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Knowledge of Sugar Content of Sports Drinks Is Not Associated With Sports Drink Consumption

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Abstract

Purpose.—To examine U.S. adult knowledge of the sugar content of sports drinks and whether this knowledge and other characteristics are associated with their sports drink consumption.

Design.—Nonexperimental.

Setting.—Nationally representative 2011 Summer ConsumerStyles survey data.

Subjects.—3929 U.S. adults.

Measures.—The outcome variable was sports drink consumption in the past 7 days. The main exposure variable was knowledge about sports drinks containing sugar. The covariates were sociodemographic characteristics, physical activity, and weight status.

Analysis.—Multivariable logistic regression analysis was used to estimate adjusted odds ratios (ORs) for adults consuming sports drinks 1 times/wk after controlling for other characteristics.

Results.—Approximately 22% of adults reported consuming sports drinks 1 times/wk. Most adults (71%) agreed that sports drinks contain sugar; however, this agreement was not significantly associated with adults' sports drink consumption. The odds of drinking sports drinks 1 times/wk were significantly higher among younger adults aged 18 to 64 years (OR range: 5.46–2.71), males (OR = 2.09), high-school graduates (OR = 1.52), and highly active adults (OR = 2.09).

Conclusion.—There were disparities in sports drink consumption by sociodemographic characteristics and physical activity level; however, knowledge of sports drinks' sugar content was not associated with consumption. Understanding why some population groups are higher consumers may assist in the development of education, providing those groups with a better

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Manuscript format: research; Research purpose: modeling/relationship testing; Study design: nonexperimental; Outcome measure: behavioral; Setting: state/national; Health focus: nutrition; Strategy: education; Target population age: adults; Target population circumstances: education/income level, geographic location, and race/ethnicity

understanding of sports drinks' nutritional value and health consequences of excessive sugar consumption in any form.

Keywords

Sugar; Knowledge; Sports Drinks; Sugar-Sweetened Beverage; Consumption; Prevention Research

Manuscript format

research

Research purpose

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Study design

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INTRODUCTION

Obesity is a major public health problem in the United States. During 2009–2010, 35.9% of U.S. adults aged ≥20 years were obese and 33.3% were overweight.¹ Obesity results from an imbalance of energy intake and expenditure, e.g., excessive calorie consumption and/or inadequate physical activity.² Among U.S. adults, 55% of males and 40% of females consume sugar-sweetened beverages (SSBs) on any given day.³ The *Dietary Guidelines for Americans, 2010* defines SSBs as follows: “Liquids that are sweetened with various forms of sugars that add calories. These beverages include, but are not limited to, soda, fruit ades and fruit drinks, and sports and energy drinks.”⁴ Research indicates a positive association between added sugars from beverages and increased consumption of calories.⁵ One-quarter of the population consumes at least 200 kcal of SSBs per day,³ far exceeding the American Heart Association’s recommendation of fewer than 450 kcal from SSBs per week.⁶ Increased consumption of SSBs is positively associated with weight gain and obesity,⁷ along with other adverse health consequences such as type 2 diabetes^{8,9} and cardiovascular disease.¹⁰ Although among all U.S. adults, sports and energy drink consumption comprises only 6% of total calories per day from SSBs (~10 kcal/d),¹¹ these drinks may represent a significant source of added sugar and calories among consumers and therefore potentially lead to weight gain. Specifically, energy intake from sports and energy drinks among consumers was 229 kcal/d for adults aged 20 to 34 years and 147 kcal/d for those aged ≥35 years in 2007–2008.¹²

Sports drinks, such as Gatorade or Powerade, were originally designed in the mid-1960s for athletes who needed to replenish carbohydrates and electrolytes after a vigorous workout.¹³ The popularity of these drinks has grown in recent years. From 1985 to 2005, the consumption of SSBs in the United States increased 8.5 gallons per capita per year and 40% of this increase was attributed to sports drinks and fruit-flavored drinks.¹⁴ One reason for the increase in popularity of sports drinks is that consumers may perceive them as nutritionally beneficial owing to aggressive marketing using health claims. Of the \$948 million that beverage companies spent in 2010 on advertising for sugary drinks, 15% was spent on sports drinks.¹⁵ This represents three times more (46%) than that which was spent on soda advertising,¹⁵ thus a disproportionately large amount was spent on sports drink advertising, considering adults consume more than six times the amount of soda compared to sports drinks.¹² Although two out of five sports drink advertisements promote their nutritional value,¹⁵ a typical 20-ounce bottle of nondiet sports drinks contains approximately 160 kcal, including 32 g of sugars.¹⁶ While reduced calorie varieties of sports drinks are available, nonreduced calorie varieties represented approximately 90% of sports drinks sold in 2011.¹⁵ Energy drinks (e.g., Red Bull, Monster), which contain large doses of caffeine and legal stimulants, are sometimes combined with sports drinks in research studies because the prevalence of consumption is relatively low compared to that of other SSBs such as soda or fruit drinks.

Minimal research has been conducted regarding U.S. adults’ knowledge and consumption of sports drinks. The most relevant study examined collegiate athletes’ knowledge about hydration and found they lacked knowledge about proper fluid replacement.¹⁷ Despite concerns regarding the sugar content and increasing intake of sports drinks, to our

knowledge, no studies have been conducted to date regarding knowledge of the sugar content of sports drinks. While other studies have examined consumption of sports drinks among U.S. adolescents,^{18,19} the only study examining sports drink consumption among adults combined sports drink and energy drink consumption and did not present separate results for the two types of drinks.^{12,20} No studies have specifically focused on sports drink consumption pattern and factors associated with sports drink intake among U.S. adults. Previous research suggests that SSB consumption differs according to weight status, but it is unknown if this relationship exists specifically with sports drinks.

The present study was designed to assess consumption of and knowledge about the sugar content of sports drinks among U.S. adults aged 18 years and older. It also examines whether adult sports drink consumption is associated with knowledge about the sugar content of sports drinks, sociodemographic characteristics, physical activity level, and weight status.

METHODS

Sample and Survey Administration

This cross-sectional study was conducted with retrospective data from the 2011 Summer ConsumerStyles survey, an online survey of U.S. adults (aged 18 years) designed to assess a variety of respondents' health-related attitudes, knowledge, and behaviors surrounding important public health issues. Porter Novelli, a market research firm, provided the data to the Centers for Disease Control and Prevention (CDC).

PorterNovelli sent the 2011 Spring ConsumerStyles survey to 14,598 adults, including 2959 adults with children aged 12 to 17 years, who were selected from among 50,000 panelists who participate in an online research panel called the KnowledgePanel. Panelists are randomly recruited by probability-based sampling regardless of whether or not they have landline phones or Internet access, and the panel is continually replenished with new members.²¹ A total of 8110 panelists completed the Spring ConsumerStyles survey, for a response rate of 56%. Those who completed the survey were eligible to win an in-kind prize generally worth <\$500 through a monthly sweepstakes.²¹

Our study was based on the results of the 2011 Summer ConsumerStyles survey and YouthStyles surveys, which were fielded together. The Summer ConsumerStyles survey was sent to a random sample of 5865 adults who had previously completed the Spring ConsumerStyles survey, including 1614 adults with children aged 12 to 17 years. Their children were sent the YouthStyles survey. Responses were received from 4050 adults and 840 of their 12- to 17-year-old children (youth). Participants in the Summer ConsumerStyles survey are assigned sample weights on the basis of sex, age, household income, race/ethnicity, household size, education, U.S. Census region, metro status, and prior Internet status to match U.S. Current Population Survey proportions.²¹

For our study, 121 participants were excluded because of missing data on sports drink consumption (n = 10), knowledge about sports drinks (n = 22), and physical activity level (n = 89), leaving a final sample of 3929 adults. No significant differences in age, sex, or race/ethnicity were found when we compared adults who were included in our sample with

those who were excluded. This analysis was exempt from the CDC Institutional Review Board process because personal identifiers were not included in the data.

Sports Drink Consumption

Sports drink consumption was based on the following question: “During the past 7 days, how many times did you drink a glass or bottle of sports drinks like Gatorade or Powerade?” Response choices were none, 1 to 2 times/wk, 3 to 4 times/wk, 5 to 6 times/wk, 1 time/d, or 2 times/d. For bivariable analyses, we created four mutually exclusive categories: none, 1 to 2 times/wk, 3 to 6 times/wk, and 1 times/d. For multivariable logistic regression analysis, this variable was dichotomized to none and 1 times/wk.

Knowledge About Sugar Content in Sports Drinks

To assess knowledge about sugar content in sports drinks, panelists were asked to rate their agreement with the following statement: “Most sports drinks, such as Gatorade or Powerade, contain sugar.” Response choices were “strongly disagree,” “somewhat disagree,” “neither agree nor disagree,” “somewhat agree,” and “strongly agree.” We created three mutually exclusive categories for our study: agree (strongly/somewhat agree), neither, and disagree (strongly/somewhat disagree).

Sociodemographic Characteristics, Physical Activity, and Weight Status

Sociodemographic characteristics included age (18–24, 25–44, 45–64, or 65 years), sex (male or female), race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, or non-Hispanic other), education level (not a high-school graduate, high-school, some college, or college graduate), and marital status (married/domestic partnership or not married). Not married included widowed, divorced, separated, or never married. Annual household income was categorized as <\$35,000, \$35,000 to \$74,999, \$75,000 to \$99,999, or \$100,000. Geographic regions of the country were based on U.S. Census regions and were Northeast, Midwest, South, and West.

Physical activity level was classified on the basis of the number of days and minutes per day of moderate physical activity and the number of days and minutes per day of vigorous physical activity during a usual week. We calculated total moderate-intensity-equivalent minutes for each participant as follows: weekly minutes of moderate physical activity + two times the weekly minutes of vigorous activity. The calculation was based on the 2008 Physical Activity Guidelines for Americans, which specifies that adults need either 150 minutes of moderate physical activity or 75 minutes of vigorous physical activity per week.²² We created four categories for physical activity levels from the calculated number of minutes per week spent on moderate physical activity (0, 1–149, 150–300, or >300 min/wk).²³

Weight status was based on body mass index (BMI), which was calculated with self-reported height and weight data. BMI categories were defined as normal/underweight (<25 kg/m²), overweight (25.0 to <30 kg/m²), or obese (≥30.0 kg/m²).²⁴ BMI values were excluded if they were missing or were considered to be potentially biologically implausible. The latter occurred when the values for height and weight fell below the minimum or above the

maximum levels for male and female heights and weights measured directly by the National Health and Nutrition Examination Survey. For males, potentially implausible height values were <51 or >81 inches; potentially implausible weight values were <87 or >818 pounds. For females, potentially implausible height values were <49 or >77 inches; potentially implausible weight values were <56 or >509 pounds.

Statistical Analysis

Chi-square tests were used to examine associations between sports drink consumption and knowledge about sugar content in sports drinks and sociodemographic characteristics, physical activity level, and weight status. Level of significance was $p < .05$. Multivariable logistic regression analysis was used to estimate adjusted odds ratios (ORs) and 95% confidence intervals (CIs) for these associations in one model. All statistical analyses were performed with SAS statistical software (version 9.3, SAS Institute Inc, Cary, North Carolina) and incorporated appropriate procedures to account for the sample design by using SURVEYFREQ and SURVEYLOGISTIC procedures with WEIGHT statements.

RESULTS

Characteristics of survey respondents are shown in Table 1. Approximately 22% of U.S. adults reported consuming a glass or bottle of sports drink at least once per week during the past 7 days. The bivariable analysis showed that sports drink consumption differed significantly by age, sex, marital status, and physical activity level (χ^2 tests, $p < .05$ for all variables). The proportions of adults who consumed sports drinks 1 time/wk were highest among those aged 18 to 24 years (38%), males (28%), those who were not married (24%), and those who were highly active (27%) (Table 1).

Overall, 71% of adults agreed that sports drinks contained sugar, 22% neither agreed nor disagreed with this statement, and 7% disagreed (Table 2). Knowledge about whether most sports drinks contain sugar significantly differed by age, race/ethnicity, education level, marital status, annual household income, physical activity level, and weight status (χ^2 tests, $p < .05$ for all variables). Subgroup analyses within these variables showed that the highest proportions of adults who agreed that most sports drinks contain sugar were those aged 25 to 44 years (77%), non-Hispanic whites (74%), college graduates (77%), those who were married (73%), those with annual household incomes $\geq$ \$75,000 (78%), those who were highly physically active (75%), and those whose BMI was normal/underweight (73%) (Table 2).

Results of the multivariable logistic regression analysis showed that the odds of drinking sports drinks 1 times/wk were significantly higher among adults aged 18 to 24 years (OR = 5.46, 95% CI: 3.54–8.44), 25 to 44 years (OR = 3.52, 95% CI: 2.49–4.99), and 45 to 64 years (OR = 2.71, 95% CI: 1.97–3.72) than among adults aged $\geq$ 65 years. The odds were also higher among males (OR = 2.09, 95% CI: 1.67–2.63) than females; adults with only a high-school diploma (OR = 1.52, 95% CI: 1.11–2.07) compared with those who were college graduates; and adults who were highly active (OR = 2.79, 95% CI: 1.66–4.69), active (OR = 2.33, 95% CI: 1.44–3.76), or insufficiently active (OR = 2.13, 95% CI: 1.29–3.49) compared with those who were physically inactive (Table 3). The odds of drinking

sports drinks 1 times/wk were significantly lower among those who were overweight (OR = 0.73, 95% CI: 0.56–0.95) than among those who were normal/underweight. No statistically significant association was found between knowledge about the sugar content in sports drinks and consumption of sports drinks (Table 3).

DISCUSSION

The results of our study are similar to those from a recent analysis of 2010 National Health Interview Survey data, which found that nearly one of four U.S. adults consumed sports or energy drinks at least once per week in the previous month.²⁰ Our results are also similar to previous studies on consumption of other SSBs beverages in the United States. These studies found that consumption of SSBs is more likely among young adults, males, and non-Hispanic blacks^{3,12} and that consumption of sports and energy drinks is more likely among young adults, males, non-Hispanic blacks and Hispanics, adults with higher incomes, and adults who are physically active.²⁰

Previous research has also found that the trend of increased SSB consumption in the United States has been driven mainly by the increase in consumption by children and younger adults.²⁵ One reason for this finding may be that older adults have established their beverage habits and taste preferences and are less likely to try new drinks or increase their consumption of the beverages they already consume. Our study found that younger adults were more likely to consume sports drinks than older adults even though younger adults were more aware of the sugar content of these beverages.

In our study, adults' knowledge about the sugar content of sports drinks was not associated with their sports drink consumption. This finding was not what we hypothesized, but it can be explained by at least three potential reasons. First, because of the high prevalence of advertisements in the media that tout nutritional and physical health benefits of sports drinks,¹⁵ adults may consume sports drinks because they believe these products have health benefits despite their sugar content. Second, a qualitative study among adults living in rural areas found that taste, cost, availability, and convenience emerged as themes associated with SSB consumption.²⁶ Adults may choose to consume sports drinks for those reasons even if they are aware that sports drinks contain sugar. Third, not all sports drinks contain sugar. Survey respondents in our study who stated that they knew that sports drinks could contain sugar may actually drink low-sugar or sugar-free sports drinks. However, 89% of sports drink sales are for regular sports drinks and only 11% are for light sports drinks, indicating that most sports drink consumers drink the nonlight variety.¹⁵

In our study, overweight adults were less likely to consume sports drinks at least once per week than were adults who were normal/underweight. We found no difference between those who were obese and those who were normal/underweight. We were unable to find any published studies that specifically examined sports drink consumption among adults by weight status. We did find studies that have examined the cross-sectional association between the consumption of other SSBs and weight status, and the results of these studies were mixed. For example, results from one cross-sectional study that used 2010 National Health Interview Survey data found that obese adults were less likely to consume sports

and energy drinks at least once per week than were adults who were normal/underweight, but found no significant difference in consumption between overweight adults and normal/underweight adults.²⁰

The American Academy of Pediatrics states that sports drinks have a specific, limited function for child and adolescent athletes during periods of prolonged, vigorous sports participation or other intense physical activity.²⁷ No equivalent recommendation exists for sports drink consumption for adults. In our study, adults who were highly active were the most likely to agree that sports drinks contain sugar, and they were also the most likely to consume sports drinks. Specifically, highly active adults were nearly three times more likely than physically inactive adults to consume sports drinks at least one time per week. Active and insufficiently active adults were more than twice as likely as physically inactive adults to consume sports drinks at least one time per week. One potential explanation for these findings is that physically active adults may consume sports drinks to rehydrate after physical activity. Because 40% of sports drink advertisements contain a message about their ability to improve hydration,¹⁵ physically active adults may think sports drinks are necessary or superior for rehydrating after or during physical activity, even though most people can use water to hydrate instead.

Our study found that approximately 7 of 10 U.S. adults agreed that most sports drinks contain sugar. However, differences in knowledge of sugar content were observed among members of nonwhite racial/ethnic groups and those with lower education and income levels. These findings may be attributable in part to advertising directed at minority populations or greater susceptibility to the nutritional claims presented in sports drink advertisements. For example, research has shown that commercials for un-healthy foods and beverages are advertised more on television programs watched by black persons than on programs that are intended for a more general audience.²⁸ Other research found that Spanish-language prime-time television advertisements aired significantly more advertisements containing processed food and “good for one’s health” claims than English-language programming.²⁹ In another study, black Americans reported that their food consumption choices were influenced by advertisements and insufficient nutrition education,³⁰ suggesting they may be more susceptible to health claims presented in food and beverage advertisements. Therefore, it is possible that black and Hispanic populations might be less knowledgeable about the sugar content of sports drinks because they are more exposed to advertisements for sports drinks on television and may accept advertising claims regarding their health value.

This study has certain limitations. First, its findings may not be generalizable nationally because the Summer ConsumerStyles survey is based on a convenience sample from an online panel survey with potential selection bias and a relatively low response rate. However, a previous study found that Summer ConsumerStyles data, including prevalence estimates on health knowledge and attitudes, are comparable to data collected by the Behavioral Risk Factor Surveillance System, which uses a probability sampling technique.³¹ Second, our study used a cross-sectional design, and neither causal associations nor the direction of association could be explored. Third, sports drink consumption and knowledge among adults were self-reported and therefore are subject to recall and social desirability

bias. However, past research has found that beverage consumption estimates from food-frequency questionnaires are strongly correlated with 24-hour food recalls.^{32,33} Therefore, our questionnaire can yield similar findings as a 24-hour dietary recall on beverage intake. Fourth, although low-sugar and sugar-free sports drinks (e.g., a low-calorie line of Gatorade drinks called G2) were available when the Summer ConsumerStyles surveys were conducted, the questions used for this study did not ask about these options. Thus, respondents who were aware of these options may not have known how to properly answer the question about the sugar content of sports drinks. Fifth, adults who were computer illiterate may not be able to participate in the study. Finally, because of the lack of continuity in response options, we were not able to discern how survey respondents classified themselves if their sports drink consumption was more than none but <1 time/wk.

Understanding why some demographic groups consume sports drinks more often than others may help in the development of education about overall caloric beverage consumption and sports drinks' nutritional value. Sports drink intake may decrease if adults learn that most sports drinks contain sugar and that the sugar can have adverse health effects if consumed regularly.

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SO WHAT? Implications for Health Promotion Practitioners and Researchers

What is already known on this topic?

Sports drink consumption is on the rise, but the authors found no existing literature on U.S. adult consumption of sports drinks. There is minimal literature examining knowledge about sports drink and consumption.

What does this article add?

This analysis indicates that certain groups of adults, particularly younger adults, males, those with less education, and those who were more physically active, have higher sports drink consumption than other groups of adults. This gives us a better idea of the demographic groups that consume sports drinks. We also learned that knowledge about the added sugar content of sports drinks was not significantly associated with sports drink consumption.

What are the implications for health promotion practice or research?

Understanding why some demographic groups consume sports drinks more often than others may help in the development of education about overall caloric beverage consumption. Although knowledge about sugar content in sports drink was unrelated to sports drink consumption, health education on sugar content of sports drinks may still be beneficial because excess sugar intake can have adverse health effects if consumed regularly. Sports drinks are not necessary for hydration in most cases and are also unnecessary calories.

Characteristics of Respondents by Sports Drink Consumption Among U.S. Adults (n = 3929), Summer ConsumerStyles Survey, 2011 *

Table 1

Characteristic	All Respondents	Sports Drink Consumption During the Past 7 d [†]				p §
		None [‡] (% ± SE)	1–2 Times/wk [‡] (% ± SE)	3–6 Times/wk (% ± SE)	1 Times/d (% ± SE)	
Total sample	100	78.1 ± 0.9	14.3 ± 0.8	5.9 ± 0.5	1.7 ± 0.3	
Age, y						
18–24	12.3 ± 0.8	61.7 ± 3.6	21.8 ± 3.0	12.8 ± 2.4	3.7 ± 1.5	<0.0001
25–44	25.8 ± 1.0	73.4 ± 2.0	20.4 ± 1.9	4.7 ± 0.9	1.4 ± 0.4	
45–64	36.8 ± 1.0	78.0 ± 1.3	13.3 ± 1.1	7.1 ± 0.9	1.6 ± 0.4	
65	25.1 ± 0.9	90.9 ± 1.1	5.8 ± 1.0	2.1 ± 0.5	1.2 ± 0.4	
Sex						
Male	48.8 ± 1.1	71.8 ± 1.4	18.2 ± 1.2	8.0 ± 0.8	2.1 ± 0.4	<0.0001
Female	51.2 ± 1.1	84.0 ± 1.2	10.6 ± 1.0	4.0 ± 0.7	1.4 ± 0.4	
Race/ethnicity						
White, non-Hispanic	68.6 ± 1.1	79.3 ± 1.0	14.1 ± 0.9	5.1 ± 0.5	1.5 ± 0.3	0.21
Black, non-Hispanic	11.3 ± 0.8	74.6 ± 3.2	16.0 ± 2.8	8.0 ± 1.9	1.4 ± 0.6	
Hispanic	13.3 ± 0.9	75.3 ± 3.1	13.8 ± 2.4	8.9 ± 2.1	2.0 ± 1.1	
Other, non-Hispanic	6.8 ± 0.5	76.6 ± 3.4	14.4 ± 2.8	5.2 ± 1.6	3.8 ± 1.6	
Education level						
Not a high-school graduate	12.3 ± 0.9	77.7 ± 3.4	11.7 ± 2.6	8.3 ± 2.3	2.3 ± 1.3	0.47
High-school graduate	30.6 ± 1.0	76.1 ± 1.8	15.4 ± 1.5	6.6 ± 1.0	1.8 ± 0.5	
Some college	28.6 ± 0.9	78.3 ± 1.5	14.0 ± 1.3	5.9 ± 0.8	1.8 ± 0.4	
College graduate	28.5 ± 0.9	80.0 ± 1.5	14.5 ± 1.3	4.3 ± 0.8	1.3 ± 0.3	
Marital status						
Married/domestic partnership	62.7 ± 1.0	79.4 ± 1.1	14.4 ± 1.0	5.0 ± 0.6	1.2 ± 0.3	0.01
Not married [¶]	37.3 ± 1.0	75.7 ± 1.6	14.2 ± 1.3	7.6 ± 1.0	2.6 ± 0.6	
Annual household income						
\$34,999	28.4 ± 1.0	79.2 ± 1.7	12.3 ± 1.4	6.6 ± 1.1	1.9 ± 0.5	0.34
\$35,000–\$74,999	34.8 ± 1.0	77.5 ± 1.5	14.3 ± 1.3	5.9 ± 0.8	2.3 ± 0.6	
\$75,000–\$99,999	15.5 ± 0.8	76.2 ± 2.4	16.0 ± 2.2	6.9 ± 1.3	0.9 ± 0.5	

Characteristic	Sports Drink Consumption During the Past 7 d [†]					p [§]
	All Respondents	None [‡] (% ± SE)	1–2 Times/wk [‡] (% ± SE)	3–6 Times/wk (% ± SE)	1 Times/d (% ± SE)	
\$100,000	21.3 ± 0.8	78.6 ± 1.9	15.8 ± 1.7	4.5 ± 1.0	1.1 ± 0.4	
Geographic regions						
Northeast	18.4 ± 0.8	79.5 ± 2.0	13.3 ± 2.7	5.6 ± 1.1	1.6 ± 0.5	0.71
Midwest	22.0 ± 0.8	79.4 ± 1.7	14.4 ± 2.1	4.8 ± 0.9	1.4 ± 0.5	
South	36.4 ± 1.0	76.2 ± 1.6	14.6 ± 1.9	7.3 ± 1.0	1.7 ± 0.4	
West	23.1 ± 0.9	78.2 ± 1.9	14.5 ± 2.5	5.1 ± 1.0	2.1 ± 0.7	
Moderate/vigorous physical activity during past 7 d						
Inactive	10.9 ± 0.7	89.7 ± 2.0	6.2 ± 1.6	2.4 ± 1.0	1.7 ± 0.8	<0.0001
Insufficiently active	28.1 ± 1.0	79.5 ± 1.7	13.7 ± 1.4	4.5 ± 0.8	1.7 ± 0.7	
Active	43.5 ± 1.1	76.2 ± 1.4	15.2 ± 1.2	7.1 ± 0.9	1.6 ± 0.4	
Highly active	17.6 ± 0.8	72.6 ± 2.3	18.5 ± 2.1	8.0 ± 1.5	0.9 ± 0.3	
Weight status						
Normal/underweight (BMI < 25)	33.9 ± 1.0	75.0 ± 1.7	16.6 ± 1.5	6.6 ± 1.0	1.8 ± 0.4	0.49
Overweight (BMI 25 to <30)	33.4 ± 1.0	80.5 ± 1.5	12.2 ± 1.2	5.7 ± 0.9	1.6 ± 0.4	
Obese (BMI ≥ 30)	26.4 ± 0.9	78.7 ± 1.7	14.5 ± 1.5	5.4 ± 0.9	1.4 ± 0.4	
Missing [¶]	6.3 ± 0.6	78.9 ± 4.0	12.4 ± 2.9	5.6 ± 2.4	3.1 ± 2.1	
Most sports drinks contain sugar						
Disagree	6.7 ± 0.5	73.7 ± 3.7	16.5 ± 3.1	8.3 ± 2.3	1.5 ± 0.7	0.12
Neutral	22.4 ± 0.9	80.9 ± 2.0	10.4 ± 1.5	6.8 ± 1.4	1.9 ± 0.7	
Agree	70.5 ± 1.0	77.6 ± 1.1	15.3 ± 0.9	5.4 ± 0.6	1.7 ± 0.3	

* Represents unweighted sample size and weighted percentage. Weighted percentage may not add up to 100% because of rounding. SE indicates standard error; and BMI, body mass index.

[†] Sports drink consumption was based on the following question: "During the past 7 days, how many times did you drink a glass or bottle of sports drinks like Gatorade or Powerade?"

[‡] Because of the lack of continuity in response options, we were not able to discern how survey respondents classified themselves if their sports drink consumption was more than "none" but <1 time/wk.

[§] Chi-square tests were used for each variable to examine differences across categories.

[¶] Not married includes widowed, divorced, separated, or never married.

^{¶¶} Includes those with missing or potentially implausible BMI values.

Characteristics of Respondents by Knowledge About Sports Drinks Among U.S. Adults (n = 3929), Summer ConsumerStyles Survey, 2011 *

Table 2

Characteristic	Most Sports Drinks Contain Sugar [†]			p [‡]
	Disagree (% ± SE)	Neither (% ± SE)	Agree (% ± SE)	
Total sample	6.7 ± 0.5	22.4 ± 0.9	70.5 ± 1.0	
Age, y				
18–24	8.0 ± 2.0	20.1 ± 3.0	71.9 ± 3.3	<0.0001
25–44	5.2 ± 0.9	17.4 ± 1.8	77.4 ± 1.9	
45–64	7.4 ± 0.9	22.2 ± 1.5	70.4 ± 1.6	
65	6.2 ± 0.9	28.1 ± 1.9	65.7 ± 1.9	
Sex				
Male	6.1 ± 0.7	23.4 ± 1.3	70.4 ± 1.4	0.34
Female	7.0 ± 0.8	21.0 ± 1.3	72.0 ± 1.4	
Race/ethnicity				
White, non-Hispanic	5.9 ± 0.6	20.1 ± 1.0	74.0 ± 1.1	<0.0001
Black, non-Hispanic	9.2 ± 1.8	27.9 ± 3.5	62.9 ± 3.6	
Hispanic	5.4 ± 1.6	28.1 ± 3.3	66.5 ± 3.4	
Other, non-Hispanic	11.4 ± 2.6	22.5 ± 3.3	66.1 ± 3.8	
Education level				
Not a high-school graduate	7.9 ± 2.3	34.6 ± 4.0	57.5 ± 4.1	<0.0001
High-school graduate	6.7 ± 1.0	27.4 ± 1.8	66.0 ± 1.9	
Some college	7.0 ± 0.9	16.4 ± 1.3	76.6 ± 1.5	
College graduate	5.6 ± 0.8	17.0 ± 1.3	77.4 ± 1.5	
Marital status				
Married/domestic partnership	6.7 ± 0.7	20.3 ± 1.1	73.0 ± 1.2	0.03
Not married [§]	6.4 ± 0.9	25.3 ± 1.7	68.2 ± 1.8	
Annual household income				
\$34,999	9.3 ± 1.3	28.6 ± 2.0	62.0 ± 2.1	<0.0001
\$35,000–\$74,999	5.3 ± 0.8	23.1 ± 1.6	71.5 ± 1.7	
\$75,000–\$99,999	6.6 ± 1.4	15.3 ± 2.0	78.0 ± 2.3	
\$100,000	4.9 ± 0.9	17.1 ± 1.7	78.0 ± 1.8	

Characteristic	Most Sports Drinks Contain Sugar [‡]			<i>p</i> [‡]
	Disagree (% ± SE)	Neither (% ± SE)	Agree (% ± SE)	
Geographic regions				
Northeast	6.7 ± 1.2	24.8 ± 2.2	68.5 ± 2.3	0.44
Midwest	6.9 ± 1.2	22.1 ± 1.8	70.9 ± 2.0	
South	7.1 ± 1.0	22.5 ± 1.6	70.3 ± 1.8	
West	5.3 ± 0.9	19.6 ± 1.9	75.0 ± 2.0	
Moderate/vigorous physical activity during past 7 d				
Inactive	7.5 ± 1.8	25.4 ± 2.9	67.0 ± 3.2	0.02
Insufficiently active	6.1 ± 0.9	26.7 ± 1.9	67.2 ± 2.0	
Active	6.8 ± 0.9	20.0 ± 1.3	73.3 ± 1.5	
Highly active	6.3 ± 1.2	18.6 ± 2.0	75.1 ± 2.2	
Weight status				
Normal/underweight (BMI < 25)	5.5 ± 0.8	21.2 ± 1.5	73.3 ± 1.6	0.047
Overweight (BMI 25 to <30)	5.6 ± 0.9	22.4 ± 1.7	72.0 ± 1.8	
Obese (BMI ≥ 30)	8.0 ± 1.1	21.9 ± 1.8	70.1 ± 1.9	
Missing	11.4 ± 3.1	28.0 ± 4.3	60.6 ± 4.7	

* Represents unweighted sample size and weighted percentage. Weighted percentage may not add up to 100% because of rounding. SE indicates standard error; and BMI, body mass index.

[‡] To assess knowledge about sports drinks, participants were asked to rate their agreement with the following statement: “Most sports drinks, such as Gatorade or Powerade, contain sugar.”

[‡] Chi-square tests were used for each variable to examine differences across categories.

[§] Not married includes widowed, divorced, separated, or never married.

^{||} Includes those with missing or potentially implausible BMI values.

Relationship Between Characteristics of Respondents and Sports Drink Consumption Among U.S. Adults (n = 3929), Summer ConsumerStyles Survey, 2011

Table 3

Characteristic	Sports Drink Consumption ^{*,†}		
	Adjusted Odds Ratio	1 Times/wk	95% CI
Total sample			
Age, y			
18–24	5.46 [‡]	3.54, 8.44	
25–44	3.52 [‡]	2.49, 4.99	
45–64	2.71 [‡]	1.97, 3.72	
65	Reference		
Sex			
Male	2.09 [‡]	1.67, 2.63	
Female	Reference		
Race/ethnicity			
White, non-Hispanic	Reference		
Black, non-Hispanic	1.27	0.87, 1.86	
Hispanic	0.97	0.67, 1.41	
Other, non-Hispanic	1.05	0.69, 1.62	
Education level			
Not a high-school graduate	1.42	0.86, 2.32	
High-school graduate	1.52 [‡]	1.11, 2.07	
Some college	1.07	0.81, 1.42	
College graduate	Reference		
Marital status			
Married/domestic partnership	Reference		
Not married [§]	1.06	0.82, 1.37	
Annual household income			
\$34,999	0.92	0.64, 1.33	
\$35,000–\$74,999	0.98	0.71, 1.36	

Characteristic	Sports Drink Consumption	
	Adjusted Odds Ratio	1 Times/wk ^{*,†} 95% CI
\$75,000–\$99,999	1.12	0.78, 1.60
\$100,000	Reference	
Geographic regions		
Northeast	0.84	0.61, 1.14
Midwest	0.83	0.62, 1.10
South	Reference	
West	0.90	0.66, 1.21
Moderate/vigorous physical activity during past 7 d		
Inactive	Reference	
Insufficiently active	2.13 [‡]	1.29, 3.49
Active	2.33 [‡]	1.44, 3.76
Highly active	2.79 [‡]	1.66, 4.69
Weight status		
Normal/underweight (BMI < 25)	Reference	
Overweight (BMI 25 to <30)	0.73 [‡]	0.56, 0.95
Obese (BMI ≥ 30)	0.90	0.67, 1.20
Missing [¶]	0.85	0.50, 1.43
Most sports drinks contain sugar		
Disagree	Reference	
Neutral	0.66	0.40, 1.06
Agree	0.78	0.51, 1.21

* Sports drink consumption was based on the following question: “During the past 7 days, how many times did you drink a glass or bottle of sports drinks like Gatorade or Powerade?” CI indicates confidence interval; and BMI, body mass index.

[†] Reference category included adults who did not drink sports drink during the past 7 days. The multivariable logistic regression model included all characteristics in one model.

[‡] Significant findings based on the 95% CI (ie, the CI does not include 1).

[§] Not married includes widowed, divorced, separated, or never married.

[¶] Includes those with missing or potentially implausible BMI values.