low sedentary behaviour, or high moderate-to-vigorous physical activity and high sleep. (67,69,73-74) In conclusion, children and adolescents can start with any of these recommendations with the eventual aim of meeting all recommendations for the best health outcomes.

ANNEXES

Singapore Integrated 24-Hour Activity Guidelines for Children and Adolescents – SUMMARY STATEMENTS

Practical Reference for Physical Activities for Children and Adolescents are attached.

Singapore Integrated 24-Hour Activity Guidelines for Children and Adolescents (Brief)

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SINGAPORE INTEGRATED 24-HOUR ACTIVITY GUIDELINES FOR CHILDREN AND ADOLESCENTS STUDY WORKGROUP

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This guideline summary, endorsed by the College of Paediatrics & Child Health of Academy of Medicine Singapore and supported by and partnered with Exercise is Medicine Singapore (EIMS), Sports Medicine Association Singapore (SMAS), Perinatal Society of Singapore, Singapore Paediatric Society (SPS), The College of Family Physicians Singapore (CFPS) & Singapore Medical Association (SMA), acts as an educational aid and reference for healthcare professionals practicing in Singapore. The guideline summary does not define a standard of care, nor is it intended to dictate an exclusive course of management. It presents recognized clinical methods and techniques for consideration by practitioners for incorporation into their practice. It is acknowledged that management may vary and must always be responsive to the need of individual patients, resources, and limitations unique to the institution or type of practice.

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SINGAPORE INTEGRATED 24-HOUR ACTIVITY GUIDELINES FOR CHILDREN AND ADOLESCENTS

CONSENSUS SUMMARY STATEMENTS

1. For physical, mental and social health, children and adolescents should acquire a lifestyle that integrates regular physical activity, limited sedentary behaviour, adequate sleep and good eating habits within each 24-hour period.

2. Accumulate at least an average of 60 minutes per day of moderate-to-vigorous intensity physical activity in a week, where more is better.

3. Engage in muscle and bone strengthening exercises at least three times a week. This could be part of the daily minimum accumulation of 60 minutes of moderate-to-vigorous intensity physical activity.

4. Engage regularly in a variety of light physical activities throughout the day.

5. Limit recreational screen time as much as possible.

6. Build in regular breaks to move around during times of prolonged sitting or inactivity.

7. Have regular sleep of at least 9 hours (for 7-13 years old), at least 8 hours (for 14-17 years old) and at least 7 hours (for 18 years old).

8. Take the necessary precautions before, during and after exercise and see a doctor if you feel unwell during the exercise.

9. Have regular meals consisting of nutritionally-balanced foods and drinks to support daily activities, to optimise growth, maturation and development.

10. Aim to achieve most or all recommendations on physical activity, sedentary behaviour, sleep and diet for the best

PRACTICAL REFERENCE FOR PHYSICAL ACTIVITIES IN CHILDREN AND ADOLESCENTS

Activity Guide

Examples of activity that involve large muscle groups of the chest, back, upper and lower limbs and the trunk. Intensity of activity may differ depending on individual fitness level and can be monitored using the physical activity intensity guide below. These activities may be done individually, in pairs or in groups. The classifications are not mutually exclusive and it is possible for examples of play, leisure or exercise activities to overlap.

Activity category	Examples of Activity
Leisure (Play)	• Rope climbing • Climbing on playgroup equipment • Riding scooter • Chasing games (e.g. Catching, Tag) • Jumping • Hopping (e.g. Hop-scotch)
Leisure (Games or Sports)	• Ball games and/or Ultimate frisbee with throwing and catching • Dancing • Soccer • Basketball • Floorball • Hockey • Badminton • Squash • Tennis • Martial arts
Exercise (Planned or otherwise)	• Brisk walking • Running • Riding bicycle • Roller blading • Rope skipping • Dancing • Swimming • Flexibility or stretching exercise • Physical education
Lifestyle (includes Active Transportation)	• House work (e.g. Sweeping, Mopping) • Walking/cycling to train station • Stair climb or descent
Muscle and Bone strengthening exercises	• Resistance exercises (using Bodyweight, Resistance bands) • Modified push-up with knees on the floor • Full push-up • Sit-up • Assisted pull up/Full pull up • Games with rapid change in direction (e.g. Soccer, Basketball, Floorball, Hockey, Tennis)

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Physical Activity Intensity Guide

Intensity	Breathing and heart rate	Talk test	Heart rate (HR) monitoring*
Light	Minimal increase in breathing and heart rate	Can talk in full sentences and sing	60-70% of max HR
Moderate	Noticeable increase in breathing and heart rate	Can talk in phrases or short sentences but cannot sing	70-80% of max HR
Vigorous	Large increase in breathing and heart rate	Can say a few words	>80% of max HR

*Formula for maximum heart rate = 208 - (0.7 x age) beats per minute

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College of Paediatrics & Child Health of Academy of Medicine Singapore

SINGAPORE INTEGRATED 24-HOUR ACTIVITY GUIDELINES FOR CHILDREN AND ADOLESCENTS (BRIEF)

CONSENSUS STATEMENTS

1. For physical, mental and social health, children and adolescents should acquire a lifestyle that integrates regular physical activity, limited sedentary behaviour, adequate sleep and good eating habits within each 24-hour period.

    - Regular physical activity improves aerobic fitness, cardiometabolic risks, mental health and academic results.
    - Prolonged sedentary behaviour and shorter sleep duration are associated with negative health effects including obesity.
    - It is equally important to understand the importance of each type of behaviour and to organise them within each 24-hour period.

2. Accumulate at least an average of 60 minutes per day of moderate-to-vigorous intensity physical activity in a week, where more is better.

    - Participating in a range of physical activities for at least an average of 60 minutes or more per day in a week to promote habitual physical activity and development of health- and skill-related fitness.
    - The intensity of physical activity can be characterised by monitoring the breathing and heart rate or by the ability to speak in full or incomplete sentences (i.e. the talk test).
    - Moderate intensity is characterised by a noticeable increase in breathing and heart rate or the ability to talk in short sentences.
    - Vigorous intensity is characterised by a large increase in breathing and heart rate or the inability to talk in complete sentences.

3. Engage in muscle and bone strengthening exercises at least three times a week. This could be part of the daily minimum accumulation of 60 minutes of moderate-to-vigorous intensity physical activity.

    - These activities promote optimal physical growth and development, improve muscle strength and endurance, strengthens bone and help with injury prevention.
    - Exercises range from weight-bearing activities (e.g. climbing stairs) to resistance exercises using body weight (e.g. push-up) or light resistance (e.g. dumbbell).

4. Engage regularly in a variety of light physical activities throughout the day.

    - Light physical activities have health benefits and these activities range from not sitting and standing still to walking leisurely.
    - Choose the more active option as much as possible, such as climbing stairs instead of using elevators.
    - Encourage active outdoor play whenever possible.
    - Aim to achieve 12,000 steps or more daily, including planned and unplanned exercises.

5. Limit recreational screen time as much as possible.

- Recreational inactive screen time activities include television viewing, electronic device (e.g. phone, tablet and computer) use and physically inactive video games.
- Daily recreational screen time of 2 hours or more is associated with the most negative health effects such as weight gain, poor motor and mental development, and poor psychosocial health.

6. Build in regular breaks to move around during times of prolonged sitting or inactivity.

- Prolonged physical inactivity is damaging to health.
- Take 3-5 minutes breaks for every 30-60 minutes of sedentary physical inactivity.
- These breaks with movement and/or play can reduce the negative impact of prolonged physical inactivity.

7. Have regular sleep of at least 9 hours (for 7-13 years old), at least 8 hours (for 14-17 years old) and at least 7 hours (for 18 years old).

- Achieving the recommended hours of sleep regularly is associated with better attention, learning, behaviour, emotional regulation, mental and physical health.
- Insufficient sleep increases the risk of obesity, hypertension, diabetes and depression in the long term.

8. Take the necessary precautions before, during and after exercise and see a doctor if you feel unwell during the exercise.

- Use appropriate equipment and footwear.
- Always warm-up before and cool-down after exercise.
- Hydrate well before, during and after the exercise and water is always the better option.
- Apply protection against sun and insects when exercising outdoors.
- Do not exercise when unwell and seek medical attention if you experience persistent chest pain, breathlessness, dizziness, bone or joint pain during or after exercise.

9. Have regular meals consisting of nutritionally-balanced foods and drinks to support daily activities, to optimise growth, maturation and development.

- Have good eating habits such as eating together as a family and having regular meal times.
- Nutritionally-balanced foods and drinks include all vegetables, fruits, whole grains, lean meats and poultry, seafood, legumes, unsalted nuts, foods prepared with limited solid fats (e.g. butter), sugars and refined starches.
- Limiting consumption of added sugars, food products with natural sugars (e.g. honey, fruit juices) and sugar-sweetened beverages can reduce the risk of obesity and dental caries in children.

10. Aim to achieve most or all recommendations on physical activity, sedentary behaviour, sleep and diet for the best results.

- These recommendations may seem daunting. However once one can make this a way of life over each 24-hour day, it will become easier, more natural, and you will reap bountiful benefits, both physically and psycho-emotionally.
- Start with one or any combination of the recommended behaviours as you can achieve similar health benefits through the same number of recommendations in various combinations.
- Do this together with your friends and family and encourage each other to achieve all the recommendations for the

FACULTY BIOGRAPHIES – CHAIRPERSONS, PANEL MEMBERS & SPEAKERS (LIST IS IN ORDER OF APPEARANCE AT THE CONFERENCE)

Professor Alex Sia

Prof Alex Sia graduated from the Faculty of Medicine, National University of Singapore in 1989. He pursued specialty training in Anaesthesia and Intensive Care Medicine at KK Women's & Children's Hospital (KKH) and Singapore General Hospital, and received his Master of Medicine in Anaesthesia in 1994, and Certificate of Specialist Accreditation in Intensive Care Medicine in 2012. He earned his Master in Business Administration in 2015 from Singapore Management University, under the Ministry of Health Holdings Hospital Administration Scholarship Scheme.

Prof Sia assumed the role of Chief Executive Officer, KKH, on 1 May 2017. Prior to that he was Chairman, Medical Board, KKH, and Senior Associate Dean (KKH Campus), SingHealth Duke-NUS Medical School, Singapore, from 2012-2017. Prof Sia was Director, KK Research Centre, from 2009 to 2013 and Deputy Group Chairman Medical Board of Singapore Health Services Pte Ltd, from 2016-2017.

Prof Sia is Professor, Duke-NUS Medical School, Singapore, and since 2013, Prof Sia has been Clinical Professor, Yong Loo Lin School of Medicine. He is also Adjunct Professor, Engineering Design & Innovation Centre, at the National University of Singapore. Trained in Anaesthesia and Intensive Care Medicine, Prof Sia is concurrently Senior Consultant in the Department of Women's Anaesthesia, KKH.

Professor Satoshi Kusuda

Prof Kusuda MD, PhD is Clinical Professor at Tokyo Health Care University and Director Neonatal Research Network of Japan. He is President of Federation of Asia and Oceania Perinatal Societies. He is a neonatologist working at Kyorin University. He graduated medical school in Osaka, Osaka City University. After completing his pediatrics residency, he started specialty training at Children's Hospital at Osaka City and completed his training at Osaka City General Hospital. He is on the Board of the Japanese Society for Perinatal and Neonatal Medicine.

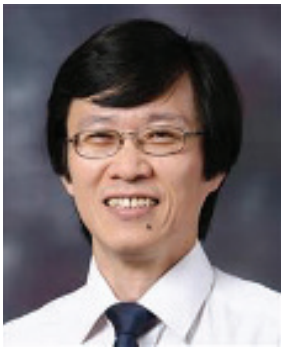
His primary research interests include neonatal management of respiratory and cardiac disorders and quality improvement. He is one of the founders of the Neonatal Research Network of Japan, and currently, he is a director of the network. The number of very preterm infants registered on the network database has reached more than 70 thousand (http://plaza.umin.ac.jp/nrndata/indexe.htm).

Associate Professor Chan Yoke Hwee

Clinical Associate Professor Yoke Hwee Chan is the Chair, Division of Medicine at KK Women's and Children's Hospital and the Chair, SingHealth Duke-NUS Paediatrics Academic Clinical Program (ACP). With her role as the Chair, Division of Medicine and Paediatrics ACP, Clinical Associate Professor Chan is passionate in the shaping of the delivery of Child Health in Singapore. She was a core member of the Transformation of Paediatric Services Taskforce commissioned by the Ministry of Health, Singapore. She is also member of the Regional Health Systems at the Singapore Health Services.

As a paediatric intensive care physician by training, Clinical Associate Professor Chan has special interest in paediatric home ventilation and played an important role in the establishment of the paediatric homecare programme in Singapore. Clinical Associate Professor Chan was the Director of the KKH Home Care Program from 2006 to 2017 during which the program benefited more than 1500 technology dependent children and expanded to include other patient with complex medical needs. Clinical Associate Professor Chan also established the Neonatal-Paediatric Extracorporeal Membrane Oxygenation Programme at the KK Women's and Children's Hospital. She also has special interest in extracorporeal therapies in the intensive care unit, namely continuous renal replacement therapies and ECMO. She is also passionate about patient safety and clinical quality.

Associate Professor Tan Hak Koon



A/Prof Tan Hak Koon is the Chairman of OBGYN-ACP, Duke-NUS Medical School and the Chairman of Division of Obstetrics and Gynaecology in KK Women's & Children's Hospital from 2020. He was the Head of Department of Obstetrics & Gynaecology of Singapore General Hospital from 2010 to 2019. He is also the Designated Institutional Official (DIO), of SingHealth Residency since 1 June 2018.

Besides general obstetrics and gynaecology, he specializes in high risk pregnancy and ultrasound scans. He is a Clinical Associate Professor for NUS Yong Loo Lin School of Medicine, as well as Adjunct Associate Professor for Duke-NUS Medical School. He was also the President for College of Obstetrics & Gynaecology Singapore from 2013 to 2015. He has been Chief, Section of Fetal Maternal Section (O&G) in SGH, (2003-2019). He is an IPRAMHO investigator.

Dr Chua Mei Chien

Dr Chua Mei Chien is a Senior Consultant and Head, Department of Neonatology, KK Women's and Children's Hospital (KKH) and Director, KK Human Milk Bank. Her special area of interest is in breastfeeding, early nutrition and the impact of nutrition on long term health. She has led a number of industry and investigator-initiated nutrition studies and also developed evidence-based protocols for nutritional management of preterm infants. Dr Chua is currently exploring new models of care with a multidisciplinary team to improve the metabolic health of mothers, infants and young children to stem the tide of non-communicable diseases in Singapore.

A breastfeeding advocate, she is the current President of the Association for Breastfeeding Advocacy (Singapore), Chairperson of the hospital's Baby Friendly Hospital Initiative (BFHI) committee and represents the hospital in the Sale of Infant Foods Ethics Committee Singapore (SIFECS). Dr Chua established Singapore's first donor human milk bank program in August 2017. The milk bank was accorded the SingHealth Excellent Award-Distinguished Team Award, the Public Service Transformation Award in 2019 and the National Clinical Excellence Team Award in 2020. She holds academic appointments with all three local medical schools and is the Vice President of the College of Pediatric and Child Health (Singapore). She is an IPRAMHO investigator.

Associate Professor Oh Jean Yin

Dr Oh Jean Yin is a Senior Consultant in the Department of Paediatrics at KK Women's & Children's Hospital, Singapore working to develop Adolescent Medicine within the hospital and community. She completed her postgraduate training in Paediatrics with specialist training and experience in Adolescent Medicine from 2006 in KK Hospital and as fellow in the Division of Adolescent Medicine, Toronto Sick Children's Hospital on 2008, returning to Singapore in 2009. With support of the Ministry of Health in the promotion of Adolescent Health, she focusses on service development for young people with obesity and eating disorders, teen pregnancy, and adolescents with chronic illness.
The work continues with KKH's Child and Adolescent Weight Management Program with efforts to find effective interventions that are risk stratified and stage-based, within the continuum of care. Her team has studied a family-based program (Lifestyle Intervention for Everyone – LITE) which has shown promising results and continue to study novel approaches using digital platforms and in the community.

She has spoken at various local and regional platforms on the stage-based approach for the management of Childhood Obesity. She is also currently a member of the Advisory Panel on Parenting (APOP) for the Ministry of Social and Family development (MSF) and was a member of the Healthy Youth Committee (HY-COM) for the Ministry of Education from 2009 – 2014. From her work in Adolescent Medicine with a focus on Childhood Obesity, she has developed an interest in inter-professional education and implementation science.

Associate Professor Fabian Yap Kok Peng

A/Prof Fabian Yap is Head & Senior Consultant Endocrinology Service, KK Women's and Children's Hospital.
His research Interests are in Clinical diabetes; Developmental origins of metabolic disease and How children grow and transform into adults. He is GUSTO Site PI and IPRAMHO Theme Lead.

Professor Tan Kok Hian

Prof Tan Kok Hian is Head, Perinatal Audit & Epidemiology and Senior Consultant, Maternal Fetal Medicine in KK Women's & Children's Hospital, Singapore. Prof Tan has active teaching faculty appointments in 3 medical schools (Duke-NUS as Professor; and both NUS-YLL & NTU-LKC as Adjunct Professor). Prof Tan is the Lead for Gestational Diabetes Mellitus (GDM), SingHealth Duke-NUS Diabetes Centre and the Lead Principal Investigator, NMRC Integrated Platform for Research in Advancing Metabolic Health Outcomes of Women and Children (IPRAMHO). He is Past President of Perinatal Society of Singapore and Past President of the Obstetrical & Gynaecological Society (OGSS) of Singapore. He is also Chairman of the Congress Trust Fund of OGSS.

Prof Tan initiated and led in the implementation of universal GDM screening and also introduced the new IADPSG criteria in KKH and SGH since January 2016. He is the key champion of GDM universal screening, which has now been adopted in all hospitals in Singapore with obstetric service. As Chairperson of College of Obstetricians & Gynaecologists, Singapore GDM Committee 2017-2018 and Chairperson, Expert Group GDM Appropriate Care Guide of The Agency for Care Effectiveness (ACE), Ministry of Health 2017-18, he was instrumental in leading GDM management. He facilitated the Asia Oceania Consensus in Gestational Diabetes in January 2018. He initiated the Perinatal Society of Singapore Advocacy Group for Engagement in Optimal Perinatal Nutrition in August 2018.

Prof Tan is the Lead for RIE2020 NMRC Collaborative Centre Grant - Integrated Platform for Research in Advancing Metabolic Health Outcomes of Women and Children (IPRAMHO) which builds core research capability & capacity in metabolic health for women and children of Singapore and Asia. Prof Tan received many awards for his academic & clinical contributions. These included World Health Organisation - UAE Health Foundation Prize 2009 as Integrated Perinatal Care Project Team Leader and the Benjamin Henry Sheares Professorship in Obstetrics and Gynaecology since 2019. He also serves as a WHO consultant for Patient Safety.

Dr Benny Loo Kai Guo

Dr Benny Loo is a Consultant Paediatrician working in General Paediatrics Service and Sports Medicine Service at KK Women's and Children's Hospital (KKH), Singapore. He graduated with MBBS in 2007 from the National University of Singapore (NUS) and obtained Masters of Medicine (Paediatric Medicine) from the NUS and Membership of the Royal College of Paediatrics and Child Health (United Kingdom) in 2014. He completed his SingHealth Paediatric Medicine Residency Programme in 2017 and joined the General Paediatrics Service.

In 2020, he joined the Sports Medicine Service in KKH as part of the SingHealth Duke-NUS Disease Centre (Sport & Exercise Medicine). Dr Benny is an IPRAMHO Investigator. He chaired the Workgroup on the development of the Singapore Integrated 24-Hour Movement Guidelines for Children and Adolescents.

Associate Professor Benedict Tan Chi'-Loong

A/Prof Ben Tan graduated in 1991 with a medical degree from the National University of Singapore and obtained his Masters in Sports Medicine in 1997 from the world-renown Australian Institute of Sport. He is a Fellow of the Academy of Medicine Singapore (FAMS) and American College of Sports Medicine (FACSM). Dr Tan is presently Chief of Sport and Exercise Medicine at Changi General Hospital. The Department runs three of Singapore's leading Sport & Exercise Medicine Centers – Singapore Sport & Exercise Medicine Centre @ CGH (SSMC@CGH), SSMC@Novena, and SSMC@SSI. In 2005, Dr Tan chaired the Sports Medicine Workgroup (Specialist Accreditation Board) that culminated in Sports Medicine being gazetted as a subspecialty in Singapore in 2011, and he continues to develop and grow the field of Sports Medicine as Chair of the Sports Medicine Subspecialty Training Committee and Head of the SingHealth Duke-NUS Sport & Exercise Medicine Centre (SDSC). A/Prof Tan chairs the Advisory Board of the NTU Lee Kong Chian School of Medicine's Graduate Diploma in Sports Medicine. Dr Tan also plays a pivotal role in the global Exercise is Medicine (EIM) movement, started by the American College of Sports Medicine, as chair of EIM Singapore and Asia. Globally, Dr Tan contributes to the sports ecosystem as a Member of the International Olympic Committee (IOC) Medical and Scientific Commission, Chair of World Sailing's Medical Commission, and Vice President of the Singapore National Olympic Council.

A former Nominated Member of Parliament, Dr Tan's main sport is sailing, where he won an Asian Games Gold and four consecutive SEA Games Golds, and represented Singapore at the 1996 Olympics. He has also completed more than 20 marathons, including all six World Marathon Majors, with a personal best of 2:56 hours. The books he authored, namely The Complete Introduction to Laser Racing (Benedict Tan, ed. The Complete Introduction to Laser Racing. Singapore: FSTOP Pte Ltd for Singapore Sports Council, 2000) and Run for Your Life! The Complete Marathon Guide (Benedict Tan, ed. Run for Your Life! The Complete Marathon Guide. Singapore: Marshall Cavendish Editions, 2009) feature the use of the sports sciences and medicine in training and competition. Another of his books, Fight the Fat - What You Must Know and Do to Lose Weight (Benedict Tan, ed. Fight the Fat – What You Must Know and Do to Lose Weight. Singapore: Marshall Cavendish Editions, 2007) forms the backbone of the SSMC Weight Loss Programme.

Associate Professor Falk Mueller-Riemenschneider

Dr Falk is Associate Professor at the Saw Swee Hock School of Public Health, National University of Singapore. He qualified as a medical doctor from the University of Cologne, Germany and subsequently worked in General Medicine and Cardiology at the Royal London Hospital and Oxford Radcliffe University Hospitals, United Kingdom. He completed a doctorate degree at the University of Cologne and a Master's degree in Public Health at the London School of Hygiene and Tropical Medicine. Falk's work focusses on the prevention of non-communicable diseases, with a particular emphasis on physical activity and movement behaviours among children and adults, as well as the application of digital technologies in public health research.

Professor Chia Yong Hwa Michael

Dr Michael Chia is a full professor of Paediatric Exercise Science at the Nanyang Technological University. He is qualified with a Distinction Diploma in Physical Education (PE) (College of Physical Education, Singapore), a first-class honours degree in PE and Sport Science (Loughborough University, United Kingdom) and Doctor of Philosophy in Exercise and Health Sciences (Exeter University, United Kingdom). His professional certifications are from the American College of Sport Medicine (Health and Fitness Director), the British Association of Sport and Exercise Sciences (Research Exercise Physiologist) and the Outward Bound School in Hong Kong (Diploma in Seamanship). His practice experience included teaching PE and coaching sport in schools in Singapore for five years and a one-year stint as a Manager for Johnson & Johnson Corporate Health Promotion at the Workplace in the antecedent years of the National Healthy Lifestyle Champaign. For a dozen years at the NIE, he held senior leadership appointments as the Academic Dean for Faculty Affairs, and before that as the Head of Physical Education and Sports Science (PESS). In that time, he was also the Chairman of the NTU Healthy Lifestyle Committee (HLC) where he introduced holistic healthy lifestyle programmes for more than 5000 university employees. This earned the NTU HLC team several national recognition awards for health promotion at the workplace.

In academia, he received several university and national awards for his excellence in teaching, for innovative research and for his administrative leadership and community service roles. He was co-contributor and co-author to the National Guidelines for Physical Activity (2011) for Singapore and the International Olympic Committee Consensus Statement on Youth Athletic Development (2015). He is the international principal investigator for a transdisciplinary research investigating the nexuses of digital and non-digital behaviours of preschool children across 20 countries (iissaar.com). He enjoys his work (teaching, research and exercise) and his play (exercise, research, teaching) tremendously, often confusing work and play as the same. Like many Singaporeans, he could do with more sleep, less sedentary time and more exercise!

Associate Professor Teoh Oon Hoe

Dr Teoh is Head and Senior Consultant of the Respiratory Medicine Service, and Deputy Head of the Department of Paediatrics at KK Women's & Children's Hospital. He also serves as the Deputy Head of the SingHealth Duke-NUS Sleep Centre.

Dr Chan Poh Chong

Dr Chan is the Head, General Ambulatory Paediatrics and Adolescent Medicine Division, Department of Paediatrics, Khoo Teck Puat National University Children's Medical Institute, National University Hospital, Singapore.

Associate Professor Ng Kee Chong

Clinical Associate Professor Ng Kee Chong is the Chairman, Medical Board, KK Women's and Children's Hospital (KKH) and a Senior Consultant, Children's Emergency, KKH. He was the Head of Children's Emergency, KKH, from March 2005 to February 2016 and was appointed Chairman, Division of Medicine in July 2012 as well as Chair, Academic clinical program (Paediatrics), SingHealth. He did a 1 year HMDP fellowship in Paediatric Emergency Medicine from 1998 to 1999 at the Hospital for Sick Children in Toronto, Ontario, Canada. He was formerly co-chairing KKH's Trauma Committee and was Chair of the KKH Emergency Preparedness Committee from 1997 to 2016. He was also Campus Director of Medical Innovation & Care Transformation (MICT), KKH till 2017

A/Prof Ng is the Vice-President of the MOH Singapore Resuscitation & First Aid Council (formerly National Resuscitation Council or NRC) and has also been a member of the MOH National Trauma Committee since 2008. He has been a member of the International Liaison Committee on Resuscitation (ILCOR) Pediatrics Taskforce since 2011. Associate Professor Ng is concurrently Duke-NUS Senior Associate Dean, KKH Campus, Clinical Associate Professor with the Duke-NUS Medical School, Yong Loo Lin School of Medicine and Lee Kong Chien School of Medicine and the President of the College of Paediatrics & Child Health, Academy of Medicine, Singapore.

Associate Professor Ang Seng Bin

Dr Ang Seng Bin is a Senior Consultant Family Physician in KK Women's and Children's Hospital. He currently heads the Family Medicine Service as well as Menopause Unit in KK Women's and Children's Hospital. He is a Co-Lead for IPRAMHO.

He is also the Associate Program Director of the SingHealth Family Medicine Residency program as well as an Adjunct Assistant Professor in Duke-NUS Medical School in the Family Medicine clerkship, Paediatric Clerkship, and Obstetrics and Gynaecology (OBGYN) Clerkship. Dr Ang is an adjunct associate professor of Curtin University. His research interests include osteoporosis, menopause, sexual health, diabetes mellitus as well as dermatology.

Associate Professor Derrick Chan

Dr Chan is Head & Senior Consultant, Neurology Service, KK Women's and Children's Hospital. He is also Programme Director, SingHealth Duke-NUS Clinician-Innovator Development Programme (CINDP), Deputy Director (Education), SingHealth MedTech Office and Director KK Research Centre.

Dr Chan has raised Paediatric Neurology at KKH to world-class standards, with trainees applying from the ASEAN region, Africa, the Middle East and Europe and recognition from Australia and the United Kingdom as a training centre. He mentored the SingHealth team for the 2017 Health Service Development Programme funded program "PINS: Paediatric Integrated Neurorehabilitation Service – Integrating tertiary and community care"

Professor Wong Tien Yin

Prof Wong is Arthur Lim Professor of Ophthalmology and Medical Director & Senior Consultant, Singapore National Eye Centre. He is Deputy Group CEO (Research & Education), SingHealth and Vice Dean, Duke-NUS Medical School. He completed medical school (MBBS) at NUS as a President's Scholar. He obtained a MPH and PhD from the Johns Hopkins University, USA and received clinical training in ophthalmology at the Singapore National Eye Centre, with retinal fellowships at the University of Wisconsin, Madison, USA and Westmead Hospital, University of Sydney, Australia. Prof Wong is an academic retinal specialist, with a clinical practice focused on macular and retinal diseases, including diabetic retinopathy and age-related macular degeneration, retinal vascular diseases and myopic macular degeneration.
Prof Wong leads an inter-disciplinary research programme in Singapore and Australia on diabetic retinopathy and on retinal imaging. He has published >1300 papers (h-index of 148). He is a Highly Cited Researchers™ 2020 by Clarivate (top 1% of all citations globally). He has given >400 invited named, plenary, and symposium lectures, and received >US$50 million in grant funding. He is a two-times recipient of the Singapore Translational Researcher (STaR) Award (2008 and 2014), the highest award for senior clinician-scientists in Singapore.

Prof Wong's research has improved the understanding of the burden and risk factors of diabetic retinopathy, a leading cause of blindness. From 2010, Prof Wong set up the national "telemedicine" screening program for diabetic retinopathy, the Singapore Integrated Diabetic Retinopathy Programme (SiDRP). The SIDRP now screens >150,000 persons with diabetes in Singapore annually across 18 primary care clinics, improving screening coverage and quality of referrals. His research on retinal imaging which have shown that measurements of changes in blood vessels in the retina may be a unique non-invasive test for a person's cardiovascular risk has led to development of a novel imaging software, now licensed and used by >30 international clinical, research and industry partners. In the past 5 years, his team have led research in artificial intelligence (AI) and digital health, with discoveries and publications in major journals such as New England Journal of Medicine, JAMA, Nature Medicine and Lancet Digital Health. He is Co-Founder of two start-up companies: plano (https://www.plano.co/) and EyRIS (http://eyris.io).

Prof Wong has been recognized with numerous awards, such as the Commonwealth Health Minister's Award, the Arnall Patz Medal from the Macula Society, the Alcon Research Institute Award and the Eisenhower Fellowship. He has given numerous named lectures, including the De Ocampo Lecture and the Jose Rizal Medal Lecture from APAO, the Tano Lecture from the APVRS, the EURETINA Lecture, the Fred Hollows Lecture from the Australian Ophthalmic and Visual Sciences, the Sir Runme Shaw Memorial Lecture from the Academy of Medicine Singapore, and the Sir Norman McAlister Gregg Lecture of Royal Australian & New Zealand College of Ophthalmologists (RANZCO). He has been recognized as the top researcher from NUS (Outstanding Researcher Award on two occasions, 2004, 2009) and the University of Melbourne (Woodward Medal). He has received the National Outstanding Clinician Scientist Award and the President's Science Award in 2010, and the President's Science and Technology Award in 2014, the highest awards for healthcare and scientific contribution in Singapore. Prof Wong is an elected Fellow of the Singapore National Academy of Sciences, one of two physicians on the Academy. He was elected to the US National Academy of Medicine (NAM) in 2020 (only the third from Singapore).

Mr John Gillman

Mr John Gillman is Director, Health Solutions for Fitbit APAC, with responsibility for driving Fitbit's health business in 14 countries across Asia Pacific. He has been with Fitbit for five years and previously held the role of Director, PR & Partnerships and Health Solutions Marketing for APAC, and is based in Singapore.

John has more than 25 years' experience in behaviour change, communications and marketing with organisations in Australia, the US and Asia. He works closely with Fitbit's global Health Solutions team to position and build Fitbit's focus on healthcare across Asia Pacific and has a passion for leading behaviour change and transformation across organisations, for their employees and customers.

At Fitbit, he has worked to build brand awareness, partnerships and has consulted with governments and organisations across the region to help them understand the benefits of integrating Fitbit products and services into population, customer and employee programs to improve health outcomes and drive positive and sustainable behaviour change.

He has worked for organisations in Australia including Telstra, National Australia Bank, Westpac and Myer, as well as Gap Inc in the US. He is a committed and enthusiastic Fitbit user with a daily target of 18,000 steps and 60 Active Zone Minutes.

Associate Professor Tan Lay Kok

Associate Professor Tan is a senior consultant obstetrician and gynecologist. He has a special interest in maternal medicine and high-risk pregnancy, and is the lead for the Centre for High Risk Pregnancy (CHiRP) at the Singapore General Hospital, which has joint multidisciplinary clinics in diabetes, cardiac disease, kidney disorders, rheumatological and hematological conditions in pregnancy, in addition to high risk obstetric and fetal medicine conditions. He is also the Vice Chair (Education) for the SingHealth OBGYN Academic Clinical Programme, and the Programme Director the postgraduate year 1 doctors (PGY1) in the Singapore General Hospital. He is also a Past President of the Singapore Obstetrical and Gynaecological Society of Singapore, and the President Elect for the College of Obstetricians and Gynaecologists Singapore. A/Prof Tan is an IPRAMHO investigator. He is in charge of the IPRAMHO education session.

Dr Serene Thain

Dr Serene Thain is a Consultant Obstetrician and Gynaecologist in the Department of Maternal Fetal Medicine at KK Women's and Children's Hospital in Singapore. She obtained her Membership of the Royal College of Surgeons MRCS (Edinburgh) in 2013 as well as her Membership of the Royal College of Physicians MRCP (UK) and Master of Medicine in Internal Medicine in 2014. In November 2015, she was admitted as a Member of the Royal College of Obstetricians and Gynaecologists (UK) and awarded the MRCOG Prize Medal for emerging as the overall highest scoring candidate in the examination, as well as the 4th Asia-Oceania Congress of Obstetrics and Gynaecology Gold Medal conferred by NUS for the M.Med (O&G) examinations. In 2017, she was also awarded the Shan S Ratnam Young Gynaecologist Award conferred by the Asia and Oceania Federation of Obstetrics and Gynaecology.

Dr Thain pursued her subspecialty training in the field of Obstetric Medicine under the mentorship of Professor Catherine Nelson-Piercy at Guy's and St Thomas' Hospital in London. She currently runs the various high risk obstetric and medical clinics within KKH and has also recently set up the one-STop Obstetric high RisK Centre (STORK) centre within KKH which aims to provide an integrated and seamless journey for women with medical and obstetric high risk conditions.

Dr Thain is currently a clinical tutor for Yong Loo Lin School of Medicine (NUS), Lee Kong Chian School of Medicine and an adjunct instructor and clinical teacher for Duke-NUS Medical School. She currently sits on the council of the College of Obstetricians and Gynaecologists, Singapore (COGS) as Treasurer and also the Obstetrical and Gynaecological Society, Singapore (OGSS). She is the representative for KK Women's and Children's Hospital in the RCOG International Representative Committee. She is also an associate editor for the Singapore Journal of Obstetrics and Gynaecology. Dr Thain is an IPRAMHO investigator

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Professor Shakila Thangaratinam

Dr Shakila Thangaratinam is a Professor of Maternal and Perinatal Health at Barts and the London School of Medicine, Barts Health NHS Trust and Queen Mary University of London. She is Joint Director of BARC (Barts Research Centre for Women's Health) and Director of WHO Collaborating Centre for Women's Health.

Professor Thangaratinam has established a strong portfolio of research in maternal and perinatal health. Her work focuses on prediction, prevention and treatment of pre-diabetes, eclampsia, epilepsy, and obesity. Her publications include papers in high-impact journals such as the Lancet, BMJ and PLOS Medicine. She leads several national and international collaborative research networks, and her work has influenced national and international guidelines. She is a member of Academic Board at the Royal College of Obstetricians and Gynaecologists (RCOG), UK.

She leads the International Weight Management in Pregnancy (i-WIP) collaborative group (40 researchers, 16 countries), with the largest live repository of individual data of over 12,500 participants (BMJ 2017). The findings of this work informed the UK Chief Medical Officers' recommendations on physical activity in pregnancy. She is the Chief Investigator of the ESTEEM trial, the largest study of Mediterranean diet in pregnancy to prevent maternal and offspring complications. She leads the prediction of pre-eclampsia IPPIC (International Prediction of Complications in Pregnancy) IPD meta-analysis project funded by NIHR HTA, and supported by the WHO study. The IPPIC collaborative network consists of 73 collaborators from 21 countries, and is the largest global repository of standardised IPD of over three million pregnancies (15 UK, 66 international datasets). Her evidence synthesis on association of complications in women with epilepsy (Lancet 2015) directly informed RCOG Green Top guidelines on the management of pregnant women. Prof Thangaratinam's work on risk of stillbirth in twin pregnancies (BMJ 2016) informs the national guidelines and garnered significant media attention

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Associate Professor Daphne Gardner

Dr Daphne Gardner graduated from Oxford University (UK) [BA (Physiological Sciences), BMBCh (Oxon)] and was a clinical lecturer in Plymouth (UK) before attaining specialist accreditation in Endocrinology in Singapore. Her fellowship year was spent in the Oxford Centre for Diabetes, Endocrinology and Metabolism, UK. She now serves as a Senior Consultant Endocrinologist and lead clinician for Young Adults with Diabetes, monogenic diabetes and the Intensive Insulin therapy programme including the use of technology and devices.

She is an adjunct Associate Professor with Duke-NUS Graduate Medical School and Director of Education in the SingHealth-Duke Disease Centre for Diabetes. She has held 2 grants aimed at stratifying diabetes to direct personalised therapy, and currently holds a Ministry of Health (Singapore) grant in the use of intermittent continuous glucose monitoring to enhance diabetes education in type 2 diabetes.

Dr Loy See Ling

Dr Loy is an Assistant Professor with Duke-NUS Medical School and working as a Senior Research Fellow in KK Women's and Children's Hospital. She attained her PhD in Human Nutrition in year 2014 and with special interest in life course epidemiology and nutritional epidemiology. She has received multiple international awards, fellowships and travel grants. Till date, she has published more than 50 journals and is the journal reviewer for many international journals. She has been awarded the NMRC Young Individual Research Grant in 2018, aiming to investigating the effect of maternal chrononutrition on pregnancy outcomes. She is actively involved in various research studies (locally or internationally), particularly cohort studies related to mother-offspring health.

Dr Tan Eng Loy

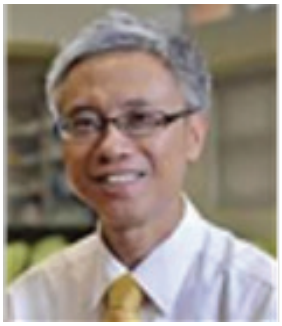
Dr Tan Eng Loy is a senior consultant obstetrician and gynaecologist at the Singapore General Hospital. His interests include high risk pregnancies, intrapartum obstetrics, electronic fetal monitoring, obstetric emergencies and trauma in pregnant women.

He is actively involved in undergraduate and post-graduate training within his department and conducts regular obstetric emergency drills and courses for medical and nursing staff. He is an experienced instructor on obstetric simulation courses such as the Managing Obstetric Emergencies and Trauma (MOET) course as well as on the PRactical Obstetric Multi-Professional Training (PROMPT) course, having taught on courses in the UK, Australia and New Zealand. He introduced PROMPT training to the Singhealth OBGYN Residency in 2014 via the inaugural OBstetrics TEam TRaining In Core Skills (OBSTETRICS) which has been held annually since. He has also crafted and organised specialized obstetric emergency courses and training for medical, nursing and midwifery staff and medical students not only in Singapore, but also in Bangalore, India, as part of a volunteer collaboration between Singhealth, the Singapore International Foundation and the State Institute of Health & Family Welfare, Government of Karnataka, Bangalore, India. A passionate educator at heart, he received the Outstanding Educator Award at the Golden Apple Awards 2017 organised by the Academic Medicine Education Institute, SingHealth Duke-NUS AMC.

At SGH, he is a Senior Consultant on the High Risk Pregnancy Clinic, the Gestational Diabetes Joint Clinic, and the Cardiac Obstetric Clinic at the SGH Centre for HIgh Risk Pregnancies (CHIRP).

Dr Tan Eng Loy graduated from medical school at the National University of Singapore in 2000. He trained in obstetrics and gynaecology at the KK Women's & Children's Hospital and the Singapore General Hospital. He obtained his Membership of the Royal College of Obstetricians & Gynaecologist (MRCOG) (United Kingdom) in 2006 and was also conferred Masters of Medicine (Obstetrics & Gynaecology) by the National University of Singapore in the same year. He trained and qualified as a certified instructor on the MOET course in 2009. He trained in a busy London maternity unit between 2011 – 2012 while further developing his skills as an instructor on obstetric emergency courses.

Associate Professor Tan Ngiap Chuan



A/Prof Tan is a Clinical Associate Professor (Dr) at SingHealth Polyclinics (SHP). He is also the Director, Department of Research at SingHealth Polyclinics HQ, Vice-chair (Research), SingHealth-Duke NUS Family Medicine Academic Clinical Program (FM ACP). He also coaches aspiring Family Physicians, primary care professionals and medical schools in the three local medical schools in Family Medicine research. He is a Co-Lead for IPRAMHO.

A/Prof Tan has research interests in the areas of chronic disease management such as diabetes mellitus, hypertension, dyslipidemia, obesity, asthma and COPD, disease prevention and innovations in primary care. He has published over 80 papers in peer-reviewed journals and one book chapter, and received presentation awards in medical conferences and the SingHealth Publish Award for FM in 2015. In the area of diabetes research, A/Prof Tan represents SHP in the Singapore Diabetes Taskforce and a member of the AGP Academy Steering Committee. He is the PI of multiple studies relating to type 2 diabetes mellitus, including NMRC HSR funded TRIUMPH study.

Associate Professor Tang Wern Ee

A/Prof Tang Wern Ee is a Family Physician, Senior Consultant and Director of the Clinical Research Unit at the National Healthcare Group Polyclinics. She is also Assistant Dean, Family Medicine at the Lee Kong Chian School of Medicine. She completed her basic medical education and Masters in Medicine (Family Medicine) at the National University of Singapore and her Masters in Health Professions Education at the MGH Institute of Health Professions (Boston). She is also a Fellow of the College of Family Physicians, Singapore. She has special interests in chronic disease management, health literacy and health services research in primary care. Under IPRAMHO, she is currently leading a team studying health education materials and resources for women who have had gestational diabetes. She is a Co-Lead for IPRAMHO.

Dr Tan Cherry

Dr Tan Cherry, PhD joined SingHealth Polyclinics in Mar 2009 after completing a full-time degree in nursing at LaTrobe University in Australia. She believed in improving patient care through research studies and went on to do a direct PhD in Nursing at the National University of Singapore. Dr Tan had in the past obtained research grant to study issues faced by older Singaporeans with type 2 diabetes in self-care management. She developed a new intervention called the Diabetes Self-efficacy Enhancing programme based on the self-efficacy model while addressing the key issues faced by older Singaporeans with type 2 diabetes. The intervention was tested in a randomized controlled trial which showed positive outcomes for older adults who underwent the intervention. Three papers arose from this study which were published in international journals. She has authored 4 refereed journal articles and presented at conferences both overseas and locally. She is an IPRAMHO investigator

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Dr Poon Zhimin

Dr Poon Zhimin graduated as a medical practitioner from National University of Singapore (MBBS NUS) in 2010 and is a family physician with the Family Physician Registry in Singapore. She has completed the Master programme in Family Medicine, MMed (FM) NUS in 2014 and is currently in her second and last year training as a Fellow of the College of Family Physician in Singapore. Dr Poon trained under the Singhealth Family Medicine Residency and was awarded Singhealth Best Resident and Outstanding Resident Representative in 2012.

Dr Poon has a keen interest in medical education and is currently a clinical tutor with the Graduate Diploma of Family Medicine, a clinical lecturer with Lee Kong Chian School of Medicine as well as a Physician Faculty with the Singhealth Family Medicine Residency programme. She is an IPRAMHO investigator

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Ms Asmira Bte Mohamed Rahim

Ms Asmira graduated as Registered Staff Midwife and served in KKH Delivery Suite caring for the laboring mothers of high and low risk groups. She obtained her Bachelor Degree in Science (Nursing) from Curtin Technological University in 2010.

Ms Asmira was appointed in KKH Obstetric Day Care (ODAC) to run the department as Nurse Clinician and Nurse Navigator, caring for the Gestational Diabetes mothers and developing a model system to guide and improve the care of GDM.

Completed Specialist Diploma in Diabetes Management in 2017 and she was a member of the Temasek Foundation Cares Gestational Diabetes Program team, ensuring improvement of care for GDM mothers and maintaining their health. Involves in implementing departmental changes in new GDM workflow as well care of high risk pregnancies. Currently still practices as a Nurse Navigator in ODAC and actively doing patient education for GDM and ensure proper follow up to prevent further complications. She is an IPRAMHO investigator

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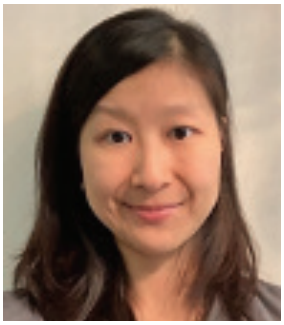
Dr Lai Jun Shi

Dr Lai is a Senior Research Fellow at the Singapore Institute for Clinical Sciences, A*STAR; and part of the GUSTO research team investigating maternal and child nutrition. She completed her undergraduate degree in Nutrition and Dietetics, and her PhD in Clinical Epidemiology at the University of Newcastle, Australia. Jun Shi is passionate about women's nutrition and health throughout the life course. During her postdoctoral training, she found several micronutrients and phytochemicals to play key roles in pregnancy outcomes such as gestational diabetes and hypertension, as well as in offspring growth and development. Her other research interests include understanding the impact of ageing on women's lifestyle habits and health outcomes.

Dr Terry Teo Chin Chye

Dr Terry Teo is a IPRAMHO Assistant Manager working at KK Women's and Children's Hospital, Singapore. He graduated with a PhD majoring in analytical chemistry in 2011 from the Nanyang Technological University and continued his postdoctoral training at Bioprocessing Technology Institute A*STAR where he was actively involved in development of analytical methodologies for extraction and analysis of lipids and metabolites for biomarker discovery in biological and human fluid samples. He was also trained in radiochemistry where he had involved in the National Environment Agency's project to set up a National Radiochemistry Laboratory for Singapore and worked as a quality control manager for a local radiopharmaceutical.

Dr Elaine Quah Phaik Ling



Dr Elaine Quah is currently a Research Fellow in the IPRAMHO team at KK Women's and Children's Hospital, Singapore. She obtained her PhD from the Yong Loo Lin School of Medicine, National University of Singapore where she researched "Soluble mediator profiles of cord blood mononuclear cells in early onset childhood allergic disorders".

Her interests in clinical sciences led her to pursue her postdoctoral training with the Growing Up in Singapore Towards healthy Outcomes (GUSTO) cohort study at the Singapore Institute for Clinical Sciences, A*STAR where her research interests revolved around maternal and infant nutrition, as well as child eating behaviors. She is an IPRAMHO investigator.

Ms Natarajan Padmapriya

Ms Priya is a Research Associate at the Yong Loo Lin School of Medicine, National University of Singapore (NUS) and a part-time Graduate Research student at the Saw Swee Hock School of Public Health (SSHSPH), NUS. She completed her Master's Degree in Nursing at the Tamilnadu Dr MGR Medical University in India, and a Graduate Diploma in Applied Epidemiology at the SSHSPH, NUS. Priya's interest in health promotion and disease prevention drives her fervent work in the public health and epidemiological research. Her research focus takes special emphasis in movement behaviors such as physical activity, screen-viewing, sedentary and sleep patterns among women and children. She is currently working with Assoc/Prof Falk Müller-Riemenschneider and other investigators in the Growing Up in Singapore Towards healthy Outcomes (GUSTO) cohort study.

Dr Divina Cristy Redondo-Samin

Dr Divina is the Chairperson, Medical Nutrition and Weight Management Center, Premiere Medical Center, Nueva Ecija, Philippines. She is also Chairperson, Hospital Research Committee, Dr. Paulino J. Garcia Memorial Research and Medical Center, Nueva Ecija, Philippines. She is a Research Coordinator and Member, Training Core, Clinical Nutrition Fellowship Program, St. Luke's Medical Center, Quezon City, Philippines

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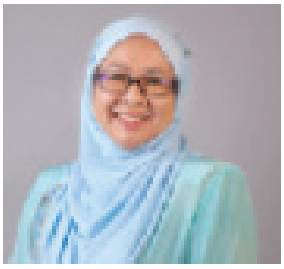
Associate Professor Azriyanti Anuar Zaini



Dr Azriyanti Anuar Zaini is a Consultant Paediatric Endocrinologist and Consultant and Senior Lecturer in the Department of Paediatrics, University Malaya Medical Centre, Kuala Lumpur Malaysia.

Associate Professor Betty BUT

Dr Wai Man, Betty BUT graduated from the Faculty of Medicine, University of Hong Kong. She was trained in Paediatrics and Paediatric Endocrinology in Queen Elizabeth Hospital, Hong Kong and Royal Children Hospital, Melbourne. She is particularly interested in Paediatric Endocrinology and Metabolic Diseases. Her present position is Chief of Service/Consultant Paediatrician of the Department of Paediatrics at Queen Elizabeth Hospital, Hong Kong.

She is currently the Chairman and Programme Director of the Paediatric Endocrinology Subspecialty Board under the Committee for Subspecialty Board of the Hong Kong College of Paediatricians. She is former President of the Hong Kong Society of Paediatric Endocrinology and Metabolism and also former Vice-President of the Hong Kong Society of Inborn Error of Metabolism. She is also appointed as Honorary Clinical Associate Professor of the University of Hong Kong and the Chinese University of Hong Kong.

Professor Luo Feihong

Prof Luo is Director, Department of Pediatric Endocrinology and Inherited Metabolic Diseases, Children's Hospital of Fudan University, Shanghai, China. He is Vice Chairman of the Committee of Adolescent Medicine and Health Specialty of the Chinese Medical Doctor Association; Former vice president of the Pediatric Endocrine and Metabolism of Chinese Society of Pediatrics, Chinese Medical Doctor Association, Council member of Asia Pacific Pediatric Endocrine Society. He main interest is in the clinical diagnosis, management and basic research of pediatric endocrine diseases, especially in the pediatric diabetes.

Professor Sachith Mettananda

Dr Mettananda is Professor and Head of Department of Paediatrics, Faculty of Medicine, University of Kelaniya, Sri Lanka and Consultant Paediatrician – University Paediatrics Unit, Colombo North Teaching Hospital, Ragama, Sri Lanka.
His qualifications are MBBS, DCH, MD(Paed), DPhil(Oxon), FRCP(Edin), FRCPCH
Specialty: General Paediatrics. Google scholar profile:
https://scholar.google.com/citations?user=hxhSO40AAAAJ&hl=en

Dr Mya Sandar Thein

Dr Mya Sandar Thein is the senior Consultant Pediatrician at Yangon Children Hospital.
She received numerous awards for (1) Training course for Pediatric Endocrinology (2011), (2) Dr LEE Jong –wook Fellowship (2014) (3) Clinical Fellowship from European Society of Pediatric Endocrinology (2018). As a consultant Pediatrician, I teach both undergrad and post graduate medical classes every week at Yangon Children Hospital from 2014 to up until now. Moreover, I usually teach classes of Family Medicine, Diploma Nursing, other post graduate classes run at Yangon Children Hospital. The teaching topics are both General Pediatric and Pediatric Endocrine. It also involves the Pediatric Endocrine training for postgraduate students from Magway Medical University, Defense Medical Service and as the supervisor of post graduate master thesis since 2014.

Senior Professor Tony Okely

Prof Anthony Okely is a Senior Professor in the School of Health and Society and Research Director at Early Start at the University of Wollongong, Australia. He is a NHMRC Leadership Fellow (Level 2), and Theme Leader at the Illawarra Health & Medical Research Institute.

His research focuses on movement behaviours (physical activity, sedentary behaviour, and sleep) in children, with a particular focus on low- and middle-income countries.
Anthony led the team that developed the Australian 24-hr Movement Guidelines for Children birth to 5 years. He was part of the Guideline Development Group for the WHO Global guidelines on physical activity, sedentary and sleep behaviours in children under 5 years of age, and for similar guidelines in South Africa, Canada and the United Kingdom.
He currently leads an international study of movement behaviours in the early years called SUNRISE, which involves 38 countries, 24 of which are low- or middle-income.

Professor Aman Pulungan

Prof Aman Pulungan is the President of Indonesian Pediatric Society, President of the Asia Pacific Pediatric Association, Executive Committee member of the International Pediatric Association, Senior Consultant in Pediatric Endocrinology, Faculty of Medicine, University of Indonesia, Committee member for medical specialist deployment Ministry of Health (MOH) Republic of Indonesia, NCD Child Governing Council, and past president of the Asia Pacific Paediatric Endocrine Society (APPES). For the past 19 years, he has been involved in many programs for diabetes in Indonesia and in the region, amongst others, the project leader for the World Diabetes Foundation type 1 DM in Indonesia, and as a member of the advisory board of the Physician International Society for Pediatric and Adolescent Diabetes.

He has been awarded by the Indonesian MOH as one of the most eminent person who has been actively involved in the national immunization program, as a honorary fellowship by the Turkish National Pediatric Association for dedication and contribution to child health, and as a honorary fellow of the Royal College of Physicians of Ireland (RCPI). He is also a member of the health advisory board of The Australia-Indonesia Centre and media and communications division of The Global Pediatric Endocrinology and Diabetes.

He initiated the formation of IKADAR, an organisation for families with diabetic children which includes patients, doctors and educators. He took important roles in the formation of Foundation for Congenital Adrenal hyperplasia Families (KAHAKI), Families Forum for Osteogenesis Imperfecta (FOSTEO), Turner Society Indonesia (TSI). He is a member of various international organizations such as APPES, ESPE, ISPAD, International Fellow of American Academy of Pediatrics, GPED, DOHAD Society, and the Endocrine Society. He is part of the editorial board of International Journal of Pediatric Endocrinology and The Annals of Pediatric Endocrinology & Metabolism.

His research interests include the genetic profile of Pygmies Rampasasa in Flores, short stature and stunting, congenital hypothyroidism, early life and metabolic syndrome, as well as global health. He is the copyright holder of the Indonesian National Growth Charts.

Dr Areekul Amornsriwatanakul

Dr Areekul Amornsriwatanakul is a Lecturer with the College of Sports Science and Technology, Mahidol University, Thailand. Her specialty: Physical activity in children and youth, health promotion, and public health policy

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Associate Professor Pongsak Noipayak

Associate Professor Pongsak Noipayak is the Vice President, Navamindradhiraj University. His specialty: Developmental and behavioural pediatrics.

Professor Muhammad Yazid Jalaudin

Professor Muhammad Yazid Jalaludin is currently Head of Department of Paediatrics, Faculty of Medicine, University Malaya. He works as a Senior Consultant Paediatrician and Senior Consultant Paediatric Endocrinologist at the University Malaya Medical Centre (UMMC) and as a Professor at the Faculty of Medicine, University Malaya. He completed his fellowship in Pediatric Endocrinology and Diabetes at Children's Hospital of Philadelphia (CHOP), USA after obtaining his MBBS and Masters in Paediatrics, both from University Malaya.

He is currently the Immediate Past President of the Asia Pacific Paediatric Endocrine Society (APPES 2020-2022) and the Malaysian Paediatric Association (MPA 2019-2021). He is also a member of The Endocrine Society USA, International Society for Paediatric and Adolescent Diabetes (ISPAD) and Malaysian Endocrine and Metabolic Society (MEMS). Prof Jalaludin main research interest is in growth (nutrition), obesity and type 2 diabetes mellitus, and vitamin D in children. He is one of the Principal Investigator (Clinical) for MyBFF@school, co-PI for MyHeARTs and co-investigator in Co-PoWR and DEWI projects. He holds many national and international research grants. He acts as Scientific Advisor for many multicentre international researches for type 2 diabetes in children. His work has been published in various academic journals including in the New England Journal of Medicine (NEJM) and as textbook chapters.

Dr Julin Wong

Dr Wong graduated with PhD in 2011 from the University of Dundee and continued her postdoctoral fellowship in Sir David Lane's Lab A*STAR where she was actively involved in numerous outreach events and management programmes for the laboratory. Julin was also successful in developing her research for commercialization. She took up project management role to provide coordination for all external contacts and outreach activities for Institute of Medical Biology, A*STAR. is an IPRAMHO fellow.

She joined KK Women's and Children's Hospital in 2019, to lead the Obstetrics & Gynecology (OBGYN) Academic Clinical Program academic and research administration.

She is an IPRAMHO investigator.

Associate Professor Nobuhiko Nagano

Associate Professor is from Department of Pediatrics and Child Health, Nihon University School of Medicine, Tokyo, Japan. He received his M.D. from Nihon University School of Medicine, Tokyo, Japan and a Ph.D. (Doctorate of Medical Science), Nihon University Graduate School of Medicine, Department of Pediatrics, Tokyo, Japan. His current research interests include neonatology, lipid metabolism, growth and development.

Dr Huynh Manh Nhi

Dr Huynh Manh Nhi graduated from University of Medicine and Pharmacy of Ho Chi Minh City in 1992 as a general practitioner, attending residency of pediatric orthopedics surgery in 1993-1996 and has practiced as a pediatric orthopedic surgeon at Hospital for Traumatology and Orthopedics since 1997. He noted a rising rate of child obesity in his patients and many related issues of child obesity, including children's eating habits and changes in economy. He wishes to contribute efforts to a sustainable program addressing child obesity in Vietnam.

Dr Nguyen Thuy Song Ha

Dr Nguyen Thuy Song Ha graduated from University of Medicine and Pharmacy of Ho Chi Minh City in 1997, working in the Department of Sports Medicine, University of Medicine Pham Ngoc Thach since 1999, teaching medical students sports medicine. Recently, she has set up a training program for persons with chronic diseases and children in Nutrihome center. Dr Song Ha was a national Taekwondo athlete of the 1990s and enjoys research on safe and effective physical exercises for everyone.

Mr Lim Chee Meng Micheal

Micheal has been instrumental in the development of clinical exercise physiology services for both children and adult women in KK Women's and Children's Hospital. He has more than 10 years of clinical experience and has setup many clinical exercise intervention programs for women and children with weight issues, chronic health conditions and special developmental needs.

Besides his clinical service, Micheal is active in clinical research and worked extensively with external organizations providing consultancy and collaborating on various exercise medicine related projects. He is actively involved in sports medicine-related professional committees including Sports Medicine Association Singapore, Exercise is Medicine Taskforce, Sports Safety Committee and Football Science and Medicine Committee. Micheal is an IPRAMHO investigator. (I-EXERCISE)

Dr Thiyagar Nadarajaw

Dr Thiyagar is a Consultant Paediatrician & Adolescent Medicine Specialist. He is currently the head of Paediatric Department in Hospital Sultanah Bahiyah, Alor Setar & State Consultant for paediatric services in Kedah, Malaysia.

He graduated from University Science Malaysia in 1990 and subsequently completed his postgraduate training in Paediatrics in the year 1998. He pursued his Adolescent Medicine subspecialty fellowship at the Centre for Adolescent Health, Royal Children's Hospital Melbourne in 2006.

He is the Past President of Malaysian Paediatric Association (2015/2017) and the current Vice President of the Malaysian Association for Adolescent Health. He also serves as an Adjunct Professor at the AIMST University, teaching the medical students in their clinical years.

Professor Victor Samuel Rajadurai

Professor Samuel Rajadurai is a Senior Consultant in the Department of Neonatology at the KK Women's and Children's Hospital, Singapore. He is an Adjunct Professor of Paediatrics at Duke-NUS and also a visiting Professor to Tianjin Central Hospital, China. He has had extensive experience in Neonatology for more than 30 years. Currently, he is the President of the Perinatal Society of Singapore and Chairman of the IPOKRaTES Group in Singapore. In the past he has served as President of the College of Paediatrics and Child Health. He was the founding Director of the National Expanded Newborn Screening Programme. Prof Sam's research interests are perinatal asphyxia, PPHN, chronic lung disease of prematurity, neonatal nutrition, hypoglycaemia, and newborn screening.

Prof Sam has participated as a collaborator in a number of international multicenter randomized control trials including the OSECT trial, RAST study, UKOS trial, N3RO trial and OPTIMIST-A trial. He has been invited to speak at several national and international conferences and has also conducted Seminars / Workshops in Malaysia, Indonesia, Bangladesh, India, Japan, Cambodia and Myanmar. He is a visiting Professor to People's Republic of China and has been invited to lecture in several cities including Beijing, Shanghai, Guangzhou, Tianjin, Shijiazhuang, Shenzhen, Chengdu and Yinchuan for the past 12 years. His publications include 3 chapters in books, 120 abstracts and over 100 articles in journals. He is an IPRAMHO investigator.

Emeritus Professor Satvinder Singh Dhaliwal

Professor Dhaliwal has worked as a Biostatistician for the past 30 years and has accumulated extensive experience, both nationally and internationally, on the practical application of Statistics/Biostatistics in a wide variety of situations.

Prof Dhaliwal's research interest includes the application of Biostatistics in the fields of Biomedical and Clinical Research. Professor Dhaliwal has a high impact publication record numbering over 200 papers (Google Scholar citation index is 48).

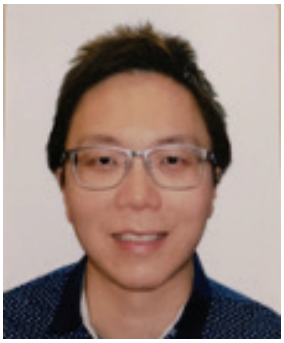
Professor Dhaliwal has been the funding recipient, with others, of more than 30 research grants, including 8 NHMRC project grants, 2 ARC Linkage, 10 Healthway grants and 1 International grant, total funding being is excess of $16 million. Prof Dhaliwal is also numerous committees within and external to Universities, previous Editorial Board memberships, and invitations to speak at international and national meetings.

Dr Ye Jiangfeng

Dr Ye Jiangfeng is a research fellow at KK Women's and Children's Hospital, Singapore. She was previously Research Associate, Department of Clinical Epidemiology, Institute of Gynecology and Obstetrics, Gynecology and Obstetrics Hospital, Fudan University Shanghai, Lecturer Department of Epidemiology and Statistics, Fujian Medical University School of Public Health in Fujian and Postdoctoral Fellow at Ministry of Education - Shanghai Key Laboratory of Children's Environmental Health, Xinhua Hospital Shanghai Jiao Tong University School of Medicine Shanghai, China. She was also Consultant World Bank Special Program of Research, Development and Research Training in Human Reproduction World Health Organization Geneva, Switzerland.

Her research focuses on reproductive and perinatal epidemiology and statistical method application in reproductive medical research, especially the perinatal environmental and hereditary factors and their effects on maternal and fetal health. She is an IPRAMHO research fellow.

Dr Ryan Lee



Dr Ryan Lee graduated from Imperial College London in 2008 with a Bachelor of medical sciences (Honours) and obtained (MBBS) (Distinctions) at St Bartholomews and the Royal London, University of London in 2009. He later obtained Masters of Medicine (O&G) and became a Member of the Royal College of Obstetricians and Gynaecologists (MRCOG) in 2015. He was awarded the NMRC health research scholarship in 2016 and graduated with a Masters of Clinical Investigation from the National University of Singapore in 2018. Subsequently, he became the first inaugural graduate from the clinician scientist residency in 2019. He is currently an associate consultant in the department of Maternal-Fetal medicine at KKH.

His main research interests are in epidemiological studies on interventional lifestyle changes including exercise and diet control to improve obstetric outcomes in pregnant women with gestational diabetes. He is a principal investigator of several research projects and was also awarded the KKH health endowment fund in 2014 and NMRC clinician scientist seed fund in 2017 for research in sub-fertile women with recurrent implantation failure. He was awarded the 2019 ASPIRE best international poster presentation for his research work on the immunological effect of endometrial injury in women with recurrent implantation failure.

Besides research, he has an incessant passion for teaching and was previously awarded the inspiring resident-educator award. He is currently appointed as a SingHealth residency physician facilitator and clinical tutor to students from Duke-NUS, YLL and LKC School of Medicine where he continues to receive commendable accolades from his students. Ryan is an IPRAMHO investigator (I-PROFILE & I-PHENOTYPE).

Associate Professor Alexis Shub

Alexis Shub is a subspecialist in Maternal Fetal Medicine and is a member of the Perinatal team caring for high risk pregnancies at Mercy Hospital for Women, Melbourne, Australia.

She is lead obstetrician for the diabetes and endocrine clinic, with research interests in pregnancies complicated by diabetes and obesity. She is a council member of the Consultative Council of Perinatal Morbidity and Mortality, coordinator of Women's Health teaching for medical students at the University of Melbourne and a Council member of the Australasian Diabetes in Pregnancy Society.

Associate Professor Valerie T Guinto

Dr. Valerie Tiempo Guinto has distinguished herself in the Philippines in administration, research, teaching and clinical practice in the field of Maternal and Fetal Medicine. She studied Medicine and M.S. Clinical Medicine in the University of the Philippines-College of Medicine and trained in the residency of Obstetrics and Gynecology and the fellowship of Maternal and Fetal Medicine in the University of the Philippines-Philippine General Hospital. Subsequently, she was invited to the faculty of the Department of Obstetrics and Gynecology in the University of the Philippines-Philippine General Hospital, where she now serves as the Chief of the Section of Maternal-Fetal Medicine. She was also appointed as Chief of the Section of Maternal-Fetal Medicine in St. Luke's Medical Center Global City and later Vice Chair for Service and then currently Vice Chair for Research in the same hospital. She has published researches locally and internationally.

Her current research interests are on the perinatal problems of recurrent pregnancy loss, pre-eclampsia and preterm labor. She is also involved in development of Clinical Practice Guidelines in the Philippines, such as those for gestational diabetes mellitus, preterm labor, intrauterine growth restriction and cesarean section. She recently headed the development of the Clinical Practice Guidelines on recurrent pregnancy loss. She has lectured in many Postgraduate Courses. She is also active in the Philippine Society of Maternal and Fetal Medicine, where she served as its President in 2017. Dr. Guinto has a very prolific practice in obstetrics and gynecology, where she mostly manages high-risk pregnancies, especially those with recurrent pregnancy loss. She is affiliated in Philippine General Hospital, St. Luke's Medical Center Global City, Asian Hospital and Medical Center and Manila Doctors Hospital. A/Prof Guinto is an IPRAMHO International investigator.

Dr Tran Thi Lien Huong

Dr Tran graduated with Doctor of Medicine from Hue University of Medicine and Pharmacy, Vietnam in 2008 and obtained Master of Science in Medicine from Ho Chi Minh City University of Medicine and Pharmacy, Vietnam in 2011.

As a Clinician, Dr Tran has worked in various departments of Tu Du Hospital, Vietnam that includes High Risk Pregnancy, Delivery, Gynecology and Emergency Departments. In 2013, she became Consultant for Medical Affairs Department and is the current Vice Head.

Dr Tran attended the Temasek Foundation International Healthcare Executives in Asia Leadership (TFI HEAL) Programme in SingHealth & Singapore December 2018. She is an IPRAMHO International investigator.

Dr Krishna Kumar Hari Krishnan

Dr Krishna Kumar A/L Hari Krishnan is Head & Consultant Obstetrician & Gynaecologist, Maternal Fetal Medicine Specialist, Hospital Tuanku Ja'afar Seremban, Malaysia. He was President, Malaysian Medical Association (MMA) and Past President Obstetrical & Gynaecological Society of Malaysia (OGSM) 2010-11. He was the organising Chairman of the 21st OGSM National Congress in collaboration with the Irish College of Surgeons. He is registered to practise in Malaysia and United Kingdom. He has worked at various levels till consultant grade in Malaysia & England. He was the Chairman of the International Representative Committee for the RCOG.

He was noted in People at the Peak- The Who's Who of Malaysia 2005 and nominated twice for the award Glory of India, India. (2002, 2006). He has written many free paper productions and publications including the guidelines of antenatal care as FIGO Honorary lecturer for International Medical University and Melaka Manipal University. He is Trainer in undergraduate, postgraduate, subspecialty and international trainer for Life Saving Skills for the Royal College of Obstetricians & Gynaecologists, United Kingdom. He has been involved in many Ministry of Health projects at national, state and hospital level. He is also involved actively in OGSM and MMA (Malaysian Medical Association). He is an IPRAMHO International investigator.

Professor Swe Swe Myint

Dr Swe Swe Myint is a Professor (Obstetrics & Gynaecology) in Central Women's Hospital (CWH), Yangon, Myanmar. She received MBBS in 1991 and Master Degree in Obstetrics and Gynaecology in 1999 from University of Medicine 1, Yangon, Myanmar. She studied in the UK from 2003 to 2006 and became a member of Royal College of Obstetrician and Gynaecologists in 2006. She is a member of perinatal audit in CWH.

She is also a member of Myanmar Medical Association (OG Society) and took part in implementing current guidelines (Obstetrics and Gynaecology) which was led by Myanmar Medical Association (OG Society). She got Dr.Med.Sc (Obstetrics & Gynaecology) in 2017 from University of Medicine 1, Yangon and FRCOG (UK) in 2019. Dr Swe Swe Myint is an IPRAMHO International investigator.

Professor Tiran Dias

Professor Tiran Dias is currently working as a Professor in Fetal Medicine in the Department of Obstetrics and Gynaecology Faculty of Medicine University of Kelaniya. He is also an honorary consultant Obstetrician and Gynaecologist at North Colombo Teaching Hospital, Ragama. He is an accredited Fetal Medicine specialist. His research interests are in small for gestational age, fetal surgery, and multiple pregnancy. His clinical interests are invasive prenatal diagnosis/ therapy, high risk pregnancy and medical problems in pregnancy. He has had his Fetal Medicine sub-specialty training in the United Kingdom. He is a member of the editorial team of the CMJ and he was the editor in chief of the Sri Lanka Journal of Obstetrics and Gynaecologists between 2013 and 2016. He has published 26 peer-reviewed articles and 2 book chapters. He is an IPRAMHO International investigator and has published jointly an international paper on GDM with IPRAMHO.

Associate Professor Dittakarn Boriboonhirunsarn

Associate Professor Dittakarn Boriboonhirunsarn is an obstetrician and currently the Head of the Research Support Unit at the Department of Obstetrics and Gynaecology, Faculty of Medicine Siriraj Hospital. He is also an administrative member and the chairperson of Subcommittee on Research of The Royal Thai College of Obstetricians and Gynaecologists.

A/Prof Dittakarn and his colleagues are the pioneer in setting up a clinical practice guideline for GDM and a GDM patient care team in Siriraj Hospital. He and his team has involved in GDM care in Siriraj Hospital for almost 20 years. He is also a member of Siriraj Center of Excellent on Diabetes as a representative for the obstetric team.

A/Prof Dittakarn and his colleagues have regularly published researches related to GDM in national and international journals. Majority of the researches on GDM are related to clinical practice, including baseline clinical information, screening and diagnosis, risk identification, prevention and prediction of clinical outcomes, and care process improvement. He is an IPRAMHO International investigator.

Dr Herman Kristanto

Dr Herman Kristanto is Head of Maternal Fetal Medicine Division, Department of Obstetrics & Gynecology Medical Faculty Diponegoro University, Diponegoro National Hospital and Kariadi Hospital Semarang Indonesia.

He is Chairman of Indonesian Society of Obstetrician and Gynecologist (POGI) Central Java Branch, Indonesian Society of Perinatology (PERINASIA) Central Java Branch. He is also Chairman of Ultrasound Working Group of POGI and Member of Education and Training Committee of PERINASIA. He is an IPRAMHO International investigator.

Professor Mamoru Tanaka

Professor Tanaka is a Professor in Department of Obstetrics and Gynecology at Keio University School of Medicine, Japan. Education:
1986 - Graduated from Keio University School of Medicine
1998 - Visiting scientist of Adashi's Lab in University of Utah
2002 - Assistant Professor in Department of OB/GYN, Keio University School of Medicine
2012 - Professor in Department of OB/GYN, St. Marianna University
2014 - Present position

Membership:
The American Society for Cell Biology; Society for Reproductive Investigation; International Society of Ultrasound in Obstetrics and Gynecology; Japan Society of Obstetrics and Gynecology: Councillor; Japan Society of Perinatal and Neonatal Medicine: Director; The Japan Society of Ultrasonics in Medicine: Councillor, Editor
Japan Society of Maternal-Fetal Medicine: Director; Japanese Society of Fetal Cardiology: Councillor; The Japan Society for Fetal Therapy: Councillor; Japan Society for Reproductive Medicine: Councillor; Japan Society of Endocrinology.
He is an IPRAMHO International investigator.

Dr Yoshifumi Kasuga

Dr Yoshifumi Kasuga is an Assistant Professor working at Keio University School of Medicine, Department of Obstetrics and Gynecology, Japan. He graduated with a PhD majoring in genetic analysis of gestational diabetes in 2017 from Keio University School of Medicine. He works for Keio University Hospital as an Obstetrician, and his clinical research focused perinatal complications, including gestational diabetes.

Professor Milind Shah

Dr Shah is a Consultant OBGYN at Naval Maternity & Nursing Home, India and Consultant OBGYN practicing in India since last 32 years. Apart from very extensive experience as clinician he has many organizational credentials like past President of ISOPARB (Indian Society of Perinatology & Reproductive Biology), past Vice President of FOGSI (Federation of all gynecological Societies of India), and Deputy Secretary General of FAOPS (Asia Oceania Federation of all Perinatal Societies).

He has teaching experience of last 32 years as Professor and HOD of department of OBGYN at GNRH Medical College. He is often invited by Government for his expert opinion while taking policy decisions. He has contributed many chapters in various textbooks and published a book on Hypertensive Disorders in Pregnancy & Pelvic Organ Prolapse. He is peer reviewer for Journal of Obstetrical & Gynecology of India.

Professor Li Xiaotian

Prof Li is a professor and vice-president of Obstetrics and Gynecology Hospital affiliated to Fudan University, Shanghai, China. He received his MD degree from Zhejiang University, China, and PhD from Shanghai Medical College, China. He trained in Internal Medicine at Xianju, Zhejiang Province, China, and Obstetrics and Gynecology at Obstetrics and Gynecology Hospital, Shanghai, China.

His principal research focus is on prenatal diagnosis and maternal medicine. He was principal investigator of a large obstetric research, and has been a principal investigator on numerous obstetrical and prenatal trials. The focus of Dr. Li's research includes high-risk pregnancy, clinical trial design in prenatal diagnosis and the study of fetus monitoring.

Dr Zhou Qiongjie

Dr Zhou is Chief Physician of Obstetrics, Obstetrics and Gynecology Hospital affiliated to Fudan University, Shanghai, China since April 2019. She completed her undergraduate training at Fudan University and graduated from Shanghai Medical School of Fudan University, Shanghai, China. She completed her residency and her fellowship in Obstetrics and Gynecology at Obstetrics & Gynecology Hospital of Fudan University. She was a visiting scholar in Harvard Medical School and Brigham and Women's Hospital in 2011-2012. Her Master Degree thesis focused on the role of tissue factor pathway inhibitor-2 in preeclampsia and her PhD Degree thesis was a population-based study on the epidemiological map of genital and TORCH (Toxoplasma, Rubella, Cytomegalovirus, Herpes simplex and Hepatitis B) infections in the preconception period among women of reproductive age in rural China.

Her research interests are on Maternal Fetal Medicine, and she has published many research articles, reviews, book chapters and was the editor of the Chinese edition of book "Fetology". She has strong interests in quality assurance, evidence based and cost-effective care. She strongly appreciates the role of translational medicine as well as multidisciplinary approaches to healthcare.

Dr Tony Tan

Dr Tony Tan graduated from the National University of Singapore in 1993. Dr Tan is a Consultant Obstetrician & Gynaecologist at Tony Tan Women and Fetal Clinic at Mount Alvernia Hospital, and is also the Medical Director, Alvernia Obstetric Screening Centre at Mount Alvernia Hospital. He is a Visiting Consultant Obstetrician and Gynaecologist, Raffles Hospital and Department of Obstetrics and Gynaecology, National University Hospital. He was previously Consultant in the Dept of Maternal Fetal Medicine in KK Women's and Children's Hospital and was the Clinical Director, Maternal Fetal Medicine in Raffles Hospital till June 2019. He is also a Visiting Consultant to the Departments of Obstetrics and Gynaecology in National University Hospital, was the President of the Obstetrical and Gynaecological Society of Singapore (OGSS) from April 2013 to April 2015, was the chairman of the Maternal Fetal Medicine Committee of Asia-Oceanic Federation of Obstetrics and Gynaecology from 2013-2017.

Dr Tan was trained in fetal medicine and fetal therapy at the renowned Queen Charlotte's Hospital, London under Professor Nicholas M Fisk. He subsequently trained with Dr Kurt Hecher, Hamburg, Germany in laser treatment for TTTS and acardiac twins. His areas of interests include monochorionic twins and its manifestations of twin twin transfusion syndrome and acardiac twins, fetal screening, fetal therapy, threatened and recurrent miscarriages, and strategies to reduce unexplained stillbirth including the routine use of cerebroplacental ratio. He is an IPRAMHO International investigator.

SPEAKER ABSTRACTS

Asia Pacific Maternal & Child Metabolic Health Conference & IPRAMHO International Meeting 2021

SYMPOSIUM I - CHILD METABOLIC HEALTH

Who is the Metabolically Healthy/Unhealthy Child?

Chua Mei Chien
Department of Neonatology, KKH, Singapore

Obesity is a heterogeneous phenotype that is crudely measured by body mass index (BMI). Although obesity is typically accompanied by deleterious metabolic profiles and chronic diseases, evidence have shown that there is a subset of obese patients who present with a favourable metabolic phenotype or with a fewer cardiometabolic abnormalities, which referred to as the metabolically healthy obese. Metabolically healthy obesity (MHO) is a novel concept that stratifies obese individuals according to their respective metabolic status. In most studies, MHO was defined as having ≤2 of the metabolic syndrome components, while some studies employed a more stringent criterion by accounting for insulin sensitivity. Epidemiological studies suggest that metabolically healthy obese individuals account for up to an approximately 30% of those with obesity, however, this figure varies by definition used. Here, we will discuss current concepts of MHO, evidence of this metabolic phenotype, and the potential clinical implications for obesity management and healthcare policies.

Challenges and Obstacles to Successful Weight Management in Children and Adolescents

Oh Jean Yin
Department of Paediatrics, KKH, Singapore

Clinical Practice Guidelines in the management of child and adolescent obesity have been clearly outlined from screening to treatment plans including lifestyle intervention, behavioural modification and recommendations for weight management programs. Implementing successful approaches throughout the patient journey is fraught with barriers and challenges.

Many patient and parental factors influence their perception of overweight as a health concern; from social-cultural acceptance of a larger body size, to neglect and denial of the health problem due to other competing demands in life. Weight stigma from negative attitudes and experiences in general let alone from health providers is emerging as one of the top reasons parents are reluctant to access health care for weight management for their children. Recognition of obesity in children and adolescents has often been driven by school health services and early and opportunistic health screening using age and gender specific BMI and growth charts can be challenging in a busy primary care or specialist outpatient clinic. There is a limited capacity in the assessment and management of obesity related illness in children, but providers often cite more training is needed in addressing behavioural change in patients, especially adolescents and their parents; provision of nutritional advice and not dieting, physical activity and not exercise in addition to understanding psychosocial risk, body image and mental health factors related to obesity.

Effective weight management strategies have evidence in family based, multi-component behavioural therapy that focus on improving eating and activity behaviours. Programs with an intensity of more than 26 contact hours have more successful outcomes. Poor engagement and high attrition rates, aside from high cost and lack of time are common themes that result in unconvincing program outcomes. A systems design with appropriate resource allocation providing multi-sectoral interventions is vital to manage this chronic relapsing progressive disease.

A Roadmap to Optimal Metabolic Health in Children – the Role of Maternal Health

Fabian Yap[1] and Tan Kok Hian[2]
[1]Paediatric Endocrinology Service, KKH, Singapore
[2]Department of Maternal Fetal Medicine, KKH, Singapore

Like the definition of health itself, metabolic health can be defined as state of physical, mental and social well-being and not merely the absence of diseases such as diabetes, obesity and hypertension. A metabolically healthy body has normal anthropometric, biochemical and clinical indicators, such as body mass index, glucose and lipid levels, and blood pressure; while a metabolically healthy mental state is characterised by positive and appropriate attitudes and emotions towards a balanced lifestyle, including diet and physical activity.

The metabolic health status of a child today is the outcome of events and exposures over time, particularly during early life. These events include multiple influences surrounding peri conception, metabolic programming during foetal development and nurturing practices in the first years of life. There is now sufficient evidence from human and animal research that metabolite overexposure in the peri conception period and during pregnancy can induce increased risk of chronic disease in the offspring. There is also growing recognition that psychological and physical readiness, and recovery, during the pre- and post-pregnancy phases, are particularly important to the lifetime health of a child.

Maternal and child health systems designed in the 20th century to tackle under nutrition and communicable diseases may no longer be relevant to deal with 21st century challenges of over nutrition and non-communicable diseases. Intergenerational cycles of hunger and poverty are now complicated by vicious cycles of metabolic disease. Altogether, these underscore the critical need to integrate and repurpose maternal and child health systems, to secure a roadmap towards optimal child health and development.

Maternal health is intimately connected to child health. Enhancing early life-course moments for mothers from preconception to periconception will optimise the potential of every child born in Singapore and our region. Together we should aspire to help translate our research findings effectively for active dissemination & implementation to improve the population health of women and children.

SYMPOSIUM II - PHYSICAL ACTIVITIES AND EXERCISE FOR CHILDREN

Movement Behaviours in Young Singaporean Children

Falk Mueller-Riemenschneider

Saw Swee Hock School of Public Health and Dept. of Medicine, Yong Loo Lin School of Medicine, National University of Singapore & Digital Health Center, Berlin Institute of Health, Charité University Medical Centre Berlin, Germany

Physical activity, sedentary behaviour, screen viewing and sleep are associated with health and well-being. To a large extent, these behaviours are established in early childhood and persist into adulthood. This presentation will give an overview of the concept of movement behaviours and its application in Singapore. It will describe and present findings from a variety of studies concerned with movement behaviours and their diverse influencing factors, with a particular focus on children of pre-school age.

Habitual Physical Activity of Children and Adolescents in Singapore

Chia Yong Hwa Michael

Physical Education & Sports Science National Institute of Education, Nanyang Technological University

Cogent data suggest that activity habits formed in childhood carry into adolescence. Sedentary lifestyles and physical inactivity in adolescence predict inimical metabolic outcomes in later adulthood. Data on the habitual daily physical activity of Singaporean youths in several studies are foregrounded. Sustained multi-agency approaches to reduce daily prolonged sedentary time and increase daily habitual physical activity require greater a-whole-of-nation acceptance.

Sleep and Physical Activity in Children

Teoh Oon Hoe

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Sleep and physical activity are individually important components of a healthy lifestyle contributing to the optimal growth and development of children. The relationship between sleep and physical activity appears to be bidirectional, and their impact potentially synergistic. Low levels of physical activity and insufficient sleep duration are associated with obesity in children. Physical activity and improved fitness is associated with improved cognitive functioning and academic performance, while poor sleep duration and quality is associated with poorer academic performance. Despite the evidence and consensus on the importance of both, many children are not achieving sufficient sleep or adequate exercise. Both are victims to the overscheduled and competitive digital age that we now live in. Sleep and physical activity are potentially modifiable health behaviours, and neither should be sacrificed for the other. It is crucial that parents and educators are aware of their importance, and an integrated 24-hour movement guideline for children and adolescents may help to create this understanding and facilitate behavioural change for better health outcomes.

Exercising in Children and Adolescents - How to Do It Safely

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General Ambulatory Paediatrics and Adolescent Medicine, NUH, Singapore

Exercising has long been proven to be one of the best therapy for many chronic physical ailments and mental health as well. In children and adolescents today, exercising no longer come naturally and spontaneously, it needs to be “prescribed” and encouraged. Like all therapy, are there concerns about exercising? What do we need to know before

exercising and how do we ensure our children and teenagers are safe during their physical activities? We will examine the health issues and safety concerns of exercise, so that children and adolescents will benefit from this recommendation without compromising their well-being

CPCHS Initiatives for Child Metabolic Health

Ng Kee Chong

President of the College of Paediatrics & Child Health of Academy of Medicine Singapore, Singapore

In children, metabolic and mental health are dominant issues in developed & developing countries – representing what Judith Palfrey terms "a new "millennial morbidity" in an "ever-moving swirl of environmental and social change". (Reference: Palfrey JS, Tonniges TF, Morris Green M, Richmond J. Introduction: Addressing the Millennial Morbidity--The Context of Community Pediatrics. Pediatrics 2005;115;1121-3. DOI: 10.1542/peds.2004-2825B)

Metabolic morbidities in children are one of the more important non-communicable diseases (NCDs) of today. Indeed, metabolic health in paediatrics does not just include overweight and obesity but also hyperglycaemia and diabetes. At the other extreme, eating disorders with morbid weight loss and biochemical impairment result from the psychosocial effects of society with all its attendant mental health morbidities and impairment. The advent of widespread, pervasive and promiscuous social media, internet and technological influences only seek to further exacerbate and compound the overall metabolic and mental health of our children, especially in developed and well-connected societies like Singapore.

As our health system continues to develop transformative new models of care to embrace 2 of MOH's key beyonds - "beyond health care to health" and 'beyond hospital to community", the Integrated Platform for Research in Advancing Metabolic Health Outcomes of Women and Children (IPRAMHO) serves to play an important and vital role in this for maternal and child health in Singapore.

We are very grateful that IPRAMHO has partnered our College of Paediatrics and Child Health Singapore (SPCHS) to develop the "Singapore Integrated 24-hour activity guidelines for children and adolescents." This is an important evidence-based guideline that will help children, their families and healthcare providers to ensure good metabolic and overall health for our children. I would like to thank all the key opinion leaders involved for coming together to set up these guidelines.

CPCHS will continue to partner with key players like IPRAMHO in the coming years to strengthen and improve child metabolic health across our Singapore community. Ours is not just a war on diabetes but a war on metabolic morbidities and diseases in childhood. The solutions we create must be sustainable and scalable so that our children will grow up metabolically healthy and in turn bring up metabolically healthy children in the next generation.

As Joyce Banda says "The seeds of success in every nation on Earth are best planted in women and children."

IPRAMHO Initiatives for Maternal & Child Metabolic Health

Tan Kok Hian

Organizing Chairperson, Asia Pacific Maternal & Child Metabolic Health Conference & IPRAMHO International Meeting 2021 & Lead, IPRAMHO, Singapore

Integrated Platform for Research in Advancing Metabolic Health Outcomes of Women and Children (IPRAMHO) is a Singapore National Medical Research Council (NMRC) funded joint collaborative pot centre grant awarded to KK Women's and Children's Hospital (KKH), SingHealth Polyclinics (SHP) & National Healthcare Group Polyclinics (NHGP). This is a unique collaborative centre grant where both Singapore public primary health care providers (SHP & NGHP) have come together to work with KKH, the largest tertiary and main referral center for Paediatrics, Obstetrics and Gynaecology in Singapore, on collaborative metabolic health research in women and children, aligning with RIE2025 goals. IPRAMHO as a research platform, seeks to develop a seamless integrated model of care through optimal translation, implementation and evaluation of effective population prevention strategies; and diabetes, weight reduction and lifestyle programmes for women and children.

Besides seeding grants to generate pilot data and nurturing healthcare research and implementation science professionals, IPRAMHO has been leading in building consensus for Singapore to improve metabolic health of mothers and children. Three local Guidelines initiated by IPRAMHO on GDM; Perinatal Nutrition; and Physical Activity & Exercise in Pregnancy are available:

1. Tan KH, Tan T, Chi C, Thian S, Tan LK, Yong TT. Guidelines for the Management of Gestational Diabetes Mellitus. College of Obstetricians and Gynaecologists, Singapore. Singapore Journal of Obstetrics & Gynaecology. 2018; 49(1):9-13

2. Chua MC, Tan T, Han WM, Chong MFF, Ang SB, Rajadurai VS, Khin LW Chi C, Lee J, Tan KH. Guidelines for Optimal Perinatal Nutrition. Perinatal Society of Singapore. Singapore Journal of Obstetrics & Gynaecology. 2019; 50(1):10-12

3. Lee R, Thain S, Tan KH, Ang SB, Tan EL, Tan B, Aleste MN, Lim, I Tan LK. Guidelines on Physical Activity & Exercise in Pregnancy. Perinatal Society of Singapore. Singapore Journal of Obstetrics & Gynaecology. 2020; 51(1):9-16

In addition, the IPRAMHO was involved in 3 Asia Pacific consensus statements on GDM; Perinatal Nutrition; and Physical Activity & Exercise in Pregnancy, 2 of which have been published:

1. Asia & Oceania Federation of Obstetrics and Gynaecology, Maternal Fetal Medicine Committee's consensus statements on screening for hyperglycemia in pregnancy. IPRAMHO Hyperglycemia in Pregnancy Consensus Working Group. J Obstet Gynaecol Res. 2018 Nov;44(11):2023-2024.

2. Tan KH, Tan TYT, Chua MC, Kor-Anantakul O & IPRAMHO Study Group. Asia Pacific Consensus on Perinatal Nutrition and Breastfeeding. Ann Nutr Metab. 2019;75(1):86-87.

A recent IPRAMHO study of 'Physical activity, sedentary behavior, sleep and screen viewing of children in Singapore aged 5-14 years old' by Quah et al showed that 43% and 38% did not participate in any vigorous or moderate physical activity; screen viewing exceeded >2 hours/day in 38%, & 39% and engagement in sedentary behaviour of >10 hours/day were seen in 25% and 23% of children on weekdays and weekends, respectively. 20% had insufficient sleep (< 8 hours/day) on weekdays.

The Singapore Integrated 24-Hour Activity Guidelines for Children and Adolescents to promote optimal activity is timely. In line with WHO global actions, national guidelines or recommendations on physical activity for the general population or specific population groups (e.g. children and adolescents) are important to educate the population on the frequency, duration, intensity and types of physical activity necessary for health. The dissemination, ownership & implementation of these guidelines can improve population metabolic health of children, enhancing and optimise the potential of every child born in Singapore and our region.

Singapore Integrated 24-Hour Activity Guidelines for Children and Adolescents

Benny Loo Kai Guo

Chairperson, Singaporean Integrated 24-Hour Activity Guidelines for Children and Adolescents Workgroup

The Singapore Integrated 24-Hour Activity Guidelines for Children and Adolescents provide a holistic approach towards improving the metabolic and general health in the paediatric population, aged 7 to 18 years old, by integrating major activities of daily living – physical activity, sedentary behavior, eating activity and sleep. These guidelines are developed by incorporating the latest international evidence and local research of Singaporean children and adolescents. In the modern fast-paced society, the context of these guidelines is framed within a fixed resource – time. Therefore, the guidelines serve to guide healthcare providers and general public on prioritizing and balancing pivotal activities for good health within a 24-hour period.

The workgroup consists of Paediatric Medicine, Sports Medicine and Family Medicine physicians, and Academics and Researchers in physical health of Singaporean children and adolescents. This national partnership allows a smooth transition of research to clinical expertise and provides complementary perspectives from primary to tertiary care.

Regular physical activity improves aerobic fitness, body composition, metabolic risks, musculoskeletal health, mental health and academic results in children and adolescents. Prolonged sedentary behaviour, particularly unregulated screen time, is associated with a range of adverse health effects, such as obesity. Insufficient sleep is also associated with obesity, hypertension, diabetes and depression. Healthy eating habits in age-appropriate portions supports a child's activities and promotes optimal growth.

Starting with one or any combination of the recommended behaviours can achieve similar health benefits. Integrate these recommendations as the child's way of life and he or she will reap bountiful benefits, both physically and psycho-emotionally. We hope these guidelines will encourage every child and adolescent to eat smart, move more, sleep well and love life!

SYMPOSIUM III - IPRAMHO METABOLIC HEALTH INNOVATION & ENTERPRISE AND TECHNOLOGY ADVANCE UPDATES

Innovation in SingHealth Duke-NUS Healthcare Cluster – Population Health Examples from Ophthalmology

Wong Tien Yin

SNEC, Singapore

Healthcare innovation requires the application of new scientific discoveries for clinical impact, a process known as "translational medicine". This is a focused, purposeful method to apply knowledge gained from scientific research to change clinical practice and policy. However, innovation is an often long, tortuous, difficult and many scientific discoveries do not actually reach the patient or impact on care. Using two decades of population health research in ophthalmology from the Singapore Eye Research Institute (SERI) as examples, this talk will discuss how research findings from the Singapore Epidemiology of Eye Diseases (SEED) population study have led to improvement in understanding the burden of vision loss, the populations at risk, the gaps in eye care, and possible solutions. The SEED population study

has provided the foundation for major shifts in clinical practice, and the development of national eye health screening strategies such as the Singapore Integrated Diabetic Retinopathy Program (SiDRP), as well the development of SELENA+ artificial intelligence system and the Plano App to tackle myopia.

What Fitbit is doing in the area of lifestyle for health?

John Gillman
Fitbit Singapore Pte Ltd

Fitbit helps people lead healthier, more active lives by empowering them with data, inspiration and guidance to reach their goals. Fitbit Health Solutions develops health and wellness solutions designed to help increase engagement, improve health outcomes, and drive a positive return for employers, health plans and health systems. Understand how Fitbit is playing a greater role in healthcare with innovations and new products and features to assist with population health outcomes.

TRACK 1 - IPRAMHO EDUCATION SESSION: TRAINING PROGRAM FOR DOCTORS AND RESIDENTS ON MATERNAL METABOLIC HEALTH

Gestational Diabetes -The Role of Healthcare Workers (Global Perspective)

Shakila Thangaratinam
WHO Collaborating Centre for Global Women's Health, UK

Gestational diabetes is on the rise. In addition to maternal and perinatal complications in pregnancy, it also predisposes to long term complications such as type 2 diabetes in the mothers and their children. To tackle this problem, we need a multi-pronged approach involving early identification in the peri-conception period of women who are at risk of gestational diabetes and its complications, and commencing interventions for primary prevention of gestational diabetes. After delivery, it is essential to determine the individualised risk of progression to type 2 diabetes and start targeted interventions in the postnatal period to prevent type 2 diabetes.

What Obstetricians Need to Know about MODY - Recognition, Diagnosis, Management & Implications

Daphne Gardner
Endocrinology SGH, Singapore

Monogenic diabetes forms 1-2% of all diabetes and presents as young onset diabetes in lean insulin-independent individuals. Amongst women of child-bearing age with diabetes, there will be an expected greater prevalence given the younger age at presentation. Whilst uncommon, diagnosing monogenic diabetes guides optimal therapy choice, predicts outcomes, and the risk of diabetes to future generations, permitting an expectant view in management. In pregnancy, the maternal and fetal status of genetic forms of diabetes can influence gestational outcomes beyond glycaemic control alone. This session will take you through recognizing the most common forms of monogenic diabetes from the more common Type 2, or Type 2 diabetes, and what relevance this has before, during and after pregnancy.

Clinical Practice Pearls: Gestational Diabetes and Pre-existing Diabetes in Pregnancy - the Obstetrician's Perspective

Tan Eng Loy
Department of Obstetrics & Gynaecology SGH, Singapore

The Growing Up In Singapore Towards Healthy Outcomes (GUSTO) Trial suggests that 1 out of 5 pregnant women in Singapore will develop gestational diabetes mellitus (GDM). The sequelae of GDM are well-established including adverse perinatal outcomes as well as increased long-term maternal risk for chronic diabetes. The Joint Clinic for Gestational Diabetes (GDJC) was started in 1997 at the Singapore General Hospital (SGH) as a one-stop service for interprofessional and multi-disciplinary care of pregnant women with chronic diabetes and GDM. Involving obstetricians, endocrinologists, specialist nurses and dieticians, the service started in 1997 with less than 200 diabetic patients. Since then, the service has expanded rapidly and now sees close to 400 patients annually. SGH's adoption of the International Association of Diabetes and Pregnancy Study Group (IADPSG) criteria to diagnose GDM since January 2016 has increased the number of mothers diagnosed with GDM by 45%. We share with you our clinical experience with the management of mothers with diabetes in GDJC from an obstetrician's perspective.

Updates on the Management of Hypertension in Pregnancy

Serene Thain
Department of Maternal and Fetal Medicine, KKH, Singapore

Hypertensive disorders of pregnancy affect about 10% of all pregnant women and is a significant contributor to maternal morbidity and even mortality. Optimal management of hypertension in pregnancy can reduce the risk of adverse obstetric,

maternal and perinatal outcomes. This update will cover the latest developments in pre-eclampsia screening and prevention as well as the management of various hypertensive disorders in pregnancy. Issues surrounding delivery and management of hypertension in the postpartum period will also be discussed.

Key Findings of Singapore PREconception Study of Long-Term Maternal and Child Outcomes (S-PRESTO)

Loy See Ling
Department of Reproductive Medicine KKH, Singapore

The Singapore PREconception Study of long-Term maternal and child Outcomes (S-PRESTO) is prospective cohort study that was designed to examine the influences of events prior to and in early pregnancy on metabolic and mental health outcomes for both mother and offspring in later life. The cohort was launched in February 2015 at the KK Women's and Children's Hospital. Until October 2017, a total of 1055 Asian women trying to conceive were recruited from the general population. Women who successfully conceived within one-year of recruitment were followed throughout the gestation. To date, 373 children were born and majority of them have reached the age of 3 years old. Across preconception, pregnancy and postnatal phases, numerous data were collected, including data on lifestyles, anthropometry, metabolic imaging, biosamples such as blood, urine, buccal smear, stool, skin tapes and epithelial swabs.

Several key findings related to preconception women's reproductive and metabolic health have been derived. Increasing preconception glycaemic levels especially fasting plasma glucose was associated with reduced fecundability and delayed time-to-pregnancy, even within the normal range glucose concentration. To lower overall glucose levels, vigorous, but not moderate, physical activity was shown as an effective approach. For screening of dysglycaemia in these preconception women, a combination of glycated haemoglobin and body mass index could be a fairly sensitive and pragmatic approach to be used in routine clinical care.

TRACK 2 - IPRAMHO PRIMARY CARE HEALTH SYMPOSIUM

Effect of an Enhanced Self-determination Weight Reduction Intervention on Overweight Post-natal Mothers: A Pilot Randomised Controlled Trial

Tan Cherry
SingHealth Polyclinics, Singapore

This randomized controlled trial examined the effect of a self-determination enhancing weight reduction programme (SDWRP) on overweight post-natal mothers. The 24-week SDWRP consisted of a three 2-hour classes on nutrition education and physical exercise, telephone follow up call; and $30 voucher incentive for continuous physical exercise post intervention. Twenty four participants (9 in intervention group and 15 in control group) completed the study. Data were collected at baseline and at 12 weeks and 24 weeks from the baseline. Outcome measures included self-determination, physical activity, eating behaviour and body weight. Compared to participants in the control group, those who received SDWRP had higher reduction in body weight at 12-week timeline, no significant increase in self-determination, eating behaviour and physical activities. The SDWRP can reduce body weight in the short run.

Primary Care Physicians Managing Postpartum Care - What Are Their Barriers and Enablers? A Qualitative Research Study

Poon Zhimin, Esther Lee Cui Wei, Tan Ngiap Chuan
SingHealth Polyclinics, Singapore

Introduction

The postpartum period is redefined as 12 weeks following the delivery of a baby. Optimal postpartum care significantly impacts on physical and mental health of both mother and neonate. The primary care physician (PCP) is the ideal postpartum care-provider as most women with uneventful deliveries return to the community. Nonetheless, evidence has revealed unmet postpartum maternal needs. We aim to explore the issues faced by PCPs in postpartum care to identify the barriers and enablers.

Methods

Four focus group discussions and eleven in-depth interviews with twenty-nine PCPs were conducted in this qualitative research study. These PCPs of both gender and variable postgraduate training background were purposively enrolled if they self-reported provision of postpartum care in both public and private primary care clinics in Singapore. The audio-recordings were transcribed into verbatim, audited and independently coded by two investigators. Thematic content analysis was performed using the codes to identify the barriers and enablers in the "clinician", "mother", "postpartum care" and "healthcare system" domains stipulated in "The Generalists' Wheel of Knowledge, Understanding and Inquiry" framework.

Results

The PCPs' personal attributes such as gender and knowledge level influenced their postpartum care. Their information mastery of postpartum care was related to their prior training, child caring experience and access to resource materials. Their professional relationship with the postpartum mothers was impacted by their mutual communication, language compatibility, understanding of the mothers' confinement practices. They affected their specific recommendations to the local multi-ethnic and multi-lingual Asian mothers. Consultation time constraint in primary care practice, awareness of community postnatal care services, inadequate handover of care from the specialists are barriers in the healthcare system.

Conclusion

Personal, maternal and healthcare system barriers and few enablers currently prevent PCPs from delivering optimal postpartum care. Interventions to improve their postpartum care will likely be multi-faceted across the different domains.

SingHealth High Risk Metabolic Postnatal Surveillance (SHRIMPS): Nurse Navigator Transformative Care Model

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Introduction

Having good surveillance and lifestyle education for GDM help to reduce the rate of obesity and Type 2 Diabetes Mellitus significantly. However, follow up for these group of high-risk postnatal women has been poor. About 30% of postnatal GDM attended appointment with only 10% who performed PN OGTT in KKH and there were no subsequent annual follow up. The rate of women who later developed Type 2 DM later in life were left unknown as there were no surveillance done postnatally.

In 2018 under Temasek Foundation Funding, nurse navigator role was developed to run a program in providing GDM education as well as to track postnatal GDM patients. This program had benefitted many pregnant women in terms of education, however it was a challenging process due to limited IT support.

After the program ended, KKH introduced SingHealth High Risk Metabolic Postnatal Surveillance (SHRIMPS), with the aim to improve postnatal GDM attendance rate and annual reduction in women with GDM into developing Type 2 DM. This enable the nurse navigators to continue GDM education, track postnatal GDM women and to collaborate with polyclinics for postnatal GDM follow up.

Methods

Postnatally, nurse navigators will follow up with the mothers before their discharge, emphasizing on the importance of rechecking OGTT at 6 weeks and annually. Women who are in the higher risk groups will be tracked closely by nurse navigators. This includes frequent follow up calls to ensure attendance for their scheduled appointment. In addition, nurse navigators aided in providing a seamless referral process for annual follow up in polyclinics. In view of the inadequate IT infrastructure, nurse navigators face the challenge in obtaining the data on the appointment status, blood results and BMI via manual means.

Results

There has been improvement in the number of postnatal attendance rate in KKH for 6 weeks postnatal GDM review. In 2019, the rate increased to 60% (1021) compared previously. This group were followed up by nurse navigators and referred to polyclinic for annual DM screening. However, due to the uncontactable status of some patients, they were dropped off from the tracking process. On the other hand, some women think that further follow up are not necessary as they were deemed 'normal' by doctors after their 6 weeks postnatal OGTT review.

Body Mass Index (BMI) is one of the important measurement data that were missed out during postnatal visit. Only a minority of the patients had their weight and height taken postnatally in clinics. It was only after introduction of new workflow in clinic, then we saw the increase in charting for measurement of height and weight during postnatal GDM review. This help in better surveillance of the postnatal BMI for these women.

For annual polyclinic referrals, we have sent out 600 referrals till date and the numbers are still rising. However, in view of different system structures among the clusters and concern on PDPA, the data for polyclinic referral cases which nurse navigators are able to retrieve are greatly limited. Nevertheless, nurse navigators will continue in sending annual DM screening referrals to polyclinics so as to ensure that these women will receive proper follow up.

Conclusion

The role of nurse navigator is to help in the follow-up care for GDM women to the primary care sector and ensuring proper treatment and advice are rendered accordingly. With the ongoing building of strong network between KKH and polyclinics, more postnatal GDM women would have proper follow-up after delivery. In turn, this helps to reduce the prevalence of developing Type 2 DM later in their lives. Improvements in the IT support are equally important so as to ease the tedious manual data collection process.

Health Education Materials and Resources for Women with History of Gestational Diabetes Mellitus

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Gestational Diabetes Mellitus (GDM) affects up to 20% of pregnant women in Singapore and is associated with an elevated life-time risk of developing Type 2 diabetes postpartum. In Singapore, women who have had GDM may be unaware of their increased risk of developing Type 2 DM. We sought to co-produce socio-culturally appropriate health education materials and resources for women with a history of Gestational Diabetes Mellitus to increase awareness and enhance adoption and maintenance of healthy lifestyle and self-care amongst women who have had GDM.

Influences of the Perinatal Diet on Maternal and Child Health: Insights from the Growing Up in Singapore Towards healthy Outcomes (GUSTO) study

Lai Jun Shi, Singapore Institute for Clinical Sciences, Singapore

Poor maternal metabolic health during pregnancy not only have implications on women's future risks of cardio-metabolic disorders, but also have profound and enduring effects on the metabolic health of the offspring and their disease risk into adulthood. Maternal diet before and during pregnancy has been identified to be a key determinant of metabolic health during pregnancy, and may contribute towards women's metabolic health later in life. More recently, maternal nutrition is starting to gain recognition as being critical for offspring's long-term metabolic health, in line with the developmental origins of health and diseases hypothesis. An overview of this body of evidence from the Asian perspective will be presented based on findings from the GUSTO (Growing Up in Singapore Towards healthy Outcomes) study, a mother–offspring multi-ethnic cohort study in Singapore. The GUSTO study has examined several dietary aspects ranging from the critical nutrients and phytochemicals during pregnancy, overall dietary patterns and appropriate meal timing, for optimal maternal and child metabolic health.

TRACK 3 – CHILD HEALTH: ASIA PACIFIC CONSENSUS WORKSHOP ON SINGAPOREAN INTEGRATED 24-HOUR ACTIVITY GUIDELINES FOR CHILDREN AND ADOLESCENTS

Physical activity, sedentary behaviour and sleep profiles and their transition in children aged 5.5 and 8 years – findings from a prospective cohort study

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Background/objective
Across the 24-h day time spent in movement behaviours (MB), including physical activity (PA), sedentary behaviour (SB) and sleep may have distinct health consequences. However, no previous studies have examined combinations of time spent by children in all domains of MBs using a 24h time-use approach. Among Asian children, we aimed to identify 24h-MB profiles based on night-time sleep, SB, light PA, moderate PA (MPA), and vigorous PA (VPA) and to describe how profiles changed from age 5.5 to 8 years.

Methods

Children in the Growing Up in Singapore Towards healthy Outcomes (GUSTO) cohort were asked to wear an accelerometer on their wrist for seven consecutive days at ages 5.5 and 8 years to measure 24h-MB patterns. This analysis included children with valid data for at least two weekdays and one weekend day at both time-points (n=442). We used latent profile analyses to identify 24h-MB profiles, which were given animal names to reflect key characteristics. Latent transition analyses were used to describe the profile membership transition from ages 5.5 to 8 years.

Results

We identified four profiles, "Rabbits" (very high-MPA/VPA, low-SB and average-night-sleep), "Chimpanzees" (high-MPA, low-SB and average-night-sleep), "Pandas" (low-PA, high-SB and slightly high-night-sleep) and "Owls" (low-PA, high-SB and low-night-sleep), across the time-points. At ages 5.5 and 8 years, the majority of children were classified into profiles of "Chimpanzees" (51% and 39%, respectively) and "Pandas" (24% and 36%, respectively). Most children in the "Rabbits" (100%) and the "Chimpanzees" (>90%) profile met PA recommendations but few children met sleep recommendations across all four profiles at both time-points (≤25.3%). About half (50.7%) of the children changed their profiles from ages 5.5 to 8 years: the predominant transitions occurred from "Chimpanzees" (30%) and "Owls" (57%) profiles to "Pandas".

Conclusions

We identified four distinct 24h-MB profiles among children. About half the children changed their profiles from ages 5.5 to 8 years; the predominant transition being towards lower PA, higher SB and longer sleep duration. These findings shed light on distinct patterns of 24h-MB in children, which can aid development and implementation of public health strategies to promote better health.

Factors in the Successful Weight Loss Intervention among Overweight and Obese Filipino School Children

Divina Cristy Redondo-Samin

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In the Philippines, 'nutrition transition' due to socio-economic growth in the urbanized sectors has been identified as a possible risk factor for childhood obesity. An increasing concern now is the risk of detrimental health consequences associated with childhood obesity. Based on IDF criteria, the overall prevalence of metabolic syndrome in children was 34.2% as seen in a weight management center in Northern Philippines.

A study was conducted which aimed to determine the factors affecting successful weight intervention among overweight and obese children in a medical nutrition and weight management center in Northern Philippines.

This descriptive study included patients enrolled in a weight management program in its short term 3 - month intervention period. Factors and challenges which include environment, person and methods were determined in the achievement of weight loss among overweight and obese Filipino children.

The first 3- month of weight loss intervention showed a good follow-up of patients primarily because of well coordination and communication between the referring primary physician and nutritionist. The success is also attributed to an individualized, culture sensitive and parent/caregiver-specific approach of nutrition counseling. Another important factor that has shown to contribute to the successful implementation of the medically supervised weight loss diets is allowing the active involvement of children in the decision and readiness to follow the intervention. About 67 % of children who have an active involvement in the program which include self-accomplishment of food diary, discussion of the challenges on food choices while in school; an open communication with their parents to discuss allowed and to avoid foods and ; involvement of parents in the agreed and accepted exercise/physical activity program have shown to contribute to a higher 1.5-2 % weight loss in just two weeks.

In terms of unsuccessful weight intervention programs, the main reason is attributed to the passive and less involvement of parents/main caregivers which also led to irregular follow-up. It was shown that the success in the weight loss intervention in overweight and obese children does not depend only on the program itself but on the active role and involvement of both children and their parents/primary caregivers in its implementation.

Prevention of Childhood Obesity - Limiting screen time and encouraging physical activity to prevent overweight and metabolic problems in school children.

Azriyanti bt Anuar Zaini

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Malaysian seems to be leading the world and currently are amongst the fattest in the region. The latest NHMS data is showing adults population are getting more overweight (29%) obese (15%) as compared to 20 years ago (16% vs 4%). A similar trend is now affecting our Malaysian children too. In 2013, SEANUTS study reported 1 in 5 children in Malaysia is either obese or overweight.

Childhood obesity should be regarded as disease rather than a sign of prosperity. It is highly associated with metabolic syndrome; a marker for developing type 2 diabetes and cardiovascular events early in life. There are some important causes of childhood obesity that should be ruled out but mostly it is due to poor behavioural eating pattern and attitude. The children and their family plays a very important role in managing these children at home. The whole family needs to be supportive and committed. Limiting screen time to less than 2 hours/day and to spend at least 1 hour of physical activities are recommended by AAP guidelines to ensure healthy and balanced lifestyle.

Child Obesity in Vietnam

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Introduction
Child obesity is emerging in Vietnam. It relates to many factors. We present these factors and suggest solutions to prevent health care burdens in the future.
Methods
We search for the rates of child obesity in literature and collect the factors relating to child obesity from clinical observation.

Results
The rates of child obesity in Vietnam are rising from 2.5% in 2003 to 5.3% in 2015 in the group under 5 years of age. For the group of 5-19 years of age, the rates of obesity are rising from 0.3% (boys) and 0.1 % (girls) in 2000 to 3.7% (boys) and 1.3 % (girls) in 2016. The relating factors includes parent and child education on nutrition and physical excercise as well as the changes in our economy.

Conclusion
We need more determination to establish a sustainable program addressing child obesity in Vietnam, with appropriate nutrition and physical exercise.

The Burden of Physical Inactivity Among Children and Adolescents in Sri Lanka

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Sri Lanka is a lower middle-income country with a population of approximately 22.5 million situated in South Asia. The annual birth cohort of the country is 350,000, which has been steady over the last several years. Of the total population, 24% is aged between 0-14 years, and 14% is aged between 15-24 years. Physical inactivity and lack of exercise are being increasingly identified as important public health concerns among children and adolescents in Sri Lanka. A recent global survey reported that 81.6% of boys and 88.7% of girls in Sri Lanka have insufficient physical activity. Also, it is reported that over 70% of children watch television for more than one hour a day. Importantly, the rates of insufficient physical activity are similar in both urban and rural populations and across all income categories. However, a significantly higher proportion of children who had insufficient physical activity are overweight or obese.
The prevalence of obesity among Sri Lankan children is 3-6%. Two recent studies done in semi-urban populations reported prevalence of metabolic complication in Sri Lankan adolescents as; impaired fasting glucose-1.3%, hypertriglyceridemia-3.9%, hypercholesterolaemia-15.1%, non-alcoholic fatty liver disease-8.4% and metabolic syndrome-1.6%. Therefore, it is timely that measures are taken to promote physical activity among children and adolescents in Sri Lanka.

A Snapshot of Obesity and Type 2 Diabetes Mellitus in Hong Kong

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The prevalence of overweight/obesity is increasing in Hong Kong especially among secondary school student. As many other countries, the incidence of paediatric-onset type 2 diabetes mellitus (T2DM) is also increasing.
Under the Hospital Authority (HA) of Hong Kong, only 5 of 12 paediatric departments have set up designated obesity clinic which provides routine care mainly. There is no one-stop service and exercise for weight control is mainly run by physiotherapists. To tackle the problem, a service model in which cooperation between the HA and District Health Centre of the Department of Health (DH) is planned.
The Student Health Service (SHS) under DH offers yearly health check programme for primary and secondary school students. A referral system is set up between the SHS and HA in which urine for glucose is screened by SHS for students between the ages of 10 – 18 years old with age and sex specific body mass index > 97th percentile. Those screened positive would be referred to HA Paediatric Departments for further workup and management. A proportion of T2DM in Hong Kong is detected by this programme.

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The Young Onset Clinical Features of Chinese Pediatric Type 2 Diabetes Warrants An Early Screening Strategy

Luo Feihong

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The continuous of improvement of economic status and subsequent environmental changes have brought repaid increase of obesity, metabolic syndrome and diabetes prevalence in China. Compared with the pediatric obesity prevalence in 1985, the boy obesity prevalence increased 29 times with an average annual growth rate of 12.3%, while the girl obesity prevalence has increased 31 times with an average annual increase of 12.7%. High metabolic syndrome prevalence was found in Chinese obesity children, a recent study suggested total prevalence of metabolic syndrome in overweight and obese children was 32.1%, 4.1% of the children were found with increased blood pressure, 24.0% of the children were found with abnormal TG and HDL. In our cohort, we found that the mean onset age of type 2 diabetes was 12.35 ± 1.99 (7.9–17.8) years, and 7% of children were younger than 10 years; A younger onset age and greater male susceptibility were found in Chinese pediatric T2D patients, and there was a stepwise deterioration trend in beta-cell function among patients with obesity, prediabetes and T2D. Based on our results, together with the SEARCH study results, an early screening and intervention program for T2D is recommended in high-risk or obese Chinese pediatric populations starting at 7 years.

Subclass distribution of low-density lipoprotein triglyceride and the clustering of metabolic syndrome components in Japanese children

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Background: Recent studies demonstrated that low-density lipoprotein-tryglyceride (LDL-TG) may represent an another marker of cardiovascular risks. Therefore, we measured LDL-TG including the LDL subclass distribution and investigated the association between LDL-TG subclass profile and the clustering of metabolic syndrome (MetS) components and insulin resistance in Japanese children.

Methods: The study included 237 schoolchildren (boys 115, girls 122). LDL-TG in 4 subclasses (large, medium, small, and very small) were quantified using high-performance liquid chromatography. Total LDL-TG and TG levels in LDL subclasses were evaluated among 4 MetS component groups; non-abdominal obesity, abdominal obesity, pre-MetS, and MetS.

Results: Total LDL-TG (p=0.0003, p=0.0175) and TG levels in LDL subclasses were significantly different among groups with increasing as the clustering of MetS components (large: p=0.0002, p=0.0084; medium : p=0.0009, p=0.0491; small: p=0.0025, p=0.0509; very small: p=0.0808, p=0.0228; boys and girls, respectively). Total LDL-TG (r=0.411. p<0.0001, r=0.378. p<0.0001) and TG levels in LDL subclasses correlated positively with HOMA-R (large: r=0.396, p<0.0001, r=0.346. p<0.0001; medium: r=0.274, p=0.0030, r=0.228, p=0.0115; small: r=0.342, p=0.0002, r=0.292. p=0.0011; very small: r=0.385, p<0.0001, r=0.426, p<0.0001, boys and girls, respectively).

Conclusions: Subclass distribution of LDL-TG had a significant association with the clustering of MetS components in both sexes, and insulin resistance is a significant determinant of LDL-TG in all LDL subclasses. LDL-TG subclass analysis, rather than LDL-C, may provide a precise evaluation for CVD risks in children with MetS.

Adolescent obesity in Malaysia

Thiyagar Nadarajaw

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Malaysia is leading in the prevalence of obesity among Southeast Asian countries. One in 2 adults in Malaysia are overweight/obese and have abdominal obesity. The majority of adult obesity has its origins in childhood or adolescence. According to the latest Malaysia's National Health Morbidity Survey(NHMS) , the prevalence of obesity is showing a significant increase from 2006 to 2019. Unhealthy eating behaviour, dietary practice and meals pattern contribute to the high incidence of obesity in adolescents. Low level of physical activities and prolong screen time compounded by poor sleep hygiene are other contributing factors for obesity in Malaysian adolescents. In the Malaysian Health and Adolescents longitudinal Research Team (MyHeART) study 25.4% of adolescents were overweight/obese and 10% of these adolescents had metabolic syndrome.

The WHO's Commission on Ending Childhood Obesity 2016, details 3 key approaches which are I. Reduce the risk of obesity by addressing critical elements in the life course ii. Tackle the obesogenic environment. iii. Treat children who are obese to improve their current and future health.
In line with WHO Commission a holistic and comprehensive long term obesity prevention programme is essential to halt the increasing prevalence in Malaysia.

The Development and Impact of Australian 24-hour Movement Guidelines for Children and Young People

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In April 2019, the Australian Government released the Australian 24-hour movement guidelines for children and young people. These were among the first set of integrated movement behaviour guidelines that were endorsed as the official government guidelines for these age groups. These guidelines take a 24-hour approach with recommendations for physical activity, sedentary behaviour and sleep for 5- to 17-year-olds.
The GRADE-ADOLOPMENT approach was used to develop the guidelines. A Leadership Group was formed and existing credible guidelines identified. The Canadian 24-Hour Movement Guidelines for Children and Youth best met the criteria established by the Panel. These were evaluated based on the evidence in the GRADE tables, summaries of findings tables and recommendations from the Canadian Guidelines. Updates to each of the Canadian systematic reviews were conducted and a Guideline Development Group was assembled to review the evidence for each behaviour separately, and in combination, deciding to adopt or adapt the Canadian recommendations for each behaviour or create de novo recommendations. An online survey was then conducted (n=237) along with three focus groups (n=11) and thirteen key informant interviews (n=13) to obtain feedback from stakeholders on the draft guidelines.
Based on the evidence from the Canadian systematic reviews and the updated systematic reviews in Australia, the Guideline Development Group agreed to adopt the Canadian recommendations and, apart from some minor changes to the wording of good practice statements, maintain the wording of the guidelines, preamble and title of the Canadian Guidelines. The Australian Guidelines provide evidence-informed recommendations for a healthy day (24-Hours), integrating physical activity, sedentary behaviour (including limits to screen time), and sleep for children (5-12 years) and young people (13-17 years).
To our knowledge, this is only the second time the GRADE-ADOLOPMENT approach has been used to develop movement behaviour guidelines for children and young people. The judgments of the Australian Guideline Development Group did not differ sufficiently to change the directions and strength of the recommendations and as such, the Canadian Guidelines were adopted with only very minor alterations. This allowed the Australian Guidelines to be developed in a shorter time frame and at a lower cost. We recommend the GRADE-ADOLOPMENT approach, especially if a credible set of guidelines, with all supporting materials and developed using the GRADE process, is available. Other countries may consider this approach when developing and/or revising national movement guidelines.

Physical Activity Participation Among Thai children and Its Relationship with Their Metabolic Health

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Prevalence of Thai children and adolescents with metabolic syndrome has been increasing continuously in the past decades, as well as prevalence of sedentary behavior. Physical activity can play a vital role in reversing these trends. International literature clearly shows that different intensity of physical activity can help improve metabolic risk factors in children. Scientific evidence in this area in Thailand is still limited. However, basic information around types, frequency, duration, patterns, and correlates of physical activity among Thai children and adolescents is growing gradually in recent years. A national survey revealed that only one in every four of Thai children and adolescents (6-17 years old) met the recommended levels of physical activity (PA) guided by WHO, although they engaged in a large number of different activities across physical activity domains. Sex, age, body mass index (BMI), geographical regions, organized sports, participation in sport and recreational activities were significant predictors of meeting the global PA guidelines. When considering sport and exercise participation among adolescents, multiple factors at different levels within an ecological framework influencing Thai adolescents' S/EP were generally similar to those found in developed countries, despite some differences. Counterintuitively, sedentary behavior has a positive association with physical activity. The information generated should lead to better informed policy and interventions aiming to increase physical activity among this population group.

Solving The Double Burden of Malnutrition in Indonesian Children

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Non-communicable diseases (NCDs) make up a significant portion of the global disease burden; in Indonesia, NCDs are estimated to account for around 73% of all deaths.1 About 1.2 million children and adolescents under 20 die from NCDs, and NCD risk factors have a negative impact on children's well-being and development. One of the great challenges in pediatric health in developing countries are the double burden of malnutrition (DBM), where a high prevalence of undernutrition coexists with overnutrition. Current global estimates show around 150 million children are stunted, and around 40 million are overweight. 2 Africa and Asia bear the greatest share of all forms of malnutrition. In 2018, more than half of all stunted children and almost half of all overweight children under 5 lived in Asia.3 The Indonesian Bureau of Statistics described in 2008 that 37.2% children under five were stunted, and in 2013, the prevalence of combined stunting and overweight/obesity in adolescence was 6.8%.4 Despite high numbers, public awareness and nutrition literacy are low. Problems in malnutrition in Indonesia include stunting, obesity, and insulin resistance.

Indonesia has one of the largest prevalence of stunting in the world, and studies found the high numbers of stunting were related to socioeconomic status due to the high price of protein sources.5 Stunting is a major concern because it affects intellectual ability, poor school achievement, and increases the risk of metabolic disorders and cardiovascular diseases. It is important to emphasize the role of nutrition in the first 2 years of age as the window of opportunity to prevent undernutrition.6

According to the International Diabetes Federation's Diabetes Atlas, Indonesia is in the top 10 countries with the highest prevalence of diabetes, and the total diabetes-related health expenditure in Indonesia is expected to reach around 5 billion US dollars in 2030.7 Overweight and obesity are closely related to insulin resistance. In Indonesia, the prevalence of obesity is 5 times higher in urban than rural area, and those who were overweight or obese in childhood are more likely to remain overweight or obese in adolescence.8,9 Furthermore, we found a high prevalence of insulin resistance in obese adolescents aged 12-15 years old in Indonesia; obesity and glucose intolerance in childhood are strongly associated with premature death.10 There is rising prevalence of type 2 diabetes mellitus in Indonesian youth, thus proper registry and patient education is needed.4

Therefore, screening by healthcare professionals should be done to provide early intervention to improve outcomes. Regular anthropometric measurement is highly recommended in daily clinical practice, along with patient education on appropriate food intake and physical activity. Support from parents, schools, pediatricians, and the government is essential.

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Childhood Overweight and Obesity: Current Challenges in Myanmar

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Childhood overweight/obesity is one of the ongoing international health concerns. It has dramatically increased in prevalence in many countries including Myanmar. It can be caused by genetic susceptibility and also by the permissive environmental factors that exposed the individual from intrauterine life to childhood. During last decades, undernutrition is one of the health concerns of children in our country. But the increasing prevalence of overweight and obesity in children make us to manage this double burden of nutritional problems. The persistence of obesity from childhood to young adult can cause early presentation of adult diseases like Type-2 Diabetes, myocardial infarct, hypertension, cardiovascular complication and cirrhosis. It can be deleterious effect to the quality of life, health cost and burden. It is extremely important to have early recognition and intervention to reduce the health burden related to childhood obesity. It has dramatically risen childhood obesity prevalence especially in urban area. The study done on nutritional status of primary school children from four geographical regions (2016) revealed that the overweight and obesity prevalence in Yangon was highest i.e., 6.0% and 5.4% respectively. It may be influenced by many factors like socioeconomic factor, family food environment, dietary behavior, inactive physical activity. The study done on the high school children of urban area (2019-2020) showed the overall prevalence of obesity, overweight, normal and thinness were 11.4%, 15.6%, 61.9% and 11.1% respectively. The prevalence of NAFLD in groups of overweight and obese children was Grade 1 NAFLD (32%), Grade 2 NAFLD (12.4%), Grade 3 NAFLD (10.1%). We have only few studies done on childhood obesity and related conditions. The overweight and obese children are mostly referred to Pediatricians, especially to private clinics. The multidisciplinary team approach is available at some private hospitals. In Myanmar, we do not have childhood obesity clinic at most government hospitals. We started Pediatric Endocrine and Diabetes clinic at our hospital in 2014. It is the first one in Myanmar. At our hospital, we see these children at Pediatric Endocrine and Diabetes clinic. It is very challenging to have comprehensive management of the overweight and obese children with limited facilities. There has been an increasing number of childhood overweight, obesity and type 2 Diabetes cases at our hospital. In Myanmar, school-based program organized by school health team are main intervention to prevent and early recognition of the childhood obesity, but it still has many challenges. Even though the parental concern of childhood obesity is somehow increasing, there is still unawareness the magnitudes of the condition. It does not halt with the single level intervention. There is an urgent need to have comprehensive, integrated, sustain measures. It should be for both the short and long term goals.

Metabolic Syndrome among Adolescents in Malaysia

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With the increasing prevalence of overweight and obesity among children and youths, the "pediatric metabolic syndrome (MetS)" has become a global public health concern. Children and adolescents with MetS are at greater risks of developing cardiovascular complications early, during the most productive years of their adult life. However, studies on polycystic ovary syndrome (PCOS) and non-alcoholic fatty liver disease (NAFLD) is limited. Early identification and intervention are therefore crucial. However, cutoffs and individual components used to diagnose MetS in children have not been standardized and need further elucidation. Given the increasing burden of obesity among children, there is a need for an alternative: a simple method or tool with good sensitivity/specificity to identify children at risk of cardiometabolic diseases and insulin resistance (IR) in the community

TRACK 4 – MATERNAL HEALTH

ASIA PACIFIC GDM & MATERNAL METABOLIC HEALTH UPDATES

Collaborative Efforts in Promoting Asia Pacific Maternal Health

IPRAMHO Asia Pacific Maternal Health Network

Integrated Platform for Research in Advancing Metabolic Health Outcomes of Women and Children (IPRAMHO)

IPRAMHO Asia Pacific Maternal Health Network was first initiated in 2017 when plan was made towards having annual international IPRAMHO meetings on maternal metabolic health. The representative members & investigators are from various Asia Pacific countries including Singapore, Malaysia, Thailand, Indonesia, Philippines, Myanmar, Vietnam, Japan, China, India, Sri Lanka & Australia. This is a unique network where Asia Pacific experts and partners in maternal health have come together to work on collaborative maternal and metabolic health research for the region, supplementing global WHO efforts.

This IPRAMHO network has been leading in building consensus for Asia Pacific region to improve metabolic health of mothers and children. Three Asia Pacific consensus statements have been achieved: on GDM; Perinatal Nutrition; and Physical Activity & Exercise in Pregnancy, 2 of which have been published:

1. Asia & Oceania Federation of Obstetrics and Gynaecology, Maternal Fetal Medicine Committee's consensus statements on screening for hyperglycemia in pregnancy. IPRAMHO Hyperglycemia in Pregnancy Consensus Working Group. J Obstet Gynaecol Res. 2018 Nov;44(11):2023-2024.
2. Asia Pacific Consensus on Perinatal Nutrition and Breastfeeding. Ann Nutr Metab. 2019;75(1):86-87.

There were 3 specific published studies from the network. These include:

1. Clinical practice in diabetic pregnancy screening in Asia-Pacific Countries: a survey review. Acta Diabetol. 2019 Jul;56(7):815-817
2. Comparing Different Diagnostic Criteria for Gestational Diabetes Mellitus in Relation to Birthweight in Sri Lankan Women Frontiers in Endocrinology. 2018 Nov 15;9:682
3. Exploring Abnormal Glucose Metabolism in Pregnancy among Australia Chinese Migrants. BMJ Open Diab Res Care 2020;8:e000903.

It is hoped that our efforts can give greater awareness and knowledge to help improve population metabolic health of mothers and women, enhancing and optimise the potential of women and every child born in our region.

New ADIPS guidelines for Type 1 and Type 2 diabetes in pregnancy

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The Australasian Diabetes in pregnancy Society have produced a new guideline regarding the management of type 1 and type 2 Diabetes in pregnancy. The major changes to guidance will be discussed.

Prevalence and Characteristics of GDM by Early Universal Screening in Siriraj Hospital

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Siriraj Hospital is the largest university-based tertiary care hospital in Thailand with approximately 8,000 deliveries per year. Prevalence of GDM was 13-15% of all pregnant women according to a risk-based, 2-step approach, using 50-g GCT followed by 100-g OGTT during first antenatal care visit and repeated at 24-28 weeks of gestation.

In 2019, the GDM care team have decided to change the GDM screening guideline to a universal screening started early in pregnancy, using the same 2-step screening and diagnosis. As a result, a systematic evaluation is warranted in order to evaluate the effects of such changes with regard to prevalence of GDM and pregnancy outcomes.

Therefore, a retrospective cohort study was conducted in 1016 women who started antenatal care before 20 weeks of gestation and received such universal GDM screening. The primary objective was to determine prevalence of GDM by the new early universal screening approach. The secondary objectives were to evaluate the effect of universal screening in terms of the increase in GDM prevalence and pregnancy outcomes.

The results showed that GDM was diagnosed in 189 women, corresponding to 18.6% prevalence. Of them, 44 cases were diagnosed in low-risk women, contributing to 23.3% of all GDM cases. Significant higher prevalence was observed among high-risk than low-risk women (21.3% vs. 13.1%, p=0.002). Majority of GDM (76.2%) were diagnosed before 20 weeks of gestation (74.5% among high-risk women and 81.8% among low-risk women). When initial screening tests were normal, risk of GDM diagnosed during 24-28 weeks was 6.0% (7.5% among high-risk women and 3.1% among low-risk women). Compared to those without GDM, women with GDM significantly had lower gestational weight gain (p<0.001), higher rate of preeclampsia (p=0.001), LGA (p=0.034), and macrosomia (p=0.004). These outcomes were more pronounced among high-risk women with GDM.

Current universal screening protocol seems to be rational and signify the importance of universal GDM screening. The protocol can be adopted in other settings with some adjustments to the context of each setting. Further studies are still needed to evaluate cost-benefit and cost-effectiveness of the protocol and determine associated factors of adverse pregnancy outcomes.

The Obstetrical VTE Prevention in China - Pregnancy-related Venous Thromboembolism and its Association with Organizational Factors

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Introduction

Thromboembolism in pregnancy is among the leading causes of maternal morbidity and mortality worldwide. We aimed to identify organizational factors affecting venous thromboembolism (VTE) incidence and to analyze whether these factors could explain the variations between hospitals.

Methods

We conducted a hospital-based point survey for the number of VTE and live births in 113 hospitals in 2019. Organizational factors, including general information (hospital type, characteristics, live birth number), resource availability (D-dimer, B-scan ultrasonography, computed tomographic pulmonary angiography (CTPA)), competency (risk assessment, anticoagulants and patient education), were collected in the year of 2019. Logistic analysis was used to assess the association of these factors with VTE, after weighted with live birth number.

Results

A total of 113 hospitals in mainland China submitted the survey, reporting 770,828 live births and 526 cases of VTE (68.2 per 100,000 live births). Ultrasonography for lower extremity veins was unfeasible in 9 hospital and lack of CTPA in 22 hospitals. After weighted by the number of live births, higher prevalence rates of VTE were observed in general hospitals [Odds ratio (OR)=4.251, 95% CI: 3.373–5.357]], in those hospitals with live birth number less than 10,000 (OR=1.650–2.193). Those hospitals without B-scan ultrasonography findings of the lower extremity veins had higher VTE rate (OR=1.661, 95% CI: 1.096-2.518). Patients had a significant low risk of VTE in hospitals that implemented patient education (OR=0.296-0.374). A decrease in hospital variation in VTE rate was observed along with the increase of live birth number per year.

Conclusion

Improved hospital-related resource availability and competency, especially patient education levels, are vital to reducing the VTE related maternal mortality and morbidity risk.

Implementation of a checklist protocol for Management of Hypertensive Disorders in Pregnancy in Mount Alvernia Hospital

Tony Tan

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There are many international consensus guidelines published on the management of hypertensive disorders in pregnancy. These guidelines are based on recent changes to diagnostic criteria and management based on published studies. It is difficult for obstetricians to keep updated about these guidelines, and to remember the different issues to consider when managing patients with hypertensive disorders in pregnancy. Checklist protocols are useful documents for both obstetricians and labour ward nursing staff to consider all the important issues in the management of every case. A checklist protocol that has been implemented at Mount Alvernia Hospital, Singapore will be presented. This is a hospital where different private obstetricians, mostly in solo practices, admit their patients to. The difficulties of implementation of such a protocol in such a practice (including modification of indication of corticosteroid usage in view of the latest finding that corticosteroid usage may increase the risk of neuropsychiatric disorders in children) and the strategies employed to ensure the smooth implementation will be discussed.

Trends in Diabetes among pregnant women in a suburban setup in Sri Lanka

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Background

Diabetes in pregnancy, which consists of both Pre-existing Diabetes (PD) and Gestational Diabetes Mellitus (GDM), is a common metabolic disorder of pregnancy which leads to significant long term and short term morbidity to the mother and the fetus. The prevalence of diabetes in pregnancy varies between regions. With the changing lifestyles the prevalence of diabetes in pregnancy is gradually increasing. This study was carried out to identify the trends in diabetes among pregnant women presenting to a suburban hospital in Sri Lanka.

Methods

This was a cohort study done in Colombo North Teaching Hospital Sri Lanka from October 2013 to September 2020. All patients had their dates corrected by ultrasound scan between 11 and 13+6 weeks of period of gestation (POG). The first oral glucose tolerance test was done before 16 weeks and the second was done between 24 and 28 weeks; interpreted by an International Association of Diabetes and Pregnancy Study Groups (IADPSG) criteria. The trends of diabetes with the year, age and the Body Mass Index (BMI) were assessed.

Results

The mean age of the cohort was 29 years. A total of 4301 women were recruited. Of that, 1195 women (27.78%) had either PD (n=642; 14.93%) or GDM (n=553; 12.86%). Overall prevalence of diabetes has not increased significantly between 2013 and 2020. Moreover, prevalence of PD has gradually increased with advancing maternal age and BMI. However, GDM prevalence remained unchanged with age.

Conclusion

The prevalence of Diabetes in pregnancy remained stable over the past 8 years.

Clinical and Metabolic Characteristics of Gestational Diabetes Diagnosed in Early Pregnancy

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Background

In Japan, gestational diabetes mellitus (GDM) has been screened for and diagnosed in early pregnancy. However, little is known about the clinical and metabolic characteristics of GDM diagnosed in early pregnancy. Hence, we investigated the clinical and metabolic characteristics of GDM diagnosed before 24 gestational weeks. We hypothesized that the development of GDM in earlier gestation would be associated with higher insulin resistance.

Materials and Methods

Women diagnosed as GDM were categorized based on gestational age at diagnosis in early GDM (E-GDM, diagnosed before 24 weeks, n = 388) or late GDM (L-GDM, diagnosed at or after 24 weeks, n = 340). Women with multi-fetal pregnancies, fetal congenital anomalies, overt diabetes in pregnancy, and pre-gestational diabetes (i.e. type 1 or 2 diabetes) were excluded. Clinical outcomes and metabolic features were compared between the two groups.

Results

Pre-pregnancy BMI and the prevalence of first-degree family history of type 2 diabetes were significantly higher in E-GDM than in L-GDM. With regard to metabolic measurements, fasting plasma glucose level (PG), ISOGTT, ISSI-2, and Insulinogenic Index were significantly higher in E-GDM compared with those in the L-GDM. Women with E-GDM showed significantly lower levels of 1h-PG, 2h-PG, and HOMA-IR as compared with L-GDM; however, there was no significant difference in insulin requirement during pregnancy between the two groups. There was no significant difference in other perinatal outcomes between the two groups except that the Apgar score at 5 minutes in E-GDM was significantly lower than that in L-GDM.

Conclusion

Contrary to our hypothesis, women with E-GDM showed significantly lower levels of HOMA-IR than those with L-GDM. Given that there was no difference in perinatal outcomes and insulin requirement during pregnancy between the two groups, the therapeutic intervention for E-GDM could be clinically appropriate.

Newborn Screening in India: Challenges in Implementation

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Newborn screening should be an integral part of maternity care as early detection and treatment can help to prevent intellectual and physical defects and life-threatening illnesses. Though, there are many analytes which are screened, at times it may not be cost effective to screen all of them. But at least those conditions which are preventable and prevalent in particular geographic areas need to be screened. We need good epidemiological data to know exact burden of these conditions. Same was proposed by Wilson & Jungner criteria worldwide long back. The WHO has recommended that genetic services should be introduced in countries with an infant mortality rate (IMR) less than 50. India has started slowly introducing newborn screening and genetic services. There are many challenges we face in day to day practice. These start from sampling, screening, reporting, confirmation, proper referral & its short term & long term follow up. Another important issue that needs to be solved about whether OBGYN or neonatologist should counsel for NBS. We need good awareness amongst not only people but also clinicians. We can overcome cost barrier by opting for smaller panel. Its exercise by both government and private sector in India.

LIST OF POSTER ABSTRACTS

MCH001

Bridging the Needs of Adolescent Diabetes Care during Coronavirus Disease 2019: A Nurse-Led Telehealth Initiative

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MCH002

Perceptions of physical activity during pregnancy among women in Singapore: A descriptive qualitative study

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MCH003

Poor sleep is associated with higher blood pressure in pregnancy

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MCH004

Childhood obesity: a survey of knowledge and practices of pediatricians and pediatric residents

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MCH005

Maternal meal regularity during pregnancy

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MCH006

Improving Psycho-social health of Adolescents with Diabetes (I-PAD)

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MCH007

IPRAMHO I-PROFILE Study: Acceptability of calibration-free continuous glucose monitoring (CF-CGM) sensor use in pregnant Singaporean women

Phaik Ling Quah[1], Nur Ain Mohd Zanar[1], Nurul Sakinah Razali[1], Nurul Syaza Razali[1], Terry Chin-Chye Teo[1], Tagore Shephali[2], Ann Wright[2], Serene Thain[2], Kok Hian Tan[1,2,3]

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MCH008

Physical Activity & Exercise in Pregnancy & Postpartum - Asia Pacific Consensus Statements

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MCH009

Risk factors for the development of prediabetes and diabetes for GDM postnatally

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MCH010

Neonatal & Obstetric Risk Assessment (NORA) Study - Insights from an Antenatal Cohort Study in Singapore

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MCH011

Macronutrient composition of pasteurized donor human milk in Singapore

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MCH012

Can Periodontitis be a Predictor of Gestational Diabetes? GESPER Cohort in Singapore

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MCH013

Maternal Inborn Errors of Metabolism and Vitamin B12 Deficiency Uncovered by Abnormal Newborn Screening

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MCH014

Food Parenting Practices' Impact on Preschoolers' Food Preferences: A Literature Review

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MCH015

Maternal night-eating pattern and glycaemic measures during pregnancy: study protocol for a prospective study

Rachael Loo Si Xuan[1], Fabian Yap Kok Peng[1,2,3], Cheung Yin Bun[4,5], Tan Kok Hian[2,6], Jerry Chan Kok Yen[2,7], Lee Yung Seng[8,9,10], Lek Ngee[1,2], Bernard Chern Su Min[2,11], Müller-Riemenschneider Falk[12,13], Chong Foong-Fong Mary[8,12], Loy See Ling[2,7,8]

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MCH016

Facilitators and barriers to post-partum diabetes screening among mothers with a history of gestational diabetes mellitus – a qualitative study from Singapore

Sharon Hanna Sunny[1], Andrew Tan Yen Siong[2], Daniel Lim Chong Soon[2], Rahul Malhotra[1], Ang Seng Bin[3,4], Benjy Soh Yi Min[2], Cassandra Ho Xin Yi[2], Martyn Gostelow[2], Marianne Tsang Li Ping[2], Smily Lock Seen Hang[2], Kwek Suat Yee[2], Jana Lim Yu Ting[2], Kayshini Vijakumar[2], Tan Ngiap Chuan[2,4]

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MCH017

KIT - Start the Teaching: Standardised Insulin Injection Training Kit for Enhancing Confidence and Safety in Insulin Administration

Er Boon Hui[1], Nanthakumahrie D/O Gunasegaran[2], Chan Yoke Ling[1], Pi Guangyan[3], Zhang Xiaoping[1]

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MCH018

Development of the one-STop Obstetric high RisK (STORK) Centre for obstetric and medical high risk services to improve patient care, safety and experience within KK Women's and Children's Hospital

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MCH019

IPRAMHO I-24 Study: Physical activity, sedentary behavior, sleep and screen viewing of children in Singapore aged 5-14 years old

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MCH020

The association of time outdoors and patterns of light exposure with myopia in children: implications for prevention

Mijie Li[1,2], Carla Lanca[2], Chuen-Seng Tan[1], Chen-Hsin Sun[3], Fabian Yap[4], Raymond P.Najjar[2,5], Charumathi Sabanayagam[2,5], Seang-Mei Saw[1,2,5]

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MCH021

The Prevalence and Management of Iron Deficiency Anaemia in Pregnancy

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MCH022

Impact of COVID-19 on home-based physical activity for children: A cross-sectional survey study

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MCH023

Community enabled Readiness for first 1000-Days Learning Ecosystem (CRADLE) Study – An Update

Joyce Teo[1], See Ling Loy[2,3], Sing Zhi Kee[4], Sze Wern Chan[5], Nurul Khairani Abdul Razak[5], Kok Hian Tan[6], Thilagamangai[5], Oh Moh Chay[7], Kee Chong Ng[1]

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MCH024

Role of diazoxide therapy in small for gestational age infants with prolonged hyperinsulinemic hypoglycemia

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MCH025

Gestational Diabetes Joint Clinic – the Singapore General Hospital Experience

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MCH026

Championing Obstetric Medicine Services - Development of the Centre for High Risk Pregnancy (CHiRP) at the Singapore General Hospital

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MCH027

Adapting the US-based clinic-community model into an online intervention model in Singapore- a descriptive study of the adaptation framework

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MCH028

The Use of Nudges during the first 1000 days of life to promote Parenting Self-Efficacy: Will They Be Effective?

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MCH029

Midwife-led Community Care in the first 1000 days of life to promote parenting self-efficacy

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MCH030

Prevalences and perinatal outcomes of gestational diabetes in Asia Pacific countries - a cross-sectional study

Integrated Platform for Research in Advancing Metabolic Health Outcomes of Women and Children in Asia (IPRAMHO) International Collaborative Study Team

MCH031

Factors influencing women's health behaviours in post-partum screening and follow-up for Type 2 Diabetes after Gestational Diabetes in Asian populations – A narrative review

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MCH032

A comparison of spot urine protein to creatinine ratio (uPCR) with 24-hour urine total protein (UTP) for early identification of preeclampsia (PET)

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MCH033

Body Mass Index, gross motor skills, physical activity and foot structure in overweight and obese children – Preliminary Report

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POSTER ABSTRACTS

MCH001

Bridging the Needs of Adolescent Diabetes Care during Coronavirus Disease 2019: A Nurse-Led Telehealth Initiative

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Introduction

Many lifestyle habits are changed during the COVID-19 pandemic and have been detrimental for children/ teenagers with diabetes, including sedentary home-based learning with dietary changes that demanded insulin adjustments. This took a toll on the adolescents with diabetes mellitus (DM) with seemingly sub-optimal glycemia. In addition, there were anxiety over attending clinic visits for fear of contacting COVID-19. This report describes a nurse-led telehealth initiative to provide adolescent an uninterrupted diabetes care (STEP) during this pandemic.

Methods

The adolescents and their parents will receive information such as a text message on clinic conversion to telehealth service with verbal consent obtained and instruction for laboratory test for blood HbA1c (on-site), collection/ home delivery of medication, and electronic submission of available home blood glucose profile. Once HbA1c result was available, an audio-call back (approximately 20-30 minutes) will be conducted. This pilot initiative was conducted between February and June 2020 guided in accordance to the National Telemedicine Guidelines, reaching out to both adolescents with type1 DM and type 2 DM.

Results

Thirty-five adolescents attended telehealth diabetes service and eighty percent of them had T1DM with issues on adjusting insulin doses during school closure and modifying food choices to better stabilize glycemia fluctuations. A user experience survey was sent which received a positive response (up to eighty percent) from both adolescents and parents on telehealth as similar to in-person clinics. Up to seventy percent felt 'very satisfied' with the administrative processes of telehealth service and will choose APN-led telehealth service. Success factors include the duration of time spent on APN-led assessment and consultation with at ease to speak, adequate opportunity to ask questions, and being understood over the telehealth session. During the same period, there were no emergency visits for diabetes-related adverse events, and HbA1c levels remained stable (averaging HbA1c of 8.2%) among those who had already returned for a second visit with their primary physician.

Conclusion

Pandemics pose unique challenges to health care delivery and services, and contingencies need to be planned for in advance. As health systems are being reconfigured, telemedicine has served to bridge the need for continuity of care during COVID-19 pandemic, especially in the management of adolescents with T1DM.

MCH002

Perceptions of physical activity during pregnancy among women in Singapore: A descriptive qualitative study

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Introduction

Regular physical activity has numerous health benefits for both the mother and the fetus that may extend beyond the perinatal period. Despite the well-established health benefits, research has highlighted that most pregnant women have low levels of physical activity. This prompted the need to understand women's experiences and concerns behind physical activity during pregnancy.

Methods

Twenty-two women were recruited in a tertiary hospital specializing in healthcare for women and children. Data were collected through in-depth semi-structured interviews. A thematic analysis was conducted to identify the main themes associated with women's perceptions of physical activity during pregnancy.

Results

Two themes, including five subthemes, were generated. The themes were: "From what I know" about physical activity to actual physical activity and "What keeps and stops me from moving". Women exhibited a lack of understanding regarding the physical activity guidelines during pregnancy. Factors such as support system, informational support, and benefits associated with physical activity have shown to motivate women's activity behaviours, while other factors such as a fear of harm to the baby, physical discomforts, and family commitments deterred women's participation in physical activity.

Conclusion

The findings suggested the need for improvements in physical activity education and social support during pregnancy. This could include conducting campaigns to raise public awareness on the importance of staying active even during pregnancy. In addition, availability of support such as antenatal classes focusing on physical activity during pregnancy could be implemented to women so that women feel safe to exercise under professional guidance.

MCH003

Poor sleep is associated with higher blood pressure in pregnancy

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Introduction

Sleep disturbances have long been recognized as a significant complication during pregnancy which can lead to multiple adverse maternal and fetal outcomes. Multiple studies have shown that sleep disturbances are associated with pregnancy induced hypertension and pre-eclampsia. However, there is no systemic study on the progression of sleep disturbances and their correlation with blood pressure throughout pregnancy. In this prospective cohort study, we aim to elucidate the correlation between sleep disturbances and blood pressure during pregnancy in women with no pre-existing hypertension.

Methods

926 subjects were recruited for this cohort study in the outpatient specialist clinics at KK Women's and Children's Hospital, Singapore, between September 1, 2010, and August 31, 2014. They were followed up throughout pregnancy with sleep quality, blood pressure and uterine artery doppler assessed at each visit.

Results

Sleep progressively worsened as pregnancy advances. Shorter sleep duration and poorer sleep efficiency were associated with higher blood pressure, especially in the first trimester. Mixed model analysis demonstrated overall positive correlation between sleep quality represented by PSQI score and diastolic blood pressure (DBP) ($p<0.001$) and mean arterial pressure (MAP) ($p=0.005$) during pregnancy after considering all trimesters. Sleep duration was found to be negatively correlated with both systolic blood pressure (SBP) ($p=0.029$) and DBP ($p=0.002$). Overall poor sleep during pregnancy was also found to be correlated to higher uterine artery pulsatility index.

Conclusion

Sleep quality is significantly associated with blood pressure and uterine artery doppler during pregnancy.

MCH004

Childhood obesity: a survey of knowledge and practices of pediatricians and pediatric residents

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Introduction

Childhood obesity is one of the most common and serious public health issues in the twenty-first century. Due to paucity of data on physicians' knowledge on childhood obesity, this study aim to assess the knowledge and practices of pediatricians and pediatric residents with respect to childhood obesity.

Methods

Baseline demographic data as well as participants' knowledge in medical, dietary, physical activity and psychological aspects of childhood obesity were collected using a 32-question survey. A group of medical and allied health professionals designed and reviewed the survey. BMI cut-offs for obesity and overweight, healthy balanced diet in proportion of plate, recommended sugar intake, physical activity for children were defined according to national and international guidelines.

Results

A total of 123 doctors were surveyed. Both juniors and seniors tend to encounter overweight and obese patients on weekly basis. The most common challenge cited during patient consultations was patient motivation-related. Expectedly, the seniors perceived themselves to be more comfortable and knowledgeable. Physical activity recommendation was the weakest area, followed by dietary advice. There were no significant differences in medical, dietary and psychological knowledge associated with obesity between both groups of doctors.

Conclusion

There were similar knowledge gaps in all domains of childhood obesity between junior and senior doctors. Physical activity recommendation is the weakest area. Patient motivation is the commonest challenge faced. Hence, future education programs should target all doctors and focus on motivational interviewing.

MCH005

Maternal meal regularity during pregnancy

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Introduction

Meal regularity can influence metabolic health. However, habits of meal skipping and meal delaying have been rarely studied among pregnant women who are vulnerable to metabolic complications. This study examined the incidences of maternal meal skipping and meal delaying, and their associated characteristics during pregnancy.

Methods

Pregnant women in the second trimester (18-24 weeks' gestation; n=90) were recruited from the antenatal clinics of KK Women's and Children's Hospital. Data collection includes sociodemographic, behavioral factors and dietary habits. Meal skipping was defined as the lack of consumption of at least one main meal (breakfast, lunch or dinner) for ≥3 times/week; meal delaying was defined as the delay of having at least one main meal for ≥3 times/week by >2 hours from regular meal timing.

Results

Twenty-five (27.8%) and 26 (28.9%) women reported meal skipping and meal delaying, respectively. Of these women, 19 (76.0%) skipped breakfast and 18 (69.2%) delayed breakfast. Women who skipped their meals were more likely than women who did not skip meals to be ethnically Malay (60.0% vs. 13.8%, respectively; $p<0.001$), exposed to cigarette smoke (76.0% vs. 32.3%; $p<0.001$), and have poor sleep quality (92.0% vs. 40.0%; $p<0.001$); while women who delayed their meals were more likely to be ethnically Malay (53.8% vs. 15.6%; $p=0.002$), be unemployed (34.6% vs. 7.8%; $p=0.003$), exposed to cigarette smoke (73.1% vs. 32.8%; $p<0.001$), spent longer time on electronic devices (3.8 vs. 2.1 h/day; $p=0.030$), have poor sleep quality (92.3% vs. 39.1%; $p<0.001$) and displayed symptoms of depression (46.2% vs. 20.3%; $p=0.019$) and stress (46.2% vs. 18.8%; $p=0.016$), as compared to those counterparts.

Conclusion

In this preliminary analysis, almost one-third of women were found to skip or delay their meals during pregnancy, particularly breakfast. Understanding the associated characteristics can help in the efforts of developing strategies to improve maternal eating habits and subsequent health outcomes.

MCH006

Improving Psycho-social health of Adolescents with Diabetes (I-PAD)

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Introduction

Adolescence is a challenging time, particularly for adolescents with diabetes as they learn to self-manage social, physical and emotional changes to become independent young adults. Diabetes Distress (DD) refers to the negative emotions arising from living with diabetes and the burden of self-management. The aim of this study is to measure DD and categorize it into "High", "Moderate" & "Low" levels, then provide psychological interventions and measure its effectiveness.

Methods

225 adolescents with diabetes were invited to participate in the online Diabetes Distress Survey (DDS) in March and again in June 2020. The average score across 4 domains (Emotional Burden, Physician Distress, Regimen Distress, Interpersonal Distress) were computed. The scores are categorized as "High" (3-5), "Moderate" (2-3) and "Low" (<2).

The first analysis compares DD between March and June to delineate a natural tendency to improve without intervention. Joint Clinics with diabetes nurse and psychologist are then implemented for "High" DD patients and Tele-Consults are administered to those with "Moderate" DD. Patients with "Low" DD are monitored during their routine clinic visits. The third DDS will be administered in January 2021 and analysis will be done to compare the change in DDS scores after intervention.

Results

There were 149 (66%) responses in March, and 93 (41%) in June. In March 2020, there were 17 patients with "High" (mean: 3.71) and 29 with "Moderate" (mean: 2.39) distress. In June 2020, there were 12 with "High" (mean: 3.77) and 19 with "Moderate" (mean: 2.35). Emotional Burden also ranks as the highest distress domain with an average DD of 2.75 (March) and 2.32 (June). This shows DD changes over time with variable stressors and coping mechanism adopted by the patient. It will be interesting to see the change in DD scores after intervention.

Conclusion

DD scores are a guiding tool to assess psychosocial health and plan holistic management for adolescents with diabetes.

MCH007

IPRAMHO I-PROFILE Study: Acceptability of calibration-free continuous glucose monitoring (CF-CGM) sensor use in pregnant Singaporean women

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Introduction

The calibration-free continuous glucose monitoring (CF-CGM) sensor can be used during pregnancy to monitor glucose profiles and provide guidance of gestational diabetes mellitus (GDM) clinical screening and treatment. There is a need to asses participant's willingness to wear the device over a sustained period. We aim to evaluate the use of the non-blinded and blinded CF-CGM device from the perspective of pregnant women, especially pertaining to acceptability during the clinical trial (I-PROFILE)

Methods

52 participants were randomized into non-blinded (n=25) or blinded (n=27) groups and advised to wear the CF-CGM sensor for 14 days. Participants in the non-blinded group wore sensors with open readers, while the blinded group wore sensors without readers. After the wear-time period, an 8-item acceptability questionnaire survey rated on a 5-point Likert scale was completed. Wear-time was a proxy of compliance. Two-tailed independent t tests and chi-squared tests were used to examine the association between the acceptability responses in both groups.

Results

94.7% of the participants agreed that this device is easy to use, user friendly, and felt confident about using it correctly. More participants in the non-blinded versus the blinded group, agreed that the device offers convenience (94.7% versus 85.0%, respectively), provides relevant information (94.7% versus 85.0%, respectively), and is of value to them (89.5% versus 85.0%, respectively) ($p>0.05$ for all). The mean (sd) for acceptability scores, and wear days were higher in the non-blinded group, compared to the blinded group [acceptability scores:4.4 (0.92) versus 4.1(0.51), respectively; mean wear days:11.4 (3.6) days versus 11.1 (2.9) days, respectively] ($p>0.05$). A higher percentage of participants in the non-blinded group were motivated to track their daily behaviors using the sensor (94.7% versus 75.0%, respectively, $p=0.088$).

Conclusion

The high acceptability of using the CF-CGM device (especially in the non-blinded group) suggests a strong potential for use in pregnant women.

MCH008

Physical Activity & Exercise in Pregnancy & Postpartum - Asia Pacific Consensus Statements

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Introduction

Physical activity comprises a spectrum of movement behaviours including moderate to vigorous physical activity (MVPA). Research into physical activity and exercise in pregnancy on gestational weight gain (GWG) and pregnancy outcomes have shown an overall benefit on limiting GWG and preventing adverse maternal and fetal outcomes There is currently no consensus recommendations on the safety and roles of physical activity and exercise in pregnancy and the postpartum period in the Asia-Pacific region.

Methods

A total of 18 members consisting of obstetricians, nurses, physiotherapists and sports medicine physicians from 10 countries presented their local perspectives on physical activity and exercise in pregnancy and the postpartum period. At the consensus workshop, questions and statements relating to physical activity and exercise in pregnancy were posted. An electronic clicker system was used to collect the responses to the questions which were recorded. Next, the key consensus recommendations on physical activity and exercise in pregnancy were voted and agreed upon by expert opinion after looking at the empirical evidence with voting responses threshold above 75% met to be accepted as recommendation for the consensus statements.

Results

The seven consensus statements were:

1. Physical activity is beneficial, and should be encouraged during and after pregnancy.
2. Physical activity is safe for pregnant women and their fetuses in the absence of any contraindications.
3. Pregnant women with no contraindications should aim to accumulate at least 150 minutes of moderate-intensity physical activity each week.
4. Pregnant women with certain medical conditions should consult their health care providers early before commencing exercise.
5. Pregnant women should take safety precautions while exercising.
6. Pregnant women with warning signs should stop exercising and seek immediate medical attention.
7. Physical activity should be resumed gradually after delivery in the postpartum period.

Conclusion

This consensus will contribute to a common understanding. It can facilitate reduction of obesity and diabetes globally in the Asia Pacific region and help to improve the metabolic outcomes of women.

MCH009

Risk factors for the development of prediabetes and diabetes for GDM postnatally

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Introduction

Women with gestational diabetes mellitus (GDM) are likely to develop postpartum diabetes mellitus (DM). We aim to determine the incidence of prediabetes and diabetes at 6–12 weeks postpartum among women with GDM, and to identify risk factors for the development of prediabetes and diabetes for GDM postnatally.

Methods

942 antenatal GDM patients based on the IADPSG 3 point's OGTT criteria (0hr, 1hr and 2hr) from November 2016 to April 2018 were included in our cohort study. Pregnant women's demographic, clinical and obstetric characteristics were investigated. Their glucose tolerance status and development were evaluated at 6–12 weeks postpartum using WHO 2 points OGTT criteria (0hr and 2hr).

Results

Of all 942 antenatal GDM cases, there were 124(13.2%) postnatal prediabetes and 33 (3.5%) postnatal diabetes patients. Multivariate analysis confirmed age of 35 years old or over, BMI of 30 kg/m2 or more at first visit, parity of 2 or less, and each of antenatal 3-point OGTT (Antenatal Fasting OGTT 5.6 mmol/L or higher; Antenatal 1hr OGTT 11.3 mmol/L or higher; and Antenatal 2hr OGTT 9.6 mmol/L or higher), as risk factors of postnatal prediabetes and diabetes after antenatal GDM. The predictive power for each of the antenatal 3-point OGTT appeared to be better than that of age and parity.

Conclusion

These risk predictors identified could be useful for postnatal risk stratification and management.

MCH010

Neonatal & Obstetric Risk Assessment (NORA) Study - Insights from an Antenatal Cohort Study in Singapore

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Introduction

The Neonatal & Obstetric Risk Assessment (NORA) prospective pregnancy cohort study was set up to assess clinical, biochemical and biophysical markers for risk assessment and prediction of the outcomes early in pregnancy.

Methods

A total of 3271 patients who were in KK Women's and Children's Hospital between September 2010 and October 2014 were screened and 1013 patients consented to participate in the study. Women were followed at 18 to 22 weeks, 28 to 32 weeks and 34 weeks and above, till their postnatal discharge from the hospital. Finally, 926 patients remained for studying the outcome.

Results

In metabolic health domain, we established locally derived and gestational age-specific reference intervals for the five thyroid hormone parameters. Using NORA cohort, we found that extracellular vesicle (EV) biomarkers enhanced the predictive robustness of an existing pre-eclampsia (PE) biomarker sufficiently to justify PE screening in a low-risk general obstetric population. There were significant differences in the PlGF and sFlt-1 concentrations during pregnancy between different ethnicities in our local population. Overweight and obese Singaporean women accounted for over a third of our pregnant population and appropriate weight management for overweight and obese Singaporean women prior to and during pregnancy is important as overweight and obesity are independent significant risk factors for gaining excessive gestational weight.

In mental health domain, antenatal anxiety symptoms were found to be common even in normal pregnancies, especially among women with depression and lower education. 9% of our women suffering from probable clinical depression throughout the pregnancy and there is a need of screening for depressive symptoms early in pregnancy to identify women who may benefit from greater formal and informal support. The persistently-higher antenatal psychological stress trajectory, experienced by two in five women, was associated with lower birthweight and possibly smaller head circumference. We found that poor sleep is associated with higher blood pressure and uterine artery pulsatility index in pregnancy in NORA study.

In obstetric health domain, higher serum progesterone levels at 28–32 weeks of pregnancy were observed in women who had preterm deliveries compared with women with term deliveries in the cohort. NORA found that ultrasound cervical length screening for pregnant Asian women between 18 and 22 weeks of gestation with a cutoff of < 2.48cm can help to identify a group of women who are at risk for preterm birth. Using NORA as a control, we find that the most significant risk factors for pregnancy-associated VTE were smoking and preterm delivery. Malay race, multiparity, non-O blood group and caesarean section, were also identified to be of higher risk.

Conclusion

The NORA Cohort Study has provided useful information on pregnancy physiology and pathology in Singapore. These information and insights should be useful for the development of optimal metabolic, mental and obstetric health strategies for pregnancy and the postpartum period in Singapore.

MCH011

Macronutrient composition of pasteurized donor human milk in Singapore

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Introduction

The KK Hospital human milk bank (KKHMB) was established to provide pasteurized donor human milk (PDHM) to sick infants in Singapore. However, little is known about the nutrient profile of our PDHM, limiting individualization of nutrition provision in recipients. We aimed to describe the macronutrient composition of donor milk at the KKHMB, and determine the corresponding associative factors.

Methods

PDHM donated between April and October 2019 to the KKHMB were analyzed for energy, fat, protein and carbohydrate content. Preterm PDHM, defined as PDHM expressed before the infant turned 37 weeks gestation, was excluded. Macronutrient composition of PDHM were described and compared to donor and donor's infant information including donor parity, birth gestation and weight, and lactation age of PDHM.

Results

Of 185 samples from 63 mothers, 35 (18.9%) were donated by 10 (15.9%) mothers of preterm infants. Median donor parity was 2 (IQR 1 – 2). Median lactation age of PDHM was 4.9 months (IQR 3.2 – 6.9), and median infant birth weight was 3010g (IQR 2600 – 3315). Median energy, fat, protein and carbohydrate concentration was 69.2kcal (IQR 64.1 – 75.1), 3.41g (IQR 2.92 – 3.93), 0.85g (IQR 0.76 – 0.91) and 8.3g (IQR 8.1 – 8.4) respectively.

Lactation age was significantly correlated with protein content (r=-0.47, p<0.001), but not carbohydrates, fat or total energy. There was no significant association between macronutrient composition and donor parity or infant birth weight. PDHM from mothers of preterm infants was significantly lower in fat compared to term infants even after controlling for lactation age of milk [' -0.41 (95%CI -0.72 - -0.10), p=0.010], resulting in an overall lower energy concentration.

Conclusion

Compared to published values, PDHM from the KKHMB appears similar or higher in energy, fat and carbohydrate, but lower in protein. Variability of composition and factors affecting macronutrients should be considered in individualized and targeted nutrition therapy.

MCH012

Can Periodontitis be a Predictor of Gestational Diabetes? GESPER Cohort in Singapore

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Introduction

Gestational diabetes mellitus (GDM) can increase risk for obstetric and fetal complications. It can arise from interference of carbohydrate metabolism by inflammatory mediators. Inflammatory mediators are constantly generated during gum diseases like periodontitis. However, it still remains uncertain how periodontitis-induced bacterial and immune changes could be associated with GDM. Previously, we have unraveled the pathogenic oral microbiota and altered immune responses during healthy pregnancy. Anchoring on our preliminary data, we propose a cohort study - GESPER (Gestational diabetes-Periodontitis Link) to be established to obtain conclusive evidence on the association of periodontitis with GDM, using high-throughput 'omics' technologies.

Methods

GESPER cohort will include Singaporean pregnant women at 12-14 weeks gestation, grouped into subjects with (n=142) and without periodontitis (n=142). Subjects will be followed up at 24-28 weeks of gestation and OGTT outcome will be used to stratify the groups into sub-groups of GDM-positive and GDM-negative patients. The association between development of GDM at the second trimester and presence of periodontitis at the first trimester will be evaluated using a logistic regression model. Saliva and subgingival samples collected from subjects with periodontitis during the second trimester will be subjected to microbiome and proteomics analysis.

Results

GESPER cohort will provide the descriptive statistics of periodontitis in GDM in Singapore and the odds ratio of developing GDM in the presence of periodontitis. Taking a step ahead, using high-throughput omics technologies, the mechanistic role of periodontal microbiota and immunome in the development of GDM will be deciphered.

Conclusion

Periodontitis is preventable and curable and if proven as a risk factor, it can open the doors to intervention studies to prevent GDM and adverse birth outcomes. GESPER study can support the development of effective preventive health initiatives and pave way for future point-of-care diagnostics for pregnant women across Singapore.

MCH013

Maternal Inborn Errors of Metabolism and Vitamin B12 Deficiency Uncovered by Abnormal Newborn Screening

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The National Expanded Newborn screening program for inborn errors of metabolism (IEM) in Singapore allows early detection of IEM in newborns and prevention of medical complications through early intervention. Maternal IEM and vitamin deficiency can be detected through the finding of abnormal concentrations of specific acylcarnitines. During the 11-year study, a total of 299,462 newborn screening was performed and the incidence rate of maternal conditions detected secondary to abnormal newborn screening was 1 in 21,390. The three maternal conditions detected were maternal systemic primary carnitine deficiency (CDSP) (n=7), maternal vitamin B12 deficiency (n=5), and maternal 3-methylcrotonyl-CoA carboxylase deficiency (3MCCD) (n=2). Most mothers with CDSP were asymptomatic and had variable response to levocarnitine supplementation, requiring titration according to carnitine levels. The mothers were found to have lower free carnitine levels, ranging from 0.5-4.6 µmol/L, compared to their newborns whose isolated low free carnitine levels ranging from 3-6 µmol/L. The two mothers with 3MCCD were asymptomatic. They did not require levocarnitine supplementation as their free carnitine levels were within normal range.

They had raised plasma 3-hydroxyisovalerylcarnitine (C5OH) levels, increased urinary excretion of 3-hydroxyisovalerate (3-HIVA) and 3-methylcrotonylglycine (3-MCG). The infants born to asymptomatic mothers with vitamin B12 deficiency had raised C3, C3/C2 ratio on dried blood spots (DBS), plasma total homocysteine, and urinary MMA. All infants with acquired vitamin B12 deficiency and their mothers were asymptomatic, and improved after receiving vitamin B12 supplementation. The detection of asymptomatic mothers with CDSP, 3MCCD and vitamin B12 deficiency through abnormal newborn screening allows targeted management plan for affected individuals to reduce the risk of associated complications, and precautionary steps to be taken during next pregnancy for affected mothers. However, further studies are required to establish long term outcomes of these asymptomatic mothers with CDSP and 3MCCD.

MCH014

Food Parenting Practices' Impact on Preschoolers' Food Preferences: A Literature Review

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Introduction

Parents play key roles in child's development of eating habits and preferences. Food parenting practices (FPP) are goal-oriented strategies to influence child's diet. A literature review was conducted to explore how FPP are used and their effects in preschoolers' preferences and intake of unhealthy and unhealthy foods.

Methods

A literature review was conducted on the following electronic databases: Cumulative Index of Nursing and Allied Health Literature, Embase, PsychINFO, PubMed, Scopus and ScienceDirect. Qualitative and quantitative studies published in English within the past five years were included. Search terms were a combination of "feeding practice", "food parenting", "preschoolers", "obesity", "fruits and vegetables consumption", "sugary drinks/beverages" and "snack food".

Results

Coercive feeding practices, including restriction, pressure, soothing with food, threats and bribes, were widely studied. Restriction and pressure were positively related to the children's weight status. However, longitudinal studies found that parents used these practices in response to children's weight and picky eating. Coercive practices were found to increase preference and consumption for unhealthy foods.

Autonomy support practices aim to promote more autonomous forms of motivation for healthy eating, by using encouragement, reasoning, praise, nutritional education and enabling child choice. Limited studies suggest a positive correlation between autonomy support practices and consumption of healthy foods. Child choice should be supported within the limits of parental guidance.

Positive structures in home food environment, such as availability and accessibility of healthy foods and modeling, were related with increased preference of healthy foods. The impact of monitoring, rules and limits, family eating, distraction, planning and preparation, attractive presentation of healthy foods were unclear.

Conclusion

There are inconsistencies in the conceptualization and measurement of FPP. Supporting child autonomy to inculcate healthy eating habits is a recent development. More research is warranted to understand the impact of autonomy support and structure FPP using better measurement tools

MCH015

Maternal night-eating pattern and glycaemic measures during pregnancy: study protocol for a prospective study

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Introduction

Gestational hyperglycaemia contributes to adverse short- and long-term outcomes for mothers and offspring. Recent evidence shows that synchronizing eating schedules with circadian rhythms or day-night cycles helps to improve glucose regulation in adults, but its association with gestational glycaemia is unclear. A better understanding on how eating time can influence glucose levels in pregnancy may improve strategies for gestational glycaemic control. This study aims to examine the association of maternal night-eating pattern with glucose tolerance at mid-pregnancy, and to investigate how lifestyle factors may be related to night-eating pattern.

Methods

This is a prospective study which will recruit 200 pregnant women from antenatal clinics at KK Women's and Children's Hospital. Information on socio-demographic and lifestyle habits will be collected at mid-pregnancy. At 18-21 weeks' gestation, 4-day food diary will be used to assess night-eating pattern; Actigraph accelerometer will be provided to assess physical activity, sedentary behaviour, sleep and light exposure; continuous glucose monitoring system will be applied to assess glycaemic variability. At 24-28 weeks' gestation, we will perform oral glucose tolerance test and insulin test; meanwhile also administer food frequency questionnaire to derive diet quality based on healthy eating index.

Results

Multivariable generalized linear models will be used to analyse the association of maternal night-eating pattern (consumption of meal and snack during 1900-0659h) with glycaemic measures, and the associated lifestyle factors of night-eating pattern, controlling for potential confounders.

Conclusion

This study aims to serve as a baseline reference for planning interventional clinical trial to examine the effect of aligning eating time with day-night cycles on glucose regulation and GDM risk in pregnancy. This may help to develop evidence-based recommendations on maternal nutrition related to meal and snack distribution, in order to improve gestational glycaemic control, reduce the risk of GDM, and thus improving pregnancy and childhood outcomes.

Introduction

Gestational Diabetes Mellitus (GDM) affects 1 in 6 births worldwide. Mothers with GDM have an increased risk of developing post-partum Type-2 Diabetes Mellitus (T2DM). However, their uptake of post-partum diabetes screening is suboptimal, including those in Singapore. Literature reports that the patient-doctor relationship, mothers' concerns about diabetes, and family-related practicalities are key factors influencing the uptake of such screening. However, we postulate additional factors related to local society, healthcare system and policies in influencing post-partum diabetes screening among mothers with GDM.

The qualitative research study aimed to explore the facilitators and barriers to post-partum diabetes screening among mothers with GDM in an Asian community.

Methods

In-depth interviews were carried out on mothers with GDM at a public primary care clinic in Singapore. Mothers were recruited from those who brought their child for vaccination appointments and their informed consent were obtained. Both mothers who completed post-partum diabetes screening within 12 weeks after childbirth and those who did not were purposively recruited. The social ecological model (SEM) provides the theoretical framework to identify facilitators and barriers at the individual, interpersonal, organizational and policy levels.

Results

Twenty multi-ethnic Asian mothers with GDM were interviewed. At the individual and interpersonal level, self-perceived risk of developing T2DM, understanding the need for screening and the benefits of early diagnosis, availability of confinement nanny in Chinese family, alternate caregivers, emotional and peer support facilitated post-partum diabetes screening. Barriers included fear of the diagnosis and its consequences, preference for personal attention and care to child, failure to find trusted caregiver, competing priorities, and unpleasant experiences with the oral glucose tolerance test. At the organizational and public policy level, bundling of scheduled appointments and standardization of procedure eased screening but uptake was hindered by inconvenient testing locations, variable post-partum care practices and advices in the recommendations of diabetes screening.

Conclusion

Based on the SEM, facilitators and barriers towards post-partum diabetes screening exist at multiple levels, with some contextualized to local factors. Interventions to improve its uptake should be multi-pronged, targeting not only at personal but also familial, health system and policy factors to ensure higher level of success.

MCH017

KIT - Start the Teaching: Standardised Insulin Injection Training Kit for Enhancing Confidence and Safety in Insulin Administration

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Introduction

Insulin is a high alert medication. When patients are newly prescribed with insulin therapy, it is crucial to teach them or their caregivers on insulin injection technique promptly. Pre-implementation data showed that delay in the initiation of insulin injection teaching led to patients' lack of confidence in insulin administration, prolonged hospital stay and re-admission to hospital.

Methods

Possible root causes for delay in insulin injection technique teaching were identified by using Ishikawa diagram. Plan-Do-Study-Act (PDSA) cycles were used to improve the workflow in insulin injection teaching. Consensus achieved from all stakeholders that insulin injection teaching should be initiated within 16 hours of insulin prescription, which is approximately within 2 working shifts.

PDSA 1:

Conduct educational program named "Train the Trainer" to impart the knowledge on insulin therapy and the importance of early initiation of insulin injection teaching.

PDSA 2:

Develop standardized insulin injection teaching kit with handy pictorial cue cards on the steps of insulin injection to facilitate ward nurses to initiate teaching at convenient timing and to ensure consistency in teaching.

PDSA 3:

Use of social media, Workplace by Facebook to create and maintain awareness among ward nurses to initiate insulin injection teaching within 16 hours

Results

Time required for ward nurses to initiate insulin injection technique teaching has improved from 20 hours to 7 hours. The rate of ward nurses attempted to initiate insulin injection technique teaching at ward level increased from 44% to 100%. The rate of delay in discharge has reduced from 40% to 0%. All patients or their caregivers had reported that they were confident to perform insulin injection prior to discharge and there was no re-admission to hospital within 6 months due to mishandling of insulin.

Conclusion

Early initiation of insulin injection teaching enabled patients and their caregivers to have more time to master and practise the new skill acquired. This translates to improved confidence and enhanced patients' safety in insulin administration.

MCH018

Development of the one-STop Obstetric high RisK (STORK) Centre for obstetric and medical high risk services to improve patient care, safety and experience within KK Women's and Children's Hospital

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Introduction

Over the past decade, there has been a steady increase in the number of women with obstetric and medical high risk pregnancies managed within KK Women's and Children's Hospital. However, current outpatient high risk services for women with medical conditions in pregnancy run in silos, with a lack of direct communication between obstetric and medical teams which can compromise on patient care, safety and experience. The aim was to reorganize and streamline obstetric and medical high risk services through development of a one-STop Obstetric high RisK (STORK) Centre to address this issue.

Methods

Prior to the establishment of the STORK centre, meetings with various stakeholders were conducted to discuss the nature of the clinic set-up and specific requirements for each individual's discipline. A formal request for a dedicated bespoke clinic space for the STORK centre was made and granted. Two new services, namely the Combined Diabetes in Pregnancy (COMDIP) clinic and the Combined Medical Disorders in Pregnancy (COMMED) clinic, were initiated in August 2020. The new model of care for these services consists of a consultant physician and consultant obstetrician running the clinic together within the same consultation room. Relevant allied health services such as diabetic nurse educators and dieticians in the case of the COMDIP clinic have also been made available in an adjacent room for immediate referral and review of patients.

Results

The new model of care has allowed for a more seamless patient journey, better coordination of clinic visits, and more effective communication between various specialists caring for the patient. The immediate availability of relevant allied health services allows the patient to access these services effortlessly, thereby removing the barrier of inconvenience. There have been observed improvements in default rates to these clinics compared to the old model of care. Feedback from patients and care providers have also been positive. As a result of these successful collaborations and set-up, other medical disciplines have expressed interest in collaborating on other combined clinic set-ups, such as a combined dermatology and obstetric clinic (Pregnancy and Skin clinic) as well as a combined haematology and obstetric clinic (COMHAEM clinic), and these are currently in the process of being developed.

Conclusion

A collaborative and multi-disciplinary patient-centred approach to service design allows for streamlining of care and improving patient care, safety and experience, and services under the STORK centre aim to do just that. We plan to introduce more high risk obstetric one-stop services in future that cater to the unique needs of our patients, such as a Preterm Birth Clinic for pregnant mothers at high risk for preterm birth, and also a Pre-Pregnancy Counselling (PPC) clinic for women with medical disorders considering starting a family.

MCH019

IPRAMHO I-24 Study: Physical activity, sedentary behavior, sleep and screen viewing of children in Singapore aged 5-14 years old

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Introduction

Singaporean children are encouraged to adopt a holistic approach towards integrating all types of activity within a daily 24-hour period for better health outcomes. This study aimed to describe these activities in Singaporean children.

Methods

A survey questionnaire was administered to 100 parents of children between ages 4-15 years old assessing the frequency of moderate and vigorous physical activity per week, sleep, screen viewing (SV) and sedentary behavior (SB) duration per day. Sleep, SV and SB duration was captured on both weekdays and weekends. Adherence to integrated Singapore guidelines was defined as: ≥60 min of moderate-to-vigorous physical activity (MVPA/day), ≤2 h of SV/day, and 8-9 hours of sleep/night. Two-tailed independent t tests or Mann-Whitney U test were used to examine the differences between sleep, SV and SB on weekday and weekends.

Results

Of the 100 children [58% Chinese ethnicity, 49% males and mean age 9.1(2.9)], 7% had a BMI >25kg/m2. Median days of children participating in vigorous and moderate physical activity in a typical week were 3(2-3) days/week and 2(1-3) days/week for a duration of 60 (30-120) minutes per session, respectively, while 43% and 38% did not participate in any vigorous or moderate physical activity, respectively. SV exceeded guidelines (>2 hours/day) in 38% and 39%, and engagement in SB of >10 hours/day were seen in 25% and 23% of children on weekdays and weekends, respectively. 20% had insufficient sleep (< 8 hours/day) on weekdays. Both SV and sleep duration were higher on weekends compared to weekdays [SV: median 3(2-5) hours/day versus 2(1-4) hours/day) and sleep: mean 9.7(1.0) hours/day versus 8.7 (1.2) hours/day, p <0.05]. There were no significant differences in SB on weekdays compared to weekends [SB: median 6(4-9) hours/day versus 5(4-8) hours/day), p>0.05].

Conclusion

Physical activity, sleep and SV were suboptimal, indicating a need for an integrated guideline with greater dissemination, visibility and activities to promote better health behaviors.

MCH020

The association of time outdoors and patterns of light exposure with myopia in children: implications for prevention

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Introduction

To evaluate the association of time outdoors, light exposure patterns with myopia in children from the Singapore Growing Up Towards Healthy Outcomes (GUSTO) birth cohort.

Methods

In this cross-sectional study, we assessed cycloplegic spherical equivalent (SE), myopia (SE≤-0.5D) and axial length (AL) of 422 multi-ethnic children (41.2% myopic; 47.6% girls; 59.5% Chinese) at the 9-year visit. Time outdoors in the past month (physical or leisure activities) and outdoor activity types were assessed with questionnaires and activity diaries filled over 7-days respectively. Light levels (lux), duration, timing (morning: 7-11AM; afternoon: 11AM-3PM; evening: 3-7PM) and frequency of light exposure (number of outdoor episodes≥1000 lux continuously≥5mins), were assessed with a wrist-worn watch (FitSight) over 14-days. 844 paired eyes were analyzed using Generalized Estimating Equations with linear or logistic multivariable regression.

Results

Time outdoors (Mean±SD:1.65±1.42 hours/day) and average light levels (467±231 lux) were low, with 76.0% of the daily duration of light exposure <5000 lux. Light levels were highest during mid-day, compared to the morning or evening (Ps<0.001). Children exhibited 1.7±1.0 daily outdoor episodes. Time outdoors was higher on weekends than weekdays (Ps<0.05). Boys exhibited higher light levels, duration and frequency of light exposure than girls (Ps<0.05). While outdoors, children spent the longest duration on walks, neighborhood play and swimming. In multivariable analyses, time outdoors was associated with lower odds of myopia (OR=0.79; 95% confidence interval (CI): 0.67,0.93; P=0.005) and less myopic SE (β=0.15D; 95% CI:0.01,0.29; P=0.034) but not associated with AL (P=0.15). Light levels were not associated with myopia and SE but were marginally associated with AL (β=-0.31mm; 95%CI: -0.62,-0.003; P=0.048). The duration, timing or frequency of light exposure were not associated with myopia, SE or AL (Ps>0.05).

Conclusion

Increasing time outdoors, but not light levels or specific outdoor light patterns, was protective against myopia and myopic SE. Longitudinal studies are needed to confirm these findings.

MCH021

The Prevalence and Management of Iron Deficiency Anaemia in Pregnancy

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Introduction

Anaemia is the one of the most common medical condition in pregnancy. It is linked to adverse maternal and neonatal outcomes. Up to four in five cases of anaemia in pregnancy is due to iron deficiency.

Methods

A retrospective review of all deliveries at KK Women's and Children's Hospital from October to December 2019 was done. The prevalence of anaemia and rates of blood transfusion in our obstetric population was reviewed, as well as clinicians' compliance to antenatal screening and management of anaemia. A multivariate logistic regression was used to identify any association between anaemia and blood transfusion rates with patient or clinician variables.

Results

There was a total of 2442 singleton deliveries in KKH over our study period. The prevalence of anaemia was 11.5% at booking, 14.4% in the third trimester and 16.1% at delivery. 63 patients (2.6%) received blood transfusion either antenatally, prior to delivery or postnatally. Only 68% of patients were screened for anaemia in the third trimester. Clinicians offered oral iron supplementation for patients with anaemia appropriately. However, only 54 patients (2.2%) received intravenous iron transfusion.

Conclusion

There is a high prevalence of anemia in our obstetric population. Optimisation of haemoglobin is essential to reduce obstetric risks. Active screening for anaemia with appropriate iron supplementation can help reduce risk of blood transfusion at delivery, and improve obstetric outcomes. Intravenous iron transfusion is an excellent alternative for women who are not compliant to oral supplementation.

MCH022

Impact of COVID-19 on home-based physical activity for children: A cross-sectional survey study

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Introduction

COVID-19 social distancing measures significantly limited children and adolescents to home-based physical activities, however, little information was available about these activities. This study highlights the characteristics of home-based physical activity in children and adolescents, and identify the effective practices and challenges encountered.

Methods

We performed an online cross-sectional survey of school-going children (aged 7 to 17 years old) in June 2020, after lifting of stringent social distancing measures. Information surveyed included characteristics of home-based physical activity, distance learning, use of electronic device and online media, sedentary behaviour and challenges encountered.

Results

There were 321 participants with 92% positive response rate. We found that only 14% of participants engaged in daily physical activity and 11% spent more than 60 minutes per day. More primary school students did dynamic activities (48%) and required an exercise partner (72%). However, secondary school students preferred static activities (51%) and fewer required an exercise partner (37%). Secondary students also reported longer duration of distance learning in physical education but also in sedentary behaviour. Three quarters of participants used electronic device and the frequent devices were computer (50%) and hand phone (24%). Online streaming was the most popular media for all participants (59%). The 2 main challenges reported were lack of space (38%) and lack of motivation (15%).

Conclusion

Children and adolescents were receptive towards and able to do home-based physical activity. We recommend to design these activities according to the educational level or age of the participants and to provide appropriate resources.

MCH023

Community enabled Readiness for first 1000-Days Learning Ecosystem (CRADLE) Study – An Update

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Introduction

Enhanced parenting self-efficacy (PSE) leads to positive parenting and health outcomes of parent and child. As first-time families are usually apprehensive of the needs and requirements of pregnancy until post-delivery, they are particularly in need of support to strengthen their early PSE. At present, there is an absence of effective and sustainable programmes to improve PSE for first-time parents. The Community enabled Readiness for first 1000-Days Learning Ecosystem (CRADLE) Programme seeks to develop a self-learning eco-community from pregnancy to early-childhood to promote PSE and improve health outcomes for first-time families.

Methods

This is a parallel, three-arm randomised controlled trial which will recruit up to 750 pregnant women from KK Women's and Children's Hospital (KKH). Participants will be randomly assigned to receive: (1) standard routine care; (2) behavorial nudges (text messages) and engagement via a social media platform; or (3) midwife-led continuity care involving direct one to one engagement with midwives throughout pregnancy up to six-months post-delivery. The primary outcome is PSE, while the secondary outcomes include health and birth experience. Participants are followed-up from recruitment visit until child turns two years of age, through measurement of specific health and nutrition domains and patient-reported outcome measures. At the end of the study, effects of the interventions across all arms will be evaluated.

Results

Recruitment began in July 2020, with 44 participants on board as of October 2020. Participants were evenly distributed into the three arms, with the mean age at 31.2 years old, and the mean gestational age of 17.8 weeks. Majority of the recruited patients are Chinese (73%), followed by Malay (11%), Others (9%) and Indian (7%). Over 80% of the participants are employed, and over 70% of the participants hold undergraduate and postgraduate qualifications. Baseline socio-demographic characteristics were similar across three arms. Of the 44 participants, there have been three cases of withdrawal due to missed miscarriage and screening failure.

Discussion

Despite recruitment delay for a few months following the emergence of COVID-19, the CRADLE Team was able to recruit 44 participants with strict safe distancing measures. Multiple strategies were established to improve the recruitment including extending publicity within and outside of KKH. Preliminary data analysis will begin once 100 participants have been recruited and CRADLE will be holding its first health education webinar in early 2021.

MCH024

Role of diazoxide therapy in small for gestational age infants with prolonged hyperinsulinemic hypoglycemia

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Introduction

Small-for-gestational-age (SGA) infants are at-risk of hyperinsulinemic hypoglycemia (HH), requiring high glucose infusion rates (GIR) to maintain euglycemia.

Aim

To compare the outcomes of SGA infants treated with diazoxide (DZX) versus watchful waiting (WW) with high GIR and feeds in the management of HH.

Methods

This observational study was conducted from September 2014 to September 2020. SGA infants with HH (GIR >10mg/kg/min, plasma glucose level < 3.0mmol/l with detectable insulin) were identified. Data on sex, gestational age (GA), birth weight (BW), age at presentation, symptoms, critical investigations, GIR, dose and duration of DZX treatment, and outcomes were analyzed.

Results

56 SGA infants were identified – 27 DZX and 29 WW, male infants being 56% and 62% respectively. Mean GA were 36.4(31-40) for DZX and 36(30-39) weeks for WW. BW were 1942′ 356 vs 1873′ 498gm respectively. 96.4% of infants presented on day 1 of life. More DZX treated infants had symptomatic HH (DZX, 22% vs WW, 7%; p=0.227). Paired glucose/insulin levels were 2.37′ 0.47mmol/L/16.39′ 27.4mU/L in DZX and 2.45′ 0.65mmol/L/8.65′ 11.3mU/L in WW cohort (p=0.196). Maximum GIR in DZX cohort was 14.8′ 4.3 vs 13.1′ 3.2mg/ kg/min in WW (p=0.097). Mean day of DZX initiation was 12.9′ 8.2 days with an average treatment duration of 65 days and the maximum dose was 4.6′ 2.2mg/kg/day. Duration of central venous line, day of resolution, and day to discharge were not statistically different between the two cohorts. However, infants who had DZX initiation <10d vs >10d of life had earlier resolution of HH (p=0.013).

Conclusion

Spontaneous resolution does occur in SGA infants with high GIR and feeds. DZX being a KATP channel agonist, its use should be restricted to symptomatic infants requiring persistently high GIR, especially in early days of life, as the DZX related long-term outcome is unclear. Duration of intensive care treatment for HH was not statistically different between the two cohorts.

MCH025

Gestational Diabetes Joint Clinic – the Singapore General Hospital Experience

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Introduction

With the local prevalence of type 2 diabetes being one of the highest in the world, coupled with rising obesity and increasing maternal age, diabetes is the leading medical disorder affecting pregnancy in Singapore. Good obstetric outcomes require joint multidisciplinary care.

Methods

The Gestational Diabetes Joint Clinic (GDJC) was set up in 1997 between the Obstetrics & Gynaecology and Endocrinology departments of Singapore General Hospital. The weekly clinic allows patients to be attended to jointly by a consultant obstetrician and endocrinologist, with close support by the dietician, fetal medicine, neonatology and anaesthesia units. Patients feedback their home glucose results to the clinic to allow adjustment of medications. Timing and mode of delivery, intrapartum and postpartum care plans are drawn up. GDJC also reviews the screening oral glucose tolerance test (OGTT) of all pregnant women.

Results

To date GDJC has seen 1352 new patients and 4451 follow-ups, of which are 517 are pre-existing diabetes. Since introducing universal three-point OGTT in 2015, the prevalence of gestational diabetes mellitus has increased by 45%. There was also an 28% increase in new GDJC cases compared from 2019 to 2014. Patients welcome the convenience of a one-stop service, and the reassurance of patient safety that an integrated, coordinated, coherent and inclusive care plan is jointly performed. Women with other medical co-morbidities eg heart disease, can seamlessly attend the other joint clinics within CHiRP (Centre for High Risk Pregnancy), with the same obstetric team being the common driver overseeing care. Future directions will focus on promoting pre-pregnancy counseling, timely postpartum contraception and improving compliance to attending postpartum OGTT testing. Residents and fellows have also benefited firsthand from participating in joint antenatal care of high risk pregnancies.

Conclusion

GDJC exemplifies joint inter-professional care of a common metabolic disorder in pregnancy not only to achieve good outcomes for both mother and baby, but to achieve better health outcomes for diabetic women in the community.

MCH026

Championing Obstetric Medicine Services - Development of the Centre for High Risk Pregnancy (CHiRP) at the Singapore General Hospital

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Introduction

As observed in many developed countries, leading causes of maternal morbidity and mortality have shifted to underlying maternal medical conditions such as cardiac disease, autoimmune conditions and diabetes. Advances in medical management of women with pre-existing and congenital medical conditions and socio-economic trends of increasing maternal age and rising obesity rates have contributed to an emerging group of high-risk pregnancies. Optimal management of these pregnancies requires joint multidisciplinary and inter-professional care in a tertiary care setting, for which Singapore General Hospital and the Outram Campus is ideally structured.

Methods

CHiRP was set up in October 2020 with the aims of providing a one stop joint multidisciplinary care for high risk pregnancies, from pre-pregnancy care, through intrapartum to postnatal care. There is now joint obstetrician cum physician consultant clinics in diabetes, cardiology, rheumatology, hematology, kidney disorders, as well as general medical conditions, supported by a tertiary fetal medicine, neonatology and obstetric anaesthesia units. Multidisciplinary meetings are held antepartum to facilitate coordinate care plans for mother and baby before, during and after delivery.

Results

CHiRP receives referrals from within Singhealth as well as transfers from other obstetric hospitals. There is five existing combined clinics, namely Gestational Diabetes Joint clinic (GDJC), High Risk Clinic (HRC), Cardiac Joint Clinic (CJC), Rheumatology Obstetric Clinic (ROC), ObGyn Haematology Clinic (OGH), in addition to two newer clinics Obstetric Kidney Clinic (OKC) and Obstetric Medicine Clinic (ObMed Clinic). From October 2020 to November 2020 a total of 61 new patients and 277 follow-ups have been seen, an average 169 patients are seen a month. Patients welcome the convenience of a one-stop service, and the reassurance of patient safety that specialists attend to them jointly and form an integrated, coordinated, coherent and inclusive care plan. Women with multiple medical co-morbidities seamlessly attend the various joint clinics, with the obstetric team being the common driver overseeing care. Future directions will focus on promoting pre-pregnancy counseling and timely postpartum contraception. Residents and fellows have also benefited firsthand from participating in joint antenatal care of high-risk pregnancies.

Conclusion

ChiRP exemplifies par excellence, multidisciplinary and inter-professional care, as applied to optimal management of medical disorders in pregnancy to achieve good outcomes for both mother and baby.

MCH027

Adapting the US-based clinic-community model into an online intervention model in Singapore- a descriptive study of the adaptation framework

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Introduction

The COVID-19 pandemic is further threatening the rise in childhood obesity rates. Adapting a US-based clinic-community model to an online community intervention for childhood obesity, with Duke University, community stakeholders (Sports Singapore and Health Promotion Board), may be an effective and sustainable treatment in the current pandemic. We aim to describe the adaptation process using published adaptation frameworks.

Methods

We conducted the recommended steps of adaptation through interviews of families with overweight children, consultation with experts in paediatric obesity and community stakeholders with experience in recruitment and running of community programs before adaptation of the US-based program to an online format. Community staff involved were trained in the online program and pilot testing of the adapted materials were completed. The online intervention programme is a 12-week program consisting of physical activity and nutrition sessions. There are 4 45-minute sessions per week and all family members are encouraged to participate with the child. We plan to recruit 40 participants aged 4-7 years old with obesity to pilot the online intervention compared with usual care. The primary outcome is moderate-to-vigorous activity levels (MVPA) per day. Secondary outcomes include implementation feasibility and fidelity of the Duke clinic-community model and to estimate the effectiveness (BMI z-score, dietary intake quality of life and motor skills) of the online intervention.

Results

17 participants have been recruited for the study with 7 in the intervention arm. Preliminary feasibility data for the online intervention programme shows a high participation rate of 83% in all the sessions. The feedback from participants have also been encouraging: all the participants have indicated that they were satisfied with the programme and would recommend it to others.

Conclusion

Preliminary results indicate that an adapted online intervention is feasible to be implemented with community partners for the treatment of childhood obesity.

MCH028

The Use of Nudges during the first 1000 days of life to promote Parenting Self-Efficacy: Will They Be Effective?

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Introduction

Nudges in the form of text messages represent a choice architecture strategy that has been shown to alter an individual behaviour in a positive way. In the Community enabled Readiness for first 1000-Days Learning Ecosystem (CRADLE) Programme, we use short text messages as nudges to influence parenting behaviours and practices. We hypothesized that text messages containing practical tips on antenatal and parenting care during the first 1000 days of life can improve parenting self-efficacy and health outcomes in first-time parents, as compared to those receiving standard routine care.

Methods

This is a randomized control trial targeting to recruit 250 pregnant women for each intervention and control group. From early pregnancy until 2 years postnatally, participants will receive weekly nudges relating to important information on antenatal care, breastfeeding, infant care, child growth and development, and postpartum care. These nudges are targeted and time specific according to the stages in the pregnancy and early childhood. They were designed by the CRADLE study team's health experts. Delivery of nudges are programmed by a fully automated triggering system, using estimated and actual date of delivery as reference points for respective pregnancy and postnatal phases. The effects of the intervention will be evaluated at the end of the 3-year study period.

Discussion

The use of nudges may represent a low-cost and sustainable method for healthcare institutions to engage first-time patients for a positive experience during the pregnancy, childbirth and early parenting. This may in turn lead to an enhanced PSE and health outcomes for both mother and child. Findings from this study will provide insight and identify suitable engagement methods in early parenting and maternal child health programmes.

MCH029

Midwife-led Community Care in the first 1000 days of life to promote parenting self-efficacy

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Introduction

Currently in Singapore, the midwife-led service is provided to patients with low-risk pregnancies, caring for both mother and child during pregnancy, labour and delivery. This service ends at the hospital level, after the mother has delivered the baby. Subsequently, postpartum care will be provided at the primary healthcare level i.e. Polyclinics, where the first visit after birth is scheduled at 6-week postpartum. Based on this structure, there is no oversight of how the women are coping in the first few weeks after birth, which is a critical period of transition and adaptation to motherhood. In the Community Enabled Readiness for first 1000-Days Learning Ecosystem (CRADLE) Programme, we support participants through engagements with midwives. We hypothesize that individual engagement sessions facilitated by midwives in the first 1000 days of life will promote Parenting Self-Efficacy (PSE).

Methods

This is a randomized control trial targeting to recruit 250 pregnant women for each intervention and control group. Participants are assigned to a midwife who will engage them at various time points throughout the study from the recruitment visit during pregnancy until 6-months after delivery. This includes face-to-face interactions antenally and at birth, and individual teleconferences at 1- and 2-week postpartum, followed by phone calls to check their progression at 6-week, 3- and 6-month postpartum. Participants can discuss any concerns relating to pregnancy and postpartum health, infant care, breastfeeding, child growth and development with the midwife. The effects of the intervention will be evaluated across the sample size of 250 participants at the end of the 3-year study period.

Discussion

The midwife-led community care with these embedded components may bring about positive impact in the PSE of first-time families, leading to improved maternal and child health. In addition, this model may provide exposure for midwives to develop and strengthen their involvement in women's health in the community, beyond the hospital setting.

MCH030

Prevalences and perinatal outcomes of gestational diabetes in Asia Pacific countries- a cross-sectional study

Integrated Platform for Research in Advancing Metabolic Health Outcomes of Women and Children in Asia (IPRAMHO) International Collaborative Study Team

Introduction

An increasingly prevalence of gestational diabetes mellitus (GDM) is evident during the last two decades. Wide variability in prevalence rates between 1 - 28.8% have been reported due to various factors including difference of the study population and the diagnostic criteria used to define GDM. While the International Association of Diabetes and Pregnancy Study Groups (IADPSG) criterion is widely adopted in many countries, clinicians have questioned the applicability of these diagnostic thresholds for different races/ethnicities. Few studies have examined and compared the perinatal outcomes of GDM diagnosed by IADPSG in different populations.

Methods

This hospital-based cross-sectional study was performed in Australia (n=6857), China (n=1843), Japan (n=605), Myanmar (n=506), Singapore (n=993), Sri Lanka (n=1834), and Thailand (n=1564). We collected data on maternal age, body mass index (BMI) and gestational age (GA), mode of delivery, and birth weight from medical records. Multivariable logistic regression was performed to calculate the relationship of GDM with age and BMI at first book or pregnancy. We calculated the age- and BMI- adjusted prevalence of GDM (IADPSG criterion) based on the logistic regression. We compared the prevalence of GDM and the caesarean section rates and incidence of macrosomia (birth weight ≥ 4000g) among GDM patients.

Results

The adjusted prevalences of GDM were Sri Lanka (41.5%), Myanmar (26.1%), Japan (18.7%) and China (18.6%). Thailand (8.1%), Australia (11.1%) and Singapore (12.9%).

The caesarean section rates among the populations were: in China (60.4%), Japan (46.6 %), Myanmar (43.9 %), Australia (38.4 %), Singapore (34.3%), and Sri Lanka (33.9%). The caesarean section rates among the GDM patients were higher: China (80.5 %), Japan (55.9 %), Myanmar (50.0 %), Singapore (45.5 %), Australia (43.6 %) and Sri Lanka (39.7%). The caesarean section rate among the non-GDM patients were China (59.4%), Japan (44.9 %), Myanmar (41.6 %), Australia (37.6 %), Singapore (34.1%), and Sri Lanka (29.6%).

The incidences of macrosomia among the populations were Australia (8.6%), Myanmar (3.0%), China (2.2%), Sri Lanka (2.2%), Thailand (1.3%), Japan (1.0%), and Singapore (0.9%). Among the GDM patients, the incidences of macrosomia were Australia (5.9%), China (4.9%), Singapore (4.0%), Sri Lanka (3.8%), Myanmar (2.2%), Thailand (1.8%), and Japan (1.1%). Among the non-GDM patients, the incidences of macrosomia were Australia (9.0%), Myanmar (3.3%), China (2.0%), Sri Lanka (1.9%), Thailand (1.2%), Japan (1.0%), and Singapore (0.5%). If macrosomia was defined as the birth weight of 4.5kg or above, the incidence of macrosomia was 1.2% in both GDM and non-GDM patients in Australia.

Conclusion

Different population were at variable risks of GDM. GDM patients had a higher risk of caesarean section and generally higher risk of macrosomia (> 4kg), although this was not obvious in this Australia sample where control of GDM might be better and population customised adjusted macrosomia definition (>4.5kg) is required.

MCH031

Factors influencing women's health behaviours in post-partum screening and follow-up for Type 2 Diabetes after Gestational Diabetes in Asian populations – A narrative review

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Introduction

Asian women continue to practice a wide range of traditional beliefs and practices during pregnancy, childbirth, and the postpartum period. A review of the individual and system level factors influencing Asian women's health behaviours in post-partum screening and follow-up for Type 2 Diabetes after Gestational Diabetes, is required.

Methods

A PubMed database search was utilized to investigate the facilitators and barriers to post-partum care and follow-up. A total of 220 articles were identified using the search terms, gestational diabetes, post-partum and health behaviours. Only 11 out of 220 articles related to Asian populations. These articles were reviewed using narrative synthesis.

An in-dept exploration to the experiences and meaning Asian women assign to the experiences after Gestational Diabetes in these 11 studies will be discussed, both at the individual level and at the system level. This review will examine the effects of system enabling factors in addition to the frequently studied individual predisposing and enabling factors during post-partum screening and follow-up for Type 2 Diabetes after Gestational Diabetes.

Results

System initiated programs such as phone reminders were found to be associated with higher postpartum testing and follow-up rates while greater efforts such as supporting these women's care for their infants can also improve the uptake.

Conclusion

Further efforts recognizing and appreciating common Asian beliefs are required, and this needs to be targeted at both the individual and system levels. "Maternal-infant health" is a promising new approach in assisting women shift their individual beliefs and attitudes towards post-partum care as we continue to enhance system-based approaches.

MCH032

A comparison of spot urine protein to creatinine ratio (uPCR) with 24-hour urine total protein (UTP) for early identification of preeclampsia (PET)

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Introduction

New onset proteinuria in pregnancy is most commonly found in preeclampsia. It can also be seen in patients with diabetes, renal and connective tissue diseases. The course of preeclampsia with or without pre-existing maternal diseases can be monitored by reliable quantitation of the proteinuria. This can also be used to guide management and distinguish PET from gestational hypertension. The 24-hour UTP has traditionally been considered the gold standard for quantitative evaluation of proteinuria in pregnancy. However, it is time consuming, inconvenient, and subject to errors such as incomplete collection. The spot uPCR has increasingly been used as a rapid and reliable alternative test and has been adopted by RCOG as the standard of care. The aim of the study was to determine the diagnostic accuracy of uPCR compared to 24-hour UTP in the local population in detecting clinically significant proteinuria in patients being evaluated for preeclampsia. The study also examined the correlation between urine dipstick for proteinuria with uPCR and 24-hour UTP.

Methods

The study population comprised 27 antenatal patients diagnosed with preeclampsia. A random urine specimen was collected either before or after 24-hour urine collection. The correlations between uPCR, 24-hour UTP, and urine dipstick were examined using the Spearman rank correlation test.

Results

There was a strong positive correlation between uPCR and 24-hour UTP, with a correlation coefficient (r) of 0.779 (p-value < 0.00001). A good positive correlation was seen between urine dipstick and uPCR ($r = 0.71$, p-value < 0.0001) and urine dipstick with 24-hour UTP ($r = 0.64$, p-value <0.0001).

Conclusion

The urine dipstick is helpful as a screening tool to identify patients with proteinuria. The uPCR is a good predictor for clinically significant proteinuria, and can be used as a reasonable and quick alternative test in preeclampsia in the local population to avoid delay in institution of treatment.

MCH033

Body Mass Index, gross motor skills, physical activity and foot structure in overweight and obese children – Preliminary Report

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Introduction

Childhood obesity is a major public health concern with rising prevalence observed globally over the past decades (Mez et al., 2017). Many programmes have been instituted to address childhood obesity globally. At KKH, it is unknown whether our standard care of providing the 24-week structured weight management programme is effective in shifting the BMI z-scores of overweight/obese children from a higher to a lower risk group and also uncertain whether improvements in physical activity, foot structure, fitness level and quality of life are observed among these children. This preliminary baseline finding is part of a pilot study in a single centre exploring whether there are changes in the body mass index (BMI), gross motor skills, physical activity and foot structure in overweight/obese children after attending a 24-weeks weight management programme.

Methods

Children and adolescents who are overweight/obese, age from 10 to 16years and are newly referred to the 24-week weight management programme in KKH were recruited. Participants on medication that is known to be associated with weight gain, had immediate acute lower limb or foot injury for the past 6 months and or unable to follow simple instructions were excluded. The participants underwent a physical activity counselling, fitness assessment, physical anthropometry, gross motor skills using the BOT-2, foot structure and quality of life assessment. They were given a triaxial accelerometer to be worn around the wrist to evaluate levels of physical activity for 7 days.

Results

A total of 18 participants (8 females,10 males) was recruited from June to December 2020. There were 11 obese (average BMI 33.75) and 7 overweight (average BMI 28.52). All participants spent an average of 874.3 minutes per day being sedentary and 303 minutes per day in light activity. None of them participate in moderate to vigorous activity. 80% of the participants shown below average strength and agility.

Conclusion

Our preliminary findings demonstrated that children who are overweight/obese tend to be more sedentary and exhibit below average strength and agility.

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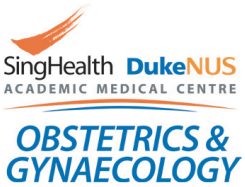

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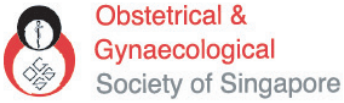

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INTEGRATED PLATFORM FOR RESEARCH IN ADVANCING METABOLIC HEALTH OUTCOMES IN WOMEN AND CHILDREN (IPRAMHO) STUDY GROUP

Research Theme 1: Collaborative Research Platform for Early Intervention for Woman at High Risk of Metabolic Diseases

Theme Leaders:	Prof Tan Kok Hian
	A/Prof Tan Ngiap Chuan
	Dr Lee Eng Sing
Key Opinion Leaders:	Prof Eric A. Finkelstein
	Prof Truls Ostbye
Key Members:	Dr Lim Wai Yee
	A/Prof Tan Lay Kok
	A/Prof Tan Thiam Chye
	Dr Shyamala Thilagaratnam
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Research Theme 2: Collaborative Research Platform for Early Intervention for Infant and Children with High Risk of Metabolic Diseases

Theme Leaders:	A/Prof Fabian Yap
	Dr Jasmine Lew
	Dr Karen Ng
Key Opinion Leaders:	Dr Oh Jean Yin
	Dr Lek Ngee
Key Members:	Prof Victor Samuel Rajadurai
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Research Theme 3: Innovative & System Research Platform for Enhancing Health Outcome in Women and Children with High Metabolic Risks

Theme Leaders:	Dr Dirk Frans de Korne
	A/Prof Bernard Chern
Key Opinion Leaders:	Prof David B. Matchar
	Dr John Pastor Ansah
Key Members:	Prof Tan Kok Hian
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Research Theme 4: Qualitative Research Platform for Maternal-Child Adjustment and Patient Activation in Women and Children with High Metabolic Risks Diseases

Theme Leaders:	Dr Chia Yen Yen
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Key Opinion Leaders:	Dr Darren Seah
	Prof George Yeo
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Key Members:	Dr Vincent Ng
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Research Theme 5: Collaborative Research Platform of Bio-Psycho-Social Integration for better Maternal and Child Health Outcomes

Theme Leaders:	A/Prof Ang Seng Bin
	Dr Adrian Ee
Key Opinion Leaders:	Dr Helen Chen
	Dr Vincent Ng
Key Members:	Dr Lois Teo
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Research Theme 6: Collaborative Implementation Science Platform for the Optimal Implementation of Programs for better Maternal and Child Health Outcomes

Theme Leaders:	Dr Tang Wern Ee
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Key Opinion Leaders:	Prof Kenneth Kwek
	Dr Han Wee Meng
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Key Members:	A/Prof Tan Ngiap Chuan
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Research Theme 7: Combined Registry for Metabolic Diseases (Obesity and Diabetes)

Theme Leaders:	A/Prof Tan Ngiap Chuan
	Prof Tan Kok Hian
Key Opinion Leaders:	Prof Eric A. Finkelstein
	Prof Jim Zhang
	Prof David B. Matchar
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INTEGRATED PLATFORM FOR RESEARCH IN ADVANCING METABOLIC HEALTH OUTCOMES IN WOMEN AND CHILDREN INTERNATIONAL NETWORK 2018-2021

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Mr Daryl Arnold

Mr Daryl Arnold is the Chief Executive Officer for Connectedlife Health Pte Ltd.

An entrepreneur experienced in data, marketing, technology and sustainability. Building businesses from the ground-up, achieving hundred million dollars plus of sales from Asia, Europe and America. Following exits in digital media, time is now focused on civic innovation, open data, internet of things and active ageing. Daryl lived and worked in the major world cities including Beijing, London, New York, Shanghai and Tokyo, and now based in Singapore.

ConnectedLife is a Wellness and Healthcare company that has developed unique technology and end to end applications of the Internet of Things (IoT) technology to address the complex needs of a fast-growing global aging population

IPRAMHO INTERNATIONAL RESEARCH NETWORK
JANUARY 2020

Asia Pacific Diabetes in Pregnancy Conference & IPRAMHO International Meeting 2020 at KKH Singapore. Dr Amy Khor with local and Asia-Oceania experts.