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Public Health

journal homepage: www.elsevier.com/puhe

Short Communication

Sugar sweetened beverages on emerging outdoor advertising in New York City

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ARTICLE INFO

Article history:

Received 13 July 2018

Received in revised form

10 October 2018

Accepted 19 October 2018

Available online 4 January 2019

Keywords:

Sugar sweetened beverage

New York City

Advertisement

ABSTRACT

Objectives: As a replacement for traditional phone booths, LinkNYC kiosks provide the ability to make free calls, connect to WiFi, and to charge electronic devices. These structures, which are supported by advertising revenue, are found in growing numbers on the streets of New York City (NYC). The purpose of this study was to determine the prevalence of sugar-sweetened beverage advertisements on LinkNYC kiosks.

Study design: Cross-sectional, observational.

Methods: A total of 100 kiosks from a sample of 507 kiosks were randomly selected and observed in Manhattan, NYC.

Results: A total of 2025 advertisements, including duplicates, were observed that included 347 (17.1%) viewed at 64 kiosks for non-alcoholic beverages. Over half ($n = 206$, 59.4%) featured beverages with added sugar. For the 206 beverages with sugar, the mean kilocalories and grams of sugar per serving were 149.90 (SD = 64.95, range = 90–300) and 35.04 (SD = 19.54, range = 17–81), respectively. Differences in the frequency of these 206 advertisements were examined by the median annual income quartile of the census tract where the kiosk was located, and no significant differences were observed, χ^2 (3, $N = 206$) = 3.09, $P = 0.38$.

Conclusions: As the NYC Department of Health and Mental Hygiene invests in efforts to reduce consumption of sugar-sweetened beverages, promoting these very products through new media controlled by the City does not seem well aligned with the goal of improving dietary intake of citizens.

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<https://doi.org/10.1016/j.puhe.2018.10.014>

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Introduction

Obesity affects an estimated 36.5% of adults and 17% of youth in the United States.¹ Obesity is linked to a myriad of health problems such as diabetes, heart disease, stroke, some cancers, coronary artery disease, hypertension, osteoarthritis, and among other physical health problems,² and has been linked to mental health and other issues that interfere with quality of life.³

Although many factors contribute to obesity, nutrition plays a key role. Among the foods and beverages one consumes, sugar-sweetened beverages are a major contributor of empty calories. Upwards of 77% of adolescents in the US consume sugar-sweetened beverages.⁴ Another recent study of adolescents revealed that 42–54% of the 847 participants reported exposure to sugar-sweetened beverage advertisements at least once per day, and reports were higher among African American (versus non-Hispanic white) participants whose parents had lower (versus higher) educational attainment.⁵

Emerging media have provided new channels for marketing and advertising. As a replacement for traditional phone booths, LinkNYC kiosks provide the ability to make free calls, to get information, and to charge cellular devices.⁶ Large in nature with 55-inch screens on both sides, there are more than 1000 of these structures noted as operational at the time of the study. The aim is for 7500 machines to be installed on NYC sidewalks across the NYC boroughs.⁷ This service is free to consumers and is paid through advertising dollars, according to the LinkNYC website.⁶ The purpose of this study was to determine the prevalence of non-alcoholic beverage advertisements on LinkNYC kiosks and to document the frequencies of these advertisements for beverages that contained versus did not contain sugar. In addition, we examined if the prevalence of advertisements for non-alcoholic beverages that contained sugar varied by median income level of the census tract where they were located.

Methods

The design of this study was cross-sectional and ancillary to a larger study.⁷ Methods were adapted from a prior study of subway advertising and are described in greater detail elsewhere.⁷ Of the 507 machines listed via the LinkNYC website in Manhattan at the inception of the study, seven were randomly selected and used to pilot test data collection methods. A 20% random sample of the remaining 500 ($n = 100$) was selected as the sample population for the study. All machines were numbered, and a random number generator was used to generate the final sample. Using an established coding sheet,⁸ researchers (C.H.B. or D.E.) stood at each kiosk for 10-min segments of time and coded the kinds of beverage advertisements displayed as the advertisements were revolving. The coding was delimited to commercial advertisements, including duplicates. Informational posts such as NYC Fast Facts and user guidelines for the machine were excluded. As advertisements revolved through the screen, the product or

service was coded onto a paper form, including the number of advertisements containing non-alcoholic beverages. The zip code of each link machine was documented, and the corresponding median annual income for that zip code was established using 2010 census tract data. The following quartiles of median annual income were: lowest <\$40,783, second lowest \$40,783 to \$86,801, second highest \$86,802 to \$105,500, and highest >\$105,500. Data analysis included calculating the frequencies and percentages of advertisements observed in total and specifically noting non-alcoholic beverages. The type of beverage along with size and flavor (when applicable) were used later to conduct web searches to ascertain the number of calories per serving along with the sugar content. To determine if there were differences in the prevalence of advertisements of sugar-sweetened beverages by income quartiles, Chi-squared analysis was used. Data analysis was conducted with SPSS (v. 24).

Results

A total of 2025 advertisements were observed, including 347 (17.1%) for non-alcoholic beverages at 64 kiosks. Over half ($n = 206$, 59.4%) featured sugar-sweetened beverages. These sugar-sweetened beverages were iced tea ($n = 106$), soda ($n = 77$), blended coffee drinks ($n = 22$), and flavored water ($n = 1$). For the 206 sugar-sweetened beverages, the mean kilocalories and grams of sugar per serving was 149.90 (SD = 64.95, range = 90–300) and 35.04 (SD = 19.54, range = 17–81), respectively (see Table 1).

A Kruskal–Wallis test compared differences in the products advertised in terms of mean grams of sugar, mean calories per serving, and mean serving size by kiosk location defined by quartiles of median annual incomes levels. This test was chosen over an analysis of variance because assumptions of homogeneity of variance and similar group sizes were violated. Differences in the frequency of advertisements for the 206 beverages with any sugar was examined by median annual income quartiles for the census tract in which the respective kiosks were located, and no significant differences were observed, $\chi^2(3, n = 206) = 3.09, P = .38$.

Table 1 – Grams (g) of sugar, kilocalories (Kcal), and serving size by median annual income quartile for 206 sugared non-alcoholic beverages, including duplicates, observed in advertisements in 64 LinkNYC kiosks, Manhattan, NYC, 2017 advertisements based on income.

Income Quartile ^a	g sugar/serving Mean (SD)	Kcal/serving Mean (SD)	Serving size (oz) Mean (SD)	N
1	36.95 (20.68)	163.22 (63.80)	16.25 (2.80)	59
2	30.74 (15.96)	129.58 (54.35)	14.93 (2.28)	72
3	28.68 (13.41)	122.40 (50.08)	15.26 (2.81)	50
4	55.64 (22.74)	232.00 (45.46)	18.32 (2.81)	25
Total	35.04 (19.54)	149.90 (64.95)	15.80 (2.83)	206

^a Income quartiles were defined as follows: 1 = <\$40,783; 2 = \$40,783 to \$86,801; 3 = \$86,802 to \$105,500; 4 = >\$105,500.

Conclusions

The findings from this study suggest that the newly installed LinkNYC kiosks are a new media channel for advertising and promoting sugar-sweetened beverages. Advertisements for sugar-sweetened beverages were observed on more than half of the LinkNYC kiosks. Unlike media channels such as television and print sources, where individuals choose to view the media, LinkNYC kiosks display communications to individuals, including youth, who observe the advertisements while walking on the street. Given that LinkNYC kiosks are located in public spaces (i.e. sidewalks), and that public policies have been proposed or promulgated to reduce consumption of sugar-sweetened beverages as one way to reduce obesity, using public spaces to advertise sugar-sweetened beverages is inconsistent with public health goals.

In 2017, the New York City Department of Health and Mental Hygiene (DOHMH) launched, ‘The Sour Side of Sweet’ Media Campaign On the Health Hazards of Sugary Drinks.⁹ A primary goal of another NYC health campaign, ‘Take Care New York 2020’, is to reduce the percentage of New Yorkers who drink at least one sugary beverage a day.¹⁰ The Deputy Mayor for Health and Human Services stated, “Our environment does not always support healthy choices, and sugary drinks are often disproportionately marketed to youth, in low-income neighborhoods and communities of color.”⁹ As the NYC DOHMH and NYC Mayor’s Office invest in efforts to reduce consumption of sugar-sweetened beverages,¹⁰ does it seem sensible to promote these very products through new media controlled by the City?

This study is important for the wider scientific and public policy community because it illustrates the prevalence of health-compromising messages present in the social environment. Socio-environmental factors are known to shape the lives of youth in many ways, including dietary behavior,^{11,12} and the presence of digital media in public spaces presents an emerging threat to population health. Governmental agencies are responsible, in part, for disease prevention and health promotion. Disseminating and reinforcing health-enhancing messages through emerging digital media in public spaces can facilitate this goal.

Additional research is needed to document the prevalence of health-compromising messages in the social environment and improve understanding about interventions that help people to learn and practice skills to resist these kinds of social pressures. Although emerging digital media may present opportunities for additional government revenue in the short term, it is incumbent on policymakers to use these media in a way that improves population health. To the extent that the goals of the various branches of local governments are aligned with this goal, the chances for substantive improvements in population health will be increased.

Author statements

Ethical approval

The Institutional Review Boards (IRBs) at Lehman College and William Paterson University do not review studies that do not

involve human subjects, and the IRB at Teachers College, Columbia University deemed this study exempt.

Funding

None declared.

Competing interests

The authors of this study do not report any conflicts of interest.

Author contributions

C.H.B., C.E.B., and D.E. conceptualized the study. C.B. and D.E. collected the data. M.L. analyzed the data. All authors contributed to writing and revising the manuscript.

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