Cross-cultural differences in sleep pattern and problems in adolescents -the ACROSS study

Joint lead by CUHK and NUS

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The Chinese University of Hong Kong
Hong Kong (China)

Meeting will start at 3:30pm Singapore Standard
Time

Agenda

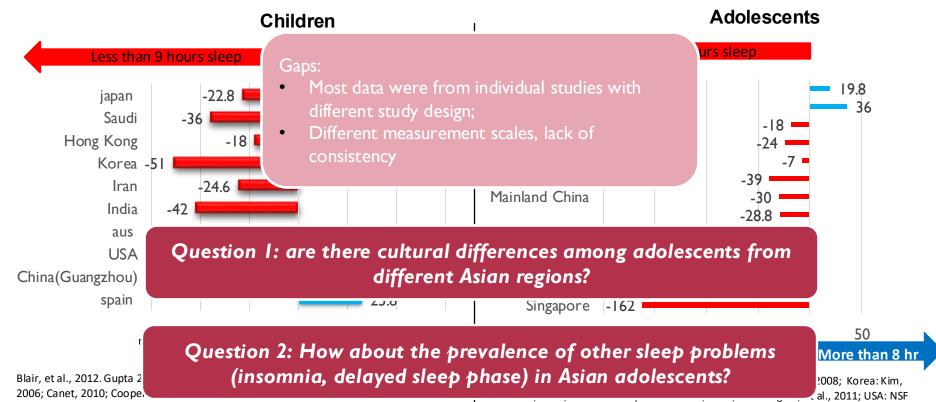
• Introduction of participating centres (20 min)

• Discussion of survey updates (30 min)

• Discussion of administrative issues (30 min)

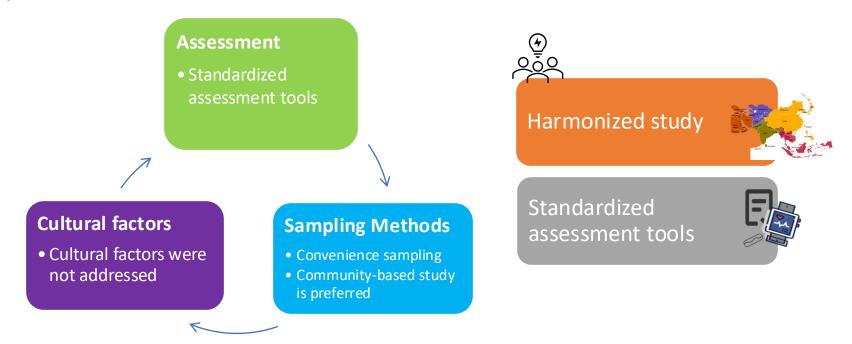
• Discussion of timeline (10 min)

School days sleep data across different regions



2006; Portugal: Paiva et al., 2015; UK: Maslowsky, & Ozer, 2014; South Aus: Short, et al., 2013; Singapore: Guo L, 2018; Pu ZH, et al. 2022; Chen CX, et al, 2023; Kim MJ et al, 2023; Kocevska D, et al, 2020

Gaps and Future directions



Systematic study including various cultures and regions is needed

Objectives

To conduct the "ACROSS" study with the following objectives:

- Conduct in Asian adolescents
- Explore the Cultural differences in sleep patterns and problems
- Evaluate the Risk factors associated with sleep problems
- Understand the Obstacles to obtain adequate sleep
- Promote healthy Sleep in Schools



Methods

01

Target: School-aged adolescents

Map out sleep patterns, risk factors, and obstacles for sleep in adolescents across Asia
Capture the diversity of societal factors affecting sleep: geographical, cultural, religious

02

Tools: Online/Paper surveys for adolescents, harmonized study

Different dimension of sleep will be covers: Sleep duration/timing/quality/disorders/ variability/habits Consequences: mood, behavioral, academic **Impact**

Cross-cultural differences

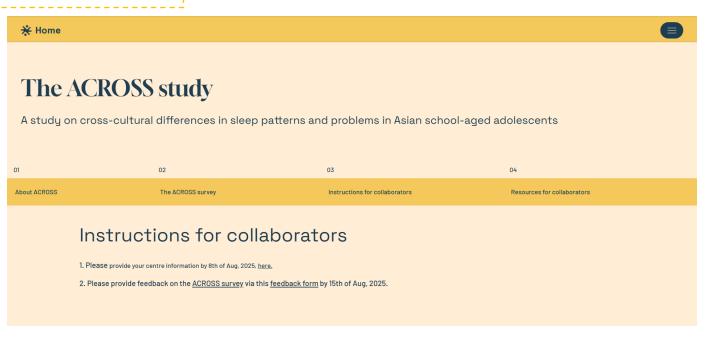
Inform policy change



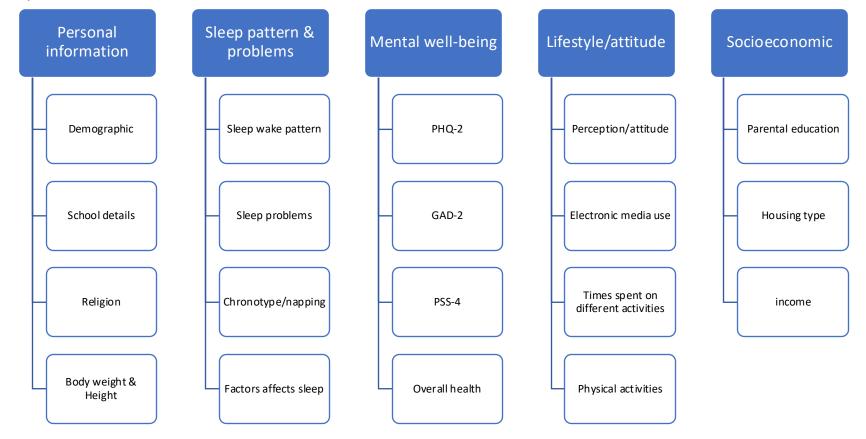
Sample size: Estimated to collect ~1000 data from each participating centre in adolescents (12-18y, male and female)

Study Website

Survey and instructions : https://www.across-study.com



Questionnaire



Study impact

Investigation of sleep with regional and cultural consideration in Asian children and adolescents



Improved Sleep Intervention:

Intervention more specific to cultures, leading to more effective solution



International
Collaboration;
Policy development;
Informed
Healthcare practice



ACROSS Study

Part 2: Progress – Survey Feedback

ACROSS centres

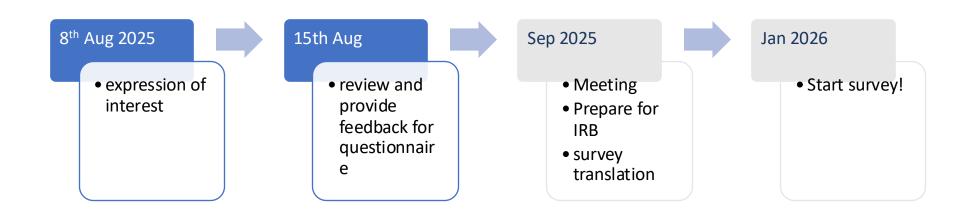
15 countries/ regions

19 centres

regions	
Country/Region	Initiating Centres
1 Hong Kong	Hong Kong Society of Sleep Medicine
2 Singapore	Singapore Sleep Society
	Participating centres
3 India	Indian Society for Sleep Research
4 Indonesia	Universitas Indonesia, Faculty of Psychology
Indonesia	Indonesia Society of Sleep Medicine (INA-Sleep)
5 Iran	Iranian Sleep Medicine Society
6 Israel	Israel Sleep Research Society
7 Japan	Japanese Society of Sleep Research
8 Korea	Korea Sleep Research Society
Korea	Korean Society of Sleep Medicine
9 Mainland China	Beijing
Mainland China	Shanghai
Mainland China	Guangzhou
10 Malaysia	Sleep Disorders Society Malaysia
11 Saudi Arabia	Saudi Sleep Medicine Society
12 Sultanate of Oman	Sultan Qaboos University
13 Taiwan	Taiwan Society of Sleep Medicine (TSSM)
14 Thailand	Sleep Society of Thailand
15 Vietnam	Vietnam Society of Sleep Medicine



Timeline



Part 2: Progress – Survey Feedback

7 □ Shinto

(A) Personal Information:

6 □ Taosim

1.	i. Date (dd/mm/yyyy)):		(e.g. if	17 th Sep 2025 ->	answer 17/09/2	2025)
2.	i. Date of Birth (dd/m	nm/yyyy):		(e.g. if	17 th Feb 2001 ->	answer 17/02/2	2001)
3.	i. Place of Residence:			_ii. □ 1Urban	□ 2Suburban	□ 3Rural	
4.	i. Sex: □ 1.Male □ 2 iii. Religion:	2.Female ii. Ethnic	eity:		-		
	1 □ Christianity	2 □ Catholism	3 □ Islam	4 🗆	Buddhism	5 □ Judaism	

8 □ Hinduism

9 □ No religion

Religion

10 □ Others

Most common religions

compiled and given as response options + Others.

(A) Personal Information:

1.	i. Date (dd/mm/yyyy):			/			(e.g. if	17th Sep 2025	- >
2.	i. Date of Birth (dd/mr	n/yyyy): _		/			(e.g. if	17 th Feb 2001	->
3.	i. Place of Residence:	<u>-</u>				ii. 🗆	1Urban	□ 2Sv urba	n
4.	i. Sex: □ 1.Male □ 2.	Female	ii. Et	thnicit	y:				
	iii. Religion:				·				
	1 □ Christianity	2 □ Catho	lism		3 □ Islam	1	4 🗆	Budusm	
	6 □ Taosim	7 □ Shinte	-		8 □ Hind	uism		Lligion	
Ş	Solution								
i	Use the standard/accepted n your country/region as re options. For coding, indica majority/minority] ethnicity	esponse te		wi	th 56 ethn	ic (Minz	u) group	zu) country s. Should) groups?"	

"As there is no differentiation of ethnic groups in Saudi Arabia, we suggest changing this question to Nationality, considering that many non-Saudis live in the country."

□ 3Rural

"Ask whether the respondent is Japanese or non-Japanese. Non-Japanese respondents are classified as minorities."

"Korean, Others"

5. i. Grade: ii. School nar	ne:	(Optional)
iii.School types: a) 1 □ Public 2 □ Priv	vate 3 □ International	
b) 1 □ Boarding school 2 □ Non-b	oarding school	
v. School start time:hhmm	vi. School end time:hhn	nm
7. i. Number of siblings: ii	Number of people in your housel	nold:
3. Living status: (can "✓" more than one		
1□ Living with parents	2□ Living with father only	3 □ Living with mother only
4□ Living with relatives	5□ Others:	
Note: Q4ii/iii 'Ethnicity' and 'Religion': Please your country as multiple-choice options. For considered an ethnic minority. Q6i 'Grade' is to be adapted for the various Education systems differ in different countrield based on the education scheme in the	or scoring purposes, please indicates and some states of the source of t	cate whether each category is

Added:

School type

- a) Public/Private/International
- b) Boarding/non-boarding school

11. a.i.	When do you usually go to bed during weekdays / school days?	hr_	min
ii.	When do you usually get up during weekdays / school days?	hr_	min
i <mark>i</mark> .	How many hours of sleep do you get during weekdays / school day? (this may be different from the number of hours you spent in bed)	hr_	min
b.i.	When do you usually go to bed during weekends / non-school days?	hr_	min
ii.	When do you usually get up during weekends / non-school days?	hr_	min
ili.	How many hours of sleep do you get during weekends / non-school days? (this may be different from the number of hours you spent in bed)	hr_	min
c.i.	When do you usually go to bed during long school holidays (1 week or more)?	hr_	min
ii.	When do you usually get up during long school holidays (1 week or more) ?	hr_	min
iii.	How many hours of sleep do you get during long school holidays (1 week or more)? (this may be different from the number of hours you spent in bed)	hr_	min

Added:

Total Sleep Time Questions
To clarify: hours of sleep may be
different from time in bed

3	How long did it normally <u>take for you to fall asleep</u> ? 1□ less than 15 min 2□ 15 to 30 min 3□ 30 to 45 min 4□ 45-60 min 5□ more than 60 min
4	 a. Do you think you have enough sleep in general? 0 Never 1 At least 2 days 2 Half of the week 3 Most of the time
	b. How many hours of sleep do you think you need to feel your best ? Hoursmins
5.	a. "How many days do you drink caffeinated beverage per week (e.g., tea, coffee, Coke, energy drinks, Receivable) to help you stay awake?" 0

b. (Optional) "How often do you consume alcohol per week (e.g., beer/wine etc)?"

0 ☐ "Never"

☐ "1 or 2 days"

2 \(\text{"3 or 4 days"}

3 ☐ "5 or 6 days"4 ☐ "Every day"

Added:

c. (Optional) "How often do you smoke cigarette per week?"

0 ☐ "Never"

1 □ "1 or 2 days"

2 \(\text{"3 or 4 days"}

3 \(\text{"5 or 6 days"}

4 \(\sum \) "Every day"

Alcohol/smoking

[Optional]: if allowed to ask in your country/region's local context

16. a. For each question below, please check the appropriate box that best describes your sleep habits for the <u>past</u> <u>month</u>. If you are not sure about your situation, please ask other family members.

	Never = 0	<1 time /month = 1	1-2 times/ Month = 2	1-2 times /week = 3	3 times or more/week = 4
Difficulty falling asleep					
Difficulty staying asleep					
Waking up too early in the morning					
Had night sweating					
Had breathing difficulties during sleep					
Had nightmares					
Stopped breathing during sleep for at least a few seconds					
Teeth grinding					
Bedwetting during sleep (enuresis)					
Sleepwalking					
Snoring					
Feel unrefreshed upon waking up in the morning					
Feel tired/sleepy during the day					
Did you have restless or "crawling" feelings in your legs at night that went away if you moved your leg					
Did you have repeated rhythmic leg jerks or leg twitches during your sleep					
	Difficulty staying asleep Waking up too early in the morning Had night sweating Had breathing difficulties during sleep Had nightmares Stopped breathing during sleep for at least a few seconds Teeth grinding Bedwetting during sleep (enuresis) Sleepwalking Snoring Feel unrefreshed upon waking up in the morning Feel tired/sleepy during the day Did you have restless or "crawling" feelings in your legs at night that went away if you moved your leg Did you have repeated rhythmic leg jerks or	Difficulty falling asleep Difficulty staying asleep Waking up too early in the morning Had night sweating Had breathing difficulties during sleep Had nightmares Stopped breathing during sleep for at least a few seconds Teeth grinding Bedwetting during sleep (enuresis) Sleepwalking Snoring Feel unrefreshed upon waking up in the morning Feel tired/sleepy during the day Did you have restless or "crawling" feelings in your legs at night that went away if you moved your leg Did you have repeated rhythmic leg jerks or	Difficulty falling asleep Difficulty staying asleep Waking up too early in the morning Had night sweating Had breathing difficulties during sleep Had nightmares Stopped breathing during sleep for at least a few seconds Teeth grinding Bedwetting during sleep (enuresis) Sleepwalking Snoring Feel unrefreshed upon waking up in the morning Feel tired/sleepy during the day Did you have restless or "crawling" feelings in your legs at night that went away if you moved your leg Did you have repeated rhythmic leg jerks or	Never = 0	Never = 0

Added:	
Restless Leg Symptoms	

i. If you experience any of the sleep problems mentioned in Question 15, what strategies have you used to ldress them? (Select all that apply) 0
If you have received treatment, please indicate what treatment (Select all that apply) 1 Over-the counter medication / supplements 2 Medication (western) 3 Medication (traditional/herbal) 4 Psychotherapy 5 Medical device (e.g. CPAP, oral devices) 6 Surgery 7 Others:

16. a. For each question below, please check the appropriate box that best describes your sleep habits for the <u>past</u> month. If you are not sure about your situation, please ask other family members.

Œ							
			Never = 0	<1 time /month = 1	1-2 times/ Month = 2	1-2 times /week = 3	3 times or more/week = 4
	a.	Difficulty falling asleep					
	b.	Difficulty staying asleep					
	c.	Waking up too early in the morning					
	d.	Had night sweating					
	e.	Had breathing difficulties during sleep					
	f.	Had nightmares					
	g.	Stopped breathing during sleep for at least a few seconds					
	h.	Teeth grinding					
	i.	Bedwetting during sleep (enuresis)					
	j.	Sleepwalking					
	k.	Snoring					
	1.	Feel unrefreshed upon waking up in the morning					
	m.	Feel tired/sleepy during the day					
	n.	Did you have restless or "crawling" feelings in your legs at night that went away if you moved your leg					
	0.	Did you have repeated rhythmic leg jerks or leg twitches during your sleep					

Added:

Help/treatment seeking behavior questions

b. i. If you experience any of the sleep problems mentioned in Question 15, what strategies have you used to address them? (Select all that apply) 0
4
· ·
ii. If you have received treatment, please indicate what treatment (Select all that apply) 1 □ Over-the counter medication / supplements 2 □ Medication (western)
3 Medication (traditional/herbal)
4 Psychotherapy
5 Medical device (e.g. CPAP, oral devices)
6 ☐ Surgery
7 Others:

b. Do you nap during the day?		
0 □ No (Go to Q17)		1 □ 1 to 2 days per week
2 □ 3 to 6 days per week		3 □ Dailv
c. If yes, when do you usually	nap? (Select all apply	
1 □ At school during class		2 □ At school during breaks
3 □ At home after school		4 □ During holidays/free days only
d. Are your naps mostly invol	luntary or planned?	
1 □ Involuntary 2 □ Plan	nned	
e. How long is your nap?		
1 □ less than 15 min	2 🗆 16 to 30 min 3	□ 31 to 60 min
4 □ 61 to 120 min	5 □ more than 120 r	min (about: min)
17. a. i. Do you have difficulty want of the second of th	aking up in the mornin week) rr week)	

Added:

Items on school-related sleep conditions

- Napping habits
- Napping opportunities
- Waking up for school

- 18. Are you a morning- or evening-type person (select the option that fits you best)?
 - 1 I am very alert/active in the morning and sleepy early in the evening (definitively morning person)
 - 2□ I am to some extent alert in the morning and sleepy in the evening (more morning than evening person)
 - 3□ Neither morning nor evening person
 - 4□ I am to some extent alert in the evening and sleepy in the morning (more evening than morning person)
 - 5 I am very alert/active in the evening and sleepy in the morning (definitively evening person)
- 19. Below are some aspects of life that can prevent us from getting good sleep. Please select **all** that impact your sleep.
 - a) Sleeping environment
 - i) 1 Uncomfortable temperature (too hot or too cold)
 - ii) 2 Noise (from outside or inside the bedroom)
 - iii) 3 Brightness of light (from outside or inside the bedroom)
 - iv) 4 Uncomfortable bed
 - v) 5 Disturbed by co-sleeper
 - vi) 6 Disturbed by roommate
 - b) Activities
 - i) 1 Social activities (in person: e.g., socialising with friends)
 - ii) 2 Social activities (virtual: e.g., online chat, messaging)
 - iii) 3 Entertainment (in person: e.g., reading for pleasure)
 - iv) 4 Entertainment (virtual: e.g., gaming, watching TV/videos, web browsing)
 - v) 5 Long commute
 - vi) 6 Study load
 - vii) 7 Part-time work
 - c) Stress
 - i) 1 Emotional
 - ii) 2 Academic worries
 - iii) 3 Family worries (e.g., parents' relationship)
 - iv) 4 Financial stress
 - v) 5 Interpersonal stress (e.g., relationship with classmates/friends)
 - d) Health
 - i) 1 Parental mental health status
 - ii) 2 Parental physical health status
 - iii) 3 Personal mental health status
 - iv) 4 Personal physical health status
 - v) 5 Mental health status of other family members
 - vi) 6 Physical health status of other family members
 - e) Others, specify:

Updated:

- Corrected heading [c) Stress]
- Added categories
 - Part-time work
- Added "Health" section
- Added "Others" option

(E) Lifestyle factors

24. Beliefs and attitudes towards sleep

The following sentences reflect people's attitudes and beliefs about sleep. Please indicate how much you agree or disagree with each sentence. There are no right or wrong answers. For each statement, place an 'X' in the square that represents your personal opinion. Even if some sentences are not very relevant to your situation, please answer all questions.

Item	Strongly disagree = 0	Disagree = 1	Neutral = 2	Agree = 3	Strongly agree = 4
My parents set a bedtime for me					
My parents are worried if I don't get enough sleep.					
My parents think I am lazy if I sleep too much					
My parents think finishing my homework is more important than sleep					
My parents encourage me to stay up late for social/family activities rather than to sleep					

Item	Strongly disagree = 0	Disagree = 1	Neutral = 2	Agree = 3	Strongly agree = 4
My friends encourage me to stay out late for social activities					
My friends encourage me to stay up late to study					
My friends often brag about how little they sleep					

Shortened:

Parent attitudes section

Updated:

Self attitudes section

Item	Strongly	Disagree	Neutral	Agree = 3	Strongly
	disagree = 0	= 1	= 2		agree = 4
I believe sacrificing sleep to get more					
work/study done is necessary					
I believe sacrificing sleep for social					
activities is worth it					
I believe sleeping well helps academic					
performance					

Item	Strongly disagree = 0	Disagree = 1	Neutral = 2	Agree = 3	Strongly agree = 4
My teachers or school staff complain about me or punish me because of my sleep issues/falling sleep in school					
My school has some sleep-related programme in the curriculum					
My teachers encourage me to sleep enough					

(E) Lifestyle factors

24. Beliefs and attitudes towards sleep

The following sentences reflect people's attitudes and beliefs about sleep. Please indicate how much you agree or disagree with each sentence. There are no right or wrong answers. For each statement, place an 'X' in the square that represents your personal opinion. Even if some sentences are not very relevant to your situation, please answer all questions.

+						
	Item	Strongly	Disagree	Neutral	Agree = 3	Strongly
		disagree = 0	= 1	= 2		agree = 4
	My parents set a bedtime for me					
	My parents are worried if I don't get enough sleep.					
	My parents think I am lazy if I sleep too much					
	My parents think finishing my homework is more important than sleep					
	My parents encourage me to stay up late for social/family activities rather than to sleep					

Item	Strongly disagree = 0	Disagree = 1	Neutral = 2	Agree = 3	Strongly agree = 4
My friends encourage me to stay out late for social activities					
My friends encourage me to stay up late to study					
My friends often brag about how little they sleep					

Added:

School culture section

Item	Strongly	Disagree	Neutral	Agree = 3	Strongly
	disagree = 0	= 1	= 2		agree = 4
I believe sacrificing sleep to get more					
work/study done is necessary					
I believe sacrificing sleep for social					
activities is worth it					
I believe sleeping well helps academic					
performance					

Item	Strongly disagree = 0	Disagree = 1	Neutral = 2	Agree = 3	Strongly agree = 4
My teachers or school staff complain about me or punish me because of my sleep issues/falling sleep in school					
My school has some sleep-related programme in the curriculum					
My teachers encourage me to sleep enough					0

29. How much time do you usually spend on each of the following activities per day?

	School day	Free day		School day	Free day
Homework	hoursmins	hoursmins	Transportation to school	hoursmins	hoursmins
Electronic device for leisure	hoursmins		Extracurricular activities: (e.g., piano, drawing, dance & etc)	hoursmins	hours_mins
Tutoring	hoursmins		Leisure activities (e.g., shopping, camping etc)	hoursmins	hoursmins
Part-time work	hoursmins		Chores (e.g., household chores, caregiving& farming)	hoursmins	hoursmins
Others, specify:	hoursmins	hoursmins			

Note: Q27 is to be adapted for the local context.

Where relevant, please provide additional categories for Q27 relevant to your local context (e.g., part-time work, assisting with household chores/caregiving, farming).

Updated:

- Private tuition → Tutoring clarification: any after-school classes aimed at improving school subjects
- Extracurricular activities
 clarification: any formal
 classes/activities not aimed at school
 subjects. [In translation please give
 locally relevant examples]

Added:

- Leisure activities clarification: any non-formal activities aimed at rest/entertainment. [In translation please give locally relevant examples]
- Chores (e.g. household, caregiving & farming)

Physical activity

30. In the last 7 days, were you involved in any of the following activities such that they made you sweat at least a little more than usual and breathe harder? If yes, note down how much time you spent on average in these activities in the last 7 days, and select the time of day you engaged in them.

Activity		If 'yes', how many days did you do this activity during the last 7 days?	How much time did you usually spend doing this activity on one of those days	If 'yes', what time usually did you engage in this activity (single choice)?
Did you use active ways like walking or cycling to get to places such as (school, the bus stop, the shopping center, work) or to visit friends?	○ 0 No ○ 1 Yes	days	hours	○ 1 Morning ○ 2 Afternoon ○ 3 Evening ○ 4 1 hour before bedtime
Did you do sports, fitness or recreational physical activities while at school, e.g., during physical education classes, during your breaks and any other time you played indoors or outdoors?	○ 0 No ○ 1 Yes	days per week	hours	o 1 Morning o 2 Afternoon o 3 Evening o 4 1 hour before bedtime
Did you do physical activities in your non-school leisure time, including exercising, playing a sport or playing with your friends?	∘ 0 No ∘ 1 Yes	days	hours mins	○ 1 Morning ○ 2 Afternoon ○ 3 Evening ○ 4 1 hour before bedtime
Did you do any other physical activities you have not already reported, e.g., when helping your family with housework/chores, doing paid/unpaid work?	○ 0 No ○ 1 Yes	days	hours mins	○ 1 Morning ○ 2 Afternoon ○ 3 Evening ○ 4 1 hour before bedtime

Updated:

Duration split into:

- How many days during the past 7 days
- How many hh:mm per day

Timing simplified options:

- Morning
- Afternoon
- Evening
- 1 hour before bedtime

(E) Socioeconomic status

30. What is the highest education level of your parents (or guardians)?

_Mother/Female guardian:

+	•			
	1 □ Elementary		2 □ Middle or high school	
	3 □ College or university		4 □ Post-graduate or above	
	What is your mother/female guardian's employment status?	□ Full time □ Pa	rt-time Not employed/not working	

Father/Male guardian:

1 □ Elementary		2 □ Middle or high school
3 □ College or university		4 □ Post-graduate or above
What is your father/male guardian's employment status?	1□ Full time 2□	Part-time 3□ Not employed/not working

Country-specific questions

a. Housing type

1□ Public estate	2□ Home ownership scheme	3□ Private estate
4□ Temporary housing	5□ Village houses	6□ Others:

b. Monthly family income:>

1□ Low	2□ Middle	3□ High
4□ Don't know		

Parental education: Simplified:

Elementary Middle/high school

College/University

Post-graduate or above

Family income:

Simplified:

- Low
- Middle
- High
- Don't know

Housing Type:

Should revise according to local context, may consider the following categories:

- 1. Affordable housing
- 2. Premium housing
- 3. Social housing (subsidized)

Response to feedback after ASSM meeting

- Concerns about survey length: take around 15 mins to complete
- Format of distribution: online/paper depends on each region's practice
- Forms of engagement (e.g., gifts, school-level report): prefer NOT to have incentives for filling in the survey, but feedback could be provided according to regional practice
- Official ASSM letter: will seek ASSM support

Next Step

Part 2: Progress – Survey Feedback

Next step

8th Aug 2025

 expression of interest

15th Aug

 review and provide feedback for questionnair e

Sep 2025

- Meeting
- Prepare for IRB
- survey translation

Jan 2026

Start survey!

Administrative issues

Translation

- To be arranged by each centre locally (coordinate if >1 centre/country)
- Back-translation method

Institutional Review Board / Ethics

- To be arranged by each centre locally
- Procedures and requirements vary
- Informed consent templates on website
- Any central requirements?

Distribution

- Platform: electronic preferred (pen and paper possible)
- Setting: classroom preferred (individual/unsupervised possible)
- Scoring: only fully scored electronic format (xls, csv, etc. / scoring template to be posted on website)

Timeline

• Final survey version to be shared (6 Oct 2025)

Translation / IRB application (Oct-Dec 2025)

Data collection (Jan-June 2026)

Thank you!