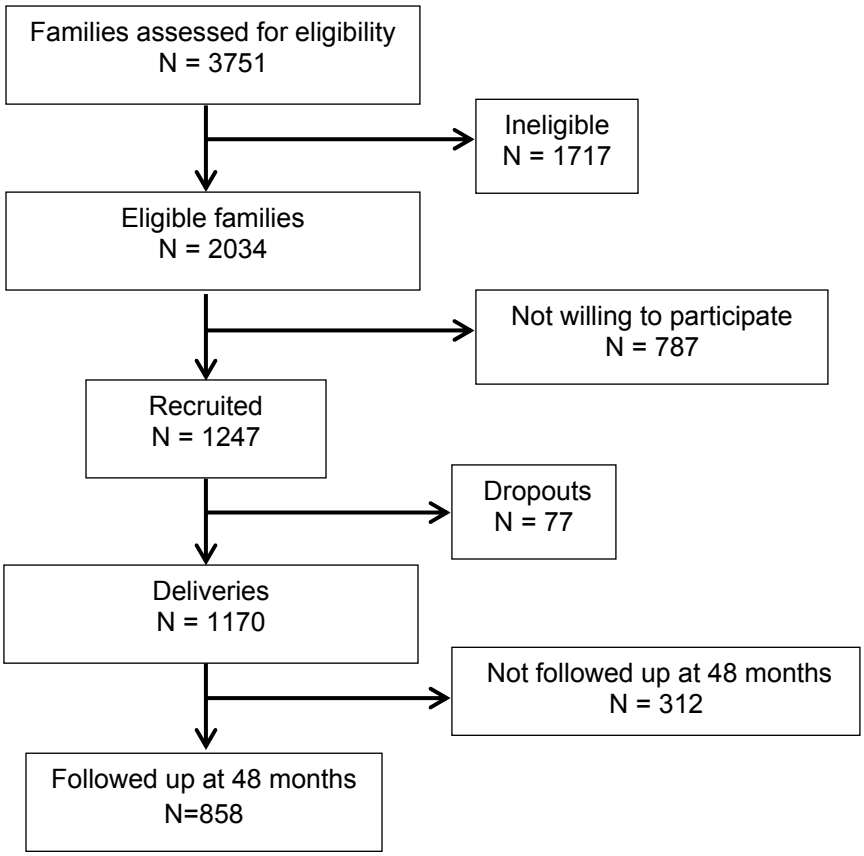
Supplemental Figure 1 - GUSTO recruitment flowchart and eventual study sample



Supplemental Table 1 - Inter-observer reliability of anthropometric measurements

	TEM	CV (%)
Weight (kg)	0.09	0.19
Height (cm)	0.26	0.16
Waist circumference (cm)	0.30	0.50
Triceps skinfolds (mm)	0.80	6.00
Biceps skinfolds (mm)	0.48	9.22
Subscapular skinfolds (mm)	0.83	4.18
Suprailiac skinfolds (mm)	0.44	6.92

TEM: Technical error of measurement; CV: coefficient of variation

Supplemental Table 2 - Characteristics of subjects excluded and included in the study

	Excluded (n = 312)	Included (n = 858)	P value
Maternal age (years)	30.2 ± 5.2	30.9 ± 5.9	0.06
Maternal education level			0.18
< 12 years	132 (44)	335 (39)	
≥ 12 years	170 (56)	518 (61)	
Parity			0.94
Primiparous	143 (46)	391 (46)	
Multiparous	169 (54)	467 (54)	
Ethnicity			0.94
Chinese	174 (56)	485 (57)	
Malay	82 (26)	217 (25)	
Indian	56 (18)	156 (18)	
Maternal height (cm)	158 ± 6	158 ± 6	0.72
Pre-pregnancy overweight			0.59
No	167 (61)	495 (63)	
Yes	108 (39)	296 (37)	
Paternal overweight			0.89
No	43 (48)	306 (49)	
Yes	47 (52)	324 (51)	
Raised FPG at mid-pregnancy			0.93
No	267 (94)	754 (95)	
Yes	16 (6)	44 (5)	
Excessive GWG			0.78
No	161 (60)	457 (59)	
Yes	109 (40)	322 (41)	
Any BF <4 months			**<0.001**
No	58 (35)	350 (52)	
Yes	106 (65)	322 (48)	
Early introduction to solids			0.59
No	164 (98)	744 (97)	
Yes	3 (2)	19 (3)	
Gestational age (weeks)	38.1 ± 1.8	38.3 ± 1.5	0.07
Child gender			0.77
Male	167 (54)	451 (53)	
Female	145 (46)	407 (47)	
Child total energy intake at 12 months (kcal)	774 (221)	760 (206)	0.44
Child physical activity at 24 months			**<0.001**
< 1 hour per day	237 (83)	478 (60)	
1 to < 2 hours per day	30 (10)	229 (29)	
≥ 2 hours per day	19 (7)	94 (11)	

BF: breastfeeding; GWG: gestational weight gain

Supplemental Table 3 - Frequency of risk factors in the study sample

Risk factor	n	Frequency (%)
Pre-pregnancy overweight/obesity[1]	296	34.5
Excessive gestational weight gain[2]	322	37.5
Paternal overweight/obesity[1]	324	37.6
Raised fasting glucose at mid-pregnancy[3]	44	5.5
Any breastfeeding < 4 months	322	41.6
Early solid food introduction[4]	19	2.5

[1] BMI ≥ 25 kg/m^2
[2] According to Institute of Medicine 2009 guidelines
[3] Fasting glucose ≥ 5.1 mmol/L
[4] Age at solid food introduction < 4 months

Supplemental Table 4 - Socio-demographic and clinical characteristics of study participants according to number of modifiable risk factors

	0 (n=172)	1 (n=274)	2 (n=244)	3 (n=126)	≥ 4 (n=42)	p value[2]
Maternal education level						**<0.001**
< 12 years	39 (12)[1]	96 (29)	111 (34)	54 (16)	28 (9)	
≥ 12 years	119 (24)	174 (34)	132 (26)	72 (14)	14 (3)	
Parity						0.68
Primiparous	78 (20)	123 (32)	110 (28)	61 (16)	16 (4)	
Multiparous	80 (17)	151 (33)	134 (29)	65 (14)	26 (6)	
Maternal height (cm)	158 ± 6[1]	158 ± 5	159 ± 6	158 ± 6	158 ± 6	0.39
Maternal age (years)	31.4 ± 4.7	31.2 ± 5.3	30.5 ± 4.9	30.6 ± 5.3	30.7 ± 6.0	0.39
Ethnicity						**<0.001**
Chinese	116 (24)	180 (37)	123 (26)	52 (11)	8 (2)	
Malay	19 (9)	54 (25)	71 (33)	45 (21)	24 (11)	
Indian	23 (15)	40 (26)	50 (33)	29 (19)	10 (7)	
Gestational age (weeks)	38.3 ± 1.6	38.2 ± 1.5	38.3 ± 1.4	38.4 ± 1.1	38.4 ± 1.2	0.62
Child gender						0.81
Male	77 (19)	123 (31)	115 (29)	63 (16)	22 (5)	
Female	81 (18)	151 (34)	129 (29)	63 (14)	20 (5)	
Child total energy intake at 12 months (kcal)	731 ± 164	729 ± 162	751 ± 169	747 ± 167	770 ± 184	0.46
Child physical activity at 24-months						0.23
< 1 hour per day	75 (16)	165 (35)	138 (29)	70 (15)	21 (4)	
1 to < 2 hours per day	42 (19)	63 (28)	70 (31)	39 (17)	12 (5)	
≥ 2 hours per day	22 (24)	29 (31)	21 (23)	12 (13)	8 (9)	

[1] Values represent mean ± SD or n (%)

[2] p value across number of risk factors were determined with the use of a chi-square analysis (categorical) or 1-factor ANOVA (continuous)

Supplemental Table 5 - Estimated regression coefficients (and 95% CIs) of the associations between number of modifiable risk factors and child adiposity at 48 months. Maternal overweight at booking is used as a risk factor instead of pre-pregnancy overweight.

Number of risk factors	BMI[1]		SG BMI z-score[2]		WHO BMI z-score[2]	
	B (95% CI)	p value	B (95% CI)	p value	B (95% CI)	p value
0	ref	-	ref	-	ref	-
1	0.22 (0.02, 0.41)	0.03	0.19 (0.02, 0.36)	0.03	0.26 (0.03, 0.49)	0.03
2	0.30 (0.09, 0.52)	0.006	0.27 (0.09, 0.46)	0.004	0.36 (0.11, 0.62)	0.005
3	0.60 (0.33, 0.87)	<0.001	0.51 (0.27, 0.75)	<0.001	0.73 (0.40, 1.05)	<0.001
≥ 4	0.73 (0.32, 1.13)	<0.001	0.62 (0.27, 0.98)	0.001	0.89 (0.41, 1.36)	<0.001
β-trend	0.18 (0.11, 0.25)	<0.001	0.15 (0.09, 0.22)	<0.001	0.22 (0.13, 0.30)	<0.001
Number of risk factors	**WHR[1]**		**SSF[1]**		**FMI[1]**	
	B (95% CI)	**p value**	**B (95% CI)**	**p value**	**B (95% CI)**	**p value**
0	ref	-	ref	-	ref	-
1	0.13 (-0.07, 0.33)	0.19	0.06 (-0.16, 0.28)	0.60	0.04 (-0.33, 0.42)	0.82
2	0.22 (-0.004, 0.44)	0.05	0.13 (-0.07, 0.33)	0.22	0.16 (-0.17, 0.49)	0.33
3	0.58 (0.31, 0.86)	<0.001	0.37 (0.09, 0.65)	0.009	0.40 (-0.07, 0.88)	0.10
≥ 4	0.68 (0.27, 1.08)	0.001	0.49 (0.08, 0.89)	0.02	0.77 (0.02, 1.51)	0.04
β-trend	0.17 (0.09, 0.24)	<0.001	0.10 (0.02, 0.17)	0.009	0.12 (0.01, 0.25)	0.04

[1]Adjusted for maternal education level, height, parity, child sex, daily physical activity level, total energy intake, ethnicity and actual age at measurement

[2] Adjusted for maternal education level, height, parity, child daily physical activity level, total energy intake and ethnicity

Supplemental Table 6 - Estimated regression coefficients (and 95% CIs) of the associations between number of modifiable risk factors and child adiposity at 48 months, based on three different analyses: (i) original risk factor categorization (ii) re-categorized risk factors (iii) multiple imputation of missing risk factors and/or covariates

Original analyses

Number of risk factors	BMI[1]		SG BMI z-score[2]		WHO BMI z-score[2]		WHtR[1]		SSF[1]		FMI[1]	
	B (95% CI)	p value	B (95% CI)	p value	B (95% CI)	p value	B (95% CI)	p value	B (95% CI)	p value	B (95% CI)	p value
0	ref	-	ref	-	ref	-	ref	-	ref	-	ref	-
1	0.24 (0.02, 0.46)	0.03	0.20 (0.01, 0.39)	0.03	0.27 (0.02, 0.53)	0.03	0.21 (-0.01, 0.43)	0.06	0.19 (-0.04, 0.42)	0.09	0.23 (-0.13, 0.60)	0.20
2	0.40 (0.17, 0.63)	0.001	0.37 (0.17, 0.57)	<0.001	0.48 (0.21, 0.74)	<0.001	0.29 (0.06, 0.52)	0.01	0.17 (-0.07, 0.40)	0.17	0.38 (0.01, 0.75)	0.04
3	0.68 (0.42, 0.93)	<0.001	0.59 (0.36, 0.81)	<0.001	0.81 (0.51, 1.12)	<0.001	0.59 (0.33, 0.85)	<0.001	0.43 (0.19, 0.74)	0.001	0.46 (0.01, 0.91)	0.04
≥ 4	0.78 (0.41, 1.15)	<0.001	0.70 (0.37, 1.02)	<0.001	0.93 (0.49, 1.37)	<0.001	0.79 (0.41, 1.16)	<0.001	0.46 (0.06, 0.83)	0.02	0.67 (0.07, 1.27)	0.02
β-trend	0.21 (0.14, 0.28)	<0.001	0.18 (0.12, 0.25)	<0.001	0.25 (0.17, 0.33)	<0.001	0.19 (0.12, 0.26)	<0.001	0.12 (0.05, 0.19)	0.001	0.14 (0.02, 0.25)	0.02

Re-categorized[3]

Number of risk factors	BMI[1]		SG BMI z-score[2]		WHO BMI z-score[2]		WHtR[1]		SSF[1]		FMI[1]	
	B (95% CI)	p value	B (95% CI)	p value	B (95% CI)	p value	B (95% CI)	p value	B (95% CI)	p value	B (95% CI)	p value
0	ref	-	ref	-	ref	-	ref	-	ref	-	ref	-
1	0.24 (0.04, 0.43)	0.02	0.21 (0.04, 0.39)	0.01	0.28 (0.05, 0.52)	0.01	0.17 (-0.02, 0.36)	0.09	0.13 (-0.06, 0.34)	0.17	0.22 (-0.11, 0.60)	0.18
2	0.33 (0.10, 0.56)	0.004	0.31 (0.11, 0.50)	0.002	0.40 (0.13, 0.67)	0.004	0.25 (0.02, 0.48)	0.03	0.16 (-0.09, 0.41)	0.22	0.23 (-0.19, 0.66)	0.28
3	0.56 (0.27, 0.85)	<0.001	0.51 (0.26, 0.77)	<0.001	0.68 (0.32, 1.03)	<0.001	0.48 (0.18, 0.78)	0.002	0.52 (0.20, 0.85)	0.002	0.70 (0.13, 1.26)	0.01
≥ 4	0.83 (0.36, 1.30)	0.001	0.69 (0.31, 1.07)	<0.001	1.00 (0.41, 1.59)	0.001	0.74 (0.30, 1.19)	0.001	0.53 (0.06, 1.01)	0.02	1.06 (0.30, 1.82)	0.007
β-trend	0.18 (0.11, 0.26)	<0.001	0.16 (0.10, 0.22)	<0.001	0.22 (0.13, 0.31)	<0.001	0.16 (0.09, 0.23)	0.001	0.13 (0.06, 0.21)	<0.001	0.21 (0.08, 0.34)	0.001

Multiple Imputation[4]

Number of risk factors	BMI[1]		SG BMI z-score[2]		WHO BMI z-score[2]		WHtR[1]		SSF[1]		FMI[1]	
	B (95% CI)	p value	B (95% CI)	p value	B (95% CI)	p value	B (95% CI)	p value	B (95% CI)	p value	B (95% CI)	p value
0	ref	-	ref	-	ref	-	ref	-	ref	-	ref	-
1	0.09 (-0.16, 0.35)	0.49	0.07 (-0.16, 0.30)	0.53	0.10 (-0.20, 0.41)	0.52	0.06 (-0.19, 0.31)	0.64	0.03 (-0.23, 0.31)	0.78	0.32 (-0.15, 0.80)	0.18
2	0.26 (0.02, 0.49)	0.03	0.24 (0.03, 0.45)	0.02	0.31 (0.03, 0.60)	0.03	0.15 (-0.09, 0.39)	0.21	0.06 (-0.17, 0.30)	0.59	0.36 (-0.06, 0.78)	0.09
3	0.50 (0.23, 0.78)	<0.001	0.46 (0.22, 0.70)	<0.001	0.60 (0.27, 0.93)	<0.001	0.41 (0.13, 0.69)	0.005	0.32 (0.04, 0.61)	0.02	0.55 (0.05, 1.06)	0.03
≥ 4	0.69 (0.35, 1.04)	<0.001	0.59 (0.29, 0.89)	<0.001	0.83 (0.41, 1.25)	<0.001	0.58 (0.24, 0.91)	0.001	0.43 (0.10, 0.77)	0.01	0.83 (0.31, 1.35)	0.002
β-trend	0.18 (0.12, 0.25)	<0.001	0.16 (0.11, 0.22)	<0.001	0.22 (0.14, 0.30)	<0.001	0.15 (0.09, 0.21)	<0.001	0.12 (0.05, 0.18)	<0.001	0.18 (0.07, 0.28)	0.001

[1] Adjusted for maternal education level, height, parity, child sex, daily physical activity level, total energy intake, ethnicity and actual age at measurement

[2] Adjusted for maternal education level, height, parity, child daily physical activity level, total energy intake and ethnicity

[3] Re-categorized risk factors: Pre-pregnancy BMI ≥ 30 kg/m^2; Paternal BMI ≥ 30 kg/m^2; Fasting glucose ≥ 5.6 mmol/L

[4] Missing data for risk factors and/or covariates are imputed using Markov-chain Monte Carlo technique generating 20 imputed datasets. Regression coefficients (and their 95% CIs) represent pooled estimates of the imputed data.

Supplemental Table 7 - Relative risk (and 95% CIs) of child overweight at 48 months in relation to number of modifiable risk factors, by different child overweight/obesity cutoffs

Number of risk factors	Overweight by Singapore reference		Overweight by IOTF reference[1]		Overweight by WHO reference[1]	
	RR (95% CI)[2]	p value	RR (95% CI)[2]	p value	RR (95% CI)[2]	p value
0	ref	-	ref	-	ref	-
1	5.1 (1.2, 21.3)	0.02	4.7 (1.1-20.1)	0.04	6.0 (0.8-48.0)	0.08
2	7.0 (1.7, 28.9)	0.007	6.9 (1.7-29.0)	0.01	6.8 (0.9-51.3)	0.06
3	9.9 (2.4, 41.3)	0.002	9.5 (2.2-40.6)	0.002	9.6 (1.1-80.5)	0.04
≥ 4	11.1 (2.5, 49.1)	0.001	11.2 (2.5-50.6)	0.002	10.5 (1.4-81.8)	0.02
β-trend	1.5 (1.3, 1.7)	<0.001	1.5 (1.3-1.8)	<0.001	1.4 (1.1-1.7)	0.004

[1] IOTF: International Obesity Task Force; WHO: World Health Organization
[2] Adjusted for maternal education level, height, parity, child daily physical activity, total energy intake and ethnicity