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Research Article
Prevalence and Factors Associated with Sugar-Sweetened Beverage Intake among Undergraduate Students in a Public University in Malaysia

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Abstract

Background and Objective: Reduction in sugar-sweetened beverage (SSB) intake is one of the World Health Organization's recommendations to reduce noncommunicable disease burden. The prevalence of SSB consumption was highest among young adults. The objective of this study was to examine the prevalence of SSBs and factors associated with their consumption among undergraduate students in a residential area in one of the public universities in Malaysia. **Materials and Methods:** This was a cross-sectional study using a pretested, validated, self-administered questionnaire on sociodemographic characteristics, level of knowledge, family history of diabetes and lifestyle pattern. High SSB intake was defined as an intake of three or more SSBs in a day. Height and weight were measured and body mass index (BMI) was calculated. **Results:** A total of 401 students responded with a response rate of 77.9%. The mean age was 21.3 years (95% CI = 21.20-21.48). The prevalence of at least once daily SSB intake and high SSB intake was 89.3 and 53.3%, respectively. Predictors for high SSB consumption were being men (OR = 2.19, 95% CI 1.07-4.48), having a low family income (OR = 2.05, 95% CI = 1.12-3.76) and having a high level of fast food intake (OR = 1.82, 95% CI = 1.03-3.22). **Conclusion:** The prevalence of SSB consumption was high among undergraduate students. Innovative health promotion strategies need to be implemented to reduce SSB consumption.

Key words: Fast food intake, Malaysia, obesity, sugar-sweetened beverages, university students, young adults

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Competing Interest: The authors have declared that no competing interest exists.

Data Availability: All relevant data are within the paper and its supporting information files.

INTRODUCTION

Sugar-sweetened beverages (SSBs) are beverages that are sweetened with added sugars that include soft drinks, energy drinks, sports drinks, coffee, tea, flavored milk and fruit juices[1]. Examples of added sugars are raw sugar, brown sugar, honey, fructose and sucrose[1]. Consumption of SSBs is associated with obesity and type 2 diabetes mellitus in children, adolescents and adults[2-6] and cardiovascular risk in adults[2]. Reduction in SSB intake among the young people is one of the essential measures to reduce disease burden[7-9].

Globally, SSB intake was highest among younger adults aged between 20-39 years[10]. In Malaysia, nearly half of the young adults were enrolled in tertiary education[11-12]. Limited studies among undergraduate students in developing countries found that SSB consumption on a daily basis ranged from approximately 40-69%[13-15]. The most popular SSBs among them were soft drinks/soda and energy drinks[13-15]. Studies have been conducted to explore the factors associated with SSB consumption. Some of the factors have included gender, ethnicity, family income, sedentary behaviors, smokers and eating at fast food restaurants[10,16-18]. However, lack of studies was conducted in Malaysia among undergraduate students[19]. Hence, little is known about the contributory factors to SSB intake in Malaysia, especially among undergraduate students. The objectives of this study were to examine the prevalence and type of SSB consumption and to identify factors associated with SSB consumption among undergraduate students in a residential area of a university in Malaysia.

MATERIALS AND METHODS

This cross-sectional study was conducted in a residential area of a public university, Universiti Putra Malaysia (UPM), which is located in Selangor, a populous state in Malaysia. This university was chosen as it has one of the highest enrollments of students in Malaysia[11]. This residential area consists of four blocks of five-floor apartments with an estimated total of 1,500 students. The students were mainly from the Faculty of Medicine and Health Sciences. Three blocks are dedicated for female students and one block for male students. Each floor has between ten to twelve apartments with an average of six students per apartment. The sample size was calculated using the proportion of the two populations[20] based on a previous study[21], where SSB intake among males and females was 34% and 21.9%, respectively. The sample size was multiplied by two adjusting for the design effect for cluster sampling and 20% was added to account for non-respondents. The final calculated sample size was 515 students.

The sampling technique used was simple one-stage cluster sampling where a cluster was each apartment. Each apartment was number coded and randomly selected using computer-generated simple random sampling. All students in the sampled clusters were selected for the study. Foreign students were excluded from this study. The duration of the study was from 3rd April 2017 to 8th August 2017.

A pretested, validated, self-administered questionnaire was used to obtain data on sociodemographic characteristics, family history of diabetes, lifestyle pattern (fast food consumption, smoking status and physical activity level), knowledge about sugar-sweetened beverages and SSB intake. A short version of the International Physical Activity Questionnaire (IPAQ) was used to assess physical activity level[22]. Physical activity was categorized as high, moderate or low. Knowledge about SSBs was based on five questions: Do you know what sugar-sweetened beverages are?, Do you know the various types of sugar-sweetened beverages?, Are commercially prepared fruit drinks a healthier choice?, Does drinking three or more sugar-sweetened beverages per day have physical and health hazards?, Can frequent consumption of sugar-sweetened beverages lead to overweight and obesity? The knowledge score was categorized into high level (scored four or five correct) and low level (scored three or less correct). SSB intake was assessed by frequency of intake in a week and in a day adapted from the Beverage Intake Questionnaire (BEVQ)[23]. The reliability of this questionnaire was moderate, ranging from 0.45-0.87. The correlation between BEVQ and food intake records for SSB intake was r = 0.59. SSB intake reported in this manuscript is based on SSB intake in a day. High SSB intake was defined as consumption three or more times per day based on a previous study[24]. No SSB intake per day and SSB intake of one to two times per day were categorized as low and moderate SSB intake, respectively. The questionnaires were distributed at times when the students were believed to be in the apartments, i.e., in the evening and at night. The questionnaire took less than 15 min to be completed.

Height and weight were also taken during the questionnaire distribution. A stadiometer (Model 213, Seca, Hamburg, Germany) and a weighing scale (model HBF 212, Omron, Kyoto, Japan) were used by pretrained enumerators. All measurements were taken three times and averaged. The instruments were calibrated before each session. To minimize interrater bias, an enumerator was assigned for weight and another enumerator for height. Body mass index (BMI) was calculated using the formula = (weight in kg)/(height in m)^2 [25].

Underweight, normal weight, overweight and obese were categorized based on a BMI less than 18.5 kg/m^2, 18.5-24.9 kg/m^2, 25.00-29.9 kg/m^2 and more than 30 kg/m^2, respectively[26].

Data analysis: Data were analyzed using Statistical Package for Social Sciences (SPSS) version 22. Tests of normality were conducted on all data with interval and ratio scales using skewness, kurtosis and graphs. For descriptive analyses, mean and standard deviation were used to describe continuous data and percentages were used for categorical data. For inferential statistics, chi-square test or Fisher's exact test was used for categorical data. Crude and adjusted odds ratio (OR) was calculated using univariate and multivariate analysis to identify significant associations between independent variables (sociodemographic characteristics, family history of diabetes, lifestyle pattern, knowledge level of SSBs, BMI) and high SSB intake. Independent variables that were associated with high SSB intake at $p \leq 0.25$ in the bivariate analyses were retained in the multiple logistic regression[27]. All independent variables were tested for correlations to avoid multicollinearity prior to inclusion in the models. Statistical significance was set at $p<0.05$.

Ethical considerations: Approval was obtained from the Universiti Putra Malaysia Ethics Committee for Research involving Human Subjects, reference number: (FPSK-U016)2017. Permission from the principal of the residential area and written consent from the respondents were also obtained.

RESULTS

Response rate: Of the 515 respondents, 401 students (68 males and 333 females) participated in the study, resulting in a response rate of 77.9%. The nonparticipation was due to some students having examinations during the data collection period.

Sociodemographic characteristics: The mean age of the 401 participants was 21.3 years (SD = 1.41) and ranged between 19 and 26 years. The majority were Malays (77.6%), followed by Chinese (11.7%), Indian (7.5%) and others (3.2%) (Table 1). Respondents were mainly Doctor of Medicine students (29.9%), followed by Nutrition students (25.2%) and Doctor of Veterinary Medicine students (14.7%). The majority (40.1%) of the participants' fathers had an education level up to secondary school, followed by first degree (22.9%) and certificate or diploma (21.7%). Likewise, for the education level of the mothers, these numbers were 45.9, 20.9 and 19.5%, respectively. The majority (58.9%) of the respondents had a monthly family income of less than Ringgit Malaysia (RM) 3,900.

Table 1: Sociodemographic characteristics of participants

Characteristic	Frequency (No.)	Percentage (%)
Age		
19-20	135	33.7
21-22	189	47.1
23-26	77	19.2
Sex		
Men	68	17.0
Women	333	83.0
Ethnicity		
Malay	311	77.6
Chinese	47	11.7
Indian and others	43	10.7
Father's education level †		
Primary	22	5.5
Secondary	161	40.1
Tertiary	218	54.4
Mother's education level ‡		
Primary	31	7.7
Secondary	184	45.9
Tertiary	186	46.4
Family income		
<RM 3,900	236	58.9
≥RM 3,900	165	41.1
Type of courses		
Doctor of medicine	120	29.9
Doctor of veterinary medicine	59	14.7
Nutrition	101	25.2
Others	121	30.2

† (n=395), ‡ (n=394), RM: Ringgit Malaysia

Lifestyle pattern, family history of diabetes, body mass index and knowledge level: Only about one-tenth of the respondents were physically active, followed by almost half of the respondents (44.4%) classified as moderately active. One-fifth of them reported having a low physical activity level. The majority of respondents (97.8%) were nonsmokers. Less than half (40.6%) consumed fast food more than once per week. Approximately one-third of them (33.4%) reported having family members with diabetes. More than two-thirds of the respondents (69.1%) had a normal body mass index (BMI), followed by overweight (15.2%), underweight (11.7%) and obese (3.7%). The majority of the respondents (90.5%) had a high level of knowledge about SSBs (scored four or five correct out of five questions). More than three-quarters of them (77.3%) agreed that commercially prepared fruit juices are not healthier choices of drinks. A high percentage (92.0%) agreed that drinking three or more SSBs carries physical and

health hazards. The majority of the sample (95.5%) agreed that frequent consumption of SSBs can lead to overweight and obesity.

Prevalence of SSB consumption: The prevalence of intake of at least one or at least three SSBs in the last week was 96.5 and 53.3%, respectively. The prevalence of at least daily intake of SSBs and a daily high SSB intake (intake of three or more SSBs per day) on average days was 89.3 and 51.6%, respectively. Table 2 shows the types of SSB consumption by frequency of intake in a day. The majority of the respondents drank sweetened coffee or tea (68.1%), followed by flavored milk and fruit juice (57.9%), three-in-one sachet drinks (57.6%) and sport drinks (23.4%).

Association between sociodemographic factors, family history of diabetes, lifestyle pattern, knowledge level of SSBs, BMI and SSB intake: Table 3 and 4 show that high SSB intake per day was associated with having a low family income ($\chi^2 = 8.70$, $p = 0.013$), being a Doctor of Veterinary Medicine student ($\chi^2 = 20.036$, $p = 0.003$) and having a high level of fast food intake ($\chi^2 = 6.933$, $p = 0.031$). Approximately two-thirds

Table 2: Types of SSBs consumed by frequency per day (N = 401)

	Low		Moderate		High	
Types of SSB	No.	Percentage	No.	Percentage	No.	Percentage
Soda or pop	326	81.3	69	17.2	6	1.4
Sweetened coffee or tea	128	31.9	247	61.6	26	6.5
Diet soda or diet pop	361	90.0	36	9.0	4	1.0
Sports drink	307	76.6	85	21.2	9	2.2
Energy drink	351	87.5	45	11.2	5	1.2
Flavored milk and fruit juice	169	42.1	200	49.9	32	7.9
3-in-1 sachet drink	170	42.4	199	49.6	32	7.9
Total SSB intake per day	43	10.7	151	37.7	207	51.6

Table 3: Association between sociodemographic factors, type of courses and SSB intake per day (N = 401)

	SSB intake per day n (%)							
	Low		Moderate		High			
Factors	No.	Percentage	No.	Percentage	No.	Percentage	χ^2	p value
Age								
19-20	10	7.4	52	38.5	73	54.1	5.93	0.204
21-22	21	11.1	66	34.9	102	54.0		
23-26	12	15.6	33	42.9	32	41.6		
Sex								
Men	4	5.9	23	33.8	41	60.3	3.30	0.192
Women	39	11.7	128	38.4	166	49.8		
Ethnicity								
Malay	32	10.3	118	37.9	161	51.8	4.15	0.385
Chinese	8	17.0	19	40.4	20	42.6		
Indian and others	3	7.0	14	32.6	26	60.5		
Father's education level†								
Primary	1	4.5	8	36.4	13	59.1	5.27†	0.261
Secondary	20	12.4	51	31.7	90	55.9		
Tertiary	22	10.4	89	42.0	101	47.6		
Mother's education level‡								
Primary	1	3.2	13	41.9	17	54.8	6.35§	0.174
Secondary	22	12.0	59	32.1	103	56.0		
Tertiary	20	11.2	76	42.5	83	46.4		
Monthly family income								
<RM 3,900	24	10.2	76	32.2	136	57.6	8.70	0.013*
≥RM 3,900	19	11.5	75	45.5	71	43.0		
Type of courses								
Doctor of medicine	13	10.8	55	45.8	52	43.3	20.0	0.003*
Doctor of veterinary medicine	11	18.6	22	37.3	26	44.1		
Nutrition	8	7.9	24	23.8	69	68.3		
Others	11	9.1	50	41.3	60	49.6		

† (n = 395), ‡ (n = 394); § Fisher's exact test, *Significant at p≤0.05. RM: Ringgit Malaysia

Table 4: Association between lifestyle pattern, family history of diabetes, BMI, knowledge level and SSB intake per day (N = 401)

	SSB intake per day n (%)							
	Low		Moderate		High			
Factors	No.	Percentage	No.	Percentage	No.	Percentage	χ^2	p-value
Physical activity status†								
Low	10	13.2	29	38.2	37	48.7	2.19	0.701
Moderate	15	8.4	62	34.8	101	56.7		
High	5	11.6	16	37.2	22	51.2		
Smoking status								
Current or past	0	0.0	2	22.2	7	77.8	2.79§	0.248
Never	43	11.0	149	38.0	200	51.0		
Fast food intake								
Low	32	13.4	94	39.5	112	47.1	6.93	0.031*
High	11	6.7	57	35.0	95	58.3		
Family history of diabetes								
None	32	12.0	108	40.4	127	47.6	5.39	0.068
Present	11	8.2	43	32.1	80	59.7		
BMI status‡								
Underweight	5	10.6	13	27.7	29	61.7	8.73	0.068
Normal weight	26	9.4	103	37.2	148	53.4		
Overweight and Obese	12	15.8	35	46.1	29	38.2		
Knowledge level								
Low	5	15.6	10	31.3	17	53.1	1.25	0.535
High	37	10.6	140	38.6	186	51.2		

† (n = 398), ‡ (n = 397); § Fisher's exact test, *Significant at $p \leq 0.05$

of the respondents with a family history of diabetes consumed a high level of SSBs per day but there was no significant association ($\chi^2 = 8.731$, $p = 0.068$). There was no significant association between the level of knowledge and consumption of SSBs ($\chi^2 = 1.251$, $p = 0.535$).

Predictors for high SSB intake among undergraduate students: In a multivariate model, respondents who were men, had lower family incomes and had a high intake of fast food were found to be two times more likely to drink SSBs than respondents who were women, had higher family incomes and a low intake of fast food (Table 5).

DISCUSSION

SSB consumption is an important modifiable factor that requires intervention because it is associated with the development of noncommunicable diseases. The present study sample was mainly women, Malay ethnicity, secondary level of education for father and mother and lower family household income. In Malaysia, the proportion of women pursuing tertiary education in public universities outnumbered their male counterparts with 62% of women compared with 38% men[11]. Malay ethnicity comprised the majority (52.9%) of the Malaysian population, followed by Chinese (27.8%) and Indian (13.3%)[28]. The median monthly household income for Malaysians reported in 2016 was RM 5,228, categorized as middle-income household[29].

The present analysis showed a high prevalence of daily SSB consumption among the undergraduate students of UPM. This prevalence of daily SSB consumption was the highest compared with undergraduates in the United States (65%), Saudi Arabia (40%) and Nigeria (42.8%)[13-15,16]. The most popular type of SSBs consumed among undergraduate students differed between our findings and other studies. The present study found that the most popular SSBs consumed were sweetened coffee and tea. Soft drinks were most popular among undergraduate students in the United States, Bangladesh and Saudi Arabia[13,14,16]. In Nigeria, the most popular drinks were malt drinks[15]. Studies have shown that the reasons behind the high consumption of coffee among college students include helping them concentrate, keeping them awake at night during examination preparation and attending early classes[30,31]. Our finding could be explained by the sample being from a residential area, with the majority of students being medical and health sciences students. They may not drink soft drinks but consumed caffeinated drinks to help them stay awake. This finding was consistent with a study among medical students in South Africa which showed that 62.6% of students consumed caffeine for 'academic purposes'[32].

The high prevalence of flavored milks and fruit juices from this present study also warrants public health attention. The students may have the misperception that such drinks are good for health. In fact, the amounts of added sugar in these types of drinks are also high, with an average of 28 g

Table 5: Crude and adjusted odds ratio for predictors of high SSB intake

Factors	Crude OR (95% CI)	p-value	Adjusted OR	p-value
Age				
19-20	1.66 (0.94-2.92)	0.08	1.79 (0.84-3.81)	0.131
21-22	1.65 (0.97-2.82)	0.07	1.46 (0.73-2.94)	0.284
23-26	Reference		Reference	
Sex				
Men	1.53 (0.90-2.60)	0.118	2.19 (1.07-4.48)	0.031*
Women	Reference		Reference	
Father's education level				
Primary	1.59 (0.65-3.87)	0.310	1.8 (0.48-6.72)	0.382
Secondary	1.39 (0.92-2.10)	0.114	1.38 (0.73-2.61)	0.323
Tertiary	Reference		Reference	
Mother's education level				
Primary	1.40 (0.65-3.02)	0.385	0.85 (0.28-2.62)	0.780
Secondary	1.47 (0.97-2.22)	0.067	1.04 (0.54-2.01)	0.910
Tertiary	Reference		Reference	
Family income				
<RM 3,900	1.80 (1.20-2.69)	0.040*	2.05 (1.12-3.76)	0.020*
≥RM 3,900	Reference		Reference	
Type of courses				
Doctor of medicine	0.78 (0.47-1.29)	0.331	0.71 (0.35-1.43)	0.341
Doctor of veterinary medicine	0.80 (0.43-1.50)	0.487	0.55 (0.22-1.37)	0.199
Nutrition	2.19 (1.27-3.80)	0.005*	2.02 (0.98-4.20)	0.059
Others	Reference		Reference	
Physical activity status				
Low	0.91 (0.43-1.91)	0.795		
Moderate	1.25 (0.64-2.44)	0.509		
High	Reference			
Smoking status				
Current or past	3.36 (0.69-16.4)	0.134	0.77 (0.12-5.06)	0.769
Never	Reference		Reference	
Fast food intake				
Low	Reference		Reference	
High	0.64 (0.42-0.95)	0.028*	1.82 (1.03-3.22)	0.040*
Family history of diabetes				
None	Reference		Reference	
Present	1.63 (1.07-2.49)	0.022*	1.5 (0.86-2.62)	0.150
BMI status				
Underweight	Reference		Reference	
Normal	0.71 (0.38-1.34)	0.294	0.99 (0.44-2.24)	0.990
Overweight and obese	0.38 (0.18-0.81)	0.012*	0.54 (0.21-1.42)	0.210

*Significant at $p \leq 0.05$

(7 teaspoons) and 24 g (6 teaspoons), respectively[33]. This amount of added sugar is beyond the recommended amount by the Ministry of Health Malaysia, which is only one teaspoon of added sugar for each cup of beverage per day[34]. This misperception could be a global issue as the sales of fruit juice and energy drinks were reported to have increased globally[35]. The significant sociodemographic characteristics associated with high SSB intake among these undergraduate students were being men and having a lower family household income. In terms of sex, this finding was consistent with other studies[10,16-17]. Other studies also found that SSB consumption was more common among lower income groups[16,17,36]. However, in South Korea and Singapore, SSB consumption was higher among high-income household groups[17,37]. A dearth of studies has examined the association between parental levels of education and young adults' SSB intake, unlike studies among children. Previous studies have linked low maternal education with SSB intake among children[37-40]. The present study hypothesized that low parental education influenced SSB consumption during childhood and that this unhealthy habit would continue into adulthood. However, there was no significant association found between low parental education level and high SSB consumption among these young adults.

The consumption of fast food more than once a week was observed in 40.6% of these students. This prevalence was similar to findings from Singapore, where it was reported that 44% of 18-29 years old were regular fast food consumers[37].

This is consistent with other studies as well[41-46]. A study in Malaysia found that fast food consumption was highest (52.5%) among young people less than 24 years old, compared with the age group older than 24 years (p<0.001), who in turn had an adjusted OR that was 3.6 times higher (95 CI%: 1.76-7.27) than adults older than 50 years of age[43]. An earlier study by Habib *et al.*[45] found that 84.5% of Malaysian university students consumed fast food but that study involved convenience sampling techniques that could have resulted in selection bias. Abdullah *et al.*[44] reported that fast food was chosen because of sociability (38.3%), followed by quick and convenient (29.9%) and taste of food (29.2%). Adolescents in Thailand reported that the ambience of the fast food restaurant was suitable for social occasions[47]. There have been reported associations between fast food consumption and SSB intake among adolescents and adults[42,43]. This positive association could be contributed to by the marketing strategy of fast food outlets that promote combo meals that consist of fast food and an SSB at cheaper prices.

We hypothesized that high SSB consumption was associated with a family history of diabetes and overweight and obesity. However, this study did not indicate those associations. The lack of these associations in this study could have been due to the study being underpowered as the sample size calculation was not based on different proportions of BMI or family history. Another possible reason was the low response rate. The nonresponse participants could be among those with higher BMI and positive family history.

This study found that despite the majority of the sample having high knowledge about SSBs, including the effects of SSBs on health, they still had a moderate to high daily SSB intake. A study by Park *et al.*[48] also found that knowledge about the effects of SSB consumption on health, such as weight gain and diabetes, was not adequate to alter the behavior of an adult with SSB intake of more than two per day. Therefore, providing health education alone may not be sufficient to reduce SSB consumption among adults. A more motivating incentive needs to be explored. This study did not find an association between smoking and SSB intake. However, a study by Keihner[39] found otherwise, where adults who smoked consumed more SSBs than nonsmokers (p<0.001). There was no significant association between overweight and obesity with high SSB intake observed in this study. This could be because overweight and obese individuals have tended to underreport their energy intake compared to normal weight individuals, which has been shown in previous studies[49,50].

There have been a number of ongoing initiatives to curb the intake of added sugar in the diet and beverages by the government of Malaysia, especially by the Ministry of Health. These have included a healthy lifestyle campaign since 1991, healthy eating promotions, reduced added sugar campaigns, food labeling that includes 'low sugar' and 'sugar-free' food and establishment of Malaysia dietary guidelines[51,52]. There has also been the abolition of subsidies for sugar since 2013 to reduce sugar intake[53]. However, none of these measures have been able to reduce the prevalence of obesity and diabetes mellitus in Malaysia[10]. Malaysia will impose an excise tax on beverages and juices that contain more than 5 grams and 12 g of sugar per 100 mL, respectively, in April 2019[53]. This is in line with one of the two suggestions by Popkin and Hawkes[35] that are specific to SSBs, which could exert more impact: SSB taxation and restriction of SSB advertising. There are other factors that have not been studied that may influence SSB intake among undergraduate students. These include peer influences on SSB intake and the availability and price of SSBs, especially with the new taxation on SSBs, which requires further research.

There are several limitations in this study. First, the location of this study was in a residential area in a public university. The residential area chosen may not represent all the undergraduate students as it housed the medical and health sciences students. This may introduce bias as they have been exposed to health-related information in their formal curriculum as opposed to other nonmedical and nonhealth sciences students. Furthermore, the interpretation of this study may be suitable for urban undergraduate students residing in Selangor, as geographical region may influence SSB consumption[54]. Second, there may be recall bias in answering the questions related to SSB intake and physical activity. In addition, as this study was conducted during the study week of some of these students, they may have hurried in answering the questionnaire. Third, the use of the BEVQ may have produced an inaccurate estimation of SSB intake. Fourth, this was a cross-sectional study whereby the direction of the association could not have been ascertained.

CONCLUSION

The prevalence of high SSB intake per day was high among undergraduate students. The factors identified were being men, having low family income and having a high level of fast food consumption. This high prevalence of SSB intake among young undergraduate adults warrants immediate action from the public health professionals. There is a need for innovative health promotion strategies that are able to change students' unhealthy eating behaviors, which would include a reduction in SSB intake and fast food intake. In

addition, the university could also reduce the number of vending machines that sell SSBs and provide stalls that sell healthier snacks, such as fresh fruits, to students. Further studies need to be conducted that represent young Malaysian people or undergraduate students and other factors to understand the determinants of SSB consumption and to develop effective policy measures and programs.

SIGNIFICANCE STATEMENT

This study was the first attempt to determine the prevalence and type of and factors associated with SSB consumption among undergraduate students in Malaysia. Other studies in Malaysia have focused on children's and adults' consumption of SSBs. This study discovered that SSB consumption on a daily basis among undergraduate students was high compared to previous studies among similar populations. The most popular drinks consumed were sweetened coffee or tea, flavored milk, fruit juices and three-in-one sachet drinks. The predictors identified were being male, having a low family income and having a high level of fast food intake. The findings provide significant initial insights into SSB consumption among young adults, specifically undergraduate students. Future studies should be conducted to provide a clearer picture of SSB consumption among young adults.

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