



The Association between Sugar-Sweetened Beverages Consumption & Sleep Outcomes

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INTRODUCTION

Consumption of sugar-sweetened beverages (SSBs) such as sodas, fruit-flavored drinks, and sport drinks is a major contributor to health problems⁵. Other than physical health issues, lifestyle-related behaviors, such as poor diet habits, smoking, physical inactivity and inadequate sleep, could also be affected. To maintain good health, sleep is essential. Sleeps plays a key role in helping students to fix and consolidate memories, plus to prevent decay of memories. It is critical to obtain seven to eight hours of sleep per night for adults to maintain optimum health and wellbeing. A cross-sectional study stated that higher consumption of energy drinks, caffeinated beverages, and other stimulants have a strong association with poor sleeping patterns and qualities¹. Also, females tend to have poorer sleep quality compared to males¹. Studies have previously looked into sugar sweetened beverage consumption and sleep duration, however, there is a lack of studies that investigate whether the consumption of sugar sweetened beverages would result in trouble falling asleep^{1,2,3,5}. But there is lacking of studies to investigate whether the consumption of sugar-sweetened beverages would result in trouble falling asleep.

OBJECTIVES

1. To determine the relationship between sugar-sweetened beverages consumption and difficulty falling asleep and snore or stop breathing during sleep.
2. To determine the relationship between sugar-sweetened beverages consumption and sleep quality with males and females.

HYPOTHESIS

1. As the difficulty of a person falling asleep increases, the consumption of sugar-sweetened beverages increases.
2. Females tend to have harder time falling asleep than males after consuming sugar-sweetened beverages.
3. As the consumption of sugar-sweetened beverages increases, people tend to snore and stop breathing during sleep.

METHODS

All data was obtained from CDC Add Health Public Use File: Wave-IV In-Home Interview with participants aged between 24 and 32.

- Variables Used:
 - Gender (Male/Female) → determine whether it is a moderator
 - Numbers of sugar-sweetened beverages consumed in the past week (continuous) → Also dichotomize to Less than/ equal to 21 drinks or More than 21 drinks
 - Frequency of trouble falling asleep (Interval)
 - Snore or stop breathing during sleep (Yes/No)
- Statistical Analysis:

Data was analyzed using IBM Statistical Package for the Social Science [SPSS Statistics] version 24.

- Results were considered statistically significant if the p-value <0.5.
- Sample characteristics were summarized with descriptive statistics and reported as %(n).
- One-way ANOVA was summarized as mean and SD.
- Chi-square was summarized with significant and odds ratio.

SAMPLE CHARACTERISTICS

Table 1. Sample Characteristics		
	n	%
Gender		
Male	3147	48.4
Female	3356	56.6
Sugar Sweetened Beverages drank in the past week		
≤21 drinks	4401	86.1
>21 drinks	713	13.9
Trouble falling asleep in the past 4 weeks		
Never	2400	46.9
<1times/wk	950	18.6
1 to 2 times/wk	911	17.8
3 to 4 times/wk	395	7.7
>5 times/wk	411	8
Snore and stop breathing during sleep		
Yes	2595	50.8
No	2458	48.1
Sugar-Sweetened Beverages drank in the past week (Cont.)		
	Mean	SD
	14.22	49.7

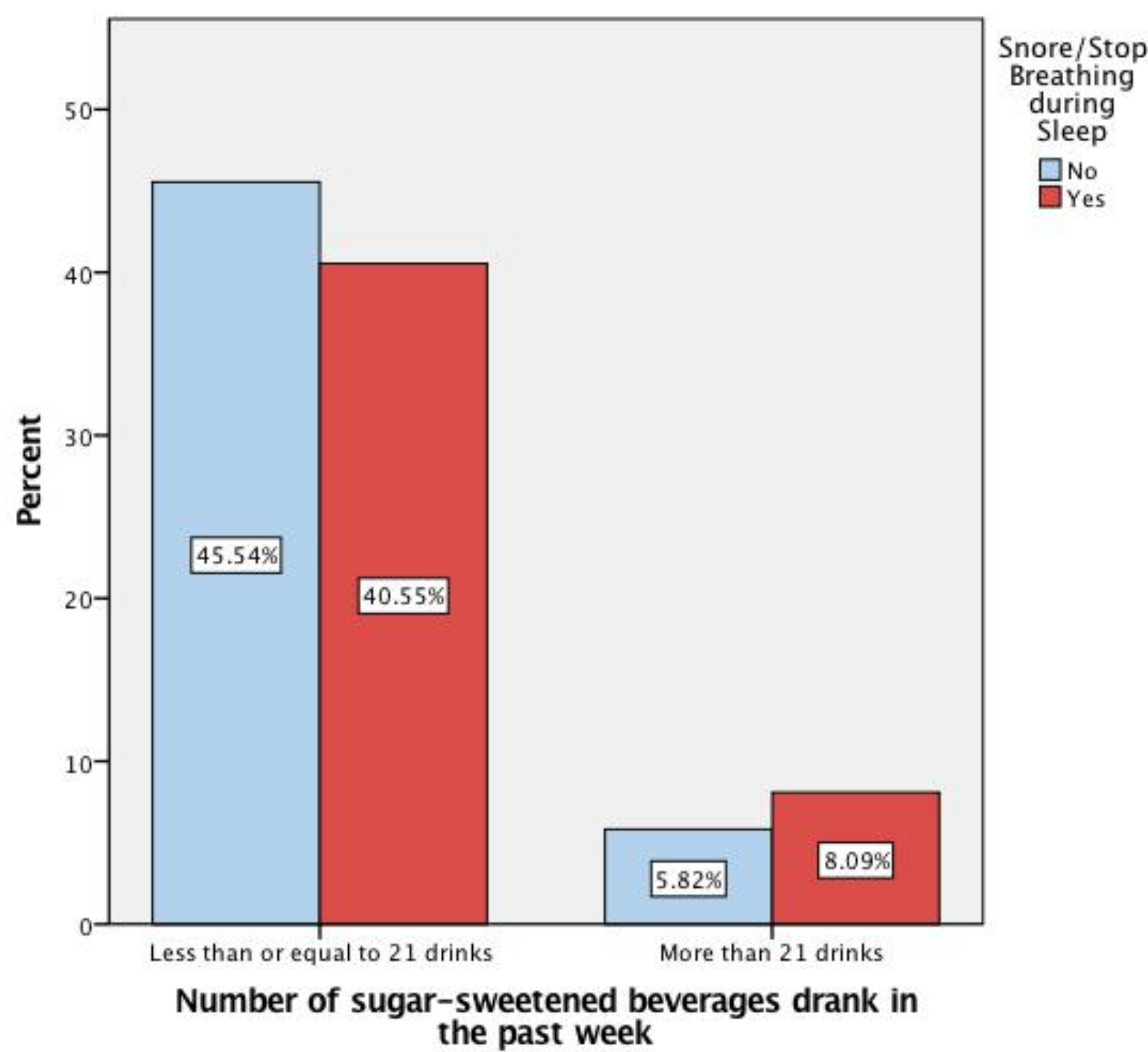


Figure 2. The relationship between numbers of sugar-sweetened beverages drank in the past week and snore or stop breathing during sleep.

- Chi-square was measured that result showed to have significant difference with a p-value <0.01 and odds ratio of 1.562.

RESULTS

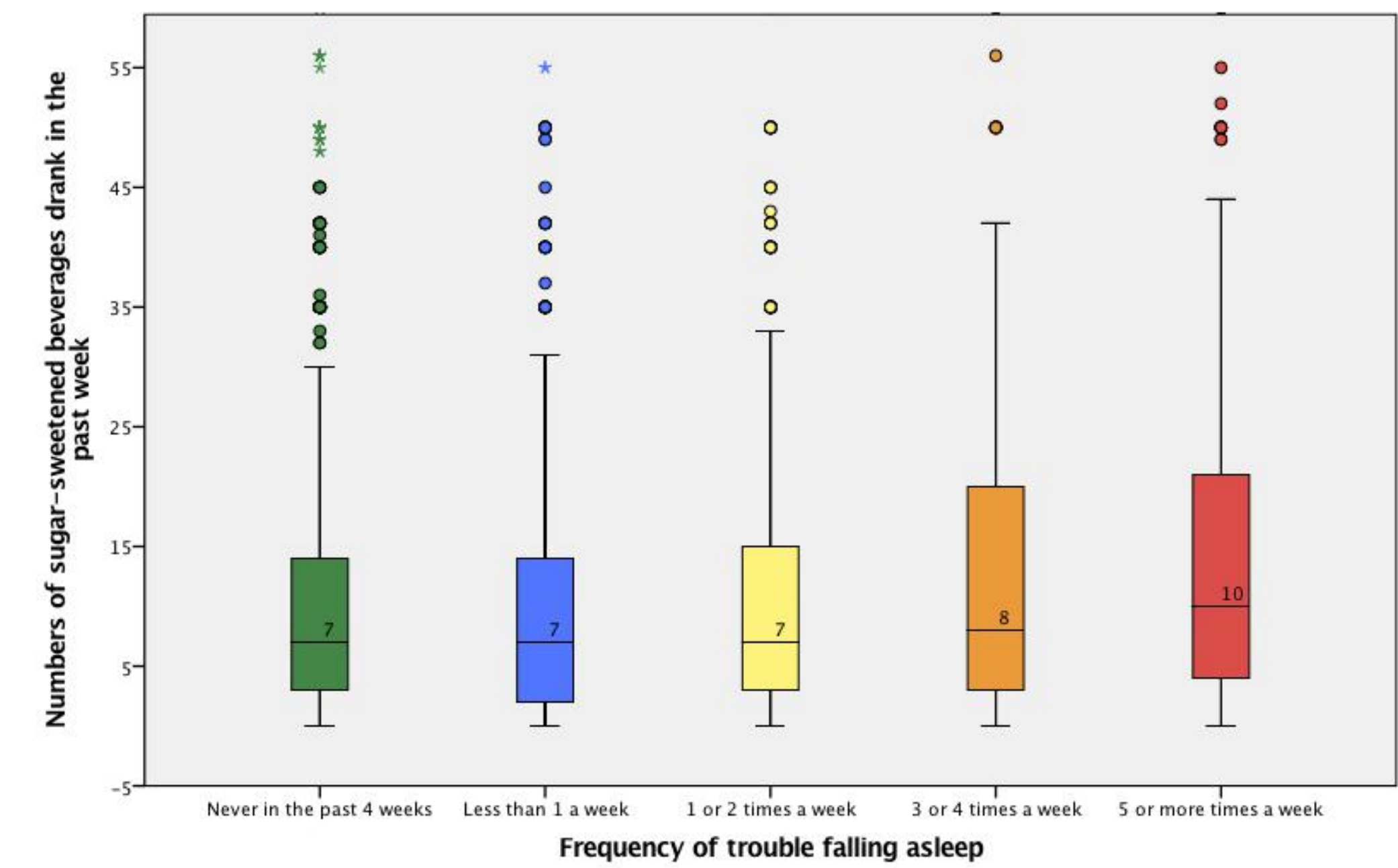


Figure 1. The association between frequency of trouble falling asleep and numbers of sugar-sweetened beverages consumed in the past week.

- One-way ANOVA was conducted with a p-value <0.001 showed significant.

Table 2. Frequency of trouble falling asleep regarding sugar-sweetened beverages consumption by Gender		
	Male Mean (SD)	Female Mean (SD)
Frequency of trouble falling asleep in the past month		
Never	12.85(12.64) ^a	9.01 (10.0) ^a
<1 time a week	11.39 (11.46) ^a	8.89 (10.22) ^a
1 or 2 times a week	12.7 (12.70) ^a	10.36 (11.04) ^a
3 or 4 times a week	14.94 (12.78) ^a	11.73 (13.02) ^b
>5 times a week	17.22(15.35) ^b	13.35 (13.75) ^c
P-value	<0.001*	<0.001*
*p-value: <0.05		
a,b,c: Frequency of trouble falling asleep means for given variable sharing the same superscript are not significantly different from each other		

Table 2. The association between sugar-sweetened beverages consumption and frequency of difficulties falling asleep among gender.

- One-way ANOVA test showed that at least one of the groups is significantly different (F=14.61, p<0.001).

CONCLUSION & IMPLICATIONS

- Figure 1:** There was a significant effect of frequency of trouble falling asleep and numbers of sugar-sweetened beverages consumed in the past week, F(4,5015)=14.6. Tuckey's post-hoc tests revealed that having more than 5 times a week of trouble falling asleep resulted in significantly higher frequency than never (p<0.01), less than once a week (p<0.01), or 1 to 2 times in a week (p<0.01).
- Figure 2:** There is statistically significant association between numbers of sugar-sweetened beverages consumption in the past week and snore and stop breathing during sleep (Chi-square=29.72, p<0.01). Participants who drank less than or equal to 21 drinks in the past week tend to report to snore and stop breathing during sleep.
- Table 2:** Gender showed not to be a significant moderator to the association because both the original and stratified models are highly significant (p-value <0.01). After performing a Post Hoc test, it showed a significant between those who have never trouble falling asleep (Male: mean=12.85; Females: mean= 9.01) and those who have trouble falling asleep more than 5 times a week (Male: mean=17.22; Female: mean=13.35).

Sleep in the key component to maintain a regular lifestyle-related behavior. As from the results, as the increase in consumption in sugar-sweetened beverages, the frequency of trouble falling asleep increases. People who drank more sugar-sweetened beverages also tend to report snore and stop breathing during sleep. When sleep quality decreases, people would not be able to stay alert with daily tasks. Thus, future research should focus on the timing when the sugar-sweetened beverages are consumed and how they would effect on people's quality of sleep.

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