



Department of Sports Science and Physical Education  
**The Chinese University of Hong Kong**



# The importance and global surveillance of 24-hour movement behaviours in young children

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## Physical Education and Sport Pedagogy

### Objectives

We aim to promote Quality Physical Education (QPE) through quality research and community projects. Our work encompasses the study of teaching and learning, application of information technology in physical education, the design and implementation of school- and family-based interventions, and teacher professional development. Through the application of evidence-based practices, we are determined to cultivate a positive and supportive environment in school and home settings that enhances the physical literacy of individuals at all ages.

### Themes

#### State-of-the-art Methods of Physical Activity Measurement



- Development of accessible tools to measure quality and quantity of movement behaviors
- Improving existing research methods for physical activity measurement

#### School- and Family-based Interventions and Promotion of Home-school Collaboration



- Improving instruction of physical education teachers through professional development training
- Enhance parents' physical literacy through parental education workshops

#### Capturing the Physical Literacy Journey of Individuals across Generations



- Examination of 24-hour movement behaviors of preschool-aged children
- Study and promotion of physical literacy in children and parents



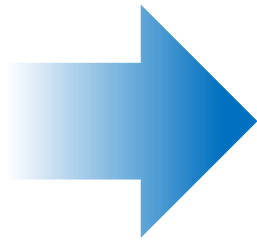
# Agenda

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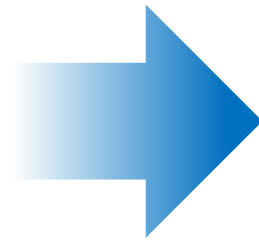
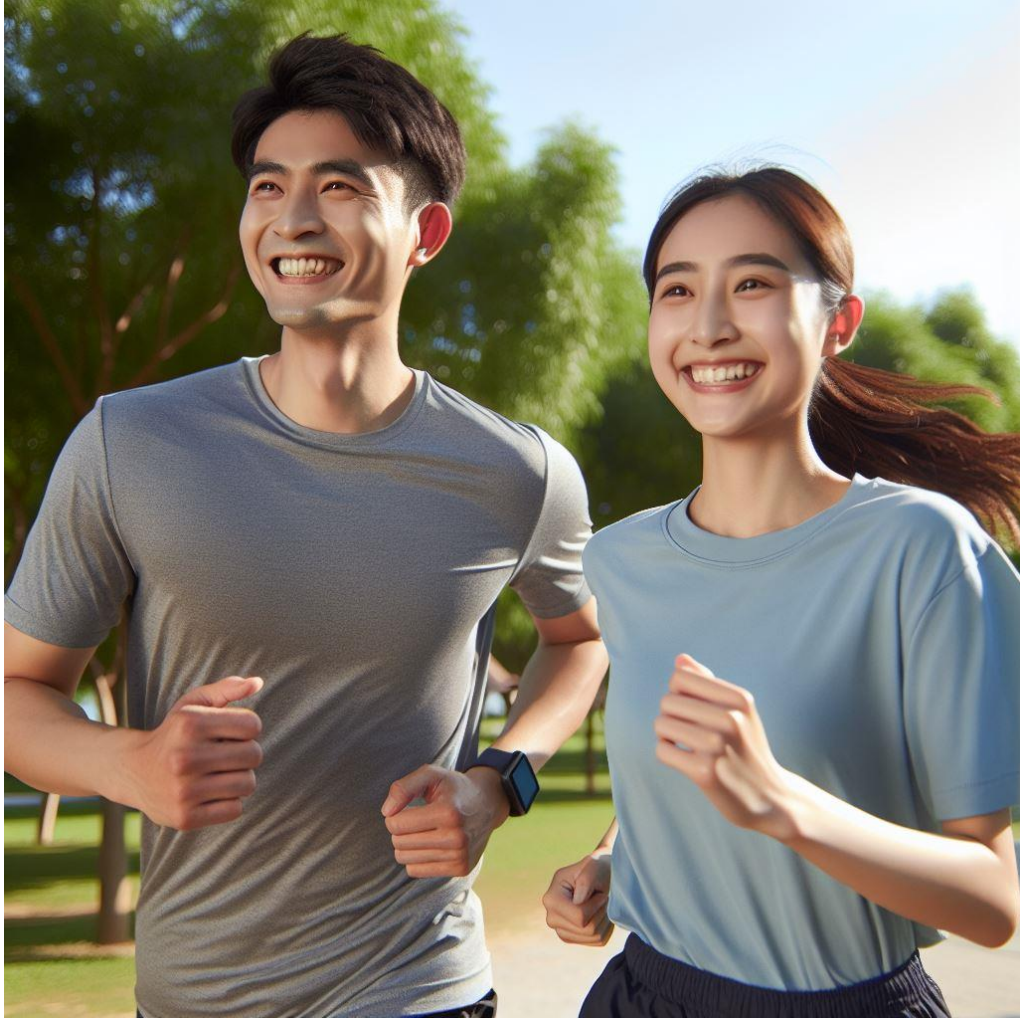


1. Global trends in the monitoring of 24-hour movement behaviors among young children
2. Promoting physical development of young children: research and practical experiences
3. Key Learnings and Conclusion –  
Why *is* the surveillance of 24-hour movements important?

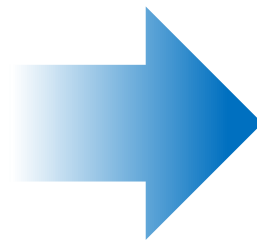
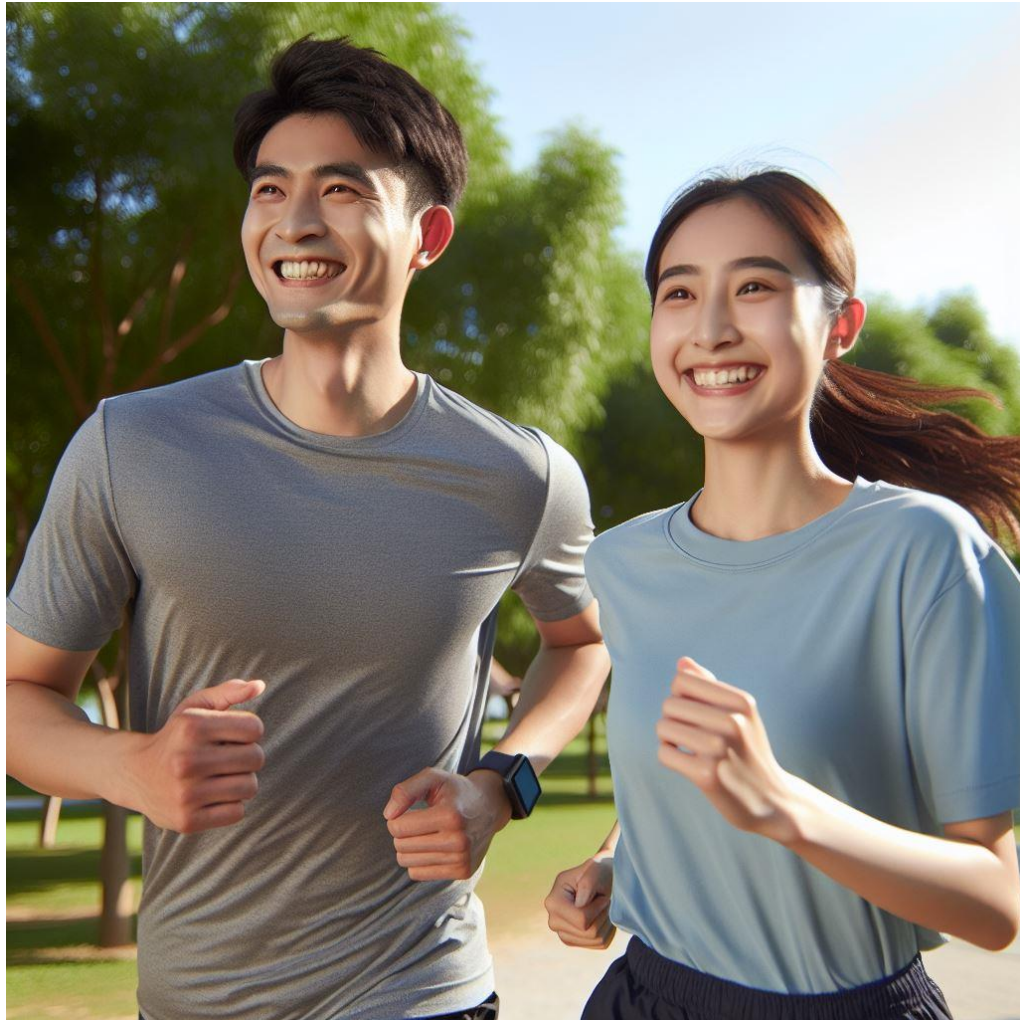
# Importance of physical activity



# Importance of physical activity

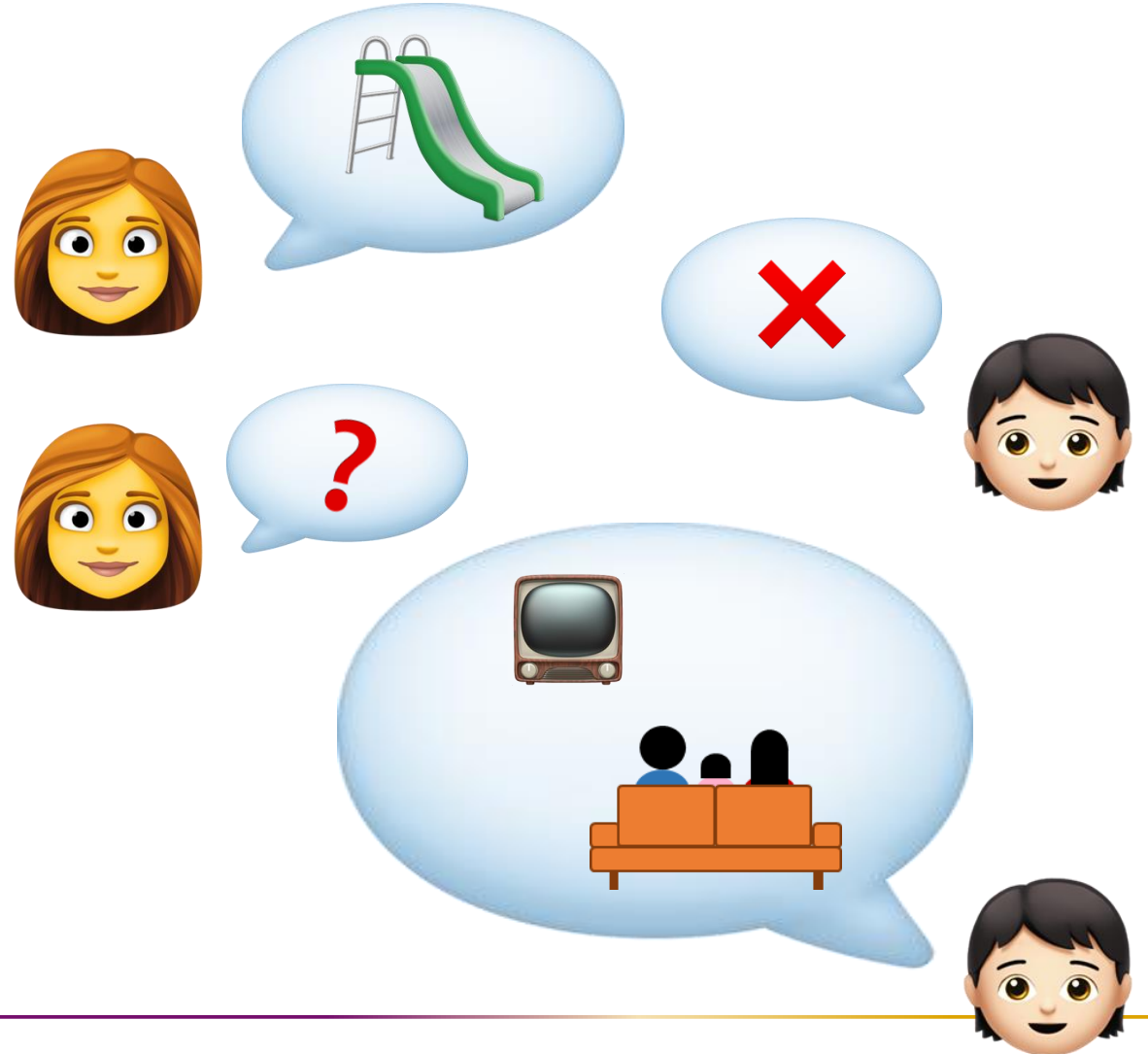


# Importance of physical activity



- Cancers** 
- Heart diseases** 
- Hospitalisation** 
- Your pocket + our medical system** 

# Importance of physical activity



# Children's brains develop when they MOVE



## Move More



- Vision
- Sensation
- Balance
- Skill
- Speech
- Movement
- Behavior
- Emotion

Kindermusik

## Sit More

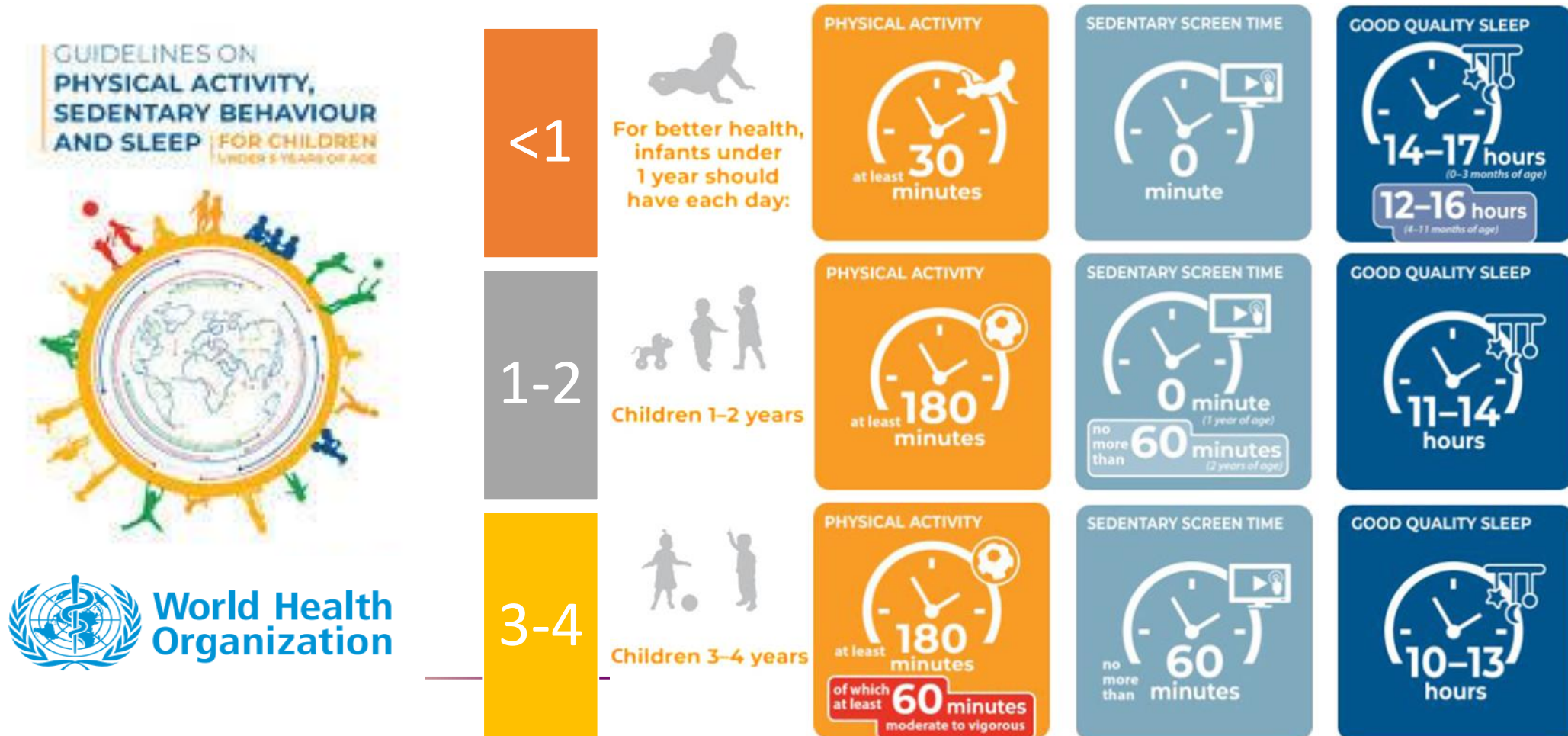




# WHO guidelines on physical activity, sedentary behavior and sleep for children under 5 years of age



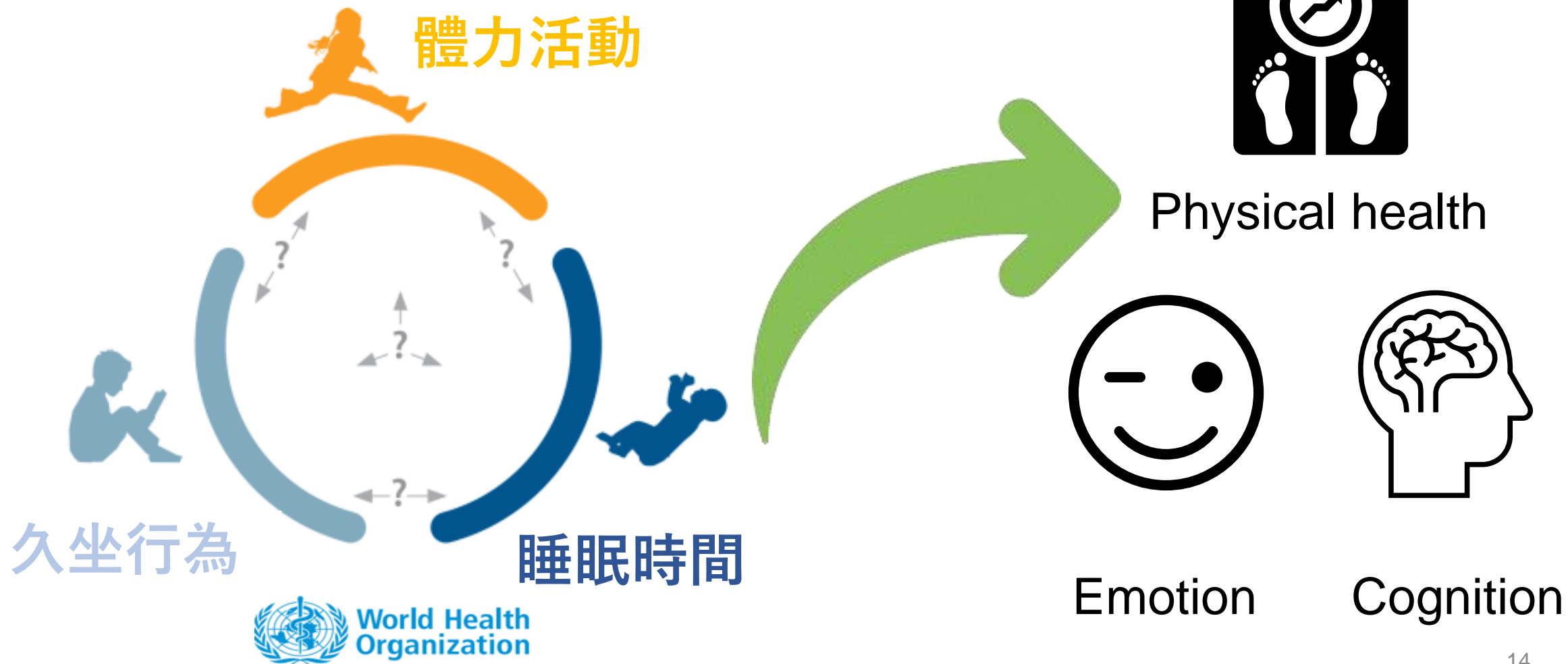
Movement behavior recommendations for a healthy day (24-h) released in **2019**



# The pattern of overall 24-hour activity is key



A 24-hour day consists of sleep, sedentary activity, and low, moderate, and vigorous intensity physical activity





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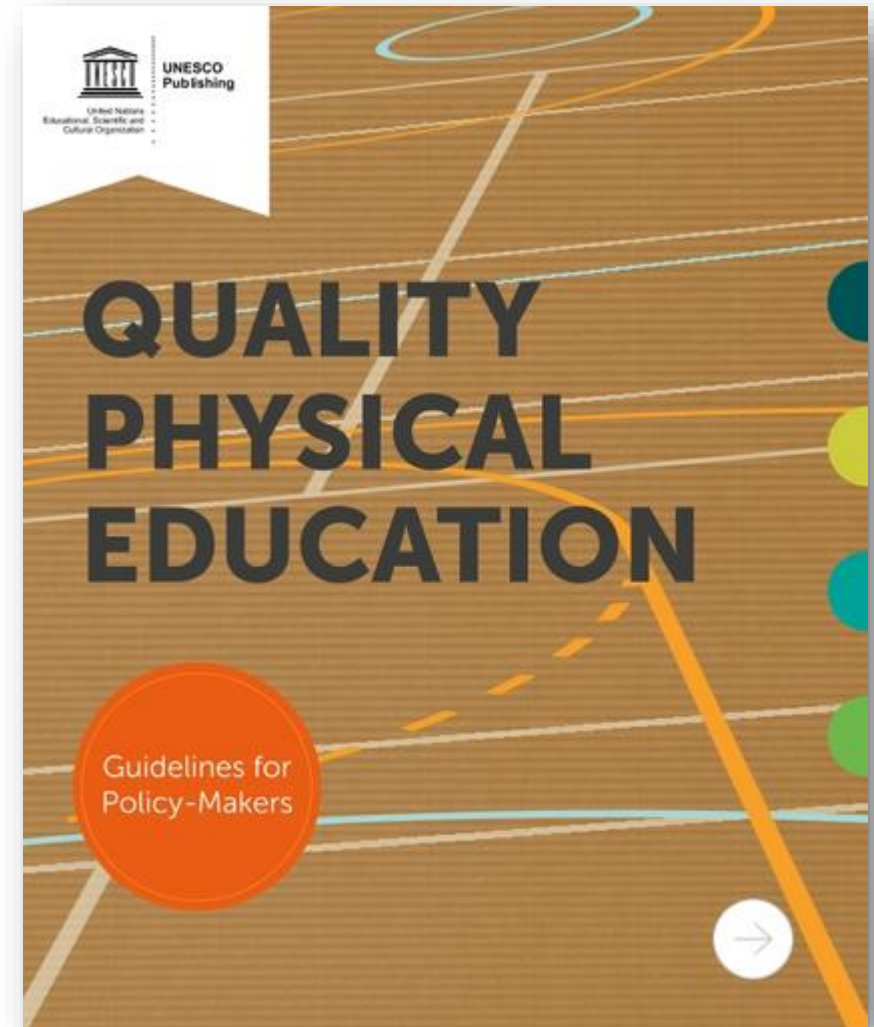
# **Promoting physical development of young children:**

## Research and practical experiences

# Quality physical education



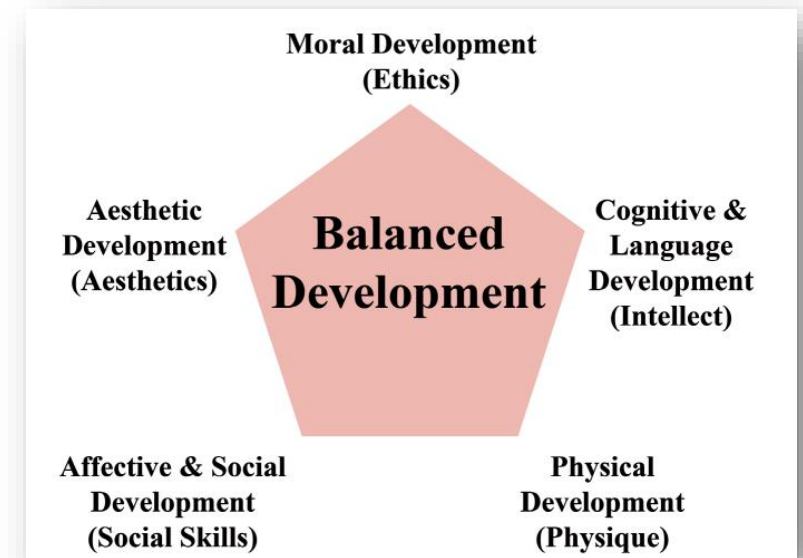
- Foundation for lifelong engagement in physical activity
- Help students acquire the psychomotor skills, cognitive understanding, social and emotional skills needed to lead a physically active life
- “Governments should be responsible for ensuring physical education is accorded the same status as other subjects”  
(p.62, UNESCO, 2015)



# Background



- In Hong Kong, “Physical education” is a specialized profession for primary and secondary education
  - But **NOT** for kindergartens
- “Physical Development” is one of five developmental objectives in kindergarten education
  - With no formal training, teachers lack the knowledge and skills



*Source: Hong Kong Education Bureau, 2017*

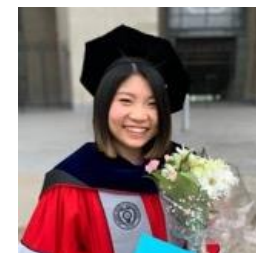
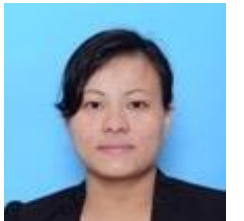
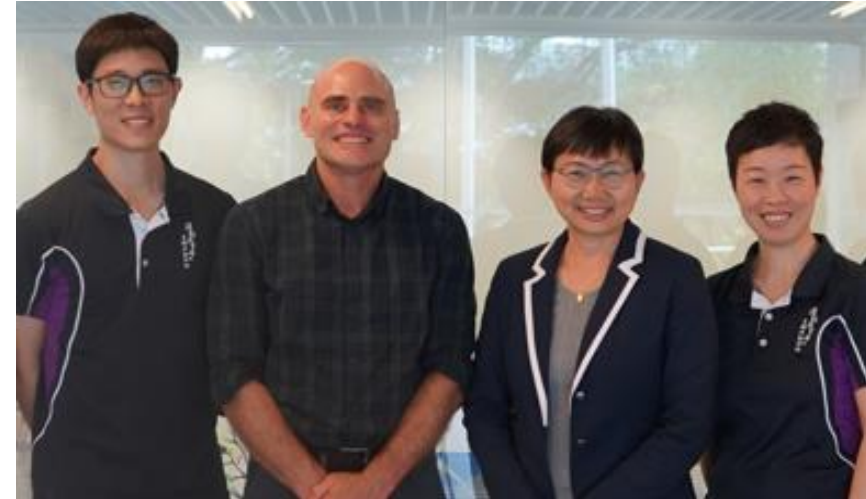
# International and local collaboration



*Physical Activity Routines, Education, Assessment, Literacy, and Information Technology application in Young children (PA REALITY): A social cognitive theory-based movement education programme for preschool students*



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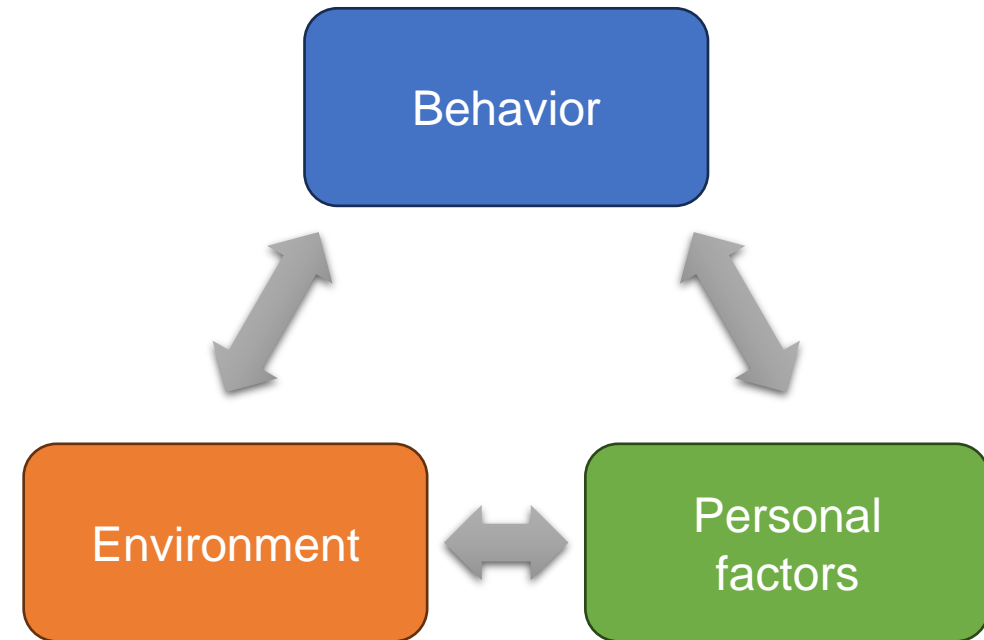


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# Social cognitive theory (Bandura, 1986)



- Individuals learn through observations and modelling behaviors and attitudes (e.g., parents and teachers)
- Behaviors and beliefs are shaped by both the physical and social environments
- Self-efficacy – the belief in one’s ability to succeed – impact behavior and motivation
  - Being physically competent → physically active lifestyle



# Key milestones / initiatives



- Improved in-service teachers' knowledge and pedagogical skills through teacher workshops, and direct observations with immediate feedback





# Key milestones / initiatives

- Enhanced classroom practices through instructional materials

**FUNDAMENTAL MOVEMENT SKILLS OF PRESCHOOL CHILDREN**

**幼童基礎動作技能**

**移動動作技能**  
LOCOMOTOR SKILLS

**雙腳跳 Jump**

**單腳跳 Hop**

**平衡穩定技能**  
STABILITY SKILLS

**平衡 Balance**

**操控用具技能**  
OBJECT CONTROL SKILLS

**上手擲球 Overhand Throw**

**踢球 Kick**

**下手滾球 Underhand Roll**

**下手擲球 Underhand Throw**

**雙手接球 Catch**

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**一喜同遊**

幼兒體育運動教育計劃

體能活動

教師輔助教材

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# Key milestones / initiatives

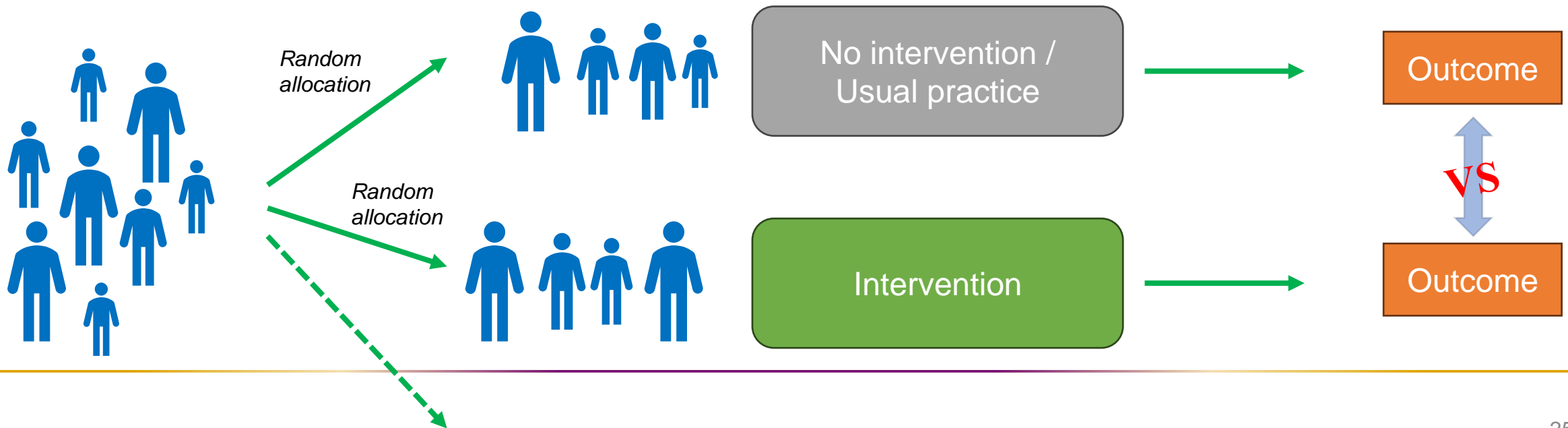
- Engaged parents through school-based family fun days, parent booklet, easy sports equipment and online resources



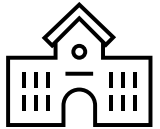
# Randomized controlled trial



- A multi-arm experimental design whereby participants are **randomly** assigned to different groups (at least one being a control) receiving different treatments
- It is a rigorous research design for the evaluation of the effectiveness of treatments / interventions



# Key milestones / initiatives



Reached **29** kindergartens  
in different districts of Hong  
Kong



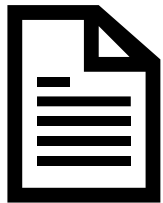
**2000** children and their parents

# Key findings



- Compliance of 24-hr movement behaviors guidelines assessed via questionnaire and accelerometer

41% met the guideline



Screen Time  
<60mins  
Mean 97mins/day



17% met the guideline

Physical Activity  
at least 180mins  
Mean 144 mins/day

Including MVPA  
at least 60mins  
Mean 67mins/day

62% met the guideline

Sleep Duration  
10-13 hours  
Mean 9 hrs/day

18% met the guideline



# Key findings



- Compliance of 24-hr movement behaviors guidelines assessed via questionnaire and accelerometer

41% met the guideline

Screen Time <60mins



17% met the guideline

Physical Activity



- ONLY 2%** of the sampled preschool children met **ALL three** WHO guidelines for 24-hour movement behaviors

62% met the guideline

18% met the guideline



Seven-day accelerometer

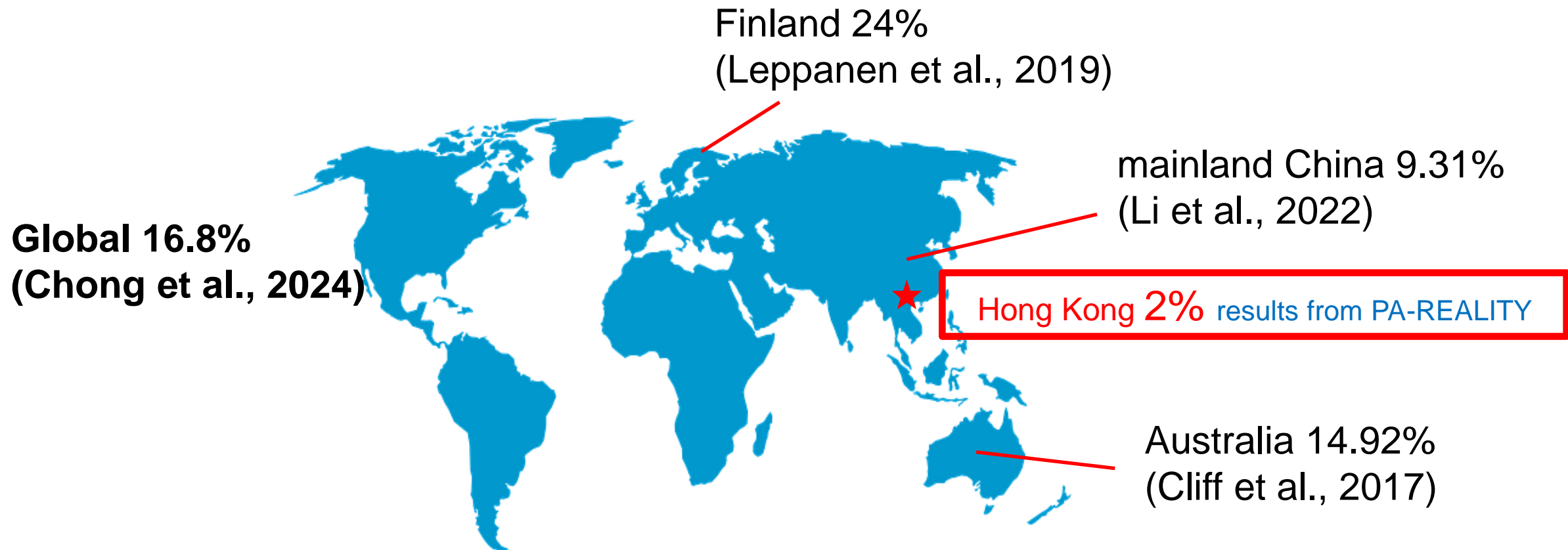


Actigraph wGT3X-BT



Sedentary pattern analysis (ActiLife 6 software)

# Compliance of all three 24-hr movement guidelines worldwide



# Key findings



- Preschool-aged children's overall **Fundamental Movement Skill (FMS) proficiency\*** is low
- **Substandard Quality** of physical activity

\*including locomotor (horizontal jump, hop, skip), object control (overhand throw, kick, catch) and balance skills

FMS	Performance Criteria (Photo <sup>1-4</sup> )	Mastery Rate
Overhand Throw (Total score : 4)	• Step with Opposite Foot <sup>1</sup>	25%
	• Initiate Windup of Throwing Arm <sup>2</sup>	19%
	• Rotate Hip and Shoudlers <sup>3</sup>	34.5%
	• Weight Transference <sup>4</sup>	4.8%

## 上手擲球 Overhand Throw



- 持球手(右)後引 相反腳(左)踏前
- 右手肘引至耳側 並轉動臂及肩膀
- 手臂抬高 擲球向前方
- 放球後繼續 投球動作 向斜方伸延

以上動作左右手可交替練習



# Key findings



- FMS is positively related to executive functioning, which is positively related to psychosocial health



# Highlights on On-going Projects

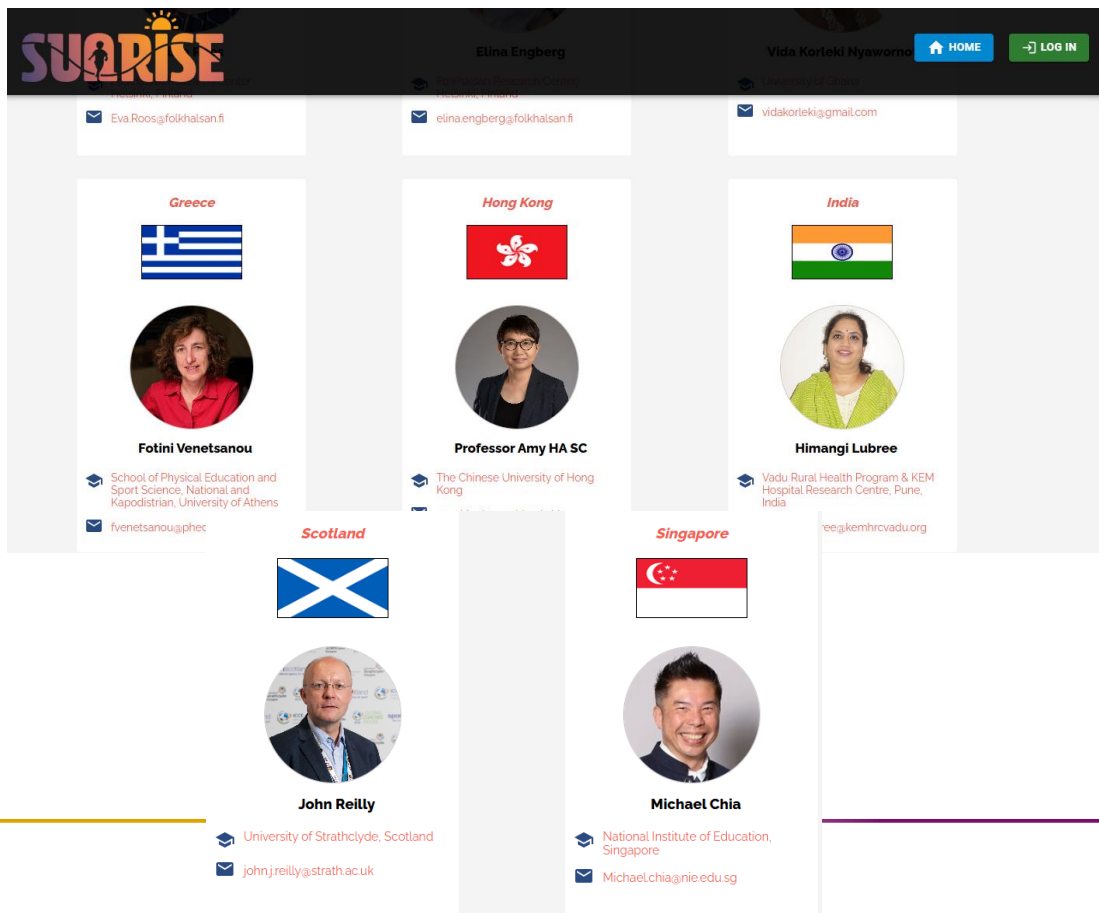


- International surveillance study on preschool-aged children's 24-hour movement behaviors
- **71 countries** involved, aims to globally monitor the World Health Organization Guidelines
- Hong Kong-based work – Main Study starting September 2024
  - **500 children, 20 kindergartens**

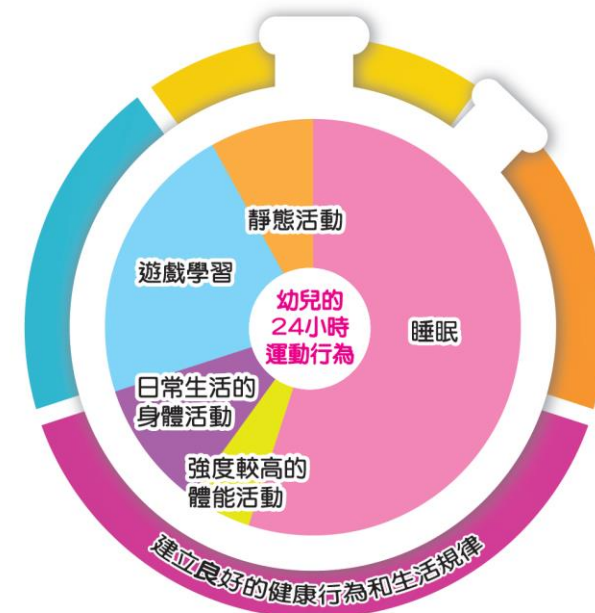
# International Collaboration



- **SUNRISE** brings together researchers from low, middle, and high income countries across the globe (>70 countries/ regions)



What does 3- to 4-year-old Hong Kong children's **24-hour movement** profile look like?



February  
2019

April  
2019

July  
2020

July  
2024

September  
2024

December  
2025

SUNRISE Pilot Study  
Data Collector Training

SUNRISE Pilot  
Data Collection at  
Kindergartens

SUNRISE COVID-19  
Survey

SUNRISE Main Study  
Data Collector Training

SUNRISE Main  
Recruitment at  
Kindergartens



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# SUNRISE Hong Kong Journey



# International Collaboration

- Collect international surveillance data using the new global 24-hr movement guidelines as benchmarks
- Data Collection on **500\*** Hong Kong preschoolers (3 to 4 years old)



**Executive  
Functioning**



**MOVE 3 h**



**SLEEP 10-13h**



**SCREEN <1 h**

# SUNRISE

## Hong Kong Data Collection



## Pilot Leading to Main Study



# SUNRISE – Hong Kong



Recruitment goal:



**500** children (3-4 yrs)  
(No more than 25 children per kindergarten)

Our invitation:

**JOIN US!**



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# Key learnings



# Key Learnings

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- Effective, integrated and coordinated communication among key stakeholders
- Establish a good researcher-participant relationship
- Show respect and appreciation of participants' involvement and effort
- Share participant-level data and aggregate data timely

# Conclusion



- Monitoring **24-hour movement behaviours** is a global research trend
  - Very few HK children meet WHO recommendations
- A **family-school partnership intervention** within preschool settings appears to be a sustainable and realistic approach to help children achieve whole-person development



# Conclusion

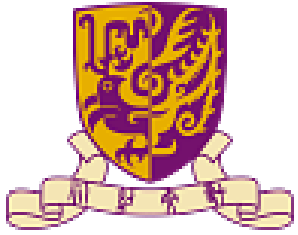
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- Early childhood educators are in **urgent need of positive supportive supervision and ongoing professional development training** for the promotion of PA and FMS in young children
- Longitudinal studies, including intervention studies, are needed to **increase preschoolers' guideline compliance** and to **gain more insight into its association with physical, mental and cognitive health outcomes**

# Thank you!





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# Q & A

**Or contact me at:**

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