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RESEARCH

Life Satisfaction and Sugar-Sweetened Beverage Consumption Among US Adults

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Abstract

Psychosocial factors such as life satisfaction may influence health-promoting and health-harming behaviors. While several studies explored socioeconomic, socio-ecological, and socio-cognitive determinants of sugar-sweetened beverage (SSB) consumption, a direct link between SSB and life satisfaction, especially among adults, remains an area less visited. This paper aimed to investigate whether life satisfaction was associated with SSB consumption among U.S. adults in a nationally representative sample. Data on 25,532 adults were from the 2022 National Health Interview Survey that included responses on life satisfaction levels and frequency of SSB consumption. We estimated a two-part model entailing a binary choice model in the first part and a generalized linear model with a log link function and Poisson distribution in the second part to assess the monthly SSB consumption frequency. Compared to adults with low life satisfaction, monthly average SSB consumption was 3.58 (95% CI: -5.54, -1.63) units lower among adults with high life satisfaction after accounting for demographic, socioeconomic, and health-related characteristics. The relationship was particularly evident among adults from higher socioeconomic status groups, manifested by income and educational attainment. These findings indicate opportunities to explore the potential role of psychosocial factors as complements to traditional measures (e.g., tax policies or awareness campaigns) for curbing SSB consumption at the population level.

Keywords Sugar-sweetened beverages · Life satisfaction · Health behaviors · Socioeconomic status · United states.

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1 Introduction

Sugar sweetened beverage (SSB) consumption remains a significant public health concern, closely tied to risk of chronic conditions such as obesity, type 2 diabetes, metabolic syndrome, cardiovascular diseases, and certain cancers (Malik et al., 2010; Tran et al., 2023). Evidence also suggests that higher daily SSB consumption is associated with all-cause mortality (Zhang et al., 2021). Despite concerted public health efforts, SSB consumption remains prevalent in the United States, with over 60% of adults reporting daily consumption of these beverages (Chevinsky et al., 2021). Traditional soda consumption has declined in recent years, yet the intake of nontraditional SSBs—such as sports drinks, energy drinks, and fruit-flavored drinks—has increased, particularly among populations with lower socioeconomic status (SES) and lower educational attainment (Dai et al., 2021). The higher odds of heavy SSB consumption in these populations further exacerbates health disparities (Han & Powell, 2013). Moreover, minority groups, including African Americans and Hispanics, continue to show disproportionately higher rates of SSB consumption, raising concerns about the influence of structural and psychosocial factors on dietary behaviors.

Several studies have explored various socio-economic, socio-ecological, and socio-cognitive determinants of SSB consumption (Purohit et al., 2023; Mazarello et al., 2015; Calabro et al., 2023). The link between psychosocial factors and SSB consumption, especially among adults, remained less visited. Psychosocial factors, such as perceived social support and loneliness, have emerged as potential determinants of health behaviors, including dietary choices. Studies have found that higher levels of perceived loneliness are associated with increased SSB consumption, while a strong support network and sense of togetherness at work are linked to lower SSB intake (Bélanger-Gravel et al., 2022; Henriksen et al., 2014). Peer influence also plays a critical role, particularly among adolescents, where social norms and pressures may contribute to higher SSB consumption. Despite these findings, there remains a gap in the literature concerning the role of life satisfaction, a key determinant of psychosocial health (Kim et al., 2021), in shaping SSB consumption behaviors among adults.

Life satisfaction, which reflects an individual's subjective assessment of their overall quality of life, has been associated with numerous health outcomes, ranging from mental health to the adoption of health-promoting behaviors (Diener, 2000). While previous studies have explored the relationship between life satisfaction and risky behaviors such as tobacco and alcohol use (Strine et al., 2008), limited attention has been given to the association between life satisfaction and dietary behaviors like SSB consumption. Individuals with lower life satisfaction may engage in health-harming behaviors, including substance use, as a means of coping with stress, loneliness, or other psychosocial stressors (Lew et al., 2019). Furthermore, several studies have found that lower educational attainment is linked to greater SSB consumption, underscoring the complex interplay between socioeconomic and psychosocial factors in shaping dietary behaviors (Qobadi & Payton, 2017).

Given the growing body of evidence highlighting the role of psychosocial factors in influencing health behaviors, this study seeks to examine the relationship between life satisfaction and SSB consumption among U.S. adults. Utilizing

nationally representative data of civilian noninstitutionalized U.S. population, this study explores whether SSB consumption among adults with high life satisfaction are different than that of their counterparts with low life satisfaction after accounting for various demographic, socioeconomic, and health-related factors. We further assess the relationship between life satisfaction and SSB consumption across SES groups manifested by family income and educational attainment. By exploring the potential psychosocial drivers of SSB consumption, the findings from this research may facilitate policy discussion about public health interventions aimed at reducing SSB consumption and addressing the broader determinants of health disparities in the U.S. population.

2 Methods

2.1 Data

This cross-sectional study used data on 25,532 adults (aged 18 + years) from the Public Use Sample Adult File of the 2022 National Health Interview Survey (NHIS). NHIS is a household interview survey providing information regarding various health outcomes of the US civilian non-institutionalized population. The sampling plan entailed geographically clustered sampling techniques based on the 2010 decennial census. NHIS interviews were conducted both in person and via phone over a 12-month period from January to December. The response rate of sample adult interviews was 47.7%.

The 2022 NHIS includes a "Diet and Nutrition" section that contains information about SSB consumption. The survey also includes a section about "Life Satisfaction", containing information about the respondent's subjective well-being. Our sample comprised of respondents for whom both SSB consumption and life satisfaction information, along with sociodemographic attributes, were available. Observations were excluded if outcome, exposure, or covariates were missing (2,119 out of 27,651). A flow diagram of analytical sample is presented in the supplemental appendix Figure S1.

We used publicly available anonymized data that met the National Institutes of Health (NIH) definition of exempt human subject research (Exemption 4). Ethical approval for this study, therefore, was not required.

3 Measures

The NHIS respondents were asked in general how satisfied they were with their lives. The response categories were as follows: (i) very satisfied, (ii) satisfied, (iii) dissatisfied, and (iv) very dissatisfied. Following previous literature, "very satisfied" was considered as high life satisfaction, and the rest as low life satisfaction (Wadsworth & Pendergast, 2014). Our exposure variable thus is a binary variable indicating high life satisfaction.

The 2022 NHIS reports consumption frequencies of regular soda or pop that contains sugar, coffee or tea with added sugar or honey, sports and energy drinks, and sweetened fruit drinks during past 30 days prior to the survey. We aggregated monthly consumption frequencies of these beverages to obtain monthly SSB consumption frequency. Our outcome measure thus was a continuous variable capturing the monthly SSB consumption frequency. We also separately examined consumption frequency of each type of SSB (i.e., soda, coffee or tea, etc.).

3.1 Statistical Analysis

Since SSB consumption frequency is 0 for those who did not drink SSBs, a two-part model was estimated to examine the association between high life satisfaction and SSB consumption. The first part entailed a binary choice model of logistic specification that fitted the probability of observing a positive SSB consumption frequency. In the second part, a generalized linear model (GLM) specification with a log link function and Poisson distribution was estimated to fit the positive frequencies, conditional on observing a positive frequency in the first part.

Models were estimated for all SSBs (that is aggregate of soda, coffee/tea, sports/energy drinks, and fruit drinks) as well as for each SSB. All models were adjusted for demographic attributes including age, sex, and race and ethnicity; socioeconomic characteristics including educational attainment, family income, employment status, and urban/rural residence (metropolitan area); family characteristics including marital status, number of adults in the family, and number of children in the family; and cardiometabolic conditions including hypertension, high cholesterol, diabetes, pre-diabetes, and obesity. These covariates were included in the model as proxies for household environment and dietary behaviors that might influence SSB consumption of an individual. A complete list of categories of these covariates is presented in Table 1. To account for regional and seasonal differences in SSB consumption, geographic region fixed effects and interview month fixed effects were also controlled for.

As sensitivity analyses, we estimated a GLM model with gamma family and log link function, which is considered as another statistical technique to account for the right-skewed nature of consumption frequency data (Pulvera et al., 2022). Additionally, we top truncated SSB consumption frequency at 75th, 90th, 95th, and 99th percentile and estimated to models with the truncated measures. This was to mitigate any influence of potential outliers in consumption frequency. The sensitivity analyses results for truncated frequencies are reported in the supplemental appendix.

As robustness analyses, we examined the relationship across different SES groups. Sub-group analyses were performed by education and income. Income sub-groups were – (i) low income: <200% of the Federal Poverty Line (FPL), (ii) middle income: 200 to < 400% of FPL, and (iii) higher income: ≥400% of FPL. Distribution of income sub-groups is illustrated in supplemental appendix Figure S2. Education sub-groups were – (i) high school or less, (ii) some college or associate degree, and (iii) college graduate (bachelor's or post-graduate degree).

The first-part results denoted the external margin of the relationship (i.e., whether consumed SSB). The second-part results denoted the internal margin of the relationship (i.e., how much was consumed). In results table, first-part results are presented

Table 1 Summary statistics by levels of life satisfaction

	Count			Weighted Percentage		
	All $N=25,532$	Low Life satisfaction $N=14,043$	High Life satisfaction $N=11,489$	All $N=25,532$	Low Life satisfaction $N=14,043$	High Life satisfaction $N=11,489$
Sex						
Male	11,757	6,596	5,161	49.21	49.66	48.66
Female	13,775	7,447	6,328	50.79	50.34	51.34
Age						
18–24	5,298	3,027	2,271	28.79	29.99	27.33
25–49	5,684	3,106	2,578	24.33	23.91	24.83
50–64	6,397	3,587	2,810	24.71	24.81	24.60
65+	8,153	4,323	3,830	22.17	21.29	23.24
Race & Ethnicity						
White	17,029	8,984	8,045	62.87	59.79	66.61
Black	1,548	941	607	6.07	6.58	5.46
Asian	3,580	2,074	1,506	16.94	17.89	15.80
Hispanic	638	392	246	2.82	3.17	2.39
Other						
Metro area	7,582	4,293	3,289	30.63	31.34	29.77
Large central metro	5,952	3,134	2,818	25.20	24.51	26.05
Large fringe metro	7,958	4,336	3,622	30.13	29.75	30.60
Medium & small metro	4,040	2,280	1,760	14.03	14.40	13.58
Nonmetropolitan						
Region	4,170	2,324	1,846	17.34	17.60	17.01
Northeast	5,621	3,065	2,556	20.89	20.66	21.18
Midwest	9,361	5,075	4,286	37.95	37.18	38.88
South	6,380	3,579	2,801	23.82	24.56	22.92
West	11,757	6,596	5,161	49.21	49.66	48.66
Education						
12th grade or less	2,117	1,415	702	10.40	12.42	7.95
High school diploma	6,420	3,913	2,507	26.99	29.58	23.84
Some college	3,804	2,266	1,538	16.28	17.66	14.61
Associate degree	3,394	1,869	1,525	13.33	12.94	13.80
Bachelor's degree	5,922	2,913	3,009	20.45	17.94	23.49
Post-graduate degree	3,875	1,667	2,208	12.55	9.46	16.31
Income						
<100% of FPL	2,478	1,785	693	9.35	12.01	6.12
100 to <149% of FPL	2,271	1,562	709	9.19	11.40	6.51
150 to <200% of FPL	2,160	1,407	753	8.41	10.02	6.45
200 to <249% of FPL	2,206	1,384	822	8.77	10.00	7.27
250 to <300% of FPL	1,746	1,030	716	7.28	7.84	6.60
300 to <349% of FPL	1,684	951	733	6.40	6.47	6.32
350 to <400% of FPL	1,726	947	779	6.66	6.61	6.72
400 to <449% of FPL	1,398	723	675	5.79	5.52	6.11
450 to <400% of FPL	1,462	720	742	5.59	5.14	6.14
≥500% of FPL	8,401	3,534	4,867	32.57	24.98	41.77

Table 1 (continued)

	Count			Weighted Percentage		
Marital status						
Never married	5,454	3,638	1,816	23.59	28.51	17.62
Married	11,882	5,279	6,603	51.72	42.93	62.40
Widowed/divorced/ separated	6,440	4,087	2,353	15.63	18.79	11.80
Other	1,756	1,039	717	9.06	9.78	8.18
No. of adults in family						
1	9,523	6,111	3,412	21.15	25.22	16.21
2	12,522	5,928	6,594	52.04	46.36	58.95
3+	3,487	2,004	1,483	26.81	28.42	24.84
No. of children in family						
0	18,969	10,694	8,275	67.64	69.83	64.98
1	2,731	1,460	1,271	13.76	13.25	14.38
2	2,422	1,221	1,201	11.55	10.66	12.63
3+	1,410	668	742	7.05	6.26	8.00
Employment status						
Employed	14,887	7,906	6,981	63.83	61.61	66.53
Cardiometabolic conditions						
Hypertension	9,404	5,580	3,824	32.04	34.73	28.76
High cholesterol	8,155	4,721	3,434	27.54	29.20	25.52
Diabetes	3,171	2,045	1,126	11.16	13.13	8.78
Pre-diabetes	4,284	2,686	1,598	15.18	17.34	12.54
Obesity	8,341	5,013	3,328	33.30	36.14	29.84

Note: Percentages were obtained using complex survey weights entailing the sampling frame of the NHIS. Percentages of respective characteristics add to 100 across rows for categorical variables. Percentages denote prevalence rates for binary variables

as odds ratios (i.e., exponentiated coefficients) from logistic regressions, and second-part results are presented as non-exponentiated coefficients from GLM regressions. An odds ratio of less than 1 indicates lower probability of SSB consumption for adults with high life satisfaction. The sign of the GLM coefficient indicates whether expected consumption frequency was lower (if negative) or higher (if positive) for adults with high life satisfaction. The value of the GLM coefficient (multiplied by 100) indicates the percentage difference (approximately) in expected consumption frequency between adults with low- and high- life satisfaction. Note that for gamma GLM, exponentiated coefficients are reported, which indicate lower (if < 1) or higher (if > 1) expected consumption frequency for high life satisfaction.

We estimated and reported average marginal effects (AMEs) of the combined logit and GLM parts, and of gamma GLM specification. Furthermore, predictive margins of SSB consumption for life satisfaction categories (i.e., low and high) were separately estimated for first- (i.e., logistic) and second- (i.e., GLM) parts and are presented in the supplemental appendix. For the first-part, predictive margins show the predicted probability of SSB consumption and for the second-part, predictive margins show the predicted means of SSB consumption frequency. Estimates were obtained using the survey weights and complex sample design of the NHIS. All analyses were performed using Stata 18.0 software.

4 Results

Around 45.2% (n = 11,489) of adults in the study sample reported high life satisfaction. A detailed overview of the pertinent sociodemographic characteristics of the study population by high and low life satisfaction categories is presented in Table 1. Distribution of sex and age across high and low life satisfaction categories was quite similar. While the share of whites was higher among adults with high life satisfaction compared to that in adults with low life satisfaction (66.6% vs. 59.8%), overall distribution of race and ethnicity was not qualitatively different. Distributions of residence in metropolitan areas and in U.S. Census Bureau regions were quite similar across high- and low- life satisfaction groups.

SES conditions, on the other hand, varied disproportionately between high- and low- life satisfaction groups. While more adults with low life satisfaction had educational attainment of high school or less, the percentage of adults with a college degree was higher among adults who reported high life satisfaction. Similarly, the percentage of adults with lower family income was higher in the low life satisfaction group, and the percentage of adults with higher income was higher in the high life satisfaction group. These patterns indicated the need for exploring the relationship between SSB consumption and life satisfaction within SES groups.

Around 82.8% (n = 20,344) of adults reported consuming any SSB. Among those with low life satisfaction, 85.0% reported consuming SSB, whereas the rate was 80.1% among those with high life satisfaction. The median monthly frequency of SSB consumption was 30 units. While the median was 30 units among adults with low life satisfaction, it was 21 units among adults with high life satisfaction. Figure 1

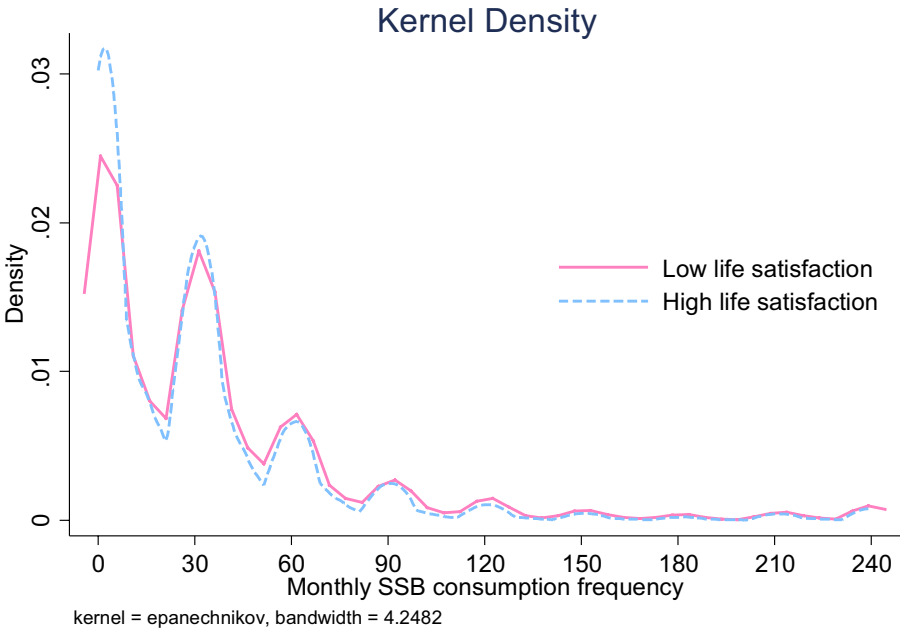

Fig. 1 Distribution of SSB consumption frequency by high and low life satisfaction

shows the Kernel density of SSB consumption frequency by high- and low- life satisfaction groups.

Table 2 presents the results from the two-part model and gamma GLM. Compared to adults with low life satisfaction, adults with high life satisfaction had a significantly lower likelihood of consuming SSB at both external- and internal- margins. While the lower likelihood at the external margin was evident for all types SSB, lower likelihood at the internal margin was evident for aggregated SSB and soda consumption only. These are also evident from predicted probabilities from the first-part (Supplemental appendix Figure S3) and predicted means from the second-part (Supplemental appendix Figure S4). For example, the predicted probability of any SSB consumption for adults with high life satisfaction was 0.81, which was 0.84 (Δ=−0.03, 95% CI: −0.04, −0.02) for adults with low life satisfaction. Among those who consumed any SSB, predicted mean of monthly consumption frequency was 43.7 units for adults with high life satisfaction, whereas it was 46.5 units (Δ=−2.8, 95% CI: −5.1, −0.5) for adults with low life satisfaction.

Adults with high life satisfaction consumed 3.6 units less SSB per month, on average, compared to their counterparts with low life satisfaction. Soda consumption per month was on average 2.2 units lower among adults with high life satisfaction. Esti-

Table 2 Estimates of two-part model and gamma GLM of sugar sweetened beverages consumption for high life satisfaction

	Two-part model			GLM – Gamma distribution	
	First Part: Logit	Second Part: GLM	Average Marginal effects	Exponentiated coefficient	Average Marginal effects
A. SSB					
High life satisfaction	0.790***	−0.061*	−3.581***	0.898***	−4.023***
	(0.731, 0.854)	(−0.112, −0.010)	(−5.537, −1.625)	(0.857, 0.939)	(−5.729, −2.316)
B. Soda					
High life satisfaction	0.839***	−0.138**	−2.199***	0.833***	−1.977***
	(0.790, 0.891)	(−0.226, −0.049)	(−3.176, −1.222)	(0.771, 0.901)	(−2.825, −1.128)
C. Coffee					
High life satisfaction	0.891***	0.003	−0.892	0.935*	−1.221*
	(0.834, 0.951)	(−0.060, 0.066)	(−2.145, 0.362)	(0.880, 0.993)	(−2.320, −0.122)
D. Sport drinks					
High life satisfaction	0.908*	0.013	−0.200	0.940	−0.314
	(0.844, 0.978)	(−0.086, 0.112)	(−0.740, 0.339)	(0.854, 1.035)	(−0.801, 0.174)
E. Fruit drinks					
High life satisfaction	0.875***	−0.065	−0.500*	0.873*	−0.447*
	(0.811, 0.944)	(−0.174, 0.044)	(−0.889, −0.111)	(0.774, 0.983)	(−0.835, −0.060)

Note: Estimates were obtained using complex survey weights. 95% confidence intervals are in parenthesis

*** $p<.001$, ** $p<.01$, * $p<.05$. First-part results are presented as odds ratios, and second-part results are presented as non-exponentiated coefficients. Adjustments were made for age, sex, race and ethnicity, urban/rural residence, marital status, number of adults in the family, number of children in the family, educational attainment, family income, hypertension, high cholesterol, diabetes, pre-diabetes, obesity, geographic region fixed effects, and interview month fixed effects

Table 3 Estimates of two-part model of sugar sweetened beverages consumption for high life satisfaction by socioeconomic status conditions

	First Part: Logit	Second Part: GLM	Average Marginal effects
A. Income: Low			
High life satisfaction	0.707***	−0.017	−2.619
	(0.586, 0.853)	(−0.111, 0.077)	(−7.004, 1.766)
B. Income: Middle			
High life satisfaction	0.736***	−0.061	−4.039*
	(0.633, 0.855)	(−0.152, 0.030)	(−7.770, −0.308)
C. Income: Higher			
High life satisfaction	0.853**	−0.092*	−3.670**
	(0.766, 0.950)	(−0.163, −0.021)	(−5.977, −1.362)
D. Education: High school or less			
High life satisfaction	0.787**	−0.021	−2.243
	(0.672, 0.921)	(−0.105, 0.064)	(−6.215, 1.728)
E. Education: Some college			
High life satisfaction	0.724***	−0.102*	−5.560**
	(0.627, 0.835)	(−0.191, −0.014)	(−8.967, −2.153)
F. Education: College graduate			
High life satisfaction	0.841**	−0.072	−2.931*
	(0.747, 0.946)	(−0.155, 0.011)	(−5.352, −0.509)

Note: Estimates were obtained using complex survey weights. 95% confidence intervals are in parenthesis

*** $p<.001$, ** $p<.01$, * $p<.05$. First-part results are presented as odds ratios, and second-part results are presented as non-exponentiated coefficients. Adjustments were made for age, sex, race and ethnicity, urban/rural residence, marital status, number of adults in the family, number of children in the family, educational attainment, family income, hypertension, high cholesterol, diabetes, pre-diabetes, obesity, geographic region fixed effects, and interview month fixed effects

mates of the gamma GLM were qualitatively similar. Adults with high life satisfaction had approximately 10.2% lower average SSB consumption compared to adults with low life satisfaction. Supplemental appendix Figures S5 and S6 show predicted means of monthly consumption frequency for low- and high- life satisfaction from two-part model and from gamma GLM, respectively. Note that AMEs reported in Table 2 are the differences of two predicted means.

Results by SES groups are presented in Table 3. While the lower likelihood of SSB consumption for high life satisfaction at the external margin was evident across all SES groups, the overall likelihood and differences at the internal margin were mostly observed in the higher SES categories. Consumption of SSB among higher income individuals with high life satisfaction was 3.7 units lower, on average, compared to their low life satisfaction counterparts. The difference was negative but not statistically significant among low-income adults. Similarly, average SSB consumption was 5.6 and 2.9 units lower among adults with high life satisfaction and having some college experience or a college degree, respectively. No statistically significant difference was observed among adults with educational attainment of high school or less. The sensitivity analyses results (in Supplemental Appendix) show that the patterns were very similar when top truncated frequencies were used.

5 Discussion

The findings of this study demonstrate an association between life satisfaction and SSB consumption among U.S. adults. Our results suggest that individuals with high life satisfaction are less likely to consume SSB, after adjusting for demographic, socioeconomic, and health-related attributes. This association highlights the potential role of psychosocial factors in shaping dietary behaviors, with low life satisfaction emerging as a risk factor for SSB intake. While previous research has focused on the relationship between life satisfaction and other risky behaviors, such as tobacco and alcohol use, this study contributes to the growing body of literature that links psychosocial well-being to dietary choices.

The relationship between life satisfaction and SSB consumption may be explained by several underlying mechanisms. Individuals with lower life satisfaction often face increased levels of stress, loneliness, and dissatisfaction, which can lead to coping behaviors, such as consuming calorie-dense, sugary beverages (Campos-Ramírez et al., 2023; Henriksen et al., 2014). SSBs, particularly soda, may provide a short-term psychological reward, helping to alleviate negative emotions. However, these short-term rewards can lead to long-term health consequences, further compounding the negative effects of low life satisfaction on overall well-being (Freije et al., 2021; Campos-Ramírez et al., 2023; Henriksen et al., 2014). The negative association between soda consumption and high life satisfaction observed in our study is consistent with previous research that identified soda as the most frequently consumed SSB across populations with lower psychosocial health (Dai et al., 2021; Han & Powell, 2013).

Our findings also align with previous research that has identified socioeconomic factors, such as educational attainment and income, as significant determinants of SSB consumption. Populations with lower socioeconomic status and educational attainment have been shown to consume higher amounts of SSBs, which may be attributed to several factors, including affordability, accessibility, and targeted marketing practices by the beverage industry (Blecher, 2017; Houghtaling et al., 2021; Masuda et al., 2021). Individuals with lower education levels are less likely to be aware of the health risks associated with SSB consumption and may lack access to healthier alternatives. For instance, studies in the Netherlands and Mississippi found that individuals with lower educational attainment, particularly those who did not complete high school, consumed more SSBs compared to their more educated counterparts (Mendy, 2017; Van Ansem et al., 2014). These findings highlight socioeconomic disparities as major determinants of SSB consumption. We showed that within SES groups, particularly for higher SES categories, SSB consumption was lower among adults with high life satisfaction. Our findings suggest that not only the standard social determinants of health, i.e., SES, but also psychosocial factors such as life satisfaction are important determinants of SSB consumption. As such, efforts to reduce SSB consumption should consider the intersectionality of psychosocial factors and broader socioeconomic contexts in which these behaviors occur.

Furthermore, our study findings were comparable to that of the literature on psychosocial factors' influence on dietary behaviors. Higher perceived loneliness has been associated with increased SSB consumption, likely due to the role of these beverages in providing a coping mechanism for emotional distress (Henriksen et al., 2014; Campos-Ramírez et al., 2023). On the other hand, individuals with strong social support networks may be more likely to engage in health-promoting behaviors and are less reliant on unhealthy dietary choices to manage stress (Grant et al., 2009; Su et al., 2022; Bélanger-Gravel et al., 2022). Peer influence, particularly among adolescents, has also been shown to play a significant role in SSB consumption, suggesting that social environments may either exacerbate or mitigate unhealthy dietary patterns (Zhang et al., 2023). We extended the evidence by showing that life satisfaction like other psychosocial factors can influence SSB consumption.

Public health efforts to curb SSB consumption commonly include strategies that reduce the availability and appeal of SSBs. For example, implementing taxes on SSBs, limiting the marketing of these beverages to vulnerable populations, and increasing the availability of healthier beverage options in schools and workplaces could help curb SSB consumption across the population (Redondo et al., 2018). The association between life satisfaction and SSB consumption found in this study may complement existing strategies to efficiently reduce SSB consumption. Especially, interventions utilizing psychosocial aspects can play a critical role in curbing SSB consumption among adults from higher SES groups, for whom availability constraints (e.g., higher tax) could be often non-binding.

5.1 Limitations and Future Directions

This study has several limitations that should be noted. First, the cross-sectional nature of the data precludes any causal inferences between life satisfaction and SSB consumption. Future research utilizing longitudinal data is needed to explore the potential causal pathways linking life satisfaction to dietary behaviors. Additionally, self-reported data on SSB consumption may be subject to recall bias or social desirability bias, potentially leading to underestimation of intake. Despite these limitations, our findings contribute valuable insights into the relationship between psychosocial health and dietary behavior, emphasizing the need for holistic approaches to improving health outcomes.

Future research should explore interventions designed to enhance life satisfaction as a strategy for reducing SSB consumption. Investigating the effectiveness of programs that promote psychosocial well-being, such as community support groups, stress management interventions, and educational campaigns, could provide valuable insights into the broader public health strategies needed to address SSB-related health risks. Additionally, understanding the role of life satisfaction across different demographic groups, such as adolescents, minority populations, and individuals with varying socioeconomic status, could further inform targeted interventions that address both psychosocial and behavioral determinants of health.

6 Conclusion

In a nationally representative data of U.S. population, we found that SSB consumption was lower among adults with high life satisfaction, compared to their counterparts with low levels of life satisfaction. Given the high economic and clinical burden of obesity in the United States (MacEwan et al., 2024), and its association with SSB consumption (Hu, 2013; Nguyen et al., 2023), it is critical to navigate and utilize multifaceted options for creating public awareness against the harms of SSB intake. Knowledge about the higher risk of SSB consumption among individuals with low life satisfaction may create opportunities for screening in the primary care setting, which may facilitate personalized cessation interventions. Tailored interventions based on the level of perceived life satisfaction, however, require further research to inform best practices in the clinical setting.

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Declarations

Ethical Approval The study used publicly available anonymized data that met the National Health Institute (NIH)'s definition of exempt human subject research (Exemption 4, e § 46.104(d)(4)(ii), (iii), and (iv). https://grants.nih.gov/sites/default/files/exemption_infographic_v8_508c_1-15-2020.pdf.

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