**Supplementary Table 1:** Comparison of characteristics between included and not included participants in the current studya

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Not included** | **Included** | **p-valueb** |
|  | n = 392 | n = 561 |
| **Maternal characteristics** |  |  |  |
| Age (years) | 30.5 ± 5.2 | 31.3 ± 5.0 | **0.015** |
| Pre-pregnancy BMI (kg/m2) | 23.9 ± 4.8 | 23.6 ± 4.6 | 0.36 |
| Pregnancy weight gain (kg) | 11.2 ± 5.0 | 11.3 ± 4.4 | 0.73 |
| Ethnicity |  |  | **<0.001** |
|  Indian | 94 (24.0) | 80 (14.3) |  |
|  Malay | 90 (23.0) | 157 (28.0) |  |
|  Chinese | 207 (52.8) | 324 (57.8) |  |
|  Missing | 1 (0.3) | 0 |  |
| Household income category |  |  | **0.002** |
|  < S$2000 | 75 (19.1) | 65 (11.6) |  |
|  S$2000-5999 | 188 (48.0) | 295 (52.6) |  |
|  > S$6000 | 97 (24.7) | 169 (30.1) |  |
|  Missing | 32 (8.2) | 32 (5.7) |  |
| Marital status |  |  | 0.45 |
|  Single, not living with husband | 5 (1.3) | 11 (2.0) |  |
|  Married, living with husband | 364 (92.9) | 533 (95.0) |  |
|  Missing | 23 (5.9) | 17 (3.0) |  |
| Education level |  |  | **0.041** |
|  Primary/Secondary | 129 (32.9) | 149 (26.6) |  |
|  Post-secondary | 134 (33.9) | 200 (35.7) |  |
|  University and above | 118 (30.1) | 207 (36.9) |  |
|  Missing | 11 (2.8) | 5 (0.9) |  |
| Alcohol use before pregnancy |  |  | 0.56 |
|  No | 257 (65.6) | 360 (64.2) |  |
|  Yes | 127 (32.4) | 193 (34.4) |  |
|  Missing | 8 (2.0) | 8 (1.4) |  |
| Alcohol use during pregnancy |  |  | 0.35 |
|  No | 367 (93.6) | 535 (95.4) |  |
|  Yes | 5 (1.3) | 12 (2.1) |  |
|  Missing | 20 (5.1) | 14 (2.5) |  |
| Smoking regularly before pregnancy |  | 0.36 |
|  No | 332 (84.7) | 488 (87.0) |  |
|  Yes | 5 (1.3) | 65 (11.6) |  |
|  Missing | 20 (5.1) | 8 (1.4) |  |
| Smoking during pregnancy |  |  | 0.54 |
|  No | 375 (95.7) | 542 (96.6) |  |
|  Yes | 10 (2.6) | 11 (2.0) |  |
|  Missing | 7 (1.8) | 8 (1.4) |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Not included** | **Included** | **p-value** |
| Moderate and strenuous exercise before pregnancy |  | **0.001** |
|  No | 309 (78.8) | 390 (69.5) |  |
|  Yes | 74 (18.9) | 162 (28.9) |  |
|  Missing | 9 (2.3) | 9 (1.6) |  |
| Moderate and strenuous exercise during pregnancy |  | 0.61 |
|  No | 374 (95.4) | 542 (96.6) |  |
|  Yes | 8 (2.0) | 9 (1.6) |  |
|  Missing | 10 (2.6) | 10 (1.8) |  |
| Folic acid supplement use during pregnancy |  | 0.94 |
|  No | 37 (9.4) | 52 (9.3) |  |
|  Yes | 287 (73.2) | 410 (73.1) |  |
|  Missing | 68 (17.3) | 99 (17.6) |  |
| Breast milk feeding duration |  |  | 0.11 |
|  Never breastfeed | 24 (6.1) | 16 (2.9) |  |
|  < 3 months | 143 (36.5) | 210 (37.4) |  |
|  3 to < 6 months | 68 (17.3) | 99 (17.6) |  |
|  6 to < 12 months | 69 (17.6) | 101 (18.0) |  |
|  ≥ 12 months | 72 (18.4) | 125 (22.3) |  |
|  Missing | 16 (4.1) | 10 (1.8) |  |
| Breastfeeding status at 18 months  |  |  |  |
|  No | 344 (87.8) | 494 (88.1) | 0.26 |
|  Yes | 36 (9.2) | 66 (11.8) |  |
|  Missing | 12 (3.1) | 1 (0.2) |  |
|  |  |  |  |
| **Child characteristics** |  |  |  |
| Age (month) | 18.6 ± 1.0 | 18.3 ± 0.7 | **<0.001** |
| Gestational age at delivery (weeks) | 38.6 ± 1.8 | 38.8 ± 1.4 | 0.17 |
| BMI at 18 months old (kg/m2) | 16.2 ± 1.4 | 16.2 ± 1.3 | 0.48 |
| Birth order |  |  | **0.009** |
|  Not first child | 239 (61.0) | 294 (52.4) |  |
|  First child | 153 (39.0) | 267 (47.6) |  |
| Gender |  |  | 0.35 |
|  Male | 214 (54.6) | 289 (51.5) |  |
|  Female | 178 (45.4) | 272 (48.5) |  |
| Caregiver of child |  |  | 0.41 |
|  Parent | 216 (55.1) | 319 (56.9) |  |
|  Other family members | 82 (20.9) | 115 (20.5) |  |
|  External help  | 32 (8.2) | 36 (6.4) |  |
|  Responsibility shared | 49 (12.5) | 90 (16.0) |  |
|  Missing | 13 (3.3) | 1 (0.2) |  |

BMI, Body Mass Index

a Values are n (%) or mean ± standard deviation.

b p-values were obtained from Pearson’s chi-square tests for categorical variables or independent-sample t tests for continuous variables (p <0.05).

**Supplementary Table 2**: Comparison of early childhood dietary guidelines

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Country | Singapore [1] | Netherlands[2]  | Flemish [3] | Germany [4] | Switzerland [5]  | USA [6] | Australia [7] | Malaysia [8] | Hong Kong [9] | India [10] | Sri Lanka [11] |
| For ages (y) | 1 to 2 | 1 to 3 | 1.5 to 3 | 1 | 1 | 2 | 1 to 2 | 3 | 2 to 4 | 1 to 3 | 1 to 2 |
| **1) Rice and alternatives** |  |  |  |  |
| Recommended intake (g) | 158 | 162.5 | 135 | 180 | 183.8 | 130 | 172.9 | 171.7 | 275 | 110 | 323.8 |
| *Difference* | *NA* | *+4.5g* *(+2.8%)* | *-23g* *(-14.6%)* | *+22g* *(+13.9%)*  | *+25.8g* *(+16.3%)* | *-28g* *(-17.7%)* | *+14.9g (+9.4%)* | *+13.7g* *(+8.7%)*  | *+117g (+74.1%)*  | *-48g* *(-30.4%)* | *+165.8g (+104.9%)*  |
| **2) Fruit** |  |  |  |  |  |  |  |  |  |  |  |
| Recommended intake (g) | 108 | 150 | 150 | 120 | 120 | 180 | 150 | 211 | 108 | 100 | 252 |
| *Difference* | *NA* | *+42g (+38.9%)* | *+42g* *(+38.9%)* | *+12g* *(+11.1%)* | *+12g* *(+11.1%)* | *+72g* *(+66.7%)* | *+42g (+38.9%)* | *+103g* *(+95.4%)* | *0 g**(0 %)* | *-8g* *(-7.4%)* | *+126g* *(+133.3%)* |
| **3) Vegetables** |  |  |  |  |  |  |  |  |  |  |  |
| Recommended intake (g) | 50 | 75  | 75  | 120 | 120 | 130 | 187.5 | 106 | 100 | 100 | 106 |
| *Difference* | *NA* | *+25g* *(+50%)* | *+25g* *(+50%)* | *+70g* *(+140%)* | *+70g* *(+140%)* | *+80g* *(+160%)* | *+137.5g (+275%)* | *+56g* *(+112%)* | *+50g (+100%)* | *+50g (+100%)* | *+56g* *(+112%)* |
| **4) Meat and alternatives** |  |  |  |  |
| Recommended intake (g) | 54 | 60 | 37.5 | 130 | 56.3 | 57 | 103 | 146.5 | 61.3 | 45 | 122.5 |
| *Difference* | *NA* | *+6g* *(+11.1%)* | *-16.5g* *(-30.6%)* | *+76g* *(+141%)* | *+2.3g* *(+4.3%)* | *+3g* *(+5.6%)* | *+49g (+90.7%)* | *+92.5g* *(+171%)* | *+7.3g (+13.5%)* | *-9g* *(-16.7%)* | *+68.5g**(+126.9%)* |
| **5) Milk and dairy products** |  |  |  |  |
| Recommended intake (g) | 335 | 310 | 510 | 300 | 259.6 | 480 | 228.7 | 280 | 286.7 | 500 | 500 |
| *Difference* | *NA* | *-25g**(-7.5%)* | *+175g**(+52.2%)* | *-35g**(-10.4%)* | *-75.4g**(-22.5%)* | *+145g**(+43.3%)* | *-106.3g (-31.7%)* | *-55g**(-16.4%)* | *-48.3g**(-14.4%)* | *+165g**(+49.3%)* | *+165g**(+49.3%)* |

To standardize comparison, all recommendations were standardized to g/day intakes. Where recommendations were based on servings/day, they were first converted to g/day based on serving sizes stated within the respective guidelines. Some assumptions about the weights were required due to insufficient information provided in the guidelines.

Comparisons of the Western and Asian dietary guidelines to Singapore dietary guidelines were made using absolute differences in weight (grams) and percentage differences. The absolute difference was calculated by taking the difference in recommended weights between Singapore and other dietary guidelines. The percentage difference was calculated by dividing the absolute difference over the recommended weight from Singapore guidelines and multiplying by 100.

We found that while there were intake recommendation differences across guidelines, the differences were generally mixed in direction and mostly within 50% from those in Singapore guideline, thus the scoring criteria for these components were retained. The only notable difference was for vegetables intake, where all other guidelines unanimously recommended a higher intake, and with 8 out of 10 other countries recommended ≥100% more than that of Singapore guideline. Thus, we adjusted our scoring criterion for the total vegetables component in our diet quality index to 100 g (1 serving).

**(Bibliography can be found at the end of this document: page 21)**

**Supplementary Material 1:** Details of food items in DQI

**Components of diet quality score**

*Basic food groups*

1. Total rice and alternatives
2. Total fruit
3. Total vegetables
4. Meat, poultry and others
5. Milk and dairy products

*Additional components*

*Foods that are recommended*

1. Whole grains

*Foods that should be consumed in moderation*

1. Foods high in sugar

**Basic components**

|  |  |
| --- | --- |
| 1. Total rice and alternatives |  |
| Food items included | Mass of an average serving size (g) | Source |
| White bread | 60 | HPBa |
| Whole meal bread | 60 | HPB |
| Bread buns with sweet filling | 65 | FCDb |
| Bread buns with meat filling | 70 | FCD |
| Chapati | 60 | HPB |
| Dried baby cereals total | 40 | HPB |
| Oats porridge | 50 | HPB |
| Breakfast cereals  | 40 | HPB |
| Plain, cooked white rice | 100 | HPB |
| Flavoured rice | 135 | HPB, NASc |
| Plain porridge, cooked with white rice | 125 | HPB, NAS |
| Flavoured porridge | 125 | HPB, NAS |
| Noodles in soup | 100 | HPB |
| Fried noodles | 83 | HPB, NAS  |
| Boiled, cooked potatoes | 135 | HPB |
| Pasta, boiled | 100 | HPB |
| Boiled, cooked sweet potatoes | 151 | FCD |
| Plain crackers/ rice crackers | 40 | HPB |

2. Total fruit

|  |  |  |
| --- | --- | --- |
| Food items included | Mass of one serving size (g) | Source |
| Apples and pears | 130 | HPB |
| Bananas | 122 | HPB |
| Papaya | 130 | HPB |
| Orange or citrus fruits | 130 | HPB |
| Grapes | 50 | HPB |
| Stone fruits | 109 | FCD |
| Berries | 50 | HPB |
| Watermelon | 130 | HPB |
| Raisins | 40 | HPB |
| Durian | 8 | NAS  |
| Avocado | 50 | Researchd |
| Pure fruit juice | 263 | HPB, NAS |

3. Total vegetables

|  |  |  |
| --- | --- | --- |
| Food items included | Mass of one serving size (g) | Source |
| Carrots, pumpkins | 100 | HPB |
| Peas and green beans | 100 | HPB |
| Sweet corn | 100 | HPB |
| Tomato, red, green peppers | 100 | HPB |
| Dark green, leafy vegetables | 100 | HPB |
| Pale green leafy vegetables | 100 | HPB |
| Broccoli, cauliflower | 100 | HPB |

4. Total meat and others

|  |  |  |
| --- | --- | --- |
| Food items included | Mass of one serving size (g) | Source |
| Chicken, duck, steamed/soup/in porridge | 90 | HPB |
| Chicken, duck, stir-fry/stewed | 90 | HPB |
| Chicken, duck, deep fried | 90 | HPB |
| Pork, beef, lamb, steamed/soup/in porridge | 90 | HPB |
| Pork, beef, lamb, stir-fry/stewed | 90 | HPB |
| Pork, beef, lamb, deep fried | 90 | HPB |
| Egg, boiled- steamed/in soup | 150 | HPB |
| Egg, fried- scrambled | 150 | HPB |
| Bean curd, tofu | 170 | HPB |
| Beans, lentils | 120 | HPB |
| Nonoily fish/ white fish- steamed/soup/in porridge | 90 | HPB |
| Nonoily fish, white fish- stir-fry/stewed | 90 | HPB |
| Nonoily fish, white fish- deep fried | 90 | HPB |
| Oily fish- steamed/in porridge | 90 | HPB |
| Oily fish- stir-fry | 90 | HPB |
| Oily fish- deep fried | 90 | HPB |

5. Total milk and dairy products

|  |  |  |
| --- | --- | --- |
| Food items included | Mass of one serving size (g) | Source |
| Infant formula | 500 | HPB |
| Full cream milk/fresh milk/flavoured milk | 516 | HPB  |
| Low fat milk/fresh milk/flavoured milk | 518 | HPB |
| Yogurt | 150 | FCD |
| Cheese | 20 | FCD  |
| Breast milk (volume expressed or volume imputed from partial or full lactation) | 500 | HPB |

**Additional components**

1. Whole grains (recommended by Singapore dietary guidelines)

|  |
| --- |
| Food items included |
| Whole meal bread |
| Chapati |
| Oats porridge |
| Brown rice or porridge |

7**.** Foods high in sugar (consume in moderation)

|  |  |
| --- | --- |
| Food items included | Weight of food item containing 35g sugar (g) |
| Sponge cakes / steamed cakes  | 136 |
| Cream cakes  | 98 |
| Chocolate  | 44 |
| Sweets  | 44 |
| Ice-cream  | 160 |
| Malted drinks | 560 |
| Fruit drinks and juices  | 332 |
| Carbonated soft drinks  | 330 |
| Non-carbonated soft drinks | 613 |
| Soya milk  | 465 |
| Traditional drinks | 380 |
| Jams/ Honey  | 52 |
| Peanut Butter  | 317 |
| Kaya  | 81 |

**Description of sources**

aHPB: Singapore dietary guidelines for 1 to 2 years old provided by health promotion Board (HPB) [12]

bFCD: local food composition database [13]

cNAS: nutrient analysis software (Dietplan, Forestfield software, UK)

dResearch: an average of 3 published serving sizes of avocado [14–16]

**Supplementary Material 2:** Details of scoring a diet in DQI

*Basic components*

The weight of food item consumed by subjects per day was calculated from the FFQ, which was then converted to number of servings using weights for a standard serve. The number of servings for each food item consumed by the participant and subsequently, each food component was calculated and the score obtained by the participant was determined.

This is explained using the example of person XX who had half an apple (65g apple) and one fifth or an orange (26g) in 1 day; Standard serving sizes of apple and orange are both 130g. The recommended serving of fruit a day is 1 serving.

Step 1: Determination of number of servings of each food item consumed

Number of servings of apple = $\frac{weight of intake amount}{weight of 1 serving} $

 = $\frac{65}{130}$ = 0.5 servings

Number of servings of orange = $\frac{26}{130}$ = 0.2 servings

Step 2: Add up the number of servings of food items in the food component to get the total number of servings in each food component

Number of servings of fruit consumed = 0.5 + 0.2 = 0.7 servings

Step 3: Determination of score

Score = $\frac{Total number of servings consumed}{Recommended number of servings }$ x maximum score of component

 = $\frac{0.7}{1} x 10$ = 7 points

*Additional components- foods high in sugar*

This is explained using the example of person XY who had 10g of chocolate and 40g of ice-cream in 1 day; 44.09g and 160.12g of chocolate and ice-cream respectively contains 35g of sugar and is taken to be 1 serving.

(35g sugar is the sugar intake limit recommended by Singapore dietary guidelines[1]. A lower intake of sugar is recommended.)

Step 1: Determination of number of servings of each food item consumed

Number of servings of chocolate = $\frac{10}{44.09}$ = 0.226 servings

Number of servings of ice cream = $\frac{40}{160.12}$ = 0.249 servings

Step 2: Add up the number of servings of food items in the food component

Number of servings of foods high in sugar = 0.226 + 0.249 = 0.475 servings

Step 3: Determination of score

Score = (1 – Total number of servings) x 10 = (1 – 0.475) x 10 = 5.25

**Supplementary Figure 1**:Histogram of energy-adjusted DQI based on food frequency questionnaire in the included GUSTO participants



DQI, Diet Quality Index

**Supplementary Table 3:** Percentages of 188 infants meeting recommended servings of food groups or AMDR and mean nutrient intakes estimated from 24-h recall, according to DQI-FFQ tertile

|  |  |  |
| --- | --- | --- |
|  | **DQI-FFQ**  |  |
|  | **Total**n = 188 | **Low tertile** n = 65 | **Middle tertile** n = 63 | **High tertile** n = 60 | **p-trend**a |
| Score range  | 22.1 – 63.1 | 22.1 – 39.6 | 39.9 – 47.3 | 47.6 – 63.1 |
| **DQI - 24h recallb** |  |  |  |  |  |
| Mean ± SD | 37.4 ± 8.3 | 31.2 ± 5.1 | 38.1 ± 6.2 | 43.3 ± 8.4 | **<0.001** |
| Range | 19.3 – 62.7 | 19.3 – 44.8 | 24.1 – 53.3 | 22.1 – 62.7 |  |
| **% of participants meeting recommended intakes of servings/d of food groupsc** |  |
| Total rice, bread and alternatives | 23.4 | 20.0 | 17.5 | 33.3 | 0.085 |
| Total fruit | 12.2 | 1.5 | 14.3 | 21.7 | **0.001** |
| Total vegetable | 6.4 | 0.0 | 4.8 | 15.0 | **0.001** |
| Total meat and alternatives | 37.8 | 18.5 | 41.3 | 55.0 | **<0.001** |
| Total milk and dairy products | 43.6 | 35.4 | 41.3 | 55.0 | **0.028** |
| Consuming whole grainsd | 27.7 | 12.3 | 23.8 | 48.3 | **<0.001** |
| Foods high in sugare | 98.9 | 96.9 | 100.0 | 100.0 | 0.090 |
| **% of participants meeting AMDR/RDA of nutrientsc** |  |
| Carbohydrates (AMDR: 45-65% kcal)\* | 70.7 | 63.1 | 79.4 | 70.0 | 0.373 |
| Total fat (AMDR: 30-45% kcal)\* | 38.3 | 32.3 | 38.1 | 45.0 | 0.146 |
| Protein (RDA: 19g)+ | 96.3 | 92.3 | 98.4 | 98.3 | 0.072 |
| **Nutrient intakes (continuous variables)f** |  |  |  |  |
| Carbohydrates (% of total energy) | 58.0 ± 8.2 | 60.0 ± 8.8 | 57.1 ± 7.3 | 56.8 ± 8.1 | **0.025** |
| Protein (% of total energy) | 14.6 ± 2.9 | 13.7 ± 2.6 | 14.4 ± 2.8 | 15.9 ± 2.8 | **<0.001** |
| Total fat (% of total energy) | 29.8 ± 7.1 | 28.9 ± 7.4 | 30.8 ± 7.0 | 29.6 ± 6.7 | 0.491 |

DQI, Diet Quality Index; FFQ, Food Frequency Questionnaire; SD, Standard Deviation, AMDR, Acceptable Macronutrient Distribution Range; RDA, Recommended Daily Allowances

a p-trend values obtained by the Cochran-Maentel-Haenzel chi-square test for categorical variables and modeling median values of the DQI-FFQ tertiles in linear regression analysis for continuous variables.

b DQI calculated from a subset of 188 infants using 24-h dietary recalls.

c Values are percentages of participants that met the recommended food group servings or AMDR/RDA (data from 24-h recall) across DQI-FFQ tertiles.

d Since no cutoff for whole grains was provided by Health Promotion Board Singapore, values are percentages of participants that consumed at least one food item with whole grains.

e For foods high in sugar, values are percentages of participants meeting recommended intake of foods and drinks high in sugar (equivalent to ≤ 35g added sugar/d).

f Values are the mean nutrient intake ± standard deviation (data from 24-h recall) across DQI-FFQ tertiles.

\* RDA/AMDR values obtained from Dietary Guidelines for Americans 2015-2020 (for age group 1 to 3 years old).

+ RDA values obtained from Health Promotion Board Singapore dietary guidelines (for age group 1 to 2 years old).

**Supplementary Figure 2: Bland-Altman plot analysis of DQI-FFQ and DQI-24h**

1. Difference of DQI-FFQ and DQI-24h against mean scores



\* Regression coefficient and statistical significance from linear regression of the difference between methods (dependent variable) against mean (independent variable)

1. Percentage difference between DQI-FFQ and DQI-24h against mean scores



**Supplementary Table 4:** Identification of infant DQI-FFQ predictors in the GUSTO cohort study using stepwise regressions (n= 561)

|  |  |  |
| --- | --- | --- |
|  | **Forward selection model** | **Backward elimination model** |
|  | β (95% CI) | p-value | β (95% CI) | p-value |
| **Maternal characteristics** |  |  |  |  |
| Age (years) | − |  | − |  |
| Pre-pregnancy BMI (kg/m2) | -0.25 (-0.40, -0.09) | **0.002** | -0.24 (-0.39, -0.08) | **0.003** |
| Pregnancy weight gain (kg) | − |  | − |  |
| Ethnicity |  |  |  |  |
|  Indian | − |  | − |  |
|  Malay | -2.04 (-3.68, -0.40) | **0.015** | -2.00 (-3.62, -0.37) | **0.016** |
|  Chinese | Ref |  | Ref |  |
| Household income category |  |  |  |  |
|  < $2000 | − |  | − |  |
|  $2000-5999 |  |  | -1.37 (-2.88, 0.15) | 0.08 |
|  > $6000 |  |  | Ref |  |
| Marital status |  |  |  |  |
|  Single, not living with husband | − |  | − |  |
|  Married, living with husband |  |  |  |  |
| Highest education level |  |  |  |  |
|  Primary/Secondary | -3.50 (-5.43, -1.58) | **<0.001** | -2.90 (-4.90, -0.91) | **0.004** |
|  Post-secondary | -2.22 (-3.94, -0.49) | **0.012** | -1.66 (-3.49, 0.17) | 0.08 |
|  University and above | Ref |  | Ref |  |
| Alcohol use before pregnancy |
|  No | − |  | − |  |
|  Yes |  |  |  |  |
| Alcohol use during pregnancy |  |  |  |
|  No | − |  | − |  |
|  Yes |  |  |  |  |
| Smoking regularly before pregnancy |
|  No | − |  | − |  |
|  Yes |  |  |  |  |
| Smoking during pregnancy |  |  |  |  |
|  No | − |  | − |  |
|  Yes |  |  |  |  |
| Moderate and strenuous exercise before pregnancy |
|  No | − |  | − |  |
|  Yes |  |  |  |  |
| Moderate and strenuous exercise during pregnancy |  |  |  |
|  No | − |  | − |  |
|  Yes |  |  |  |  |

|  |  |  |
| --- | --- | --- |
|  | **Forward selection model** | **Backward elimination model** |
|  | β value (95% CI) | p-value | β value (95% CI) | p-value |
| Folic acid supplement use during pregnancy |
|  No | − |  | − |  |
|  Yes |  |  |  |  |
| Breast milk feeding duration |
|  Never breastfeed | -5.00 (-9.67, -0.32) | **0.036** | -6.93 (-11.72, -2.14) | **0.005** |
|  < 3 months | -3.93 (-5.49, -2.37) | **<0.001** | -5.56 (-7.49, -3.64) | **<0.001** |
|  3 to < 6 months | − |  | -2.39 (-4.54, -0.23) | **0.030** |
|  6 to < 12 months | − |  | -2.89 (-5.05, -0.74) | **0.009** |
|  ≥12 months | Ref |  | Ref |  |
| Breastfeeding status at 18 months |  |  |  |
|  No | − |  | − |  |
|  Yes |  |  |  |  |
| **Child characteristics** |  |  |  |  |
| Age (month) | − |  | − |  |
| Gestational age at delivery (weeks) | − |  | − |  |
| BMI at 18 months old (kg/m2) | − |  | − |  |
| Birth order |  |  |  |  |
|  Not first child | − |  | − |  |
|  First child  |  |  |  |  |
| Gender |  |  |  |  |
|  Male | − |  | − |  |
|  Female |  |  |  |  |
| Caregiver of child  |  |
|  Parents | − |  | − |  |
|  Other family members |  |  |  |  |
|  External help  |  |  |  |  |
|  Responsibility shared |  |  |  |  |

DQI, Diet Quality Index; FFQ, food frequency questionnaire; BMI, Body Mass Index

**Supplementary Table 5**: Associations between sociodemographic and lifestyle factors and infant DQI-24h recall in the subset of 188 infantsa

|  |  |  |
| --- | --- | --- |
|  | **Univariable model** | **Multivariable modelb** |
|  | β (95% CI) | p-value | β (95% CI) | p-value |
| **Maternal characteristics** |  |  |  |  |
| Age (years) | 0.42 (0.20, 0.64) | **<0.001** | 0.23 (0.01, 0.45) | **0.046** |
| Pre-pregnancy BMI (kg/m2) | -0.42 (-0.67, -0.16) | **0.001** | -0.15 (-0.40, 0.11) | 0.26 |
| Pregnancy weight gain (kg) | 0.14 (-0.13, 0.40) | 0.15 | − |  |
| Ethnicity |  |  |  |  |
|  Indian | -4.26 (-7.49, -1.04) | **0.010** | -3.66 (-7.18, -0.13) | **0.042** |
|  Malay | -8.23 (-10.72, -5.74) | **<0.001** | -5.91 (-8.79, -3.03) | **<0.001** |
|  Chinese | Ref |  | Ref |  |
| Household income category |  |  |  |  |
|  < S$2000 | -6.47 (-10.50, -2.45) | **0.002** | 0.99 (-3.66, 5.64) | 0.68 |
|  S$2000-5999 | -4.55 (-7.43, -1.67) | **0.002** | 0.26 (-3.12, 3.63) | 0.88 |
|  > S$6000 | Ref |  | Ref |  |
| Marital status |  |  |  |  |
|  Single, not living with husband | -9.81 (-21.33, 1.72) | 0.10 | − |  |
|  Married, living with husband | Ref |  |  |  |
| Highest education level |  |  |  |  |
|  Primary/Secondary | -6.21 (-9.07, -3.35) | **<0.001** | -3.63 (-7.42, 0.15) | 0.06 |
|  Post-secondary | -4.69 (-7.41, -1.97) | **0.001** | -2.10 (-5.61, 1.41) | 0.24 |
|  University and above | Ref |  | Ref |  |
| Alcohol use before pregnancy |
|  No | -1.10 (-3.80, 1.61) | 0.42 | − |  |
|  Yes | Ref |  |  |  |
| Alcohol use during pregnancy |  |  |  |
|  No | -3.02 (-19.54, 13.50) | 0.72 | − |  |
|  Yes | Ref |  |  |  |
| Smoking regularly before pregnancy |
|  No | 5.91 (2.27, 9.56) | **0.002** | 1.97 (-1.91, 5.85) | 0.32 |
|  Yes | Ref |  | Ref |  |
| Smoking during pregnancy |  |  |  |  |
|  No | 2.59 (-4.25, 9.44) | 0.46 | − |  |
|  Yes | Ref |  |  |  |
| Moderate and strenuous exercise before pregnancy |
|  No | -2.35 (-5.12, 0.42) | 0.10 | − |  |
|  Yes | Ref |  |  |  |
| Moderate and strenuous exercise during pregnancy |
|  No | -7.36 (-16.89, 2.17) | 0.13 | − |  |
|  Yes | Ref |  |  |  |

|  |  |  |
| --- | --- | --- |
|  | **Univariable model** | **Multivariable model** |
|  | β (95% CI)a | p-value | β (95% CI)b | p-value |
| Folic acid supplement use during pregnancy |
|  No | -0.05 (-3.34, 3.24) | 0.98 | − |  |
|  Yes | Ref |  |  |  |
| Breast milk feeding duration |
|  Never breastfeed | -4.68 (-10.80, 1.43) | 0.13 | -5.08 (-11.29, 1.14) | 0.11 |
|  <3 months | -4.56 (-7.56, -1.54) | **0.003** | -2.26 (-5.43, 0.91) | 0.16 |
|  3 to <6 months | -0.68 (-4.27, -2.91) | 0.71 | -2.15 (-5.60, 1.30) | 0.22 |
|  6 to <12 months | -2.32 (-4.39, -0.25) | 0.83 | -2.29 (-6.01, 1.43) | 0.23 |
|  ≥12 months | Ref |  | Ref |  |
| Breastfeeding status at 18 months  |  |  |  |  |
|  No | -1.77 (-5.12, 1.58) | 0.30 | − |  |
|  Yes | Ref |  |  |  |
| **Child characteristics** |  |  |  |  |
| Age (month) | 1.21 (-1.57, 3.98) | 0.39 | − |  |
| Gestational age at delivery (weeks) | 0.12 (-0.83, 1.07) | 0.80 | − |  |
| BMI at 18-month-old (kg/m2) | 0.03 (-0.02, 0.08) | 0.28 | − |  |
| Birth order |  |  |  |  |
|  Not first child | 0.79 (-1.62, 3.21) | 0.52 | − |  |
|  First child  | Ref |  |  |  |
| Gender |  |  |  |  |
|  Male | 2.39 (0.02, 4.77) | **0.048** | 1.76 (-0.54, 4.06) | 0.13 |
|  Female | Ref |  | Ref |  |
| Caregiver of child  |  |
|  Parents | -1.49 (-4.97, 1.99) | 0.40 | − |  |
|  Other family members | -1.98 (-6.41, 2.45) | 0.38 |  |  |
|  External help  | 1.47 (-5.14, 8.07) | 0.66 |  |  |
|  Responsibility shared | Ref |  |  |  |

BMI, Body Mass Index

a Values are beta coefficients with 95% CI from linear regression analysis.

b Variables with p <0.10 in univariable analysis were included in multivariable model.

**Supplementary Table 6:** Identification of infant DQI-24h recall predictors in the subset of 188 infants using stepwise regressions

|  |  |  |
| --- | --- | --- |
|  | **Forward selection model** | **Backward elimination model** |
|  | β (95% CI) | p-value | β (95% CI) | p-value |
| **Maternal characteristics** |  |  |  |  |
| Age (years) | 0.31 (0.10, 0.52) | **0.005** | 0.28 (0.06, 0.49) | **0.011** |
| Pre-pregnancy BMI (kg/m2) | − |  | − |  |
| Pregnancy weight gain (kg) | − |  | − |  |
| Ethnicity |  |  |  |  |
|  Indian | − |  | -3.57 (-6.99, -0.16) | **0.040** |
|  Malay | -6.30 (-8.89, -3.72) | **<0.001** | -6.29 (-9.02, -3.56) | **<0.001** |
|  Chinese | Ref |  | Ref |  |
| Household income category |  |  |  |  |
|  < $2000 | − |  | − |  |
|  $2000-5999 |  |  |  |  |
|  > $6000 |  |  |  |  |
| Marital status |  |  |  |  |
|  Single, not living with husband | − |  | − |  |
|  Married, living with husband |  |  |  |  |
| Highest education level |  |  |  |  |
|  Primary/Secondary | -2.85 (-5.32, -0.37) | **0.024** | -4.21 (-7.15, -1.26) | **0.005** |
|  Post-secondary | − |  | -2.47 (-5.33, 0.39) | 0.09 |
|  University and above | Ref |  | Ref |  |
| Alcohol use before pregnancy |
|  No | − |  | − |  |
|  Yes |  |  |  |  |
| Alcohol use during pregnancy |  |  |  |
|  No | − |  | − |  |
|  Yes |  |  |  |  |
| Smoking regularly before pregnancy |
|  No | − |  | − |  |
|  Yes |  |  |  |  |
| Smoking during pregnancy |  |  |  |  |
|  No | − |  | − |  |
|  Yes |  |  |  |  |
| Moderate and strenuous exercise before pregnancy |
|  No | − |  | − |  |
|  Yes |  |  |  |  |
| Moderate and strenuous exercise during pregnancy |  |  |  |
|  No | − |  | − |  |
|  Yes |  |  |  |  |

|  |  |  |
| --- | --- | --- |
|  | **Forward selection model** | **Backward elimination model** |
|  | β value (95% CI) | p-value | β value (95% CI) | p-value |
| Folic acid supplement use during pregnancy |
|  No | − |  |  − |  |
|  Yes |  |  |  |  |
| Breast milk feeding duration |
|  Never breastfeed | − |  | − |  |
|  < 3 months |  |  |  |  |
|  3 to < 6 months |  |  |  |  |
|  6 to < 12 months |  |  |  |  |
|  ≥12 months |  |  |  |  |
| Breastfeeding status at 18 months |  |  |  |
| No | − |  | − |  |
| Yes |  |  |  |  |
| **Child characteristics** |  |  |  |  |
| Age (month) | − |  | − |  |
| Gestational age at delivery (weeks) | − |  | − |  |
| BMI at 18 months old (kg/m2) | − |  | − |  |
| Birth order |  |  |  |  |
|  Not first child | − |  |  − |  |
|  First child  |  |  |  |  |
| Gender |  |  |  |  |
|  Male | -2.44 (-4.68, -0.21) | **0.033** | -1.97 (-4.23, 0.28) | 0.09 |
|  Female | Ref |  | Ref |  |
| Caregiver of child  |  |
|  Parents | − |  | − |  |
|  Other family members |  |  |  |  |
|  External help  |  |  |  |  |
|  Responsibility shared |  |  |  |  |

DQI, Diet Quality Index; BMI, Body Mass Index

**References**

1. HPB. A Healthy Food Foundation - for Kids and Teens [Internet]. Health Promotion Board. 2015. Available from: https://www.healthhub.sg/live-healthy/578/A Healthy Food Foundation - for Kids and Teens

2. Netherlands Nutrition Centre (Voedingscentrum). Dutch Food-based Dietary Guidelines (Richtlijnen voedselkeuze). 2011.

3. Flemish Institute for Health Promotion and Disease Prevention. De actieve voedingsdriehoek [The Active Food Guide Pyramid]. 2012.

4. Kersting M HA. Ernährung bei Kleinkindern: Empfehlungen und Ernahrungspräxis. (Nutrition in infants: recommendations and nutritional practice). 14. 2012. p. 24–9.

5. Schweizerische Gesellschaft für Ernährung. Ernährung von Kindern (Nutrition of children). 2011. p. 6.

6. USDA. 2015 – 2020 Dietary Guidelines for Americans. 2015 – 2020 Diet Guidel Am (8th Ed. 2015;18.

7. National Medical Health and Research Council. Australian Dietary Guidelines. National Health and Medical Research Council; 2013.

8. MOH. Malaysian Dietary Guidelines for Children and Adolescents. 2013;1–74.

9. Department of Health. Nutrition Guidelines for Children Aged 2 to 6 (Hong Kong). 2014. p. 1–150.

10. National Institute of Nutrition. Dietary Guidelines for Indians - A Manual. 2011. p. 139.

11. Nutrition Division Ministry of Health. Food Based Dietary Guidelines for Sri Lankans. 2011.

12. HPB. Healthier Choice Symbol Programme [Internet]. 2015 [cited 2015 Oct 27]. Available from: http://www.hpb.gov.sg/HOPPortal/health-article/2780

13. Singapore HPB. Energy and Nutrient Composition of food. 2011.

14. Comerford K, Ayoob K, Murray R, Atkinson S. The Role of Avocados in Complementary and Transitional Feeding. Nutrients. 2016 May 21;8(5):316.

15. DAA. Avocados | Dietitians Association of Australia [Internet]. 2016 [cited 2016 Dec 26]. Available from: http://daa.asn.au/for-the-public/smart-eating-for-you/nutrition-a-z/avocados/

16. NHS. Rough guide - Fruit & vegetable portion sizes [Internet]. 2015 [cited 2016 Dec 26]. p. 1–9. Available from: https://www.nhs.uk/Livewell/5ADAY/Documents/Downloads/5ADAY\_portion\_guide.pdf