



Retailer-Led Sugar-Sweetened Beverage Price Increase Reduces Purchases in a Hospital Convenience Store in Melbourne, Australia: A Mixed Methods Evaluation



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ARTICLE INFORMATION

Article history:

Submitted 2 February 2017
Accepted 28 June 2017
Available online 1 September 2017

Keywords:

Carbonated beverages
Commerce
Program evaluation
Mixed methods
Community retail

Supplementary materials:

Figures 1, 2, 3, and 6 are available at www.jandonline.org

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<http://dx.doi.org/10.1016/j.jand.2017.06.367>

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ABSTRACT

Background Limited evidence has been gathered on the real-world impact of sugar-sweetened beverage price changes on purchasing behavior over time or in community-retail settings.

Objective Our aim was to determine changes in beverage purchases, business outcomes, and customer and retailer satisfaction associated with a retailer-led sugar-sweetened beverage price increase in a convenience store. We hypothesized that purchases of less-healthy beverages would decrease compared to predicted sales.

Design A convergent parallel mixed methods design complemented sales data (122 weeks pre-intervention, 17 weeks during intervention) with stakeholder interviews and customer surveys.

Participants/setting Electronic beverage sales data were collected from a convenience store in Melbourne, Australia (August through November 2015). Convenience store staff completed semi-structured interviews (n=4) and adult customers exiting the store completed surveys (n=352).

Intervention Beverages were classified using a state government framework. Prices of “red” beverages (eg, nondiet soft drinks, energy drinks) increased by 20%. Prices of “amber” (eg, diet soft drinks, small pure fruit juices) and “green” beverages (eg, water) were unchanged.

Main outcome measures Changes in beverage volume, item sales, and revenue during the intervention were compared with predicted sales.

Statistical analyses Sales data were analyzed using time series segmented regression while controlling for pre-intervention trends, autocorrelation in sales data, and seasonal fluctuations.

Results Beverage volume sales of red (−27.6%; 95% CI −32.2 to −23.0) and amber (−26.7%; 95% CI −39.3 to −16.0) decreased, and volume of green beverages increased (+26.9%; 95% CI +14.1 to +39.7) in the 17th intervention week compared with predicted sales. Store manager and staff considered the intervention business-neutral, despite a small reduction in beverage revenue. Fifteen percent of customers noticed the price difference and 61% supported the intervention.

Conclusions A 20% sugar-sweetened beverage price increase was associated with a reduction in their purchases and an increase in purchases of healthier alternatives. Community retail settings present a bottom-up approach to improving consumer beverage choices.

J Acad Nutr Diet. 2018;118(6):1027-1036.

INCREASINGLY, HEALTH-MOTIVATED SUGAR-SWEETENED beverage (SSB) taxes are being considered and implemented around the globe to combat obesity, yet limited evidence has been gathered on the real-world impact of SSB taxes on purchasing behavior over time.¹⁻³ SSBs are considered a good target for price manipulation⁴⁻⁶ because of the association of their consumption with increased risk of a

number of adverse health outcomes, including obesity and dental decay^{7,8}; their minimal nutritional benefits; and the apparent responsiveness of SSB purchases to price changes.^{1,2,9-13}

Over the past few years, an increasing number of jurisdictions have committed to implementing SSB taxes.^{2,14,15} Limited real-world evidence suggests that SSB taxes can

impact behavior.^{2,3,16} For example, Colchero and colleagues² found that a 1-peso/L (approximately 10%) SSB tax in Mexico reduced the purchase volume of taxed beverages by an average of 6% in the 12 months after policy implementation.

In addition to government regulation, there is the potential for retailers to independently alter SSB prices. SSB price increases represent an underexplored tool for health-promotion practitioners and dietitians promoting healthier foods in settings with limited healthy offerings. Community retailers may be more engaged with customers at an individual level^{17,18} and do not require larger organizational support for policy changes. Despite this, there is currently a paucity of peer-reviewed experimental evidence on community SSB price increases, which includes the effect on customer purchases and “business outcomes,” such as retailer perceptions and revenue.^{12,19} Block and colleagues¹² trialed a \$0.45 per SSB item (approximately 35%) price increase in a hospital cafeteria in Boston, MA, in 2008 for 4 weeks. They found a 26% reduction in SSB sales compared to baseline. However, they were unable to change the price of self-pour beverages and trialed a higher price increase than is likely to be implemented in practice.

Using a mixed methods approach, we aimed to evaluate the effects of a 20% retailer-led SSB price increase in a convenience store in Melbourne, Australia. Key outcomes included customer beverage purchases of targeted (less healthy, sugary) beverages and nontargeted (healthier) beverages; business outcomes, including total revenue from beverages; and customer and retailer perceptions, including satisfaction with price changes. We hypothesized that purchases of less-healthy beverages would decrease compared with predicted sales.

MATERIALS AND METHODS

The Convenience Store

The convenience store, located in a large metropolitan public hospital, sells prepackaged snack food and beverages, and functions as a news agency and post office for hospital staff, patients, and visitors. The store is accessed internally within the hospital, but advertising signage for the store is also located on the street front; most but not all customer traffic is from within the hospital. Within the hospital complex there is a large cafeteria selling hot and cold meals and snacks as

well as beverages. Vending machines selling beverages and snacks are located throughout the hospital. The intervention site has, by far, the largest range of beverage brands and sizes and the largest beverage shelf space in the hospital complex. Store baseline beverage prices were generally at similar or higher prices compared with the cafeteria and vending machines. In the 12 months before the intervention, there was a mean of 1,538 beverage units sold per week in the store, from more than 200 beverage product lines. The independent retailer responsible for the convenience store, with encouragement from the health service, introduced a 20% price increase on unhealthy beverages, which they agreed to have evaluated.

The Intervention

Beverages were classified using a traffic-light system from the Healthy Choices guidelines from the Victorian Department of Health and Human Services.²⁰ The categories were “red” (“limit,” eg, sugary soft drinks, juices >250 mL), “amber” (“choose carefully,” eg, diet soft drinks), and “green” (“best choices,” eg, water). This classification system considers the macronutrient and energy content of beverages for different beverage categories (see Table 1 for further detail).

Prices of red beverages were increased by 20%, while amber and green beverage prices were unchanged for 17 weeks (August through November 2015). For example, 450-mL bottles of a popular brand of nondiet soft drink increased from \$3.90 to \$4.50 Australian dollars, while the equivalent diet soft drink remained at \$3.90. Customers were not explicitly informed of the price increases; however, price tags were displayed next to beverages and researchers provided store staff with flyers to give to customers who inquired about the intervention. The flyer detailed the purpose of the intervention and relevant hospital staff contact details. Researchers monitored intervention fidelity weekly through visual inspection of beverage price tags. Prices of red beverages in vending machines surrounding the store were also increased by 20% (results presented elsewhere²²).

Evaluation Methodology

The business, customer, and potential health implications of the retail intervention were investigated through a socio-ecological framework that recognizes that individuals' choices are influenced by and interact with the

Table 1. Classification of beverages categories,^a convenience store pricing intervention in Melbourne, Australia, from August through November 2015

“Red” beverages	“Amber” beverages	“Green” beverages
Nondiet soft drinks, sport drinks, energy drinks, iced teas, nutrient waters	Diet energy drinks (\leq 250 mL), soft drinks, sport drinks, iced teas, nutrient waters	Bottled water, including naturally flavored, still, and sparkling
Full-fat or large flavored milks (>382 kcal per serving)	Plain full-fat milk; medium low-fat flavored milks (215 to 382 kcal per serving)	Plain low-fat milk or milk substitutes; small low-fat flavored milks (<215 kcal per serving)
Fruit juice (>250 mL); fruit drinks (<99% fruit juice)	Fruit juice (at least 99% juice, \leq 250 mL)	

^aBeverages were classified according to the Victorian Healthy Choices guidelines.²¹

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