Child obesity is prevalent in developing countries !

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Background

Now, obesity is the most important public health concern around the world !

—Various risk factors—

- Physical inactivity
- Unhealthy diets
- Genetics
- Home environment

etc.

Obesity increases lifestyle-related diseases !

Worldwide trend

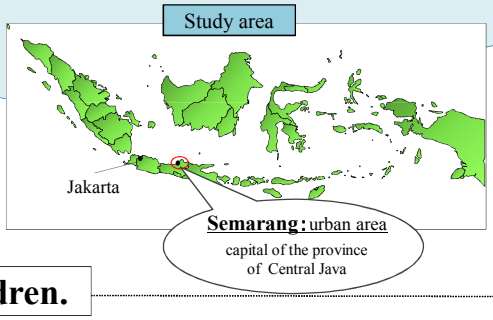
➢**Obesity** is prevalent in…

only high-income countries ➡ **low-, middle- income countries** (particularly urban areas)

only adults ➡ **children**

Indonesia

- Economic development has been accelerated. (GDP doubled ! ※2005~2009)
- Child obesity increases in urban areas*.



➢Why childhood obesity is serious health concern?

- **It relates to adulthood obesity.**
- **It develops lifestyle-related diseases at a younger age.**

In my study, focus on lifestyle of **obese children.**

dietary intake in

Food recall

Ask about both "quality" and "quantity" of what they ate and drank

What did you eat?
When did you eat ?
How many/much~did you eat ?

▼various **food models !**

2. **Estimate** the portion size

▼There are many "**outside food store**" around the school.

3. **Calculate** TEI (total energy intake) and nutrition intake

Energy ≒ recommended level

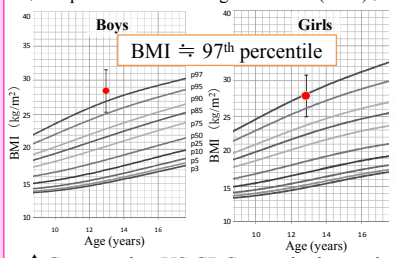
	Boys (n=60)	Girls (n=30)
Energy (kcal)	2,457	2,276
protein (g)	69.9	63.8
fat (g)	76.5	67.3
carbohydrate (g)	360.4	337.3

▲Fried noodles, chicken, snacks, juice etc.

• Energy was approximately equal to RDA (recommended daily allowance) of Indonesia in both boys and girls.
(※RDA: boys 2,400 / girls 2,350 kcal)

	Boys (n=62)	Girls (n=31)
Age (year)	13.0±0.4	12.8±0.5
Height (cm)	156.9±7.6	153.5±6.4
Weight (kg)	70.4±10.4	66.0±9.9
BMI (kg/m²)	28.5±3.1	27.9±3.0
%fat (%)	31.6±7.8	36.5±4.6
Fat free mass (kg)	47.9±7.4	41.8±5.2

〈Comparison to US CDC growth chart (2000)〉

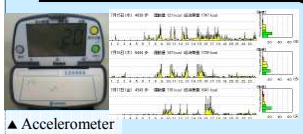


▲Compared to US CDC growth charts, the mean BMI of both boys and girls almost corresponded to the 97th percentile .

• Compared data from a nationwide survey in Indonesia, the mean "weight for height" of both boys and girls exceeded the 97th percentile.
(CDC: United States Centers for Disease Control.)

physical activity out

Acceleration monitoring



▲Accelerometer

- Attach the accelerometer for 7 consecutive days
- Calculate Total daily energy expenditure (TEE) and daily step frequency (STEP)

	Boys (n=55)	Girls (n=24)
BMR[1] (kcal/day)	1,735	1,578
TEE[2] (kcal/day)	2,666	2,398
PAL[3]	1.58	1.52
STEP (step/day)	9,320	7,775

[1] BMR: basal metabolic rate
[2] TEE : total energy expenditure
[3] PAL : physical activity level (TEE / BMR)

PAL : Light to Moderate

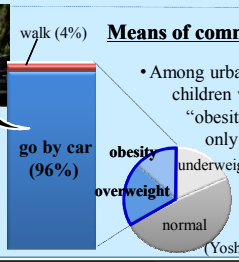
STEP < recommended level

• PAL was light to moderate** in both boys and girls.

• STEP was below the recommended level (boys 14,000/girls 11,000***) in both boys and girls.

▲ There are many cars around the school.

Means of commuting to school ?



• Among urban elementary school children who were classified "obesity" or "overweight", only 4 % walked to school.

Most of them went to school by car!

(Yoshimura et al., 2010)

Discussion

Dietary intake was appropriate, but physical activity level was low.

Inactive lifestyle cause obesity to children !

➢ To prevent childhood obesity…?

Evaluate accurately own dietary intake + Incorporate exercise into daily life

Maintain **healthy body weight** and **fat percentage.**

Future prospects

- Reveal current status of prevalent of child obesity and examine lifestyle of them in rural area of Indonesia.
  ⇒ Compare those data in rural to urban area.
- Examine characteristics of obese children in detail.
  (Ex. cardiopulmonary function, QOL, characteristics of parents)

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