Original Article

Sociodemographic, Dietary, and Lifestyle Factors Associated with Overweight and Obesity in School Children in Indonesia and Jamaica: A Comparative Study

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Abstract

Background: Childhood obesity is on the increase in many developing countries and constitutes a major public health problem. **Aim and Objectives:** This study sought to investigate the prevalence and factors associated with overweight and obesity in school children in Indonesia and Jamaica. **Materials and Methods:** We conducted the descriptive and inferential analyses of two large datasets obtained from the Global School-based Health Survey 2015 in Indonesia and 2017 in Jamaica. Multinomial logistic regression modeling was used to assess factors associated with overweight and obesity. **Results:** The prevalence of overweight and obesity was higher in Jamaican students (13.5% and 10.4%, respectively) than in Indonesian students (11% and 5.2%, respectively). There were also disparities in the strength and direction of the associations between the explanatory variables and overweight and obesity in the two countries. Age, gender, consumption of fruits, tobacco smoking, physical activity, and alcohol consumption were significantly associated with overweight and obesity. **Conclusion:** The findings suggest that policy-makers and planners of programs for the prevention and control of childhood overweight and obesity should take age, gender, dietary factors, and lifestyles into consideration within the specific contexts of their country.

Keywords: Children, dietary factors, lifestyle factors, nutritional status, obesity

Introduction

Obesity is defined by the World Health Organization (WHO) as an abnormal accumulation of body fat that may result in negative health outcomes.[1] Childhood overweight and obesity have steadily increased in most countries and affect children of all ages, with 38 million under-five children being overweight or obese in 2019 and over 340 million children between 5 and 19 years being overweight or obese in 2016.[1] Regionally, countries in Southeast Asia, including Indonesia, are undergoing nutritional transition and are experiencing an increasing trend of overweight and obesity.[2-5] Prevalence of overweight and obesity doubled in about two decades in Indonesia.[6,7] In Caribbean countries, childhood overweight and obesity have risen significantly over the past two decades, reaching epidemic levels in Jamaica.[8,9] The prevalence of childhood overweight and obesity is higher than the global average and is still increasing.[8-11]

Access this article online

Quick Response Code:

Website: https://journals.lww.com/mtsp

DOI: 10.4103/mtsp.mtsp_23_24_1

Childhood overweight and obesity have been implicated in the causation of several noncommunicable diseases, including type 2 diabetes mellitus, high blood pressure, asthma and other respiratory problems, sleep disorders, and liver disease.[12] Overweight and obese children may also experience psychological problems, including low self-esteem, depression, and social isolation.[12,13]

Some evidence suggests that, in childhood, the burden of overweight and obesity differs with age,[1] some

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How to cite this article: Machmud PB, Putra WK, Oshi SN, Agu CF, Nwokocha M, Khairani N, *et al*. Sociodemographic, dietary, and lifestyle factors associated with overweight and obesity in school children in Indonesia and Jamaica: A comparative study. Matrix Sci Pharma 2025;9:6-13.

Received: 23-10-2024, **Revised:** 06-11-2024,
Accepted: 16-11-2024, **Published:** 25-07-2025

studies found no significant association between stage in childhood (under-five, preadolescence, early adolescence, middle, and late adolescence) and overweight and overweight/obesity.[7,14] Gender has been linked to childhood overweight and obesity in some studies, and global prevalence figures point to overweight and obesity being higher in males than females.[1] de Gouw *et al*. found a higher prevalence of overweight and obesity among boys than girls but noted that the boys in their sample were more sedentary (engaged more in watching television and being on the computer more).[15] Females had significantly lower risks of overweight and obesity than males in a study by Khan *et al*.[16] The authors noted that females were significantly more likely to consume high quantities of vegetables, less likely to eat high quantities of fast food, less likely to consume high quantities of soft drinks, and more likely to regularly walk or cycle to school than males.[16]

Besides demographic factors, dietary and lifestyle factors associated with overweight and obesity are multiple and complex, and most of them work by altering the energy balance between calories intake and calories expenditure.[1] Dietary behaviors that involve increased consumption of high-calorie foods that contain high quantities of sugars and fats are associated with increased likelihood of overweight and obesity,[17] while high consumption of fruits has been shown to reduce the risk of overweight and obesity.[14,16,18] Regular physical activity and reduced sedentary behavior are associated with decreased risks of overweight and obesity;[19-21] conversely, lack of physical activity, and increased indulgence in sedentary behavior increase the likelihood of overweight and obesity.[15,22,23]

The relationship between alcohol consumption, tobacco smoking, marijuana use and obesity is complex, perhaps due to interaction with other risk and protective factors associated with obesity and overweight. The findings from studies on the association between alcohol and overweight/obesity are inconsistent, with some finding no relationship while others found an inverse or positive association.[24,25] Some studies reported no significant association between smoking status and obesity or overweight, while others reported that it was negatively associated with overweight and obesity.[26,27]

Dietary and lifestyle factors are themselves influenced by the economic development of a country, urbanization, transportation, and public sector policies relating to health and food as well as social and cultural practices and beliefs within a geographical region and country,[1,8] and possibly by race and ethnicity. Evidence from studies that investigate these factors in two countries with different levels of economic development, social and cultural practices and beliefs, in Southeast Asia and Latin America/Caribbean region is scarce. This current study therefore sought to investigate and compare the prevalence and factors associated with overweight and obesity in school children in Indonesia and Jamaica.

Materials and Methods

Study design

We conducted secondary data analyses of two large cross-sectional surveys, namely, the Global School-based Student Health Survey (GSHS) Indonesia 2015 and GSHS Jamaica 2017.

Study settings

Indonesia is a large country in Southeast Asia, which though pluralistic in ethnic composition, is mainly Islamic, and thus influenced by Islamic culture.[28] Indonesia belongs to the lower middle-income country, by World Bank's classification.[29] Jamaica is a small country located in the Caribbean region (Latin America and Caribbean region). Approximately 97% of Jamaicans are of partial or total African descent.[30] The population is largely Christian. Jamaican culture is influenced by several factors including its African roots, the predominantly Christian religion, and its geographic proximity and historical socio-economic ties to the United States.

Data sources, sampling and sample

We analyzed the Indonesian 2015 and Jamaica 2017 Global School-based Student Health Survey (GSHS) data. GSHS data were collected from school-age children in 43 developing countries and the surveys were conducted by the WHO in collaborating with the Centers for Disease Prevention and Control.[31] The GSHS is a collaborative surveillance project in which self-administered questionnaire is used to collect the data on health behavior and associated factors in the young population.[31] A two-stage cluster sampling design with probability proportional to number enrolled in school is typically used to draw a sample that is representative of all students in a country.[31,32]

In Indonesia, GSHS survey was conducted in 2007, 2008, and 2015. In 2015, data collection was done in 75 junior and high schools from 26 provinces in Indonesia. A total of 11,163 students participated in this survey.[33] The GSHS surveys were conducted in Jamaica in 2010 and 2017. The sample frame consisted of all school-age adolescents from the 12 parishes in the country. A sample consisting of 1667 students took part in the survey.[32]

Participants

A total of 12,830 students (11,163 students and 1667 students from Indonesia and Jamaica, respectively) took part in the GSHS survey Indonesia 2015 and GSHS survey Jamaica 2017. Among them, 9081 Indonesian students and 1258 Jamaican students (10,339 total) had complete data for the outcome and explanatory variables assessed in this study [Figure 1].

Specification of variables

Outcome variable

The outcome variable in this study was nutritional status, which was categorized into three groups: Normal weight, overweight, and obesity. Students who had Z-score>+2

standard deviation (SD) from the median for body mass index (BMI) for age and sex were classified as overweight. Students who had Z-score>+2 SD from the median for BMI for age and sex were classified as obese. We used the BMI classification recommended by the WHO for Asian and Caribbean adolescents.[34]

Explanatory variables

Three main groups of explanatory variables were assessed in this study; these were sociodemographic characteristics, dietary behavior, and lifestyle factors. Sociodemographic characteristics included age and gender. Based on the American Academy of Pediatrics' Stages of Adolescents' Development classification, age was categorized into three: Early adolescence (11–14 years), middle adolescence (15–17 years, and late adolescence (18–21 years).[35]

Dietary behavior was defined as a student's consumption of fruits, vegetables, carbonated soft drinks, and fast food during the past 30 days. The cutoff points for fruits and vegetable consumption were based on a minimum daily recommendation.[36,37] Fruits consumption was categorized into two: Less than two times daily and two or more times per day. Vegetable consumption was divided into two categories: Less than three times daily and three or more times per day. The consumption of carbonated soft drinks and fast food was each grouped into two categories: Never versus at least once daily.[38]

Lifestyle factors consisted of substance use, physical activity behavior, and sedentary behavior. Substance use was measured as tobacco during the past 30 days, and tobacco included cigarette and other tobacco products, such as *sirih*, piper betel, *cerutu*, cigar, beadies, and hookah pipes. The response options were "Yes" or "No." Alcohol consumption was assessed as alcohol drinking during the past 30 days, and the response options were "Yes" or "No." Marijuana use was assessed as use of marijuana during the past 30 days and the response options were "Yes" or "No."

Physical activity behavior consisted of regular physical exercise and walking or riding a bicycle to or from school during the past 7 days. Regular physical exercise was defined in this study as physical activity for a total of at least 60 min per day and categorized into two groups: Two days or less and more than 2 days in the last 7 days. Walking and riding a bicycle were categorized into three groups: Never, occasionally (1–3 days), and regularly (>3 days). Sedentary behavior was defined in this study as when students spend a typical or usual day sitting and watching television, playing computer games, talking with friends, or doing other sitting activities. This variable contained two categories: Five hours or less per day and more than 5 h per day.

Statistical data analysis

In the descriptive data analysis, means and SDs (or medians and range) were computed for the continuous variables (height and weight), whereas frequencies and percentages were computed for the categorical variables related to sociodemographic, dietary, and lifestyle factors. The BMI was computed and used to classify the participants into normal weight, overweight, and obese groups. Multinomial logistic regression analysis was used to assess the factors associated with overweight and obesity. Multivariable analysis results were presented with their adjusted odds ratios (AOR) and 95% confidence intervals (95% CIs). All analyses were done using the Statistical Package for the Social Sciences (SPSS) software version 20.0 (IBM Corporation: Armonk, New York, United States).

Ethical considerations and availability of data

The Jamaican and Indonesian Global School-based Student Health Survey (GSHS) data were publicly available on the Internet. GSHS data are based on the surveys conducted by the WHO in collaborating with the Centers for Disease Prevention and Control in over 40 countries, globally. Researchers can register online and obtain the datasets. We abode by ethical best practices in our analyses, interpretation, and discussion of findings.

Results

Table 1 shows the sociodemographic characteristics, dietary, and lifestyle factors of Indonesian and Jamaican students. Out of the combined total of 10,339 students (Indonesians and Jamaicans), about 60% of them were early adolescents aged 11–14 years, 38.5% were middle adolescents (15–17 years) while only 1.8% were late adolescents (18 years and above). There was about the same ratio of boys to and girls between Indonesia and Jamaica (43% vs. 57% and 41% vs. 59%), respectively.

About one-third (33.5%) of Indonesian students indicated that they ate fruits two times or more per day and 27.5% ate vegetables three times or more per day compared to 27.7% and 14.0%, respectively, for Jamaica. About one-quarter (27.1%) of Indonesian students drank carbonated soft drinks at least once daily compared to two-thirds (68.0%) of Jamaican students. Approximately 76% and 67% of students in Indonesia and Jamaica, respectively, claimed that they had never consumed fast food in the past 30 days.

The prevalence of alcohol consumption in the past 30 days was 44% among Jamaican students compared to 4% of Indonesian students. The proportion of students who used marijuana in Jamaica was higher than in Indonesia (10.6% vs. 0.8%). The proportion of students who did physical exercise for more than 2 days in the past 7 days in Jamaica was higher than that of Indonesia (45% vs. 28%). However, proportion of Jamaican students involved in sedentary activities for more than 5 h per day was almost four times higher than that of Indonesia (38.7% vs. 10.3%).

The anthropometric characteristics and nutritional status of Indonesian and Jamaican students, stratified by gender, are presented on Table 2. The average weight of Indonesian and Jamaican students was 46.3 kg (SD = 10.8) and 58.1 kg (SD = 13.8), respectively. The average height of

Table 1: Sociodemographic characteristics, dietary and lifestyle factors of Indonesian and Jamaican students

Variable	Total (*n*=10,339), *n* (%)	Indonesia (*n*=9081), *n* (%)	Jamaica (*n*=1258), *n* (%)
Age (years)			
Early adolescence (11–14)	6174 (59.7)	5709 (62.9)	465 (37.0)
Middle adolescence (15–17)	3980 (38.5)	3223 (35.5)	757 (60.1)
Late adolescence (≥18)	185 (1.8)	149 (1.6)	36 (2.9)
Gender			
Boys	4427 (42.8)	3909 (43.0)	518 (41.2)
Girls	5912 (57.2)	5172 (57.0)	740 (58.8)
Fruits consumption (per day) (times)			
≥2	3362 (32.5)	3041 (33.5)	348 (27.7)
<2	6950 (67.5)	6040 (66.5)	910 (72.3)
Vegetables consumption (per day) (times)			
≥3	2671 (25.8)	2495 (27.5)	176 (14.0)
<3	7668 (74.2)	6586 (72.5)	1082 (86.0)
Carbonate soft drinks consumption			
Never	7021 (67.9)	6618 (72.9)	403 (32.0)
At least once daily	3318 (32.1)	2463 (27.1)	855 (68.0)
Fast food consumption			
Never	7707 (74.5)	6869 (75.6)	838 (66.6)
At least once daily	2632 (25.5)	2212 (24.4)	420 (33.4)
Tobacco smoking			
No	9177 (88.8)	8103 (89.2)	1074 (85.4)
Yes	1162 (11.2)	978 (10.8)	184 (14.6)
Alcohol consumption			
No	9420 (91.1)	8716 (96.0)	704 (56.0)
Yes	919 (8.9)	365 (4.0)	554 (44.0)
Marijuana use			
No	10,135 (98.0)	9010 (99.2)	1125 (89.4)
Yes	204 (2.0)	71 (0.8)	133 (10.6)
Regular physical exercises (days)			
≤2	7221 (69.8)	6532 (71.9)	689 (54.8)
>2	3118 (30.2)	2549 (28.1)	569 (45.2)
Walk/ride a bicycle to school (days)			
Never	6324 (61.2)	5520 (60.8)	804 (63.9)
Occasionally (1–3)	1201 (11.6)	1086 (12.0)	115 (9.2)
Regularly (>3)	2814 (27.2)	2475 (27.2)	339 (26.9)
Sedentary behavior (per day) (h)			
≤5	8917 (86.2)	8146 (89.7)	771 (61.3)
>5	1422 (13.8)	935 (10.3)	487 (38.7)

Data source: Global School-based Health Survey Indonesia 2015 and Jamaica 2017. *n*: Number of students

Table 2: Anthropometric characteristics and nutritional status of Indonesian and Jamaican students, stratified by gender

Variable	Indonesia (*n*=9081)			Jamaica (*n*=1258)		
	Boys	Girls	Total	Boys	Girls	Total
Weight (kg), mean (SD)	47.4 (12.3)	45.5 (9.5)	46.3 (10.8)	60.8 (14.9)	57.7 (12.8)	58.1 (13.8)
Height (m), mean (SD)	1.6 (0.1)	1.5 (0.0)	1.5 (0.1)	1.7 (0.1)	1.6 (0.1)	1.7 (0.0)
BMI (kg/m^2), mean (SD)	19.4 (3.8)	19.9 (3.5)	19.7 (3.6)	21.1 (4.5)	21.9 (4.8)	21.6 (4.7)
Nutrition status, *n* (%)						
Normal weight	3249 (42.6)	4381 (57.4)	7630 (84.0)	409 (42.7)	548 (57.3)	957 (76.1)
Overweight	395 (40.2)	588 (58.8)	983 (10.8)	57 (33.5)	113 (66.5)	170 (13.5)
Obese	265 (56.6)	203 (43.4)	468 (5.2)	52 (39.7)	79 (60.3)	131 (10.4)

Data source: Global School-based Health Survey Indonesia 2015 and Jamaica 2017. SD: Standard deviation, BMI: Body mass index

Indonesian and Jamaican students was 1.5 m (SD = 0.1) and 1.6 m (SD = 0.07), respectively. The mean BMI of Indonesian students was 19.7 kg/m^2 (kg/m^2 [SD = 3.6]) while that of Jamaican students was 21.6 kg/m^2 (SD = 4.7).

Approximately 11% and 5.2% of students in Indonesia were overweight and obese compared to 13.5% and 10.4% for Jamaica, respectively. In both countries, the proportions of overweight students were higher among girls (58.8% vs. 40.2%, respectively, for Indonesia and 66.5% versus 33.5% for Jamaica. In Indonesia, the proportion of obese students was higher among boys than girls (56.6% vs. 43.3%); in contrast, 39.7% and 60.3% of obese students in Jamaica were boys and girls, respectively.

Table 3 displays the results of multinomial logistic regression modeling of the association of students' sociodemographic characteristics, dietary, and lifestyle factors with overweight and obesity. In Indonesia, the odds of overweight were 1.34 (95% CI = 1.16–1.55) and 6.48 (95% CI 2.06–20.39) times higher in the middle adolescents (15–17 years) and late adolescents (18 and above), respectively, compared to the early adolescents (11–14 years). Furthermore, the students in the middle adolescence were 1.38 (95% CI = 1.20–1.71) times more likely to be obese compared to early adolescents. Girls were about two times (AOR = 2.02, 95% CI = 1.66–2.45) more likely to be obese compared to boys. Students who ate fruit less than twice daily were 1.16 and 1.45 times as likely to be overweight and obese compared to students who ate fruits two or more times daily in the past 30 days. Students who had a smoking habit were 2.20 times more likely to be obese than students who had no smoking habit. Students who did physical exercise more than 2 days in the past 7 days were 14% (AOR = 0.86, 95% CI = 0.74–0.98) less likely to be overweight compared to those who did exercise <2 days.

The findings for Jamaica were quite different than the Indonesian findings. Students in middle adolescence were 31% (AOR = 0.69, 95% CI = 0.49–0.97) less likely to be overweight. Jamaican girls were 1.61 times more likely to be overweight compared to boys. Jamaican students who ate fruits less than twice daily were 36% (AOR = 0.64, 95% CI = 0.43–0.94) less likely to be obese as compared to students who ate fruits more than two times per day. Students who drank alcohol in the last 30 days were 1.66 times (AOR: 1.66, 95% CI = 1.19–2.32) as likely to be overweight as students who did not.

Table 3: Results of multinomial logistic regression modelling of the association of student's sociodemographic characteristics, dietary, and lifestyle factors with overweight and obesity

Variable	Indonesia				Jamaica			
	Overweight		Obese		Overweight		Obese	
	AOR (95% CI)	*P*	AOR (95% CI)	*P*	AOR (95% CI)	*P*	AOR (95% CI)	*P*
Age (years)								
≤11–14	1		1		1			
15–17	1.34 (1.16–1.55)	<0.0001	1.38 (1.20–1.71)	0.003	0.69 (0.49–0.97)	0.033	-	-
≥18	6.48 (2.06–20.39)	0.001	1.24 (0.54–2.85)	0.611	1.90 (0.85–4.25)	0.118	-	-
Gender								
Boys	1		1	<0.0001	1		-	-
Girls	0.86 (0.76–0.99)	0.046	2.02 (1.66–2.45)		1.61 (1.14–2.28)	0.007	-	-
Fruits consumption (per day) (times)								
≥2	1		1	<0.0001			1	0.024
<2	1.16 (1.01–1.33)	0.037	1.45 (1.19–1.76)			-	0.64 (0.43–0.94)	
Vegetable consumption (per day)								
≥3 times				-			1	0.069
<3 times	-	-	-		-	-	1.76 (0.96–3.25)	
Carbonated soft drink consumption								
Never	-	-	1	0.098	-	-	-	-
At least once daily	-	-	1.20 (0.97–1.50)		-	-	-	-
Tobacco smoking								
No			1	<0.0001				-
Yes	-	-	2.20 (1.51–3.20)		-	-	-	
Alcohol consumption								
No				-	1			-
Yes	-	-	-		1.66 (1.19–2.32)	0.003	-	
Marijuana								
No	-	-	-	-	-	-	1	0.091
Yes	-	-	-	-	-	-	0.53 (0.25–1.11)	
Regular exercises (days)								
≤2	1			-			1	0.057
>2	0.86 (0.74–0.98)	0.045	-		-	-	0.70 (0.48–1.01)	

AOR: Adjusted odds ratio, CI: Confidence interval, *P*: Significance level

Discussion

This study assessed and compared the prevalence and sociodemographic, dietary, and lifestyle factors associated with overweight and obesity in school children in Indonesia and Jamaica. There were important differences in the findings between the two countries.

Prevalence of overweight and obesity

Comparing the prevalence obtained in our study to those found in previous studies in the same countries, it seems that there has been an increasing trend in overweight and obesity in Indonesia over the past two decades[6,7] and Jamaica.[10,11] However, the prevalence of both overweight and obesity in Jamaican children was higher than those of Indonesian children, with obesity in Jamaican children being twice as high as that of Indonesian children. It is likely that the differences in the prevalence of overweight and obesity between the two countries may be partly due to the differences in social, economic, cultural factors, and genetic between the two countries.[8,38,39] Both published and anecdotal evidence show that children in the Caribbean (and Jamaica, specifically) consume much more carbonated sweetened sugary beverages than children in Southeast Asia (including Indonesia).[38] Genetic factors might also play a role.[39] Jamaicans are mainly people of African origin as compared to Indonesians who are Asians. The WHO acknowledged about two decades ago that the distribution and proportion of fat, and waist circumference and musculature differ by race/ethnicity.[39]

Sociodemographic characteristics and overweight/obesity

Compared to the students in early adolescence, students in middle and late adolescence in our study had significantly higher odds of being overweight in Indonesia. This finding suggests that the tendency to get overweight or obese increases with age of children. This may be due to several biopsychosocial factors that cut across both countries, for example, the physiological and psychological development and changes in the adolescents as they grow. While growth spurt and other physiological and psychological development starts in this phase and continues into the late adolescence, risk taking and habits (including habits that may be obesognic, for example, sedentary behavior) formed in early adolescence may be sustained and carried into middle and late adolescence.[40] Contrary to our findings, Syahrul *et al*. found no significant differences in nutritional status between children in the preadolescent age group (6–9 years) and those in early adolescence (10–13 years).[7] Similarly, Hadi *et al*. found no relationship between age and nutritional status but they classified their age as <10 years and 10–12 years.[14] Thus, we think that a possible explanation for the disparity between their findings and the findings in this present study may be due to the stage of childhood and adolescence examined in each study.

In our study, female gender was associated with increased risk of overweight, in both Indonesia and Jamaica. This finding differs with reports from previous studies.[1,7,14-16] Reports from Indonesian studies suggest that females are less likely to be overweight/obese than males.[7,14] Furthermore, contrary to our finding, females had significantly lower risks of overweight and obesity than males in Bangladesh.[16] In the Bangladeshi study, compared to males, females were significantly more likely to consume high quantities of vegetables, less likely to eat high quantities of fast food, less likely to consume high quantities of soft drinks, and more likely to regularly walk or cycle to school.[16] However, in consonance with our findings, other Jamaican researchers reported higher odds of overweight and obesity among females.[8,10]

Dietary and overweight/obesity

The finding in this present study shows that students who ate fruits less than twice daily had increased odds of overweight and obesity in Indonesia compared to those who ate fruits two or more times per day. High consumption of fruits has been shown in previous studies to reduce the risk of overweight and obesity,[14,16,18] thus, as observed among Indonesian children, children who consume little amounts of fruits will have higher probabilities of overweight and obesity. Interestingly, taking of fruits less than twice daily was associated with decreased odds of obesity among Jamaican students in our study. This finding differs from those of other studies.[14,16,18]

The consumption of vegetables did not appear to have any significant association with overweight or obesity in our study. This contrasts with the findings by some researchers who reported a significant, positive association between vegetable consumption and overweight and obesity.[14,18] Although vegetables are high fiber and low-energy food materials that produce a satiating effect, thus contributing to a decreased risk of overweight and obesity, some studies suggest that vegetable intake needs to interact with other factors to exert a significant effect. Such factors as sedentary behavior and fruit intake may modify, or confound, the effect of vegetable intake on nutritional status.[14,18]

Lifestyle factors and overweight/obesity

Tobacco smoking was associated with increased odds of obesity in Indonesia while alcohol consumption increased the odds of overweight in Jamaica in this present study. Consistent

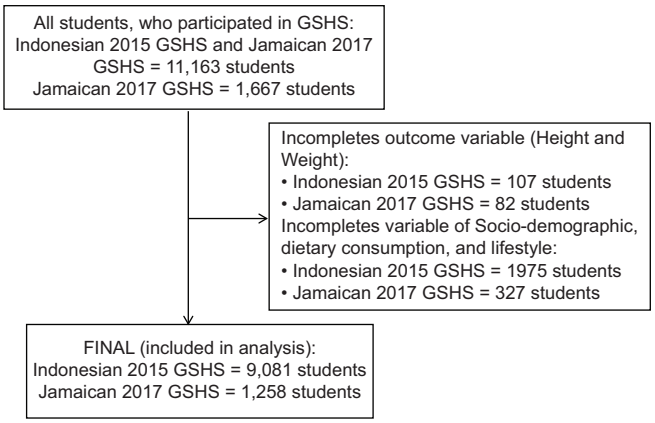

Figure 1: Flow chart for selection of participants from the Indonesian 2015 and Jamaica 2017 Global School-based Student Health Survey datasets

with our finding, a previous study found that people who smoked previously had higher risks of overweight/obesity than never smokers.[26] Former smokers were found in another study to have higher odds of obesity compared with current smokers and never smokers.[27] Reports on the relationship between alcohol use and overweight/obesity are inconsistent.[25] Many of the studies point to no significant association between mild/moderate alcohol intake and overweight/obesity in the short term,[25] while some findings suggest that heavy drinkers might experience increased risk of overweight and obesity in the long term.[24]

Regular exercises have been reported to decrease the risk of overweight and obesity in previous studies.[19-21] Consistent with these studies, doing regular exercises was significantly associated with decreased odds of overweight in Indonesia in this present study. A significant association was not found in the Jamaican sample.

Strengths and limitations of the study

This study was based on the Global School-based Health Survey, with relatively large samples (9081 and 1258 for Indonesia and Jamaica, respectively). We used multinomial logistic regression modeling to assess for factors associated with overweight and obesity in the two countries and compared the results, making it one of the few studies looking at two countries in Southeast Asia and the Caribbean with different ethic/racial, economic, social and cultural characteristics. The study, however, has some limitations. It is a cross-sectional study and so the findings cannot be used to make causal inferences.

Conclusion

The findings suggest that the prevalence of overweight and obesity was higher in Jamaican students than in Indonesian students, while there were also disparities in the strength and direction of the association between the explanatory variables and overweight and obesity in the two countries. The implication of our study is that policymakers, planners, and implementers of programs for the prevention and control of childhood overweight and obesity should take into consideration the age group of children, gender, dietary factors, and lifestyles within their own country contexts.

Acknowledgments

We would like to thank our friends and colleagues who reviewed this manuscript and gave us feedback.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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