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A SCENARIO OF SUGAR ADDED FOOD AND BEVERAGE CONSUMPTION AMONG PRESCHOOL CHILDREN IN KELANTAN, MALAYSIA

Ruhaya Hasan*, Wan Muhamad Amir W Ahmad*, Mohamad Shafiq Bin Mohd Ibrahim*, Nor Azlida Aleng*, Hemala Munisamy**, Nurfadhlina Halim*** & Zalila Ali******

* School of Dental Sciences, Health Campus, Universiti Sains Malaysia (USM), Kubang Kerian, Kelantan, Malaysia
*** School of Health Sciences, Health Campus, Universiti Sains Malaysia (USM), Kubang Kerian, Kelantan, Malaysia
** School of Informatics and Applied Mathematics, Universiti Malaysia Terengganu (UMT), Kuala Terengganu, Terengganu
**** School of Mathematics Sciences, Universiti Sains Malaysia (USM), Minden, Pulau Pinang, Malaysia

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Abstract:

This paper focuses on the Malaysian scenario of nutritional intake among preschool children in Kelantan, East Coast Malaysia. Nutritional intake and eating habits in Malaysia varies among urban and rural areas. This is because the differences toward lifestyle environment and socioeconomic background. This study was aimed to investigate the truth scenario about nutritional status intake and eating practices among preschool children in urban area. Anthropometric measurements were performed on the children and socioeconomic and Sugary Food Frequency Questioner (FFQ) was answered by their parents. The anthropometric measurement were referred according to WHO references 2007 standards (5 to 19 years old) and WHO child growth references (2 to 5 years old). The mean weight and height of the preschool children were 15.73±3.64 kg and 105.73±5.99 cm respectively while the mean BMI was 13.96±2.24 kg/m^2. More than half the children shown to be in normal nutritional status for BMI-for-age (62.6%) followed by thinness (20.5%), severe thinness (8.7%) but only very small percentage of children were shown to be overweight (3.2%), obese (2.7%) and risk of overweight (2.3%). Apart from that most of the children were also in normal category for height-for-age (89.0%) and weight-for-age (69.9%). For height-for-age 9.6% children were shown to be stunting followed by 1.4% children with severely stunting. Concerning to nutritional status the BMI-for-age shows the most of the preschool children fall under the normal BMI-for-age category and there were more children were thinness or severe thinness compared to risk of overweight, overweight and obese. For the height-for-age and weight-for-age shows that most children have normal growth but there is still children who were stunted or severely stunted and underweight or severely underweight.

Key Words: Nutritional, sugar added food, beverage

1. Introduction:

Malaysia is one of the topmost countries where the sugar and sweeteners are available and the continuous growth in the availability of sugar and sweeteners can be seen from the Food Balance Sheet (Khor, 2012). The availability of sugar and sweeteners (kg per capita per year) in Malaysia have escalated from 28.8kg in 1967 to 48.7kg in 2007, which shows almost 70% increase which indicates one of the harmful dietary pattern in Malaysia (Khor, 2012). The sugar is a term used to simply identify monosaccharides (glucose, fructose, and galactose) and disaccharides (sucrose, lactose and maltose) (Malaysian Dietary Guidelines, 2010). Sugar can be divided into intrinsic sugar and free sugar. The intrinsic sugar found as integrated component within the fruits and vegetables and also sugar in milk which is lactose and galactose. The free sugar includes monosaccharides and disaccharides which have been added to beverages and food by the manufactures, cook or consumer and also include sugars which are naturally present in the honey, syrups, fruit juices and fruit juice concentrates (WHO, 2015). Recommendation and guideline by World Health Organization on sugar intake in adult and children only focuses on free sugar and not intrinsic sugar because there was no proof regarding adverse effects due to consumption of intrinsic sugar (WHO, 2015). The term extrinsic sugar, refined, or added sugar are referred to sucrose and glucose which is widely used in the food industry and home. Looking physiologically the added sugar and intrinsic sugar are not different but the added sugar has lower nutrient content but high in energy density (Malaysian Dietary Guidelines, 2010). It is important to take note when there is word "no added sugar" which actually means no sugar was added to the particular food during processing and manufacturing but it is important to realise that most of the food contain sugar naturally in various form (Malaysian Dietary

Guidelines, 2010). Usually in food surveys the sugar is described as purified sucrose and terms like refined sugar and added sugar are used to identify. Other than that added sugar is also referred as partially refined product for example corn syrup, molasses, caramel, brown sugar, honey, "gula Melaka", and "gula kabung" apart from this sucrose or other type of refined sugar which is added into soft drinks, foods, fruit drinks, or other beverages is also known as added sugar (Malaysian Dietary Guidelines, 2010). Sugar-added Beverages (SAB) or Sugar-sweetened Beverages (SSB) does not have a standard definition but it can be defined as beverages that contain calorie sweeteners, the beverages can come under the category of sugar-sweetened beverages includes soft drinks (drinks which is are non-alcoholic, flavoured, can be carbonated or not carbonated includes soda, pop and soda-pop), fruit drinks (diluted fruits juices which have been sweetened), sports drinks, tea and coffee drinks (beverages where the calorie sweeteners have been added), energy drinks (most available energy drink contain high amount caffeine, sugar and other ingredients), sweetened milks or milk alternatives (beverages where it is produced by mixing sweetened powder or syrup to the milk) and also other beverages where sugar has been added either in the form of high fructose corn syrup or sucrose (table sugar) (CDC, 2010). Sugar-sweetened Beverages (SSB) and sugary food is actually a medium for sugar consumption (Park *et al*., 2015) and by consuming it will cause additional calorie intake among consumer. Sugar-sweetened beverages (SSB) not only increase calorie intake in young children but it is associated to the consumption of certain food which is generally unhealthy for example pizza and grain-based desserts (Mathias *et al*., 2013). Study shows there is association between sugar-sweetened beverages (SSB) consumption with higher Body Mass Index (BMI) z-score (DeBoer *et al*., 2013). The higher calorie intake among the sugar-sweetened beverages consumer compared to the not sugar-sweetened beverages consumer is primarily due to the consumption of sugar-sweetened beverages (Mathias *et al*., 2013). The recommended intake for free sugar by WHO is less than 10% of total energy intake for children's and adults (WHO, 2015). In a study conducted among preschool children in Pasir Mas, Kelantan showed their BMI-for-age of pre-schoolers largely falls in the normal and underweight category although the current trend of increasing childhood obesity around the world (Ruhaya *et al*., 2012). The result also shows there is inequity in the distribution of health, wealth and disposable incomes between rich and poor at Pasir Mas, Kelantan and will affect the health outcome to those who is still consider living under the poverty line. The socioeconomic status (SES) is also an important determinant in nutritional status and health outcome. The prevalence of overweight among infants and young children is higher among the upper-middle-income population but the rise of overweight is the fastest in the lower-middle-income group (WHO, 2011). Therefore, it's important to gain a better understanding between dietary sugar intake and nutritional status among preschool children which is a major concern in preschool children.

2. Sample Size Determination:

Sample size was calculated by using a formula by Daniel (1999), based on study by Ruhaya *et al*., (2012), it shows the prevalence of overweight among preschool children in Pasir Mas, Kelantan, Malaysia is 5.5%. Sample size is calculated using single proportion as follows:

$$\mathrm{n} = \left(\frac{1.96}{0.05}\right)^2 0.055(1-0.055)$$

Where

Δ = Width of the confidence interval
$z = 1.96$ when $\alpha = 0.05$
p = Anticipated population proportion

After taking into account an estimated drop-out rate of 20% and also the design effect of 2, the estimated sample size for this study was 80 + (80 $\times$ 0.2) = 96 subjects. Minimum 96 subject were required at this stage of analysis

3. Conceptual Framework of the Study:

The source of the population for this study were all preschool children who are attending selected TABIKA KEMAS which is located in Kota Bharu, Kelantan. The total preschools (TABIKA KEMAS) in Kota Bharu District is 193, where 31 from Parliament Kota Bharu, 50 from Parliament Kubang Kerian, 60 from Parliament Ketereh and 52 from Parliament Pengkalan Chepa. The total enrolment of preschool children in this district was 4573. Only 15 TABIKA KEMAS was selected through systematic sampling which involves 219 subjects in this study. Systematic sampling involved listing of TABIKA KEMAS in Kota Bharu district, then every 5th preschool was selected until the required number of sample was obtained. All the pre-school children from the selected preschool was recruited in this study after filtering though the inclusion and exclusion criteria. This study has been granted approval by Human Research Ethics Committee USM (HREC) with reference code USM/JEPeM/15110471.

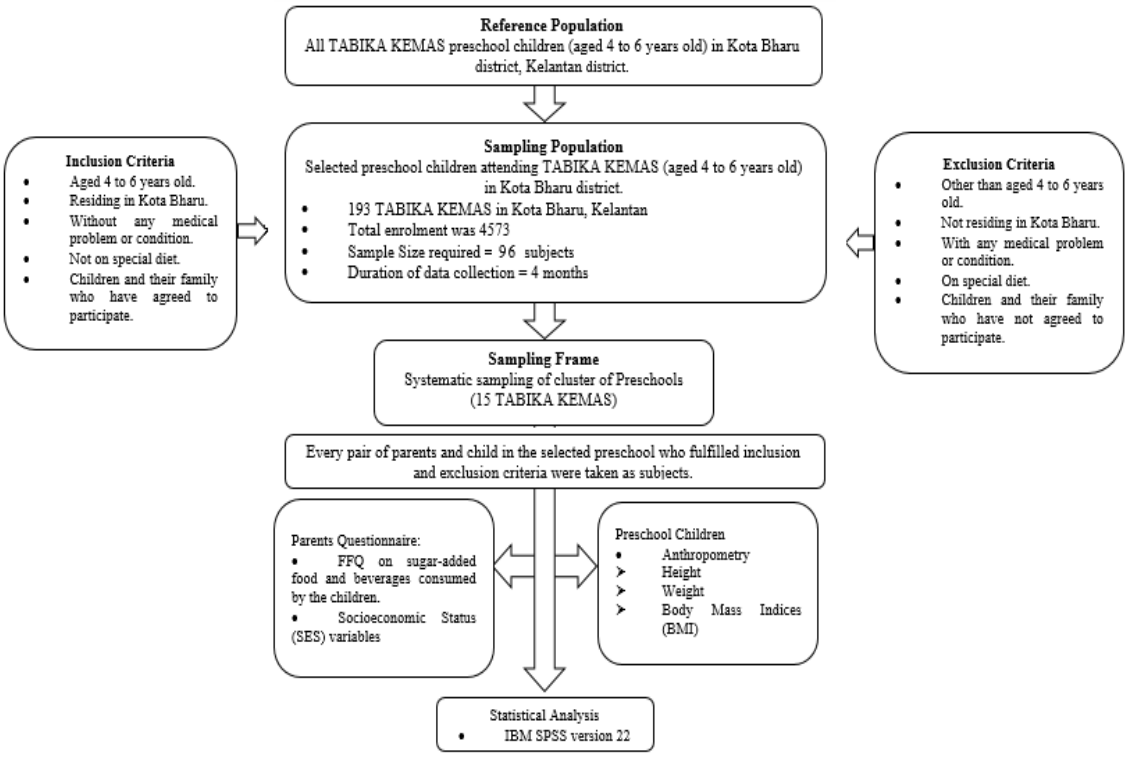

Figure 1: Conceptual Framework of Study

4. Results and Discussion:

The Table 4.1 below shows the general characteristics of participants and their family. The results shows the total number of participant involved in the study was 219 aged 4 to 6 years olds preschool children in Kota Bharu District, Kelantan. The were no much in differences in number of Male and Female participant in this study where female participants were (49.3%) and male participants were (50.7%). Based on the result, it showed that the mean age of mothers and fathers were 34.71±6.72 and 38.85±7.47 years respectively and the age range with highest frequency is 30-39 years old for both mother (54.8%) and father (44.9%) (Table 4.1). Most of the children's parents were Malay where father (96.8%) and mother (97.7%) and few of them were in other categories for example Cambodian where fathers and mothers (1.8%) respectively. Looking at the highest parents education it shows that both fathers and mothers highest education level are in secondary school education with 62.8% and 69.0% of mother and father respectively. Number parents with degree level or higher of education is second lowest with 6.0% and 6.5% for mother and father respectively. Occupation result showed the mothers have higher level of unemployment which is 63.9% but fathers have lowest level of unemployment (1.9%).

Most of the fathers were self-employed (35.8%) and followed by employee (32.1%) (Table 4.1). The mean number of household size is 5.46±1.68, where most of the respondent have medium household size (57.5%), followed by small (30.6%) and lastly large (11.9%) in decreasing order (Table 4.1). Most of the family also spend about RM 660 per month for food in a family (Table 4.1). The median monthly household income of the family is around RM 1900 per month where most of the family does not fall under the poverty line (RM930)(65.8%) but 27.9% family fall under poor category (<RM930) and 6.4% fall under very poor category (<RM580) when filtered through poverty line for Peninsular Malaysia but according Malaysian household distribution for Malaysia shows that most family are considered as the below 40% household income with 89.0% and only 9.1% family is considered as middle 40% and very little percentage which is 1.8% known to be at top 20% of household income (Table 4.1).

4.2 Prevalence of Nutritional Status of the Preschool Children:

Table 4.2 and 4.3 shows the results of the anthropometric measurement among preschool children in TABIKA KEMAS Kota Bharu, Kelantan. The anthropometric measurement (weight-for-age, height-for-age, and BMI-for-age) were referred according to WHO references 2007 standards (5 to 19 years old) and WHO child growth references (2 to 5 years old). The mean weight and height of the preschool children were 15.73±3.64 kg and 105.73±5.99 cm respectively while the mean BMI was 13.96±2.24 kg/m^2 (Table 4.2). More than half the children shown to be in normal nutritional status for BMI-for-age (62.6%) followed by thinness (20.5%), severe thinness (8.7%) but only very small percentage of children were shown to be overweight

(3.2%), obese (2.7%) and risk of overweight (2.3%) (Table 4.3). Apart from that most of the children were also in normal category for height-for-age (89.0%) and weight-for-age (69.9%) (Table 4.3). For height-for-age 9.6% children were shown to be stunting followed by 1.4% children with severely stunting (Table 4.3). This trend is also slightly similar to weight-for-age where 21.0% children were shown to be underweight and followed by 9.1% children were severely underweight (Table 4.3).

Table 4.1: General characteristics of participants (n=219)

Gender of preschool children					**n(%)**
	Male				111(50.7)
	Female				108(49.3)
Socio-demographic profile of parents		**Mothers**			**Fathers**
Ethnicity	Malay	214(98.2)			212(98.1)
	Others	4(1.8)			4(1.9)
Level of education	No Schooling	1(0.5)			3(1.4)
	Primary	14(6.4)			15(6.9)
	Secondary	137(62.8)			149(69.0)
	Form 6, College, Diploma	53(24.3)			35(16.2)
	Degree and above	13(6.0)			14(6.5)
Occupation	Housewife/Unemployed	138(63.9)			4(1.9)
	Retired	12(5.6)			27(12.7)
	Self-Employed	22(10.2)			76(35.8)
	Employee	23(10.6)			68(32.1)
	Employer	21(9.7)			37(17.5)
Socioeconomic status of parents		**Mean ± SD**	**Min.**		**Max.**
Mothers age		34.71±6.72	20		52
					n(%)
19 – 29 Years Old					51(23.5)
30 – 39 Years Old					119(54.8)
40 – 49 Years Old					42(19.4)
≥ 50 Years Old					5(2.3)
Fathers age		38.85±7.47	24		57
					n(%)
19 – 29 Years Old					23(10.7)
30 – 39 Years Old					96(44.9)
40 – 49 Years Old					76(35.5)
≥ 50 Years Old					19(8.9)
Household size		5.46±1.68	2		12
					n(%)
Small (<5 People)					67(30.6)
Medium (5 – 7 People)					126(57.5)
Large (≥8 people)					26(11.9)
Monthly household expenditure for food (RM)		658.43±577.81	20		5000
					n(%)
≤ RM500.00					128(61.0)
RM501.00 – RM 2000.00					76(36.2)
≥ RM2001.00					6(2.9)
		Mean ± SD	**Median**	**Min.**	**Max.**
Monthly household income (RM)		1891.43±1966.62	1200	300	14000
					n(%)
	Hardcore Poor (<RM580)				14(6.4)
	Poor (<RM930)				61(27.9)
	Not Poor (>RM930)				144(65.8)
	Malaysian Household Distributuin (RM)				
	Below 40% (<RM3860)				195(89.0)
	Middle 40% (RM3860-RM8319)				20(9.1)
	Top 20% (>RM8319)				4(1.8)

Table 4.2: Anthropometric Measurement of Preschool Children (n=219)

Anthropometric Measurement	Total (n=219) Mean±SD	Boys (n=111) Mean±SD	Girls (n=108) Mean±SD
Weight (kg)	15.73±3.64	15.88±3.66	15.59±3.64
Height (cm)	105.73±5.99	106.18±6.05	105.27±5.92
BMI(kg/m2)	13.96±2.24	13.98±2.23	13.95±2.25

Table 4.3: Nutritional status (BMI-for-age, height-for-age, and weight-for-age) of preschool children (n=219)

Indicators		**n(%)**
BMI-for-Age	Severe Thinness (<-3SD)	19(8.7)
	Thinness (<-2SD)	45(20.5)
	Normal (-2SD to +1SD)	137(62.6)
	Risk of Overweight (>+1SD)*	5(2.3)
	Overweight (>+1SD) (>+2SD)*	7(3.2)
	Obese (>+2SD) (>+3SD)*	6(2.7)
Height-for-Age	Severely Stunted (<-3SD)	3(1.4)
	Stunted (<-2SD)	21(9.6)
	Normal (≥-2SD)	195(89.0)
Weight-for-Age	Severely Underweight (<-3SD)	20(9.1)
	Underweight (<-2SD)	46(21.0)
	Normal (≥-2SD)	153(69.9)

**for those age from 2 to 5 years 0months uses WHO child growth standards*

4.3 Frequency of Sugar Added Food and Beverage Consumption Among Preschool Children:

Table 4.4 shows the frequency of consumption of all the 58 items of 11 categories of food and beverages from the food frequency of sugary food and drinks questionnaire. The percentages of consumption differ for each food item. For the cake category the consumption frequency once daily was not reported but 1.4% and 0.9% respondent consume chocolate cake and normal cake respectively, two to three times daily (Table 4.4). For the biscuit category the plain biscuit have highest frequency of consumption in a day where 7.8% and 7.3% for once daily and two to three times daily respectively (Table 4.4). Under the chocolate and sweets category the food item "Cokelat" or sweets have highest frequency of consumption in a day where 14.2% and 9.6% for once daily and two to three times daily respectively (Table 4.4). Under the "kuih" category the food item donut have the highest frequency of consumption in a day where 11.0% and 4.1% for once daily and two to three times daily respectively (Table 4.4). Under the breakfast cereals category the food item coco crunch have the highest frequency of consumption in a day where 8.7% and 5.5% for once daily and two to three times daily respectively (Table 4.4). For the not carbonated drink category the chocolate drink have the highest frequency of consumption in day where 32% and 25.6% for once daily and two to three times daily while for carbonated drink the frequency recorded is very low for daily consumption where only 0.5% for once daily or two to three times daily consumption (Table 4.4). When concerning desserts the children consume very low in frequency where only 0.9% consume "Pengat Keledek" and "Cole Rojak" once daily (Table 4.4). Raisins and other dried fruits shows the consumption in a day is 6.8% and 2.7% for once daily and two to three times daily (Table 4.4).

Finally under the other food category the food item Ice Cream have the highest frequency of consumption in a day where 15.1% and 10.0% for once daily and two to three times daily respectively (Table 4.4). Overall five mostly consumed food and beverage in daily basis is chocolate drink followed by Ice Cream, "Sirap" drink, "Cokelat" or sweets and Donut. When the frequency score was calculated for each food item using the formula by Reaburn, Krondl & Lau (1979), is shows none of the food items listed where mostly consumed food where most of them either in moderately consumed or less consumed sugar added food and beverage category (Table 4.5). The top 5 food that have highest frequency score in moderately consumed food category is chocolate drink, ice cream, sirap drink, sweets and donut while the 5 lowest score in less consumed food is fruit cake, pineapple juice, "bunga tanjung", "tahi itik" and "jala mas" (Table 4.5).

Table 4.4: Frequency of sugar added food and beverage consumption among preschool children.

Frequency / **Food Intake**	**Never/ Seldom**	**Once Monthly**	**2-3 × Monthly**	**Once × Weekly**	**2-3 × Weekly**	**Once × Daily**	**2-3 × Daily**
				n(%)			
Cake							
Chocolate Cake	92(42.0)	66(30.1)	41(18.7)	9(4.1)	8(3.7)	0(0.0)	3(1.4)
Fruit Cake	169(77.2)	33(15.1)	13(5.9)	3(1.4)	1(0.5)	0(0.0)	0(0.0)
Sponge Cake	160(73.1)	30(13.7)	17(7.8)	5(2.3)	7(3.2)	0(0.0)	0(0.0)
Banana Cake	106(48.4)	44(20.1)	46(21.0)	7(3.2)	16(7.3)	0(0.0)	0(0.0)
Normal Cake	110(50.2)	44(20.1)	39(17.8)	6(2.7)	18(8.2)	0(0.0)	2(0.9)
Biscuit							
Coconut Biscuit	178(81.3)	15(6.8)	12(5.5)	2(0.9)	6(2.7)	2(0.9)	4(1.8)
Cream Cracker	98(44.7)	37(16.9)	29(13.2)	13(5.9)	26(11.9)	5(2.3)	11(5.0)
Milk Biscuit	52(23.7)	43(19.6)	55(25.1)	21(9.6)	33(15.1)	2(0.9)	13(5.9)
Cream Biscuit	133(60.7)	30(13.7)	15(6.8)	16(7.3)	19(8.7)	2(0.9)	4(1.8)
Plain Biscuit	68(31.1)	35(16.0)	27(12.3)	21(9.6)	35(16.0)	17(7.8)	16(7.3)
Chocolate Biscuit	105(47.9)	38(17.4)	34(15.5)	12(5.5)	24(11.0)	3(1.4)	3(1.4)
Chocolate/ Sweets							
Milk Chocolate	94(42.9)	34(15.5)	26(11.9)	21(9.6)	21(9.6)	12(5.5)	11(5.0)
Bar Chocolate	132(60.3)	38(17.4)	19(8.7)	13(5.9)	15(6.8)	1(0.5)	1(0.5)
Raisins	139(63.5)	31(14.2)	16(7.3)	13(5.9)	12(5.5)	4(1.8)	4(1.8)
Chocolate	62(28.3)	30(13.7)	31(14.2)	15(6.8)	29(13.2)	31(14.2)	21(9.6)
Wafer	114(52.1)	36(16.4)	22(10.0)	10(4.6)	23(10.5)	6(2.7)	8(3.7)
Kuih							
Donut	51(23.3)	26(11.9)	29(13.2)	38(17.4)	42(19.2)	24(11.0)	9(4.1)
Kuih Bom/ Lengur	150(68.5)	11(5.0)	18(8.2)	10(4.6)	22(10.0)	6(2.7)	2(0.9)
Kuih Kasui	161(73.5)	13(5.9)	14(6.4)	10(4.6)	15(6.8)	5(2.3)	1(0.5)
Kuih Lapis	134(61.2)	18(8.2)	16(7.3)	20(9.1)	20(9.1)	9(4.1)	2(0.9)
Kuih Seri Muka	151(68.9)	21(9.6)	11(5.0)	15(6.8)	14(6.4)	5(2.3)	2(0.9)
Kuih Akok	119(54.3)	37(16.9)	24(11.0)	18(8.2)	16(7.3)	4(1.8)	1(0.5)
Kuih Bahulu	122(55.7)	30(13.7)	24(11.0)	19(8.7)	20(9.1)	0(0.0)	4(1.8)
Kuih Apam	142(64.8)	27(12.3)	16(7.3)	16(7.3)	14(6.4)	1(0.5)	3(1.4)
Curry Puffs	63(28.8)	30(13.7)	35(16.0)	38(17.4)	39(17.8)	12(5.5)	2(0.9)
Pulut Panggang	118(53.9)	31(14.2)	24(11.0)	18(8.2)	20(9.1)	5(2.3)	3(1.4)
Kuih Pau	135(61.6)	24(11.0)	24(11.0)	17(7.8)	12(5.5)	4(1.8)	3(1.4)
Jala Mas	195(89.0)	11(5.0)	9(4.1)	3(1.4)	0(0.0)	1(0.5)	0(0.0)
Tahi Itik	204(93.2)	4(1.8)	6(2.7)	3(1.4)	0(0.0)	2(0.9)	0(0.0)
Lopat Tikam	137(62.6)	32(14.6)	21(9.6)	15(6.8)	9(4.1)	4(1.8)	1(0.5)
Bunga Tanjung	207(94.5)	2(0.9)	4(1.8)	4(1.8)	0(0.0)	2(0.9)	0(0.0)
Breakfast Cereals							
Bran Flakes	137(62.6)	19(8.7)	18(8.2)	14(6.4)	11(5.0)	13(5.9)	7(3.2)
Chocolate Cereals	76(34.7)	24(11.0)	38(17.4)	23(10.5)	27(12.3)	19(8.7)	12(5.5)
Corn Flakes	105(47.9)	27(12.3)	28(12.8)	20(9.1)	19(8.7)	14(6.4)	6(2.7)
Not Carbonated Drinks							
Chocolate Drink	16(7.3)	9(4.1)	15(6.8)	10(4.6)	43(19.6)	70(32.0)	56(25.6)
Grape Cordial	115(52.5)	23(10.5)	15(6.8)	14(6.4)	29(13.2)	16(7.3)	7(3.2)
Sirap Drink	64(29.2)	18(8.2)	24(11.0)	19(8.7)	47(21.5)	30(13.7)	17(7.8)
Flavoured Ice	170(77.6)	18(8.2)	10(4.6)	4(1.8)	10(4.6)	4(1.8)	3(1.4)

Blended Drink							
Soya Drink	84(38.4)	23(10.5)	34(15.5)	17(7.8)	37(16.9)	13(5.9)	11(5.0)
Cordial Drink	143(65.3)	30(13.7)	12(5.5)	14(6.4)	12(5.5)	4(1.8)	4(1.8)
Carbonated Drink	146(66.7)	50(22.8)	13(5.9)	3(1.4)	5(2.3)	1(0.5)	1(0.5)
Juice (not 100% pure)							
Apple Juice	138(63.0)	30(13.70	26(11.9)	14(6.4)	6(2.7)	1(0.5)	4(1.8)
Grapes Juice	137(62.6)	30(13.7)	28(12.8)	10(4.6)	7(3.2)	2(0.9)	5(2.3)
Lemon Juice	148(67.6)	25(11.4)	24(11.0)	9(4.1)	9(4.1)	2(0.9)	2(0.9)
Orange Juice	101(46.1)	32(14.6)	31(14.2)	26(11.9)	18(8.2)	6(2.7)	5(2.3)
Pineapple Juice	189(86.3)	10(4.6)	7(3.2)	7(3.2)	3(1.4)	2(0.9)	1(0.5)
Desserts							
Bubur Kacang Hijau	130(59.4)	41(18.7)	27(12.3)	10(4.6)	10(4.6)	0(0.0)	1(0.5)
Bubur Kacang Merah	161(73.5)	30(13.7)	16(7.3)	5(2.3)	6(2.7)	0(0.0)	1(0.5)
Pengat Keledek	171(78.1)	22(10.0)	13(5.9)	6(2.7)	7(3.2)	0(0.0)	0(0.0)
Pengat Pisang	143(65.3)	37(16.9)	24(11.0)	6(2.7)	7(3.2)	2(0.9)	0(0.0)
Cole Rojak (Mee, Buah)	165(75.3)	24(11.0)	14(6.4)	4(1.8)	8(3.7)	2(0.9)	2(0.9)
Raisins and other Dried Fruits	136(62.1)	30(13.7)	13(5.9)	6(2.7)	13(5.9)	15(6.8)	6(2.7)
Others							
Jam	137(62.6)	29(13.2)	18(8.2)	12(5.5)	11(5.0)	7(3.2)	5(2.3)
Honey	146(66.7)	25(11.4)	15(6.8)	6(2.7)	8(3.7)	13(5.9)	6(2.7)
Ice Cream	34(15.5)	19(8.7)	27(12.3)	31(14.2)	53(24.2)	33(15.1)	22(10.0)
Kaya	103(47.0)	35(16.0)	17(7.8)	23(10.5)	20(9.1)	15(6.8)	6(2.7)
"Lok Chen"	133(60.7)	16(7.3)	22(10.0)	24(11.0)	19(8.7)	1(0.5)	4(1.8)
Lollipop	143(65.3)	25(11.4)	11(5.0)	14(6.4)	13(5.9)	6(2.7)	7(3.2)

Table 4.5: Food Consumption Frequency Score

Mostly Consumed Food (80.0 – 100.0)	Moderately Consumed Food (30.0 – 79.9)		Less Consumed Food (≥10.0 – 29.9)	
	Chocolate Drink	75.7	Plain Cake	29.9
	Ice Cream	58.0	"Lok Chen"	29.7
	Sirap Drink	51.3	Cream Biscuits	29.0
	Sweets	49.3	Kuih Bahulu	28.9
	Donut	49.0	Banana Cake	28.6
	Plain Biscuit	45.2	Kuih Lapis	28.6
	Chip Chocolate / Milk Biscuit	43.1	Kuih Akok	28.6
	Chocolate Cereals	43.0	Honey	28.4
	Karipap	42.9	Kuih bom/ Lengur	28.1
	Soya Drink	42.3	Lollipop	27.9
	Dairy Chocolate	38.0	Kuih Pau	27.6
	Kaya	36.4	Jam	27.1
	Grape Cordial	35.4	Raisins Chocolate	26.7
	Cream Cracker Biscuit with Sugar	35.0	Grape Juice	26.4
	Corn Flakes	34.1	Lopat tikam	26.1
	Orange Juice	34.0	Cordial Drink	26.1
Mostly Consumed Food (80.0 – 100.0)	Moderately Consumed Food (30.0 – 79.9)		Less Consumed Food (≥10.0 – 29.9)	
	Wafer (Cream, Chocolate, dll)	33.6	Bar Chocolate with Biscuit	25.7
	Chocolate Cake	33.3	Apple Juice	25.7
	Chocolate Biscuit	31.1	Bubur Kacang Hijau	25.4
	Raisins and other Dried Fruits	30.4	Kuih Apam	25.0
	Pulut Panggang	30.1	Lemon Juice	24.6

Bran flakes	30.1	Kuih Kasui	24.4
		Kuih Seri Muka	24.4
		Pengat Pisang	23.6
		Flavoured Ice Blended Drink	23.0
		ColeRojak (mee, fruits)	22.3
		Coconut Biscuits	21.3
		Sponge Cake	21.1
		Bubur Kacang Merah	20.9
		Carbonated Drink	20.7
		Pengat Keledek	20.4
		Fruit Cake	18.4
		Pineapple Juice	18.3
		Bunga Tanjung	16.7
		Tahi Itik	16.6
		Jala Mas	16.4

5. Conclusion:

For these population of preschool children belong to family who are above the poverty line but still can be consider bottom 40% of the household distribution in Malaysia for year 2014. The parents were mostly have the highest education of secondary education, most of the mothers are not working and fathers are working. Family spend RM500 or less for the household food and their family size are mostly medium and large (≥5). This shows most of the family can be classified to have low socioeconomic status. The consumption of sugar added food and beverage of the overall community is in moderate and low level according to their food frequency score.

6. Recommendation:

We recommend to develop nutrition education and promotion of healthy food habits targeted to this cohort of age and to educate their parents and caretakers to monitor their children from preventing their children develop unhealthy food intake in later years.

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