

## Short Communication

# The effect on drink sales of removal of unhealthy drinks from display in a self-service café

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### Abstract

**Objective:** The present study assessed the impact of the retailer-led removal of unhealthy beverages from display at a self-service café within a major health service. While unhealthy beverages remained available from behind the counter upon request, this was not communicated directly to customers.

**Design:** Drinks were categorised based on the state government nutrient profiling system, classifying drinks as ‘green’ (best choices), ‘amber’ (choose carefully) and ‘red’ (limit). Total drink sales (as number of items sold per week) in the café were measured for five weeks. All unhealthy ‘red’ beverages were removed from display (but were still available for purchase) and the sales of all beverages were measured for another six weeks.

**Results:** We found that, in response to this strategy, the proportion of ‘red’ drinks sold decreased from 33% to 10% of total drink sales. As ‘amber’ and ‘green’ drink sales increased in response to this strategy, total retailer sales remained steady. Most consumers appeared to switch to purchasing ‘amber’ drinks rather than the healthiest option, ‘green’ drinks.

**Conclusions:** The removal of unhealthy beverages from display can result in consumers making healthier purchases, while not significantly affecting retailers’ sales.

**Keywords**  
Public health policy  
Nutrition  
Community  
Retail

Compelling evidence suggests that consumption of unhealthy drinks is associated with weight gain and increased risk of a number of adverse health outcomes<sup>(1,2)</sup>. Therefore governing bodies and health departments around the world have made a number of recommendations to decrease their consumption<sup>(3,4)</sup>.

Community retail settings represent an important avenue of unhealthy drink purchase and consumption. As such, many strategies have been considered that attempt to influence consumer choices at the point of purchase, including standardised portion sizes and warning labels<sup>(5)</sup>.

In Victoria, Australia, one health service is working with its food retailers to trial and implement a range of different strategies to improve the healthfulness of foods and drinks purchased throughout the service<sup>(6)</sup>. The present study assessed the impact of one of these novel strategies,

removing unhealthy drinks from display in a self-service café, on total drink sales and on sales of healthy and unhealthy drinks. These drinks were kept behind the counter and were still available on request by the customer.

### Methods

The present study was a non-controlled before-and-after evaluation of a natural experiment at a café located in a major Victorian hospital. This location leads to high numbers of both sales and customers, including hospital employees and hospital patients and their families. At the café, customers make their drink selection via a self-service fridge and then take their choice to the counter to pay. These self-service fridges are displayed in conjunction with food displays.

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Drinks were categorised based on the state government nutrient profiling system, classifying drinks as ‘green’ (best choices), ‘amber’ (choose carefully) and ‘red’ (limit) based on energy and nutrient content<sup>(7)</sup>. ‘Red’ drinks include sugar-sweetened soft drinks, sports drinks, and fruit juices with added sugar. ‘Amber’ drinks include low-calorie (less than 300 kJ per serving) and zero-calorie ‘diet’ soft drinks, small fruit juices with no added sugar, and regular-fat plain milk. ‘Green’ drinks include plain and sparkling water and reduced-fat plain milk.

In late 2015 the retailer decided to remove all ‘red’ drinks from display. These ‘red’ drinks were placed in a separate refrigerator located behind the counter (out of sight) and remained available for purchase at the counter when requested by customers. This change was not communicated to customers. The number of drinks sold in each category was measured for five weeks before implementation of the strategy and six weeks after implementation. To measure total weekly sales volumes, researchers counted the number of drinks available at the café at the beginning of each week, at the same time each week. Items were counted within categories and researchers specified drink brands/types and volumes. Café management and staff then counted and reported on all drinks brought into the café for restocking purposes. The number of drinks sold that week could then be calculated through:

$$\begin{aligned} \text{Week 1 drink sales} &= \text{stock at week 1 beginning} \\ &+ \text{week 1 stocktake} \\ &- \text{stock at week 2 beginning.} \end{aligned}$$

Wilcoxon rank-sum tests were used to compare the median number of drinks sold per week (total drinks and number in each category: ‘red’, ‘amber’, ‘green’) for the five weeks pre-strategy implementation and the six weeks post-strategy implementation. Chi-squared tests were used to compare the proportion of drinks sold that were ‘red’ for the five weeks pre-strategy implementation with that for the six weeks post-strategy implementation. Analyses were performed using the statistical software package Stata 14. Statistical significance was set at  $P < 0.05$ . Interrupted time series analysis was not performed for the study as the minimum number of data points required for an interrupted time series analysis is twelve pre-strategy implementation and twelve post-strategy implementation<sup>(8)</sup>. Hence the time constraints surrounding data collection for the study did not allow such an analysis to be performed.

**Results**

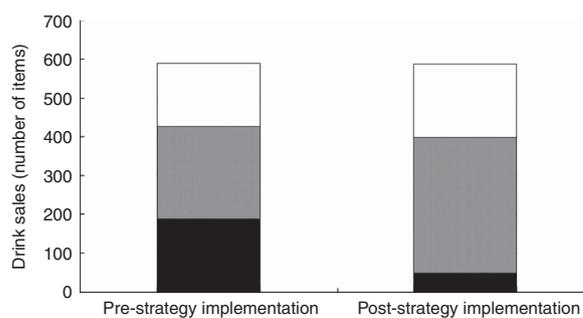
The café’s median weekly number of drinks sold did not change significantly following strategy implementation ( $P = 0.58$ ). The median weekly number of ‘red’ drinks sold at the café decreased significantly by 139 drinks ( $P = 0.006$ ) while the median weekly number of ‘amber’ drinks sold at

the café increased significantly by 111 drinks ( $P = 0.03$ ). The median weekly number of ‘green’ drinks sold at the café increased by twenty-seven drinks, but this change was not significant ( $P = 0.27$ ; Fig. 1). The proportion of ‘red’ drink sales at the café decreased from 33% of total sales to 10% of total sales, and this decrease was significant ( $P < 0.001$ ).

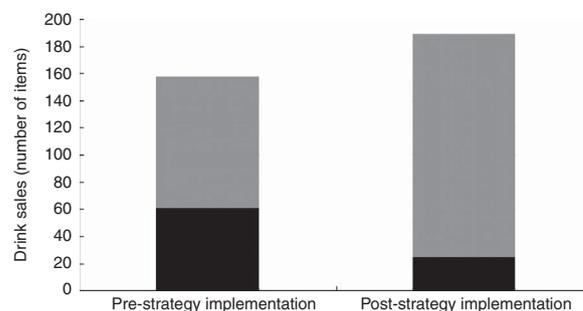
We also analysed the median weekly number of items sold for one high-selling soft drink product (a ‘red’ drink) and its combined low-calorie variants (‘amber’ drinks), pre- and post-strategy implementation. We observed that, post-strategy implementation, the median weekly number of items sold of the full-calorie (‘red’) variant decreased significantly from sixty-one drinks per week to twenty-five drinks per week ( $P = 0.01$ ), while the median weekly number of items sold of the combined low-calorie variants (‘amber’) increased significantly from ninety-seven drinks per week to 164 drinks per week ( $P = 0.04$ ). As a result, total sales of this soft drink product and its low-calorie variants combined did not significantly change in response to the removal of ‘red’ drinks from display ( $P = 0.47$ ; Fig. 2).

**Discussion**

In this self-service café within a major Victorian hospital, customers responded to a retailer-led strategy of removing



**Fig. 1** Median weekly sales of ‘green’ (best choices; □), ‘amber’ (choose carefully; ■) and ‘red’ (limit; ■) drinks pre- and post-removal of all ‘red’ drinks from display at a self-service café within a major health service, Melbourne, Australia, 2015



**Fig. 2** Median weekly sales of ‘amber’ (choose carefully; ■) and ‘red’ (limit; ■) drink variants of a specific soft drink product, pre- and post-removal of the ‘red’ drink variant from display at a self-service café within a major health service, Melbourne, Australia, 2015

'red' drinks from display by making healthier purchases. The majority of consumers appeared to switch to purchasing 'amber' drinks in place of 'red' drinks. This was supported by observation of a specific soft drink product, where sales for 'red' drink variants decreased by a similar quantity to the increase in sales of 'amber' drink variants. As consumers appeared to prefer to switch to 'amber' drinks, over the healthiest option, 'green' drinks, future strategies could target the purchase of 'green' over 'amber' drinks.

As the total number of drinks sold remained steady, these results suggest that such a strategy might not decrease retailers' sales. This could make retailers more receptive to implementation of a strategy such as this one at other food outlets. Further, while the focus of this retailer was to maintain customer choice, the results of our study might also encourage retailers to cease the sale of unhealthy 'red' drinks entirely, as we show here that there is potential for them to retain the majority of their sales while doing so.

Previous studies have examined the effect of the hiding or removal of unhealthy drinks in retail settings. Our results reflect those observed by Butler *et al.*<sup>(9)</sup>, who observed the change in beverage sales following the removal of the three top-selling sugar-sweetened water-based drinks at a store in a remote Australian Aboriginal community. They found that consumers shifted to purchasing low- or zero-sugar options. The total number of drinks sold did not change significantly in response to this intervention. However, some studies, which examined the availability of soft drinks and other sugar-sweetened beverages at schools in the USA, observed that the removal of these unhealthy beverages from schools did not significantly affect students' overall consumption of unhealthy drinks, with many simply purchasing them from an external retailer<sup>(10,11)</sup>. Hence, there appears to be room for further studies in this area, to determine the overall effect on consumption of the removal or hiding of unhealthy drinks.

One of the major limitations of the present study includes the nature of data collection, which was limited due to the need to tailor it to the real-world implementation of this strategy, and relied on the café's staff for one component of stocktake measurement. This provided no opportunity for cross-checking and a few unlikely values were obtained during the data collection. However, there was no observable pattern in these values; it is therefore likely that random error was involved and thus unlikely that the overall conclusions are affected.

Another limitation of the study was time constraints and feasibility limiting data collection to five weeks pre-strategy implementation and six weeks post-strategy implementation. There is the potential for drink sales to have changed over time and in response to weather changes, although the effect of this is likely to be minimal. Specifically, data collection mostly occurred over a single season, reducing seasonal variations in sales. In addition, seasonal changes are likely to affect the total number of drinks sold, but not

the proportion of healthy and unhealthy drinks sold. Finally, a similar retailer-led initiative observed similar results to those reported here, while taking place over an extended period of time<sup>(6)</sup>. However, future monitoring would be useful to determine the long-term effects of such a strategy with more stable data.

A final limitation of the present study is the lack of concurrent control, whereby post-strategy implementation sales could be compared with sales at a different café over the same time period. The retailer-led nature of this strategy meant that the inclusion of such a control group was not feasible.

The present study shows that removal of unhealthy drinks from sight in a real-world retail setting can result in healthier consumer choices while not reducing retailers' sales. In this instance, the retailer elected to continue with this strategy. With a potential decrease in the number of 'red' drinks sold by over 5000 per year for this outlet alone, this strategy has the potential to impact population health if scaled up.

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