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Availability of Healthy Snacks in Stores Near Low-Income Urban, High-Income Urban, and Rural Elementary/Middle Schools

Background

- Snacking has become increasingly common among children & is a likely contributor to childhood obesity

- Replacing energy-dense snacks with healthier choices could be a way to reduce children's caloric intake & improve diet quality

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Background continued

- Food stores near schools are an important source of snacks for children

- Very few studies have explored the type of snacks available in these stores, and none have examined whether availability of healthy snacks varies by neighborhood socioeconomic status or rural-urban location

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Purpose

- To compare the availability of healthy snack foods and beverages in stores located within walking distance of high-income urban, low-income urban, and rural elementary and middle schools in Oregon

- Hypothesis: High-income urban would have greatest availability; rural would have least

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Sampling Strategy

- Stores were selected based on their proximity within ½ mile of high-income urban, low-income urban, and rural schools
- Urban schools were in Portland
- Rural schools were in Union & Wallowa counties

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Measurement

- Goal: to identify foods & beverages that were recommended or were healthier versions of products that children might choose as a snack

- Checklist developed

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IOM Standards Used for Checklist

Snacks

- ≤ 200 calories per portion as packaged and:
- ≤ 35% total calories from fat
- < 10% total calories from saturated fat
- Zero trans fat (≤ 0.5 g per serving)
- ≤ 35% calories from total sugars (except for yogurt with ≤ 30 g of total sugars per 8-oz portion)
- ≤ 200 mg sodium

Beverages

- Water without flavoring, additives, or carbonation
- Low-fat (1%) and nonfat milk (8-oz portion); flavored milk with no more than 22 g of total sugars per 8-oz portion
- 100% fruit juice in 4-oz portion
- Caffeine-free

Products had to be ready-to-eat and in single-portion size

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Data Collection & Analysis

- Food store assessments conducted by 2 graduate students between August & October, 2012.

- The analysis included descriptive statistics, and pairwise comparison using chi square

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Stores Surveyed

	High-income urban	Low-income urban	Rural
Supermarket/ grocery store	12 (29.3%)	6 (20.0%)	5 (35.7%)
Convenience store/ food mart	29 (70.7%)	24 (80.0%)	9 (64.3%)
Total	41	30	14

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Results: Beverages

Beverages	High-income urban (n=41)	Low-income urban (n=30)	Rural (n=14)
100% fruit juice	0	0	0
1% milk	5 (12.2)	1 (3.3)	0
Nonfat milk	1 (2.4)	0	0
Flavored milk	5 (12.2)	1 (3.3)	0
Soy milk	0	0	0
Water	37 (09.2)	29 (96.7)	14 (100.0)

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Results: Processed Snacks

Snacks	High-income urban (n=41)	Low-income urban (n=30)	Rural (n=14)
Nuts & seeds	31 (75.6)	23 (76.7)	13 (92.9)
Granola bars	31 (75.6)	19 (63.3)	9 (64.3)
Yogurt	23 (56.1)	7 (23.3)	6 (42.9)
Other canned fruit	19 (46.3)	6 (20.0)	0
Dried fruit	18 (43.9)	4 (13.3)	0

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Results: Processed Snacks cont.

Snacks	High-income urban (n=41)	Low-income urban (n=30)	Rural (n=14)
Chips	10 (24.4)	4 (13.3)	0
Applesauce	5 (12.2)	0	1 (7.1)
Graham/animal crackers	0	2 (6.7)	0
Crackers	1 (2.4)	0	0
Chex mix	0	0	0
Pretzels	0	0	0
Rice cakes	0	0	0
Popcorn	0	0	0
Trail mix	0	0	0
Cookies	0	0	0
Bagels	0	0	0
Muffins	0	0	0
Popsicles/other frozen desserts	0	0	0

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Results: Processed Snacks cont.

- 8 snack items found in high-income stores; 7 in low-income stores; 4 in rural stores

- Significant differences between locations ($p<0.05$):
  - Rural less likely to have “baked or low-fat chips” than high-income urban
  - Low-income urban less likely to have “low-fat/nonfat yogurt” and “unsweetened applesauce” than high-income urban
  - Low-income urban & rural less likely to have “other canned or bottled fruit in natural juice or water” and “dried fruit with no added sugar” than high-income urban

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Results: Fruits

Fruits	High-income urban (n=41)	Low-income urban (n=30)	Rural (n=14)
Apples	20 (48.8)	11 (36.7)	9 (64.3)
Bananas	18 (43.9)	12 (40.0)	3 (21.4)
Oranges	16 (39.0)	7 (23.3)	9 (64.3)
Other fresh fruit	14 (34.2)	4 (13.3)	5 (35.7)
Mixed fruit	17 (41.5)	3 (10.0)	0
Melon	14 (34.2)	3 (10.0)	0
Pears	9 (22.0)	2 (6.7)	5 (35.7)
Grapefruits	9 (22.0)	2 (6.7)	4 (28.6)

Results: Fruits cont.

Fruits	High-income urban (n=41)	Low-income urban (n=30)	Rural (n=14)
Plums	10 (24.4)	3 (10.0)	3 (21.4)
Peaches	9 (22.0)	4 (13.3)	2 (14.3)
Nectarines	9 (22.0)	3 (10.0)	2 (14.3)
Pineapple	10 (24.4)	1 (3.3)	1 (7.1)
Blueberries	7 (17.1)	2 (6.7)	3 (21.4)
Apricots	5 (12.2)	3 (10.0)	0
Grapes	2 (4.9)	1 (3.3)	2 (14.3)
Strawberries	3 (7.3)	1 (3.3)	1 (7.1)
Cherries	5 (12.2)	0	0

Results: Fruits cont.

- All fruits found in high-income stores; 16 in low-income stores; 13 in rural stores

- Significant differences between locations ($p<0.05$):
  - Low-income urban less likely to have cherries, cut-up pineapple, and “other fresh fruit” than high-income urban
  - Low-income urban & rural less likely to have cut-up melon and fresh mixed fruit than high-income urban
  - Rural was significantly **more** likely to have oranges, grapefruits, and pears than low-income urban

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Results: Vegetables

Vegetables	High-income urban (n=41)	Low-income urban (n=30)	Rural (n=14)
Broccoli florets	2 (4.9)	0	0
Carrots, baby	5 (12.2)	2 (6.7)	0
Cauliflower florets	1 (2.4)	0	0
Celery sticks	3 (7.3)	0	0
Tomatoes, cherry	9 (22.0)	5 (16.7)	0
Mixed vegetables	5 (12.2)	2 (6.7)	0
Other vegetables	5 (12.2)	2 (6.7)	2 (14.3)

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Summary

- Availability of recommended or more healthful snacks & beverages was limited in stores near schools all 3 locations

- Stores near rural schools had the lowest variety of more healthful snacks; stores near high-income urban schools had the greatest variety

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Limitations

- Small sample size, especially rural
- Percent of students eligible for free/ reduced fee lunch in Portland schools was only an estimate of neighborhood socioeconomic status

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Conclusion

- Stores near schools are an important source of snacks for children

- Understanding availability of healthy snacks & how this varies by neighborhood socio-economic & geographic characteristics is necessary to inform policy & interventions to improve these food environments & reduce obesity disparities

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Acknowledgements

- Co-investigators:
  - Betty Izumi, PhD, MPH, RD – Portland State University
  - Thuan Nguyen, PhD - OHSU

- Funding source:
  - Betty Gray Rural Health Development Award, OHSU School of Nursing

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