



## INTRODUCTION

- Breakfast is arguably the most important meal to refuel the body with essential nutrients.
- MyBreakfast Study (2018) indicated that breakfast skipping (skipped  $\geq 3$  days per week) tended to increase overweight and obesity risk<sup>[1]</sup>.
- Poorer overall dietary quality was demonstrated amongst those who skipped breakfast<sup>[2]</sup>.
- Previous study<sup>[3]</sup> showed a high prevalence of breakfast skipping among children; therefore, it is worth to further investigate its influence on nutrient intakes.

## OBJECTIVE

To investigate breakfast consumption by sociodemographic factors and its impact on nutrient intakes amongst primary schoolchildren.

## METHODOLOGY

- This study was part of the South East Asian Nutrition Surveys (SEANUTS II) Malaysia.
- All the protocols and materials were approved by Research Ethics Committee of UKM (JEP-2018-569).
- Written consent from parents/guardians and verbal assent from children were obtained.

Research Design	: Cross-sectional
Sampling Method	: Multistage cluster sampling
Sample Size	: 1313 children (representing 2.1 million children in Peninsular Malaysia)
Subject	: Primary schoolchildren (6.0-12.9 years)
Study Location	: Central, Northern, Southern, and East Coast of Peninsular Malaysia

## Questionnaires

- Sociodemographic Questionnaire (SES) : Sociodemographic characteristic
  - Child Food Habit Questionnaire (CFH) : Breakfast consumption pattern
- Breakfast consumption pattern was grouped into:
- Daily : Consumed breakfast daily
  - Non-daily : Skipped breakfast at least one day per week

## Dietary Assessment

- One day triple-pass 24-hour dietary recall<sup>[4]</sup>.
- 6.0-9.9 (Years) : Parent proxy-reported
- 10.0-12.9 (Years) : Child self-reported
- Nutritionist Pro software was employed in nutrient analysis.
- The 1997 Malaysian Food Composition Database (FCD 1997)<sup>[5]</sup> served as the main reference for nutrient analysis.
- Black and Cole formula (2000)<sup>[6]</sup>, with the ratio of energy intake: energy expenditure (EI:EE ratio), was used to exclude implausible data reporting.

## Statistical Analysis

- Analysed using Statistical Product and Service Solution (SPSS) version 22.
- Complex sampling Pearson chi-square tests used for comparison of sociodemographic characteristic groups.
- Complex sampling ANOVA used for comparison of breakfast consumption pattern.

## RESULTS

Figure 1: Proportion (%) of daily breakfast consumption among primary schoolchildren aged 6.0-12.9 years

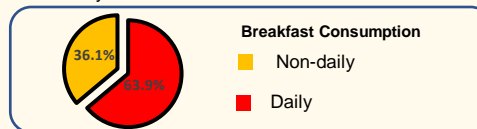
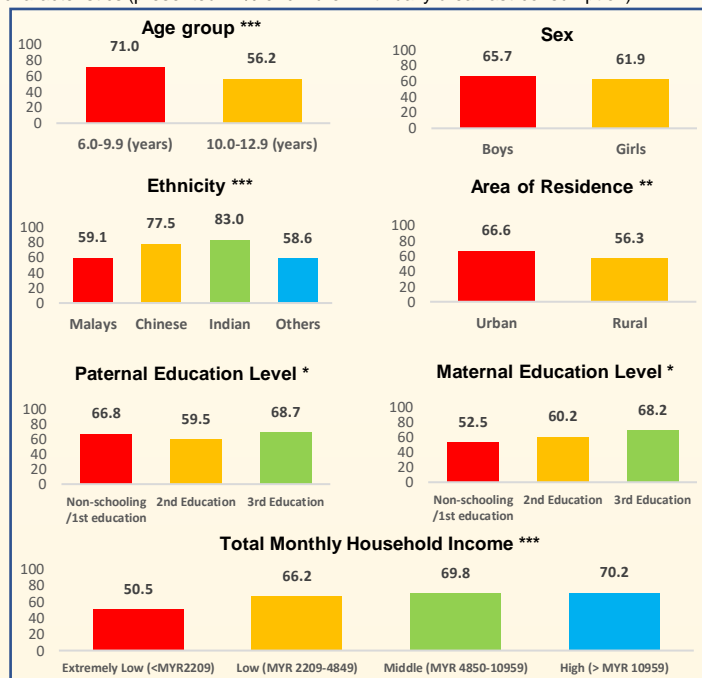


Figure 2: Comparison of breakfast consumption pattern by sociodemographic characteristics (presented in % of children with daily breakfast consumption)



Significant differences between sociodemographic characteristics were determined using Complex Sampling Pearson chi-square tests at \* $p < 0.05$ , \*\*  $p < 0.01$  and \*\*\*  $p < 0.001$

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Table 1: Energy and nutrients intake by daily breakfast consumption patterns [presented in mean (95%CI)]

Characteristics	All (n=1313)	Daily BF (n=871)	Non-daily BF (n=442)
Energy (kcal)	1540(1506-1574)	1563(1520-1606)	1499(1444-1554)
Protein (g)	58.0(56.4-59.6)	58.7(56.7-60.8)	56.7(54.0-59.3)
Carbohydrate (g)	208.5(203.9-213.1)	211.9(206.1-217.6)	202.5(194.9-210.1)
Fat (g)	52.6(51.0-54.1)	53.4(51.4-55.4)	51.1(48.8-53.5)
Vitamin A (mcg RE)	737.7(707.1-768.3)	755.7(715.2-796.2)	705.8(661.1-750.5)
Vitamin C (mg)	73.3(67.7-78.9)	76.2(69.4-83.0)	68.1(58.3-77.8)
Vitamin D (mcg)***	4.6(4.3-4.8)	4.9(4.6-5.2)	4.0(3.6-4.3)
Thiamine (mg)**	1.1(1.1-1.2)	1.2(1.1-1.2)	1.0(1.0-1.1)
Riboflavin (mg)***	1.4(1.4-1.4)	1.5(1.4-1.5)	1.3(1.2-1.3)
Cobalamin (mg)	3.2(3.0-3.4)	3.2(2.9-3.4)	3.2(2.9-3.5)
Sodium (mg)	2002(1927-2076)	2043(1942-2144)	1928(1825-2032)
Potassium (mg)**	1103(1069-1137)	1140(1095-1186)	1037(991-1083)
Calcium (mg)***	571.3(550.6-591.9)	601.2(574.2-628.1)	518.3(488.0-548.6)
Iron (mg)	12.1(11.7-12.5)	12.4(11.9-12.9)	11.7(10.9-12.4)
Phosphorus (mg)	736.9(715.0-758.7)	753.0(725.8-780.2)	708.3(672.0-744.7)

Significant differences between daily and non-daily breakfast consumption were determined using Complex Sampling ANOVA at \*\*  $p < 0.01$  and \*\*\*  $p < 0.001$

## DISCUSSION

- Around two-thirds (63.9%) of children consumed breakfast daily, which is slightly lower than SEANUTS I (66.8%) findings<sup>[3]</sup>.
- Lower proportion of daily breakfast consumption was observed amongst those in the older age group (10.0-12.9 years), Malays and other ethnicities, residing in rural areas, with extremely low household income, and those with parents with lower education ( $p < 0.05$ ).
- Children who skipped breakfast tended to have lower intake of vitamin D, thiamine, riboflavin, potassium, and calcium ( $p < 0.05$ ).
- These findings in agreement with the Australian children's study, which indicated higher intake of calcium and folate was found amongst breakfast consumers<sup>[7]</sup>.

## CONCLUSION

- Breakfast skipping was associated with age, ethnicity, area of residence, household income, and parental education level, which could lead to lower micronutrient intakes.
- Promotion of healthy eating habits in school and at home is much needed in order to tackle the breakfast skipping among schoolchildren.

## ACKNOWLEDGMENT

- SEANUTS II (Project Code: NN-2018-159) was funded by FrieslandCampina, Amersfoort, The Netherlands. Special thanks to MOE, JPN, teachers, parents, and children involved in this study.