ABSTRACT

Consumption of sugar sweetened beverages (SSBs) contributes to increasing obesity rates because they are a highly caloric beverage with poor nutritional value. Substituting SSB consumption with water consumption will help to decrease obesity. Water consumption is affected by various factors, including water access, a clean water supply, SSB popularity, policies, recommendations, and individual perceptions. Little research has addressed water consumption in rural populations. We are investigating access to drinking water of residents of the rural multicultural town of Cuba, NM. A literature review has been conducted on the advantages of water consumption and adverse effects of SSBs. Field observations assessed access to water and water quality in schools. Federal, state, and local requirements for water in schools were reviewed. A modified version of the Nutrition Environment Measures Survey assessed the availability and pricing of water in comparison to that of SSBs. An analysis of a transcribed meeting on community water consumption provided information on the knowledge, behaviors, and attitudes of community members regarding their water supply and consumption rates. A geographic information system map was used to document water sources and quality as previously determined by annual tests (2014). Our findings provided information on environmental factors influencing water consumption in Cuba that informed the development of a community guide to facilitate discussions about increasing water consumption in that community. This information also contributed to research on increasing drinking water consumption in other rural communities.

BACKGROUND

- More than 33% of U.S. adults and 17% of U.S. children are overweight or obese.1
- SSBs have become the largest source of added sugar in the U.S. diet, resulting in greater total energy intake.2
- The VIVA II-Step Into Cuba research project assists with a community initiative to reduce chronic disease and improve health-related quality of life in Cuba, New Mexico.3
- Cuba is a rural town located in the northern region of Sandoval County; its population is approximately 731.4
- Cuba has a large Native American (30%) and Hispanic population (65%) in addition to non-Hispanic whites (United States Census, 2014).5

METHODS

- Literature Review
- School Drinking Water Access Assessment
- VIVA II Community Water Meeting
- Nutrition Environment Measures Store Survey

RESULTS

SCHOOL DRINKING WATER ACCESS ASSESSMENT

<table>
<thead>
<tr>
<th>School</th>
<th>Meal Period</th>
<th>Water Access Policies</th>
<th>Water Sources (No.)</th>
<th>Vending Machines (No.)</th>
<th>Signs Promoting Drinking Water</th>
<th>Drinking Water Temperatures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuba Elementary</td>
<td>No; juice or milk</td>
<td>Refillable bottles allowed</td>
<td>9</td>
<td>1 (water)</td>
<td>No</td>
<td>Tastes ok, staff prefer bottled water</td>
</tr>
<tr>
<td>Cuba Middle</td>
<td>No; milk</td>
<td>Clear, refillable bottles allowed</td>
<td>8</td>
<td>2 (water)</td>
<td>No</td>
<td>Safe, preference for filtered or softened, lots of minerals</td>
</tr>
<tr>
<td>Cuba High</td>
<td>No; milk</td>
<td>Clear, refillable bottles allowed</td>
<td>13 (4 broken)</td>
<td>0</td>
<td>No</td>
<td>Warm water, metallic undertone</td>
</tr>
</tbody>
</table>

Nutrition Environment Measures Store Survey

- Evaluated access, availability, pricing, and promotion of beverages in store settings

VIVA II COMMUNITY WATER MEETING

- Collected observations of the community member perceptions of water quality
- Discussed barriers and facilitators to increasing water consumption
- Discussed interventions to decrease consumption of SSBs

VIVA II COMMUNITY WATER MEETING

- People have access to water in Cuba, but there is widespread agreement that it tastes bad
- Navajo communities have water access problems
- Habit/addiction to sugary drinks
- Lack of awareness of contribution of soda to obesity and diabetes

2014 CUBA WATER QUALITY REPORT

<table>
<thead>
<tr>
<th>Drinking Water Contaminant</th>
<th>SMCL (µg/L)</th>
<th>MC (µg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arsenic (SMCL 10 µg/L)</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Sulfate (SMCL 10 µg/L)</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>TDS (SMCL 900 mg/L)</td>
<td>1500</td>
<td>1500</td>
</tr>
<tr>
<td>Uranium (SMCL 10 µg/L)</td>
<td>0.01</td>
<td>0.01</td>
</tr>
</tbody>
</table>

2014 CUBA WATER QUALITY REPORT

<table>
<thead>
<tr>
<th>Drinking Water Contaminant</th>
<th>SMCL (µg/L)</th>
<th>MC (µg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Trihalomethanes (SMCL 0.5 µg/L)</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Trihalomethanes (SMCL 0.5 µg/L)</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>Di(2-ethylhexyl)phthalate (SMCL 6 µg/L)</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>Alkalinity (SMCL 150 mg/L)</td>
<td>1500</td>
<td>1500</td>
</tr>
<tr>
<td>Uranium (SMCL 10 µg/L)</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Total Radium 226 and 228 (SMCL 0.02 µCi/L)</td>
<td>0.02</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Water quality in Cuba met the mandatory requirements set by the Environmental Protection Agency. Results were also similar to those in Albuquerque, NM.

CONCLUSIONS

- Schools in Cuba can potentially increase water consumption with meal period water access and signs promoting drinking water.
- School drinking water is perceived as tasting a lot better than other community drinking water.
- Residents of Cuba do not like the taste of their water and could benefit from an awareness campaign on limiting consumption of SSBs.
- The water quality in Cuba meets the mandatory requirements set by the Environmental Protection Agency.
- Water is the least expensive beverage available for purchase in local Cuba stores.

LIMITATIONS

- School Drinking Water Assessment: assessment performed during the summer
- Water Quality Reports: aesthetic factor testing results are unavailable for Cuba
- Nutrition Environment Measures Survey: prices may vary throughout the year

FUTURE DIRECTIONS

- Implementation of an increasing water consumption intervention along with the VIVA II-Step Into Cuba Project until September 2019.
- Development and use of focus group discussion guides aimed at increasing water consumption in Cuba.
- Increasing education about drinking water and increasing signs promoting drinking water in Cuba.

REFERENCES


ACKNOWLEDGEMENTS


STANDARD BEVERAGE COSTS IN CUBA STORES

- Least expensive: 16 oz. water
- Most expensive: 16 oz. flavored milk
- Low fat 14 oz. flavored milk
- Whole flavored 14 oz. milk
- No store had any healthy drinking marketing materials.