Symposium on
Building Towards Sustainable Physical Activity Behavior
Status, Programs and Approaches

August 2, 2019
Block MD11, Clinical Research Centre (CRC) Auditorium,
National University of Singapore

SUMMARY REPORT
Overview

Globally, more than 1.4 billion adults are at risk of developing or exacerbating diseases due to a lack of physical activity, according to the recent World Health Organization (WHO) study in 2018. Physical inactivity is a complex and multi-factorial behavior whose determinants vary across countries. Over the past years, Singapore’s sedentary lifestyle influenced by rapid urbanization has been a public health concern with serious health implications. Lack of time or energy, and its tropical climate, further deter individuals from participating in physical activity.

ILSI SEA Region organized a one-day Symposium on Building Towards Sustainable Physical Activity Behavior: Status, Programs and Approaches on August 2, 2019. The symposium was held at the National University of Singapore (NUS), in collaboration with the Department of Physiology of Yong Loo Lin School of Medicine, NUS. Over 90 participants consisting of healthcare and sports professionals attended the symposium, which aimed to review the current status of physical activity in Singapore, share national programs and guidelines for promoting and performing physical activity, discuss technological tools for tracking and assessing physical activity, and highlight nutritional approaches and exercise strategies for maximizing health and physical performance.

The symposium commenced with a warm welcome address from Mr. Geoffry Smith, President of ILSI SEA Region, Singapore and Prof. Michael Chia, Professor from Physical Education & Sports Science, Nanyang Technological University, Singapore.
Presentations

Ms. Alice Ong, Deputy Director of Physical Activity & Weight Management, Health Promotion Board (HPB), Singapore provided an overview of “Singapore’s Approach to Physical Activity for a Healthier Generation: Status, Guidelines and Programs”. She shared the current status of non-communicable diseases (NCDs) in Singapore, highlighting that the large disease burden of NCDs, mainly diabetes, together with an ageing population is taking a toll on Singapore’s health expenditure. One of HPB’s key strategy is to tackle the problem of growing obesity by increasing physical activity levels. Ms. Ong shared how HPB uses a three-pronged approach to address sedentary lifestyles. She also introduced how technology and gamification were leveraged for health promotion in Singapore through the National Steps Challenge™ (NSC), the first population-level pedometer-based physical activity initiative aimed at incidental physical activity. Despite being largely extrinsically-driven, the NSC was still able to instil habituation in its participants, as seen from the increase in baseline steps count. Ms. Ong concluded with a future vision of shifting NSC from program-centric to person-centric with greater personalization instead of a one-size-fits-all approach.

Next, Dr. Hock Woon Chiang, Deputy Chief Executive Officer of Sport Singapore (SportSG) shared the topic of “Empowering Health through Sport and Physical Activity: Active Health Lab as a Key Enabler”. He highlighted that the sports participation rate in Singapore has been increasing although a significant number of Singaporeans remain sedentary. Group participation in sports also declined with age due to a smaller social circle. Dr. Chiang presented how Sport Singapore’s infrastructure network of Active Health Labs, integrated with the ActiveSG platform, forges a strategic partnership to shape the national movement for personal ownership of health and wellness. He also shared the transformational shifts of Active Health and success stories of people embarking on the onboarding process. Together with People’s Association, SportSG has also put in place numerous facilities and incentives to aid in active living at a community level. He emphasized the importance of collaboration with other health organizations, such as the Health Promotion Board.

“Exercise is Medicine: Prescription for Non-Communicable Diseases” was presented by Dr. Ivy Lim, Consultant, Singapore Sport and Exercise Medicine Centre at Changi General Hospital and Novena Medical Centre, Singapore. In her presentation, she noted a high global mortality rate attributing to NCDs and explained the relationship between insufficient physical activity and common NCDs, such as diabetes and high blood pressure. She cited a study conducted to measure the relationship between physical activity, healthy ageing and mortality and elaborated on the different exercise prescriptions with condition-specific considerations for various NCDs, namely type 2 diabetes, hypertension and metabolic syndrome. Dr. Lim concluded with the importance of reducing sedentary behavior in addition to increasing physical activity.
The next speaker was Dr. Stuart Phillips, Professor, Department of Kinesiology and School of Medicine, McMaster University, Canada, who talked about “Dietary Protein in Support of Adaptation to Exercise: Finding the Signal in the Noise”. He discussed the role of dietary protein supplementation in optimal recovery and in promoting adaptation which becomes less effective with age. In a research study, he illustrated that protein ingestion prior to sleep could increase muscle protein synthesis rates during overnight recovery from an exercise bout. Leucine amino acid was also demonstrated to trigger the highest level of muscle protein synthesis among various types of proteins. Dr. Phillips provided various recommendations on protein dosage and meal spacing and emphasized their importance in maximizing hypertrophy. He suggested that protein supplementation beyond a total daily protein intake of approximately 1.6 g/kg per day during resistance exercise training provided no further benefit on gains in muscle mass or strength. However, it is still important to note that the impact of protein supplementation is not as large as compared to exercise.

The presentation on “e- & mHealth for Tracking and Changing Physical Activity” was delivered by Dr. Andre Matthias Müller, Lecturer, Saw Swee Hock School of Public Health, National University of Singapore. In his recent research findings under Physical Activity and Nutrition Determinants in Asia (PANDA), he highlighted the issues in measuring the accuracy of two trackers measuring heart rate in the lab and free-living conditions due to variation of settings and devices, such as difference in temperature, hardware and algorithms. He acknowledged that technology is a double-edged sword - it can encourage physical inactivity but is also able to improve physical activity surveillance and promotion. Dr. Müller suggested that activity trackers do promote physical activity, albeit only in the short term, especially among people who are motivated by either intrinsic or extrinsic rewards. Moving forward, it is imperative to focus on effective engagement for a more personalized approach, as well as behavioral change.

Dr. Jason Lee, Associate Professor, Yong Loo Lin School of Medicine, National University of Singapore shared in his presentation on “Improving Physical Activity in a Tropical Climate: Challenges & Strategies to Combat the Heat” that impending increase in heat stress will severely degrade performance. By reducing the starting body temperature, attenuating the temperature rise and extending the maximum limit, one’s heat capacity and work tolerance could be expanded. Dr. Lee noted that behavioral adjustment is the most effective heat mitigation strategy to reduce heat strain and thus, enhancing endurance performance in the heat. He pointed out that excessive dehydration could affect performance and health while over-drinking can lead to exercise-associated hyponatremia (EAH). Dr. Lee concluded that pre-exercise hydration status may determine the impact of hydration during exercise although the amount of fluids required to induce benefits may be hard to achieve during exercise.
Panel Discussion

The panel discussion was chaired by Prof. Michael Chia, Professor from Physical Education & Sports Science, Nanyang Technological University, Singapore and comprised of panelists: Ms. Alice Ong, Deputy Director of Physical Activity & Weight Management, Health Promotion Board, Singapore; Dr. Ivy Lim, Consultant, Singapore Sport and Exercise Medicine Centre, Changi General Hospital and Novena Medical Centre, Singapore; Dr. Stuart Phillips, Professor, Department of Kinesiology and School of Medicine, McMaster University, Canada; Dr. Andre Matthias Müller, Lecturer, Saw Swee Hock School of Public Health, National University of Singapore; and Dr. Jason Lee, Associate Professor, Yong Loo Lin School of Medicine, National University of Singapore.

It was a fruitful discussion among the panelists with a focus on future efforts to increase physical activity in Singapore and how they can be effectively implemented. The discussion also addressed concerns on whether heat impairs physical activity participation in non-exertional contexts and examined challenges to build facilities to promote physical activity at most workplaces and schools. Panelists also explored the potential of collaboration among statutory boards in Singapore to support sustainable physical activity among the citizens. Prof. Chia summarized the panel discussion by sharing that while the problem of insufficient physical activity is highly complex, a change of attitude and physical activity behavior, and the social influence in various settings may gradually encourage exercise involvement on less active individuals. Mr. Smith concluded the symposium and thanked all speakers, chairpersons, panelists and participants for their time and support.
Co-Chairpersons’ Biographies

Mr. Geoffry Smith is President of ILSI Southeast Asia Region based in Singapore, and a Member of the Executive Committee of the global ILSI Board. In addition, he is the Chairman of the Essential Micronutrients Foundation, a non-profit organization which addresses micronutrient deficiencies globally as a public health issue. He is also Director of Nutrition Strategies International which deals with food and nutrition issues in developing countries. In addition, he serves as a Member of the editorial board of the journal, Food and Nutrition Bulletin. Prior to his current positions, Mr. Smith was the Global Director, Health Chelates for Akzo Nobel Functional Chemicals, and directed the global business for these compounds in food and nutrition as well as pharmaceutical applications. He was responsible for the global project within Akzo Nobel addressing iron deficiency anemia. In addition, Mr. Smith directed the Asia Pacific activities for Akzo Nobel’s Innovation Unit. He is a thirty-year veteran of the chemical industry in the Asia Pacific and has resided in Singapore for more than 20 years. He is a Member of the Nutrition Society of the UK, the American Society of Nutrition and the American Chemical Society.

Prof. Michael Chia is Professor of Paediatric Exercise Science at National Institute of Education, Nanyang Technological University in Singapore. He received his graduate and post-graduate training from Loughborough University and Exeter University in the UK. His professional credentials include certifications from ACSM, BASES and the OBS in Hong Kong. Prof. Chia has published and presented his research in at least 200 outlets including national and international position statements and guidelines for physical activity and youth development in sport. As an academic, he received multiple awards for his teaching, research and leadership roles. In recent times, his research was featured on BBC World Service and the Straits Times in Singapore.
Speakers’ Biographies

Ms. Alice Ong is Deputy Director of the Incidental Physical Activity Department, Physical Activity & Weight Management Division at Health Promotion Board (HPB), Singapore. She is responsible for planning, developing and executing programmes that help Singapore residents incorporate physical activities into their daily routines to prevent obesity and improve health outcomes. Alice has also been leading the National Steps Challenge™, a nation-wide pedometer-based physical activity initiative, since the Challenge was initiated in November 2015. In its fourth season now, the National Steps Challenge™ has reached out to 1 in 3 Singaporeans and has demonstrated sustainable and measurable changes in physical activity levels among its participants. Alice has more than 10 years of experience in public health and health promotion. Her previous portfolio includes workplace health outreach and tobacco control. In 2010, she was in charge of the National Smoking Control Programme (NSCP) which utilises a multi-pronged strategy to combat tobacco use. Prior to leading the National Steps Challenge™, she was involved in the strategic alignment of Occupational Safety and Health and Well-being and Health Promotion at work, across the public sector, company and service industry.

Dr. Hock Woon Chiang is Deputy Chief Executive Officer (CEO) of Sport Singapore. He initiated the nation-wide Active Health social movement that aims to transform the way Singaporeans manage their health and physical well-being. Working closely with like-minded partners, Active Health has established an ecosystem of Active Health Lab network in various parts of Singapore to better serve the needs of the community. He also leads the organization’s push towards digital transformation and human capital transformation efforts.

Dr. Ivy Lim is Consultant at Singapore Sport and Exercise Medicine Centre at Novena Medical Center and Changi General Hospital. She is the first locally-trained female sports physician and a registered family physician. Dr. Lim is the Public Outreach Director for Exercise is Medicine Singapore (EIMS), which is part of a global initiative managed by the American College of Sports Medicine, and has presented her work at local and international conferences. She also participates in various professional committees, such as Sports Medicine Association Singapore and Fencing Confederation of Asia Medical Commission.

Dr. Lim is regularly featured in the media and healthcare forums, where she contributes her expertise on sports and exercise-related topics for the public and her fellow medical professionals. She is the co-editor of the book “Exercise is Medicine: Singapore Exercise Prescription Guide”, and has co-authored chapters in the book “Boys to Men: A Complete Guide for National Servicemen” and the medical textbook “Principles of Rehabilitation Medicine”. Her clinical interests include sports injuries, pre-participation screening, sports safety, exercise in women and the role of physical activity in chronic disease management. She is also actively involved in undergraduate and postgraduate education in various institutions. Dr. Lim holds an MBBS and MMED in Family Medicine.
Dr. Stuart Phillips is Professor in the Department of Kinesiology and School of Medicine at McMaster University, Canada. He joined McMaster University in 1998 and is also currently the Tier 1 Canada Research Chair in Skeletal Muscle Health and Director of the McMaster Centre for Nutrition, Exercise, and Health Research and the Physical Activity Centre of Excellence (PACE). His research focuses on the impact of nutrition and exercise on human protein turnover, specifically in skeletal muscle. He is also dedicated to understanding how exercise and dietary protein impact body composition, strength, and function in aging. Dr. Phillips is also a fellow of the American College of Sports Medicine, the American College of Nutrition, and the Canadian Academy of Health Sciences.

Dr. Phillips has authored more than 185 original research papers and 75 reviews, and has given more than 200 invited presentations. He has mentored 17 Ph.D. and 22 M.Sc. students and more than 110 undergraduate thesis students. He is a 5-time nominee and a 3-time winner of McMaster Student Union’s Outstanding Teaching Award. He was also the inaugural recipient of the Canadian Society for Exercise Physiology’s Mentorship award. In 2018, he was named by Clarivate as a highly cited researcher being in the top 1% of all cited researchers in nutritional sciences. He obtained a Ph.D. in Human Physiology from the University of Waterloo, Canada.

Dr. Andre Matthias Müller is Lecturer in Saw Swee Hock School of Public Health at the National University of Singapore. He also currently leads various physical activity projects within the Physical Activity and Nutrition Determinants in Asia (PANDA) programme. Prior to joining NUS, he was a research fellow at the Health Psychology Group, University of Southampton, United Kingdom where he developed online lifestyle programs. Trained as a sport scientist in Germany, Dr. Andre is interested in behavioral e- & mHealth physical activity research. He has developed strong regional and international ties with experts in the field and currently co-chairs the Special Interest Group on e- & mHealth affiliated to the International Society of Behavioral Nutrition and Physical Activity (ISBNPA). He obtained his Ph.D. in Sport and Exercise Psychology from the University of Malaya, Malaysia where he designed an SMS-based exercise program that helped older adults to be more active.

Dr. Jason Lee is Associate Professor in Yong Loo Lin School of Medicine at the National University of Singapore. He is also a Fellow of the American College of Sports Medicine. He serves in various national and international panels related to human performance and safety. His main research interests are in fluid balance, thermoregulation and mitigation strategies for improving human performance. A key outcome of his research is the formulation of a holistic heat management system. He recently completed his 12-year tenure at the DSO National Laboratories by directing the Human Performance Programme in his final appointment.

Dr. Lee is also a Member of the WHO and WMO Work Group on Climate Change on Workers Health and Productivity and chairs the Scientific Committee on Thermal Factors at the International Commission on Occupational Health. He obtained his Ph.D. in Exercise Physiology at Loughborough
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University, United Kingdom under the sponsorship from the UK Overseas Research Scholarship and Faculty Studentship. He also received the award of G V Sibley Memorial Prize upon obtaining his B.Sc. (1st Class Honours) in Sports and Exercise Science at the same university.