Worksite neighborhood characteristics and individual obesogenic behaviors among a sample of Seattle worksites

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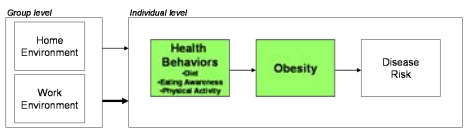
Introduction

- The environment around individuals influences health behaviors
  - -Changing the environment may assist in changing behavior
- Workplace neighborhood has been less studied than home neighborhood
- Extent of workplace influence:
  - -Approximately 60% of adults employed
  - -Greater than 50% of adult's waking hours spent at work

Figure 1. Overall conceptual model



Aim

To evaluate the role of food and activity environments around worksites on:body mass index (BMI), eating awareness, and dietary and physical activity behaviors among adults.

Area-level Measures+

Food Environment
- Dine-in restaurants
- Fast food (or "quick-serve") restaurants
- Food stores (grocery and produce markets)

Physical Activity Environment
- Fitness destinations (e.g. pools, fitness centers, etc.)
- Street connectivity (i.e. intersections)
- Land-use mix (i.e. retail destinations, employment, residential density)

+Count of features within 1km airline buffer; Data only available for King County, WA

Individual-level Measures

Body mass index (BMI)
Dietary behaviors
- Fruit and vegetables, fast food, soft-drinks

Eating awareness
- Eating while doing other activities

Physical activity behaviors
- Free-time activity, walking

Self-efficacy
- To monitor eating, to increase activity

Data and Results

Promoting Activity and Changes in Eating (PACE)
- Intervention to prevent weight gain
- 34 participating worksites at baseline
- Group-randomized
- Subsample located within King County, WA
- N=27; n=2362

Figure 2. PACE worksites with 1 km buffer

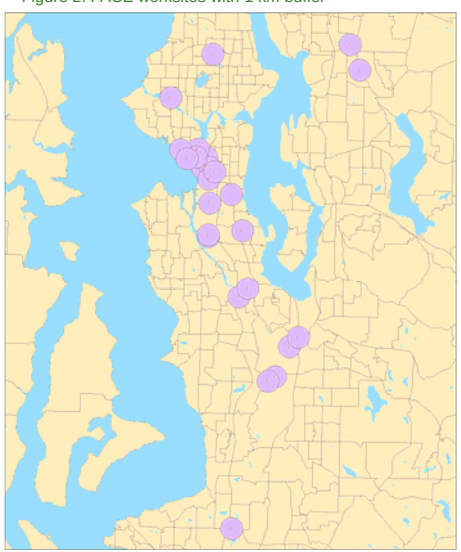


Table 1. Baseline demographic characteristics of PACE worksites located within King County, WA.

	Total[a] (n=2362)	
	mean	SD
Age	42.0	11.3
	n	%
Race		
White	1677	76.0
African American	120	5.8
Hispanic/Latino	78	3.3
Asian	303	14.0
Education		
<HS, HS graduate or GED	375	16.4
Some college or technical college	746	32.2
College graduate	826	35.4
Post-graduate or professional degree	375	16.0
Household income		
<$50,000	611	30.9
$50,000 to $74,999	461	22.7
$75,000 to $100,000	394	19.4
>$100,000	559	26.9

[a]N=27; n=2362

Table 1a. Count of PACE worksite neighborhood features within 1 km airline buffer

	Total (N=27)	
	mean	sd
Fitness destinations	6.28	5.7
Intersections	189.6	118.4
Healthy food outlets		
Grocery and produce stores	12.0	13.4
Dine-in restaurants	38.4	46.6
Unhealthy food outlets		
Fast or "quick-serve" restaurants	14.3	13.7
Convenience stores	6.8	6.5
Employment (# of jobs)	34,399.6	44,846.6
Residential units	4,158.6	4,509.9

Table 2. Baseline reported BMI, physical activity-, and dietary-related behaviors among PACE worksites located within King County, WA [a]

	Total (n=2362)	
	mean	sd
BMI[b]	27.2	6.0
Godin physical activity score	30.5	25.3
Regular sweat inducing activity (n, %)	608	26.2
No walking (n, %)	383	17.4
High self-efficacy to increase activity (n, %)	451	19.2
Fruit and vegetable servings per day		
5 A Day summary	3.1	2.1
Single item	3	1.7
Fast food meals per week	0.6	0.7
Soft-drink consumption per week	3.6	4.4
High self-efficacy to monitor eating (n, %)	184	8
Low eating awareness (n, %)	782	33.4

[a]N=34; n=2382
[b]kg/m²

Table 3. Association between density of food environment attributes and dietary behaviors.

	Fresh food stores				Dine-in restaurants				Fast food or Convenience stores			
	Diff[a]	Ratio[b]	95% CI	Pvalue[c]	Diff	Ratio	95% CI	Pvalue	Diff	Ratio	95% CI	Pvalue
Fruit and vegetables servings (per day)												
5 A Day summary	-0.03		(-0.23, 0.14)	0.713	-0.05		(-0.24, 0.13)	0.590	-0.05		(-0.20, 0.11)	0.564
Single-item	0.10		(-0.03, 0.28)	0.105	0.11		(-0.04, 0.27)	0.155	0.11		(-0.03, 0.24)	0.114
Fast food meals (per week)		0.93	(0.90, 0.97)	0.001		0.94	(0.90, 0.98)	0.002		0.96	(0.94, 0.99)	0.006
Soft-drink intake (per week)		0.96	(0.81, 1.13)	0.616		0.99	(0.84, 1.17)	0.895		1.00	(0.90, 1.12)	0.969
Eating awareness	0.04		(-0.02, 0.12)	0.141	0.04		(-0.03, 0.11)	0.208	0.04		(-0.02, 0.10)	0.239

[a] Difference in estimated minutes of walking per week presented for increase of IQR of each built environment attribute within km buffer area; Slope between groups estimated by linear mixed models adjusted for age (continuous), sex, race (collapsed into 4 categories), and education (collapsed into 4 categories)
[b] Log-transformation of variable; ratio of medians presented
[c] Wald Test

Table 4. Association between density of fitness destinations BMI, and physical activity-related variables.

	Fitness Destinations			
	Difference[a]	Ratio[b]	95% CI	Pvalue[c]
Body Mass Index (kg/m²)		1.0	(0.96, 1.01)	0.384
Godin Physical Activity Score	3.1		(0.2, 6.0)	0.038
Godin Sweat-inducing Activity	0.0		(-0.1, 0.1)	0.862
Self-efficacy to increase activity	0.1		(0.0, 0.2)	0.187

[a] Difference in predictor presented for increase of IQR of each built environment attribute within km buffer area; Slope between groups calculated via linear mixed models adjusted for age (continuous), sex, race (collapsed into 4 categories), and education (collapsed into 4 categories) as fixed effects and a worksite random effect
[b] Log-transformation of variable; ratio of medians presented
[c] Wald Test

Table 5. Association between density of built environment attributes and the probability of walking among PACE adults.

	Difference[a]	95% CI	Pvalue[b]
Components of Walkability			
Intersections	1.33	(1.02, 1.73)	0.035
Food stores	1.26	(1.01, 1.57)	0.037
Restaurants	1.31	(1.03, 1.66)	0.025
Employment opportunities	1.20	(1.03, 1.39)	0.017
Residential units	1.42	(1.09, 1.85)	0.010

[a] Difference in probability of walking per week presented for increase of IQR of each built environment attribute within km buffer area; Slope between groups estimated by multilevel logistic model adjusted for age (continuous), sex, race (collapsed into 4 categories), and education (collapsed into 4 categories) as fixed effects and a worksite random effect
[b] Wald Test

Conclusions

- Physical activity behaviors may be more sensitive to worksite neighborhood characteristics than dietary behaviors
- Worksites in more "walkable" neighborhoods have higher proportions of employees who walk

Limitations

- Cross-sectional analysis
  - -Direction of association questionable
- Potential ecologic fallacy
  - -Possible that behaviors occur outside of worksite neighborhood

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