Neighborhood Crime and the Weight Status of Older Adults: The Role of Gender

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Background

Recent research suggests the critical role of neighborhood context for health and well-being in later life (Cornwell and Cagney, 2014; Lochner et al., 2003; Roux et al., 2001, Yen, Michaela and Purdue, 2009). Among the potential sources of environmental stress, crime is considered especially consequential for the mental and physical well-being of urban residents (Browning, Cagney, and Ivenuik, 2012; Stafford, Chandola, and Marmot, 2007). In particular, burglary is understood as particularly fear-inducing for older adults given its greater likelihood, and the potential that home invasion could lead to other forms of criminal activity (Coakley and Woodford-Williams 1979; O'Neill 1989). Compared to violent crime, burglary is unpredictable and disrupts feelings of security, which may have an immediate threat that magnifies a sense of vulnerability and fear. In fact, fear associated with exposure to threatening environments may be accompanied by a physiological stress response with implications for processes such as inflammation and glucocorticoid hormone production. For example, living in a high-crime community may diminish health status both through increased fear-related stress on health behaviors and through the direct effects of stress on pathophysiological processes. People living in these communities may be more likely to feel fear, and less likely to want to use outdoor space. Less engagement in outdoor physical activities may be associated with an energy imbalance, which results in a greater deposition of fat and a higher risk for the development of chronic disease. This may all take place in a context where older adults have lived in their neighborhoods for long periods of time, have deep and abiding connections, and are potentially more reliant on neighbors to meet daily needs.

While examining the role of crime in the context of health is not new (e.g., Ferraro and LaGrange, 1992; Ferraro, 1995), little is known about the role of gender in conditioning the effects of local stressors on health in later life. Yet there is a theoretical reason to expect that processes may work differently for men and women given evidence from research on youth (Eitle and Turner, 2002). Nicolson and Browning (2012), for example, found that younger women, not men, are more likely to be influenced by neighborhood disadvantage in their communities. We seek to understand whether this gender difference also is evident at older ages, and with crime as a component of disadvantage. We hypothesize that (1) crime may be positively associated with weight status such as waist circumference and BMI and may operate differently for men and women, and that (2) community context such as physical disorder and social cohesion may mediate this association. We believe this may be due to physical conditions such as run-down, dilapidated buildings and litter in residential areas that may increase stress, fear and discomfort or a lack of resources and social support that can increase isolation, and fear of victimization, which may precipitate unhealthy behaviors such as smoking and sedentary activities.

Data

In this paper, we examine the relationship between weight-related health outcomes and a host of neighborhood characteristics with a focus on gender differences in older adults. We use a nationally representative survey of older adults (NSHAP W2), which provides a wide variety of individual demographic factors as well as self-reported health behaviors. One useful feature of these data is that they also include an array of neighborhood social characteristics, allowing for a more developed analysis of the context in which health decrements take root. From field interviewer reports on the conditions of the respondents' building and street, we construct a scale of neighborhood physical disorder in respondents' immediate built environment (alpha=0.83). Similarly, we construct a scale of

social cohesion described by respondents (alpha=0.76), which involves neighbors knowing and trusting one another and having shared values. Geocoded crime data were derived from the FBI Uniform Crime Report Databases. Since crime rates are higher in urban areas, we limit our analytic sample to urban-dwelling respondents (N=1,708) and aggregate crime reports to the county-level. To adjust the crime report's right skewness, we divide burglary incidence into tertiles. To our knowledge, no study examines gender differences with particular emphasis on older adults and their neighborhood environments – specifically, exposure to fear-inducing crime and health. We hypothesize that living in a high-crime neighborhood may lead to physiological manifestations of stress as indexed by changes in waist circumference (WC) and body mass index (BMI).

Preliminary Results

Descriptive statistics for variables used in this study are weighted and adjusted for survey design. Data on age, race, living arrangement, education, and health behaviors indexed by smoking, drinking and exercise, and comorbidity index are used (descriptive statistics available upon request). On average, men (n= 823) had a wider waist (105.50 vs. 94.34) and were heavier (94.34 and 28.74) than women (n=885). Notably, men were more likely to engage in unhealthy behaviors (use of cigarettes =14.54% and alcohol = 7.80%) compared to women (10.78% and 1.40%, respectively). However, compared to men, approximately 10 percent more of the women report that they do not exercise. In addition, men were more likely to live in deleterious neighborhood contexts characterized by higher levels of burglary and physical disorder, and by lower levels of social cohesion.

Our next step was to examine the effect of burglary on waist circumference and BMI among men and women in multivariate models. Results in Table 1 suggest that even when controlling for physical disorder and social cohesion in neighborhoods, living in a high-crime neighborhood is positively associated with an increase in waist circumference for women. For instance, living in the highest crime neighborhood increased waist circumference for urban-dwelling women by 3.15 centimeters ($p<0.05$), holding other covariates constant. However, this result is not present for men. Similarly, in Table 2, women residing in the highest burglary neighborhoods (highest tertile) were more likely to have a higher BMI, but, again, not true for men.

These initial results are consistent with extant studies on gender differences in associations between neighborhood disadvantage and BMI in a younger population (Nicholson and Browning 2012), suggesting that fear of crime may operate differently for men and women. One possible explanation for this finding is that community-level disadvantage is less likely to lead to fear and withdrawal from public space not only for young adult men but also older adult men. Consequently, our study suggests that the mechanisms which produce physiological manifestations of stress in older adults vary by gender, and this may be more pervasive in the highest crime neighborhoods. Future work will explore associations linking crime to health outcomes using lower levels of geographic aggregation at the census tract or block group with different types of inflammatory biomarkers such as C-reactive protein and cortisol. Also, data on medication use for this wave of NSHAP will soon be available, allowing us to incorporate medications related to cardiovascular health, inflammation, and diabetes, which may confound our physiological outcomes.

Table 1. Multivariate regression on the effect of burglary on waist circumference (in centimeters) by gender

	Men			Women		
Variable Name/Model	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Crime (Burglary)	-1.61	-1.61	0.04	1.10	1.50	1.25
Medium	-1.99	-2.09	0.14	3.76*	4.18*	3.53*
High						
Neighborhood Characteristics						
Physical disorder		0.18	1.14		2.45*	1.48
Social cohesion		-1.20	-1.12		-0.23	0.91
Individual Characteristics						
Age (Ref = 62-70)			-4.46**			-4.25*
71-80			-7.83***			-7.66***
80 and up						
Race/ethnicity (Ref=White)						
Black, non-Hispanic			-7.12**			2.59
Hispanic			-6.16**			-3.16
Others			-5.56			5.05
Living Alone			0.26			1.00
Education (Ref= less than HS)						
HS			-0.49			-2.59
Some college			0.83			-4.56
BA or more			-2.07			-5.53
Smoking (Ref = never smoked)						
Ever smoked			0.52			0.25
Currently smokes			-4.04			-7.90***
Alcohol (Ref = does not drink)						
Moderate drink			-1.02			-0.65
Heavy drinker[a]			-6.93*			-3.25
Does not exercise			0.38			4.32**
NSHAP Comorbidity Index[b]			1.03*			1.96***
Constant	106.69***	108.75***	1110.15***	92.84***	91.19***	91.70***
Legend: * p<0.05; ** p<0.01; *** p<0.001						

[a] More than 4 standard drinks on any one day were considered as heavy drinking.

[b] NSHAP comorbidity index additionally includes five more conditions – that is, hypertension, skin cancer (i.e., melanoma), osteoarthritis, osteoporosis, hip fracture, Parkinson's disease, sensorimotor conditions (i.e., urinary and stool incontinence problems), in addition to ten chronic conditions used in Charlson Comorbidity Index of heart attach, congestive heart failure, procedure for coronary artery disease, stroke, cancer (i.e., all non-metastatic cancers other than skin cancer), metastatic cancer, COPD/asthma, rheumatoid arthritis, Alzheimer's, and other dementia. The total conditions of NSHAP comorbidity index therefore are 15 items.

Table 2. Multivariate regression on the effect of burglary on BMI[a] by gender

	Men			Women		
Variable Name/Model	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Crime (Burglary)						
Medium	-0.50	-0.55	-0.02	0.75	0.87	0.67
High	-1.04*	-0.86	-0.31	1.38*	1.62*	0.96
Neighborhood Characteristics						
Physical disorder		-0.00	0.08		0.83	0.19
Social cohesion		-0.18	-0.23		-0.09	0.27
Individual Characteristics						
Age (Ref = 62-70)						
71-80			-1.44**			-1.56*
80 and up			-3.17***			-4.35***
Race/ethnicity (Ref=White)						
Black, non-Hispanic			-1.80*			2.02*
Hispanic			-1.27			-0.50
Others			-1.87			-0.42
Living Alone			0.34			0.53
Education (Ref= less than HS)						
HS			-0.65			-0.82
Some college			-0.14			-0.43
BA or more			-1.61			-1.29
Smoking (Ref = never smoked)						
Ever smoked			-0.42			-0.35
Currently smokes			-2.35*			-3.06**
Alcohol (Ref = does not drink)						
Moderate drink			-0.40			-0.85
Heavy drinker			-0.95			-3.31*
Does not exercise			-0.10			1.96**
NSHAP Comorbidity Index			0.16			0.88***
Constant	29.36***	29.91***	32.02***	28.08***	27.65***	27.80***
Legend: * p<0.05; ** p<0.01; *** p<0.001						

[a] BMI was log transformed after removing extreme values above and below 3 standard deviation from the mean.

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