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Is greater variety of chocolates and confectionery in supermarkets associated with more consumption?

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A key contributor to unhealthy weight gain is excess energy intake, which can occur through overeating and/or eating foods considered energy-dense (i.e. foods high in fat and sugar). While the term “snack food” is not clearly defined, it is often used to refer to foods and drinks that are consumed outside the three main daily meals. Many foods that are considered snack foods (e.g. potato chips, chocolate bars, confectionery) are energy-dense, high in sodium and low in micronutrients [1]. Reduction in intake of energy-dense snack foods is likely to result in decreased energy intake and reduced obesity rates [2].

In metropolitan areas, large supermarkets are often the key source of food for the majority of households. A number of factors are likely to trigger within-store purchasing decisions in supermarkets, including product placement, in-store advertisements, and specials [3]. In addition, it is plausible that greater product variety caters to more taste preferences and leads to increased consumption of a product category. Previously, Walker and colleagues reported data from a single Australian supermarket, finding an overwhelmingly high choice of snack foods available, with the majority (over 70%) of the 1070 snack foods and 863 drinks available considered unhealthy [1]. We also previously found a high variety of snack foods available in supermarkets in Melbourne, Australia[4].

In our current investigation we examined associations between the number of different varieties of chocolate and confectionery items stocked in local supermarkets and consumption of these foods over and above what would be expected based on demographic and socioeconomic characteristics. This analysis used data from 1007 women in 35 neighbourhoods participating in the Socioeconomic Status and Activity in
Women (SESAW) study, sampled in 2004 from Melbourne, Australia (methods described previously [4, 5]). We collected information from women on the consumption of chocolate and confectionery, and audited supermarkets within the sampled suburbs to calculate the number of different varieties of these items stocked. Multilevel analysis was used to determine whether the variety of these snack food items in local neighbourhood supermarkets was associated with women’s confectionery and chocolate consumption. Our findings showed that the majority of women ate either chocolate (75%) or confectionery (82%) once a week or less; a small percentage of participants ate chocolates (5%) or confectionery (3%) on a daily basis. However, multilevel multinomial models did not provide statistically significant evidence to suggest that increased variety of snack foods in supermarkets was associated with more frequent snack food chocolate or confectionery consumption (Table 1).

The effect of exposure to unhealthy snack foods on eating behaviours has rarely been examined. Our study did not show an association between the number of varieties of such products and women’s consumption of these foods. While it is possible that this reflects a true lack of association, there are many other within-store factors that may influence snack consumption behaviours, and the exclusion of these from investigation in the present study may contribute to explaining the null findings. These include the relative proportion of healthy and unhealthy foods in supermarkets; shelf-space occupied by snack foods; presence of snacks at checkouts; buy-one get-one free promotions (usually on unhealthy snack foods); promotions that entice children and offer incentives such as toys; and a more prominent promotion of unhealthy food
products in comparison to fruits and vegetables. Further, the measures of access used may not accurately reflect an individuals’ true contextual exposure to the full range of food vendors throughout the course of their daily lives. Collecting more detailed data on the specific supermarket where the main food shopping takes place, and on other places where individuals are exposed to and purchase snack foods, may be instructive here). Factors such as these should be considered in future research to more definitively rule out an association between snack food exposure and purchasing behaviour.

Although consistently strong associations have been observed between energy-dense food consumption and obesity, without definitive evidence that snack food exposure is or is not a determinant of dietary behaviour, policy responses targeting the food purchasing environment and hence consumption behaviours are hard to justify.

**Acknowledgements**

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References


Table 1: Odds ratios and confidence intervals for multilevel multinomial regression analysis of associations between chocolate and confectionery consumption frequency and varieties within supermarkets

<table>
<thead>
<tr>
<th>Different varieties of chocolates available within local supermarkets</th>
<th>Chocolate consumption</th>
<th>Confectionery consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1-3 per month*</td>
<td>Once per week*</td>
</tr>
<tr>
<td>Less than 40 varieties</td>
<td>OR (95% CI)</td>
<td>p-value</td>
</tr>
<tr>
<td>40-49 varieties</td>
<td>1.00</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>0.94 (0.60–0.97)</td>
<td>0.772</td>
</tr>
<tr>
<td></td>
<td>–1.47</td>
<td>–1.57</td>
</tr>
<tr>
<td>50 or more varieties</td>
<td>1.02 (0.60–0.96)</td>
<td>0.930</td>
</tr>
<tr>
<td></td>
<td>–1.74</td>
<td>–1.77</td>
</tr>
<tr>
<td>P for trend</td>
<td>0.975</td>
<td>0.962</td>
</tr>
</tbody>
</table>

* Denotes significance level of p < 0.05.
<table>
<thead>
<tr>
<th>Different varieties of confectionery available within local supermarkets</th>
<th>OR (95% CI)</th>
<th>p-value</th>
<th>OR (95% CI)</th>
<th>p-value</th>
<th>OR (95% CI)</th>
<th>p-value</th>
<th>OR (95% CI)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 40 varieties</td>
<td>1.00 (-)</td>
<td>1.00 (-)</td>
<td>1.00 (-)</td>
<td>1.00 (-)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40-49 varieties</td>
<td>1.31 (0.74–2.34)</td>
<td>0.354</td>
<td>1.04 (0.54–1.99)</td>
<td>0.911</td>
<td>1.43 (0.69–2.96)</td>
<td>0.337</td>
<td>0.93 (0.17–5.21)</td>
<td>0.934</td>
</tr>
<tr>
<td>50 or more varieties</td>
<td>1.08 (0.72–1.61)</td>
<td>0.717</td>
<td>0.94 (0.61–1.46)</td>
<td>0.795</td>
<td>1.27 (0.77–1.46)</td>
<td>0.351</td>
<td>1.46 (0.52–4.12)</td>
<td>0.477</td>
</tr>
<tr>
<td>P for trend</td>
<td>0.836</td>
<td>0.763</td>
<td>0.414</td>
<td>0.422</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* For multinomial logistic regression, each outcome category is compared to those who consumed once per month or less

Models adjusted for age, country of birth, marital status, education, occupation, household income, number of people dependent on income and area-deprivation