

## ORIGINAL ARTICLE

# Worksite nutrition supports and sugar-sweetened beverage consumption

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## Summary

### Objective

This study examined the link between worksite environmental supports for nutrition behaviours and sugar-sweetened beverage (SSB) consumption and offers insight into potential intervention points for reducing SSB consumption and combatting overweight and obesity.

### Methods

Perceived worksite supports for healthy nutrition and self-reported SSB consumption were analysed for 2,015 working adults in the state of Missouri using a subset of questions from the Supports at Home and Work for Maintaining Energy Balance (SHOW-ME) study.

### Results

Employees' use of vending facilities and the availability of water coolers/water bottles was significantly associated with increased SSB consumption, while use of cafeterias was significantly associated with decreased SSB consumption. Symbols or signs to identify healthy alternatives were significantly associated with sports drink consumption.

### Conclusions

This study supports previous work indicating the worksite as a necessary environment for nutrition interventions. When choices (vending and cafeteria) are provided, employees report making healthier decisions. For worksites without cafeterias, alternatives should be explored including mobile food trucks and farmer's markets.

**Keywords:** Cafeteria, health, obesity, soda, vending.

## Introduction

Obesity is tenably the primary health challenge for adults in the United States and other developed countries, steadily increasing over the last 30 years (1). Approximately one-third of American adults are currently obese, with a higher prevalence in middle-aged adults (40–59 years: 39.5%) compared to younger (20–39 year olds: 30.3%) or older (60 years and over: 35.4%) adults (2). Obesity taxes the health of our population via its link to numerous comorbidities such as hypertension, chronic inflammation, type 2 diabetes, and other cardiovascular disease (CVD) risk factors (3). Obesity has also been linked to increased cancer risk (4).

One key contributor to the rise in obesity prevalence is the increase in consumption of sugar-sweetened beverages (SSBs) (5–7). This is largely because of the simultaneous increase in the percentage of high-fructose corn syrup (HFCS) content in SSBs, and the subsequent increase in obesity rates (1,8–10). Additionally, liquid energy intake, such as SSBs, may pose hurdles to weight management for those already overweight and obese (11).

An individual's environment is linked to his or her health behaviours, and thus it is necessary to understand factors beyond the individual level that may influence behaviour (12,13). The worksite environment is a venue for improving employee health, including interventions for combatting obesity (14–16). Young adults (aged 20–44 years of

age) have been shown to be the highest percentage of SSB consumers, with 20% of their SSB consumption occurring at work (17). Previous research has linked the worksite environment to health behaviours and employee wellbeing, including promotion of healthy eating habits and energy balance (18–21). However, the worksite environment has largely been ignored in previous SSB research.

To further evaluate the link between the worksite environment and SSB consumption, the aim of this study was to examine access and use of twelve unique worksite appliances, cafeteria, services, and supports for nutrition behaviours and their association with self-reported consumption across five different SSB categories.

## Methods

### Survey design

The Supports at Home and Work for Maintaining Energy Balance (SHOW-ME) study (22), a cross-sectional telephone-based survey, examined the associations between residential and worksite environmental and policy influences and energy balance behaviours and outcomes. A subset of questions focusing on worksite supports and SSB consumption was used for the purpose of this analysis.

### Study population

The SHOW-ME study included employed adults living within four metropolitan areas of Missouri: St. Louis, Kansas City, Columbia, and Springfield. These four areas were selected for their size and geographic representation in the state as well as for their racial and ethnic diversity and the availability of GIS data. These four areas encompass approximately 50% of the Missouri population. Inclusion criteria for participant home census tracts required a population density greater than 10<sup>th</sup> percentile of the population density of study areas and less than 50% of the census tract population inhabitants aged 15–24 years. A multistage stratified sampling procedure was used for sampling participants within seven strata in order to achieve the desired sample. These included: metro size (large, small), and within the large metro size were walkability (low, moderate and high), and racial/ethnic minority (low, high) strata (23).

The University of Missouri Health and Behavioral Risk Research Center (HBRRRC) purchased a list of resident phone numbers and addresses from a commercial vendor, Genesys, in accordance with sampling frame. Participants ( $n=2,015$  completed surveys) were selected through targeted, random digit dialling. Informed verbal

consent was obtained via phone by trained members of the research team at HBRRRC using an IRB-approved script. The survey was conducted in three waves between April 2012 and April 2013. If the desired quota was unachievable, census tracts were resampled or matched census tracts were sampled in waves two and three. The first willing adult per household to meet eligibility criteria was selected to participate. Eligibility criteria required participants: be aged 21–65 years, be employed at least 20 h per week outside of the home, work at one primary location comprised of five or more employees, not be pregnant at the time of the survey, have no physical limitation to prevent walking or bicycling in the past week, and have a household telephone land-line (by virtue of the sampling method).

### Measures

Questions from the Environmental Assessment Tool (24), California Check for Health (25), Community Healthy Living Index (26), and California Health Interview Survey (27) were adapted to assess perceived access to and use of worksite appliances, cafeteria, services, supports, and self-reported nutrition behaviours (e.g., 'Do you have a water cooler or bottled water available to employees free of charge at all times?'; 'Does your cafeteria, snack bar or food service provide calorie information for food served onsite?'; 'Do the vending machines usually provide symbols to identify "healthy" alternatives on or near the machines?'; 'During the past week, how often did you drink soda or pop that contains sugar?'). For the general categories of cafeteria and vending, participants were first asked if they have access to these facilities and then if confirmed they were asked about use of facilities. Reliability of all items has been previously established, with reliability coefficients above 0.60 (22).

Cafeteria facilities were defined as services provided by cafeterias, snack bars, or food services. Vending facilities were defined as any self-service machines that dispense merchandise after payment. All questions considered for this analysis consisted of four-point Likert scale response options for perceived environmental supports, which ranged from 1 (strongly agree) to 4 (strongly disagree). For analysis, these were dichotomized as 'agree' (strongly agree, agree) and 'disagree' (disagree, strongly disagree).

Participants were asked the number of sugar-sweetened beverages consumed over the past seven days, from which daily totals were derived. All SSB variables were reported and recorded as counts – the number of SSBs consumed per day. Each item was tested individually in the model. Outcome variables included the following mutually exclusive categories of

SSB: soda, coffee, sports drinks, other (juice, Kool-aid, tea, etc.), and total (a summed variable for all SSBs).

The following covariates were adjusted in the multivariate regression models: age (three categories: 21–44 years, 45–54 years, 55–65 years), race (two categories: white, non-Hispanic; all other races, Hispanic), gender (two categories: female, male), income (three categories: <\$30,000/year, \$30,000–\$69,000/year, ≥\$70,000/year), self-reported health status (three categories: poor or fair, good, very good or excellent), occupation (six categories: healthcare, business, education and professional, service, blue collar, office and administrative support), and obesity status (based on self-reported height and weight used to calculate BMI; two categories: not obese, obese). Authors selected confounding factors and relevant categories based on previous literature, known associations between confounding factors and energy-balance behaviours, and outcomes and significant correlation with the outcomes variables.

### Statistical analysis

All analyses were conducted in SAS version 9.3 (SAS Institute, Cary, NC). As the variables were counts of consumption and could not be negative integer values, the statistical analyses included Poisson regression to estimate incidence rate ratios (IRRs) and 95% Confidence Intervals (CIs) for daily consumption of SSBs. Statistical significance was based on an alpha level of ≤0.05.

## Results

A total of 2,015 employed adults were included in analyses. Females (67.7%) and non-Hispanic Whites (62.6%) were the majority demographics. One-third (33.7%) of the sample was obese, with 14.9% reporting only fair or poor health status. Table 1 further describes the study population. Table 2 reports the odds ratio estimates resulting from the Poisson regression analyses.

### Vending

No significant associations on the self-reported consumption of SSBs were found for the *availability* of vending facilities nor for the availability of low-fat dairy options in vending facilities.

Use of vending facilities increased the likelihood of soda consumption, sports drinks, and total SSBs. Employees that used vending machines had a 76% increased likelihood of soda consumption (IRR=1.76, CI=[1.44, 2.15]) and 86% increased likelihood of sports drink consumption (IRR=1.86, CI=[1.32, 2.61]), compared to those who did not use vending, but had access. There was also a 34% increase in the odds of total SSB

**Table 1** Demographic characteristics of the study population

Variable	N	%
Age		
21–44 years	688	34.9
45–54 years	648	32.9
55–65 years	635	32.2
Race		
White, non-Hispanic	1236	62.6
All other races, Hispanic	739	37.4
Gender		
Female	1350	67.7
Male	644	32.3
Income		
<\$30 000 per year	387	20.7
\$30 000–\$69 0000 per year	803	42.9
≥\$70 000 per year	681	36.4
Self-reported health status		
Poor or fair	297	14.9
Good	752	37.7
Very good or excellent	944	47.4
Occupation		
Healthcare	279	14.2
Business	335	17.1
Education and professional	369	18.8
Service	342	17.4
Blue collar	284	14.5
Office and administrative support	355	18.1
Obesity status		
Not obese	1265	66.2
Obese	645	33.7

consumption among those who used vending (IRR=1.34, CI=[1.20, 1.51]). Employees who used vending facilities were no more likely to consume sugar-sweetened coffee (IRR=1.04, CI=[0.86, 1.26]) or other SSBs (IRR=1.14, CI=[0.87, 1.50]) compared to those not reporting use of vending, although consumption patterns trended in the same direction.

### Cafeteria

No significant associations on the self-reported consumption of SSBs were found for the *availability* of cafeteria facilities in the worksite, including the listing of calorie information and presence of low-fat dairy items.

Use of cafeteria facilities had a negative association with the likelihood of total SSB consumption – employees reporting use of cafeteria facilities showed a 20% significant decrease in the odds of total SSB consumption (IRR=0.80, CI=[0.67, 0.96]). Similar associations were seen in the individual SSB categories, although these were not significant.

There was a significant association between consumption of sports drinks and the presence of symbols

**Table 2** Worksite supports for nutrition and odds of consuming sugar-sweetened beverages

	N	Soda	CI	Coffee and sugar	CI	Sports drinks	CI	Other SSB	CI	Total SSB	CI
Vending Available	1,756	1.05	0.87, 1.27	1.00	0.85, 1.19	0.87	0.64, 1.17	0.96	0.75, 1.24	0.99	0.89, 1.10
Use of Symbols for healthy item choice	1,320	1.76*	1.44, 2.15	1.04	0.86, 1.26	1.86*	1.32, 2.61	1.17	0.89, 1.53	1.34*	1.20, 1.51
Low-fat dairy items	1,320	1.13	0.92, 1.39	1.11	0.92, 1.34	1.51*	1.08, 2.10	1.14	0.87, 1.50	1.16*	1.04, 1.31
Cafeteria Available	1,320	0.98	0.80, 1.19	0.93	0.78, 1.11	1.30	0.91, 1.84	1.11	0.84, 1.47	1.01	0.90, 1.13
Use of Symbols for healthy item choice	1,756	0.99	0.84, 1.17	0.95	0.82, 1.11	1.08	0.82, 1.41	0.93	0.75, 1.17	0.97	0.89, 1.07
Calorie information displayed	878	0.82	0.59, 1.14	0.79	0.60, 1.05	0.70	0.42, 1.15	0.89	0.56, 1.40	0.80*	0.67, 0.96
Posters encouraging healthy choices	878	1.07	0.84, 1.37	0.92	0.74, 1.14	1.76*	1.17, 2.65	1.14	0.82, 1.59	1.08	0.94, 1.23
Low-fat dairy items	878	1.16	0.91, 1.48	0.95	0.76, 1.18	1.24	0.84, 1.83	1.32	0.95, 1.83	1.11	0.97, 1.27
Water availability	878	0.99	0.78, 1.26	1.14	0.92, 1.42	1.78*	1.18, 2.68	1.19	0.85, 1.66	1.16*	1.01, 1.33
Water fountain	878	0.78	0.58, 1.05	0.98	0.74, 1.30	1.28	0.76, 2.16	1.01	0.66, 1.54	0.94	0.79, 1.12
Water cooler	1749	0.72*	0.58, 0.89	1.05	0.84, 1.32	1.19	0.77, 1.83	1.05	0.75, 1.46	0.93	0.81, 1.06
	1756	1.05	0.89, 1.23	1.11	0.96, 1.29	1.91*	1.43, 2.54	1.38*	1.11, 1.73	1.21*	1.10, 1.32

Note: \* = significant at  $p < 0.05$ .

denoting healthy beverage and food choice displayed in cafeteria facilities and with the presence of posters encouraging healthy nutrition options – both positively associated with the likelihood of sports drink consumption. Employees reporting displayed calorie information and nutrition posters had 76% (IRR=1.76, CI=[1.17, 2.65]) and 78% (IRR=1.78, CI=[1.18, 2.68]) increased odds of consuming sports drinks, respectively, compared to those that did not report the presence of these environmental prompts. Additionally, posters encouraging healthy nutrition options were significantly associated with a 16% increased odds of total SSB consumption (IRR=1.16, CI=[1.01, 1.33]).

**Water availability**

No significant associations with self-reported consumption of SSBs were found for the availability of water fountains at the worksite. The presence of water coolers or water bottles was significantly positively associated with the likelihood of sports drink consumption (IRR=1.91, CI=[1.43, 2.54]), other SSB consumption (IRR=1.38, CI=[1.11, 1.73]), and total SSB consumption (IRR=1.21, CI=[1.10, 1.32]).

Further analysis was undertaken to compare the associations between singular and combined access to vending facilities and cafeteria facilities with SSB consumption. Tables 3–12 summarize the odds ratio estimates that resulted from the Poisson regression analyses of these two comparisons.

No significant associations with SSB consumption were found when analyzing variance in access to cafeteria and vending facilities for the individual SSB categories. However, analysis of the variance in use of cafeteria and vending facilities revealed a significant variance in the different SSB consumption variables (Appendix 1, Tables 8–12).

**Use of vending only compared to use of neither**

Employees that reported using only vending facilities had a twofold increase in the odds of total SSB consumption as compared to employees that used neither cafeteria nor vending facilities when both were present in the worksite (IRR=2.01, CI [1.37, 2.94]; Table 7). This same group was also approximately three times more likely to report soda consumption (IRR=2.92, CI=[1.54, 5.56]; Table 3).

**Use of cafeteria only compared to use of vending only**

Employees that used only cafeteria facilities had 72% decreased odds of soda consumption (IRR=0.28, CI=[0.017, 0.46]; Table 3), 76% decreased odds of sports

**Table 3** Use of vending and cafeteria facilities and the odds of consuming soda ( $N = 769$ )

Reference group -->	Use of neither vending nor cafeteria facilities		Use of vending facilities only		Use of cafeteria facilities only		Use of both vending and cafeteria facilities	
	OR	CI	OR	CI	OR	CI	OR	CI
Use of neither vending nor cafeteria facilities	—							
Use of vending facilities only	2.92*	1.54, 5.56	—					
Use of cafeteria facilities only	0.81	0.50, 1.32	0.28*	0.17, 0.46	—			
Use of both vending and cafeteria facilities	1.49	0.91, 2.46	0.51*	0.31, 0.84	1.84*	1.37, 2.48	—	

Note:

\* = significant at  $p < 0.05$ .**Table 4** Use of vending and cafeteria facilities and the odds of consuming sugar-sweetened coffee drinks ( $N = 769$ )

Reference group -->	Use of neither vending nor cafeteria facilities		Use of vending facilities only		Use of cafeteria facilities only		Use of both vending and cafeteria facilities	
	OR	CI	OR	CI	OR	CI	OR	CI
Use of neither vending nor cafeteria facilities	—							
Use of vending facilities only	1.62	0.85, 3.07	—					
Use of cafeteria facilities only	0.88	0.61, 1.29	0.55*	0.31, 0.96	—			
Use of both vending and cafeteria facilities	0.80	0.52, 1.23	0.50*	0.28, 0.89	0.91	0.68, 1.21	—	

Note

\* = significant at  $p < 0.05$ .**Table 5** Use of vending and cafeteria facilities and the odds of consuming sugar-sweetened sports drinks ( $N = 769$ )

Reference group -->	Use of neither vending nor cafeteria facilities		Use of vending facilities only		Use of cafeteria facilities only		Use of both vending and cafeteria facilities	
	OR	CI	OR	CI	OR	CI	OR	CI
Use of neither vending nor cafeteria facilities	—							
Use of vending facilities only	2.52	0.91, 6.99	—					
Use of cafeteria facilities only	0.61	0.28, 1.31	0.24*	0.11, 0.55	—			
Use of both vending and cafeteria facilities	1.27	0.59, 2.77	0.51	0.23, 1.12	2.09*	1.28, 3.41	—	

Note:

\* = significant at  $p < 0.05$ .**Table 6** Use of vending and cafeteria facilities and the odds of abstaining from other sugar-sweetened beverages (e.g., juice and Kool-aid) ( $N = 769$ )

Reference Group -->	Use of neither vending nor cafeteria facilities		Use of vending facilities only		Use of cafeteria facilities only		Use of both vending and cafeteria facilities	
	OR	CI	OR	CI	OR	CI	OR	CI
Use of neither vending nor cafeteria facilities	—							
Use of vending facilities only	1.17	0.41, 3.35	—					
Use of cafeteria facilities only	1.07	0.55, 2.08	0.92	0.38, 2.23	—			
Use of both vending and cafeteria facilities	1.01	0.50, 2.03	0.87	0.35, 2.12	0.95	0.63, 1.42	—	

Note:

\* = significant at  $p < 0.05$ .

**Table 7** Use of vending and cafeteria facilities and the odds of abstaining from all sugar-sweetened beverages ( $N = 769$ )

Reference group -->	Use of neither vending nor cafeteria facilities		Use of vending facilities only		Use of cafeteria facilities only		Use of both vending and cafeteria facilities	
	OR	CI	OR	CI	OR	CI	OR	CI
Use of neither vending nor cafeteria facilities	—		—		—		—	
Use of vending facilities only	2.01*	1.37, 2.94	—		—		—	
Use of cafeteria facilities only	0.86	0.66, 1.11	0.43*	0.31, 0.59	—		—	
Use of both vending and cafeteria facilities	1.10	0.84, 1.44	0.54*	0.40, 0.75	1.28*	1.08, 1.51	—	

Note:

\*= significant at  $p < 0.05$ .

drink consumption (IRR = 0.24, CI [0.11, 0.55]; Table 5) 45% decreased odds of coffee consumption (IRR = 0.55, CI = [0.31, 0.96]; Table 4) and 57% decreased odds of total SSB consumption (IRR = 0.43, CI = [0.31, 0.59]; Table 7), compared to employees that only used vending facilities.

#### Use of both compared to use of vending only

Employees reporting use of both vending and cafeteria facilities reported 49% decreased odds of soda consumption (IRR = 0.51, CI = [0.31, 0.84]; Table 3), 50% decreased odds of coffee consumption (IRR = 0.50, CI [0.28, 0.89]; Table 4) and 46% decreased odds of total SSB consumption (IRR = 0.54, CI [0.40, 0.75]; Table 7) when compared to employees that only used vending facilities.

#### Use of both compared to use of cafeteria only

Employees reporting use of cafeteria services in conjunction with vending services had an 84% increase in the likelihood of soda consumption (IRR = 1.84, CI = [1.37, 2.48]; Table 3) and a 28% increase in the likelihood of total SSB consumption (IRR = 1.28, CI [1.08, 1.51]; Table 7) when compared to employees that used only the cafeteria. They also had approximately double the likelihood of sports drink consumption (IRR = 2.09, CI [1.28, 3.41]; Table 5).

## Discussion

Employee use of different facilities in which SSBs may be purchased at the worksite has a diverging association with overall likelihood of consumption rates. Use of vending facilities appeared to have a facultative association in that employees reporting use of vending facilities were significantly more likely to report SSB consumption, compared to those that did not use worksite vending, when both vending and cafeteria facilities were present. Conversely, use of cafeterias had a negative association; employees

reporting the use of cafeteria facilities had decreased odds of SSB consumption compared to those that did not use the available cafeteria.

Further analysis into the use of facilities showed employees that used only cafeteria facilities were far less likely to consume soda, other SSBs, and total SSBs than employees that used only vending facilities and did not use the cafeteria, indicating that employers offering both types of facilities could target interventions at encouraging cafeteria use and focus on providing and promoting healthy options in that setting. As adding a cafeteria to a work environment may be cost- or space-prohibitive for many employers, decreasing the enabling effect of vending could come through interventions to increase the number of healthy beverage options offered (28,29), decrease the price of healthier options (30), or making water fountains more readily available in worksites that only offer vending facilities. Alternatives to adding a cafeteria could also be explored, in the form of recruiting farmer's markets, food trucks, or other outside vendors such as healthy delivery services (e.g., naturebox.com, fruitmycube.com) to visit the worksite, or worksite neighbourhood, during lunch hours.

Seemingly counterintuitive is the relationship between the presence of water coolers or water bottles and the significant increase in the likelihood of sports drink, other SSB, and total SSB consumption. Another study examining the worksite environment's influence on SSB and water consumption found similar results, showing greater number of worksite water coolers was significantly associated with increased SSB intake in obese employees (31). The study also found that worksites that were not classified as manual labour were more likely to consume healthier beverage options (31). One explanation for these findings could be the nature of manual labour, as individuals perspiring more during the workday may seek out sports drinks instead of water in an effort to replace electrolytes and remain hydrated.

The same study also found a significant, positive association between availability of vending and SSB

consumption (31). Similarly, this study found employees reporting use of only vending were more likely to consume soda than those that used neither vending nor cafeteria facilities. Additionally, use of both vending and cafeteria facilities was associated with increased odds of both soda and total SSB consumption overall, as compared to employees that reported only use of cafeteria facilities. This further indicates need for efforts to improve the worksite nutritional environment, specifically the content of beverage vending. One recent intervention in Missouri worksites showed employee support for changes in the worksite nutrition environment; however, subsequent analysis on employees' nutrition behaviours has yet to be undertaken (32).

Interestingly, messaging appears to have an undesirable influence (a positive association), if any, on self-reported SSB consumption. Regardless of setting, significant relationships were present between use of symbols to indicate healthy options and increased odds of employees' sports drink consumption and total SSB consumption. A similar association was seen in the use of posters with nutrition information in cafeterias. Others have found no association between knowledge of sports drink caloric and sugar contents and subsequent consumption as well as links between sports drink consumption and obesity (33,34). Perhaps the nutrition messaging is being misinterpreted in regard to consumption of sports drinks. The sports drink results contrast with one cafeteria-based intervention that used labelling to improve food choices, with particular concern for decreasing mean calorie per beverage consumption. Use of a stoplight-style labelling system brought about a significant reduction in liquid calorie consumption (35). This intervention also paired the messaging with a 'choice architecture' intervention, making healthier items physically more accessible than unhealthy options. Another successful messaging campaign paired nutrition labelling with group education and pricing incentives (36). This indicates current messaging efforts need to be redirected or paired with more effective intervention strategies. Qualitative research into employees' motivations for snacking and related use of vending could provide better insight as to the type and content of more effective point-of-purchase messaging, especially in worksites that do not have cafeteria facilities. A previous study into snacking behaviours in working adults has linked increased amounts of snacking energy from SSBs to poor dietary quality; however, this study does not explore motivations for consumption of SSBs in the worksite (37).

One limitation of this study is the small cell sizes because of controlling for a large number of covariates in the regression analyses. As a result, although trends were seen across groups, many relationships were not

significant. Additional limitations apply to the design of the survey questionnaire, in that SSB consumption was measured over the previous seven days and then divided to reach a daily limit. The resulting number could then include SSBs consumed outside of the worksite. Furthermore, questions concerning messaging in either the vending or cafeteria settings were general, and not specific to beverages alone. Both environment and diet were self-reported, the study is cross sectional and therefore the direction of association cannot be determined and the study cannot assign causality.

## Conclusion

Consumption of SSBs has increased dramatically in the past decades, paralleling the increase prevalence of overweight and obesity in the US. The present analyses reveal employees using vending are significantly more likely to drink SSBs while employees using a worksite cafeteria are significantly less likely to drink SSBs. Vending and cafeteria symbols and signage to help the employee identify healthy alternatives is associated with increased sports drink consumption, perhaps identifying a mixed or incomplete message associated with sugars in sports drinks.

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## Disclosure

The authors have declared that no competing interests exist.

## Author contributions

JAH and HVB conceived the study questions. HVB carried out the analyses. All authors were involved in writing the paper and had final approval of the submitted and published versions.

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## Appendix 1

**Table 8** Access to vending and cafeteria facilities and the odds of consuming soda ( $N = 1756$ )

Reference group -->	Access to neither vending nor cafeteria facilities		Access to vending facilities only		Access to cafeteria facilities only		Access to both vending and cafeteria facilities	
	OR	CI	OR	CI	OR	CI	OR	CI
Access to neither vending nor cafeteria facilities	—							
Access to vending facilities only	1.09	0.86, 1.37	—					
Access to cafeteria facilities only	1.04	0.71, 1.54	0.96	0.66 1.39	—			
Access to both vending and cafeteria facilities	1.04	0.83, 1.31	0.96	0.79, 1.16	1.00	0.69, 1.44	—	

Note:

\*= significant at  $p < 0.05$ .

**Table 9** Access to vending and cafeteria facilities and the odds of consuming sugar-sweetened coffee drinks ( $N = 1756$ )

Reference group -->	Access to neither vending nor cafeteria facilities		Access to vending facilities only		Access to cafeteria facilities only		Access to both vending and cafeteria facilities	
	OR	CI	OR	CI	OR	CI	OR	CI
Access to neither vending nor cafeteria facilities	—							
Access to vending facilities only	1.02	0.83, 1.26	—					
Access to cafeteria facilities only	0.95	0.67, 1.35	0.93	0.67, 1.30	—			
Access to both vending and cafeteria facilities	0.97	0.79, 1.19	0.95	0.80, 1.13	1.02	0.74, 1.49	—	

Note:

\*= significant at  $p < 0.05$ .

**Table 10** Access to vending and cafeteria facilities and the odds of consuming sugar-sweetened sports drinks ( $N = 1756$ )

Reference group -->	Access to neither vending nor cafeteria facilities		Access to vending facilities only		Access to cafeteria facilities only		Access to both vending and cafeteria facilities	
	OR	CI	OR	CI	OR	CI	OR	CI
Access to neither vending nor cafeteria facilities	—							
Access to vending facilities only	0.88	0.60, 1.30	—					
Access to cafeteria facilities only	1.27	0.73, 2.21	1.43	0.84, 2.45	—			
Access to both vending and cafeteria facilities	0.96	0.66, 1.38	1.08	0.78, 1.50	0.75	0.45, 1.26	—	

Note:

\*= significant at  $p < 0.05$ .

**Table 11** Access to vending and cafeteria facilities and the odds of consuming other sugar-sweetened beverages (e.g. juice and Kool-aid) (N = 1756)

Reference group -->	Access to neither vending nor cafeteria facilities		Access to vending facilities only		Access to cafeteria facilities only		Access to both vending and cafeteria facilities	
	OR	CI	OR	CI	OR	CI	OR	CI
Access to neither vending nor cafeteria facilities		—						
Access to vending facilities only	1.10	0.80, 1.49		—				
Access to cafeteria facilities only	1.24	0.77, 2.02	1.13	0.72, 1.79		—		
Access to both vending and cafeteria facilities	0.95	0.70, 1.29	0.87	0.67, 1.13	0.77	0.56, 1.39		—

Note:

\*= significant at  $p < 0.05$ .

**Table 12** Access to vending and cafeteria facilities and the odds of consuming all sugar-sweetened beverages (N = 1756)

Reference group -->	Access to neither vending nor cafeteria facilities		Access to vending facilities only		Access to cafeteria facilities only		Access to both vending and cafeteria facilities	
	OR	CI	OR	CI	OR	CI	OR	CI
Access to neither vending nor cafeteria facilities		—						
Access to vending facilities only	1.04	0.91,1.18		—				
Access to cafeteria facilities only	1.07	0.87,1.32	1.03	0.85,1.27		—		
Access to both vending and cafeteria facilities	0.98	0.87,1.12	0.95	0.85,1.06	0.92	0.75,1.12		—

Note:

\*= significant at  $p < 0.05$ .