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The built environment and alcohol consumption in urban neighborhoods

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Abstract

Objectives: To examine the relations between characteristics of the neighborhood built environment and recent alcohol use.
Methods: We recruited participants through a random digit dial telephone survey of New York City (NYC) residents. Alcohol consumption was assessed using a structured interview. All respondents were assigned to neighborhood of residence. Data on the internal and external built environment in 59 NYC neighborhoods were collected from archival sources. Multilevel models were used to assess the adjusted relations between features of the built environment and alcohol use.
Results: Of the 1355 respondents, 40% reported any alcohol consumption in the past 30 days, and 3% reported more than five drinks in one sitting (heavy drinking) in the past 30 days. Few characteristics of the built environment were associated with any alcohol use in the past 30 days. However, several features of the internal and external built environment were associated with recent heavy drinking. After adjustment, persons living in neighborhoods characterized by poorer features of the built environment were up to 150% more likely to report heavy drinking in the last 30 days compared to persons living in neighborhoods characterized by a better built environment.
Conclusions: Quality of the neighborhood built environment may be associated with heavy alcohol consumption in urban populations, independent of individual characteristics. The role of the residential environment as a determinant of alcohol abuse warrants further examination.

Keywords: Epidemiology; Alcohol; Multilevel modeling; Neighborhood

1. Introduction

The global burden of disease attributed to alcohol consumption is substantial. Between 1.5% and 3.2% of global mortality and 6% of total global life years lost have been attributed to alcohol consumption (Murray and Lopez, 1996; Rehm et al., 2003). Furthermore, a dose response relationship has been documented between increasing amounts of daily alcohol consumption and the risk of developing disease, including oral, esophageal, liver, and breast cancers, unipolar major depression, epilepsy, coronary heart disease, stroke, and liver cirrhosis (Rehm et al., 2003). In the United States, per capita alcohol consumption in 2003 was estimated to be 2.22 gal, representing a 0.9% increase over 2002 (Lakins et al., 2005).

Several individual characteristics have been associated with an increased risk of frequent heavy drinking. Frequent heavy drinking and its sequelae vary by gender and race/ethnicity (Caetano and Clark, 1998a,b). Lower educational attainment and income, unemployment, being single, separated, or divorced, and younger age have been shown to increase the risk of heavy drinking (Galvan and Caetano, 2003). Attitudes towards drinking also appear to differ by both gender and race/ethnicity, with non-Whites having more negative attitudes towards drinking and drunkenness compared to Whites (Caetano and Clark, 1999). Furthermore, liberal attitudes and norms regarding drinking have been associated with increased risk of heavy drinking (Caetano and Clark, 1999).

Although during the past decade a growing body of research has considered the relations between characteristics of

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neighborhoods and health (Cohen et al., 2003; Diehr et al., 1993; Ellaway and Macintyre, 1996; Macintyre and Ellaway, 2003; Subramania et al., 2001), there is a paucity of research on features of an individual's neighborhood context that may play a role in shaping alcohol use and misuse. There has been some research on characteristics of neighborhoods and their relation to alcohol use among adolescents and young adults (Kim and McCarthy, 2006; Wilson et al., 2005). Among adolescents, regular alcohol use increases with lower neighborhood attachment, organization, and higher community norms favoring drug use and the perceived availability of drugs (Beyers et al., 2004). One analysis has shown that alcohol use among adolescents is correlated with increased neighborhood violence and drug use, and decreased safety (Lambert et al., 2004). It has been reported that high socio-economic status (SES) neighborhoods have increased reporting of parental drinking which may in turn be associated with increased adolescent alcohol use (Chuang et al., 2005).

A few recent reports have assessed the spatial relations between availability of alcohol within communities and individual alcohol consumption. These studies have found a relationship between proximity and availability of alcohol in both individual consumption of alcohol and community disorder and violence (Cohen et al., 2006; Gorman et al., 2001; Gruenewald et al., 1993, 2002; Lipton and Gruenewald, 2002; Millar and Gruenewald, 1997; Zhu et al., 2004). However, these studies were concerned particularly with the location and density of the availability of alcohol as key determinants of alcohol consumption and attendant adverse health consequences and did not consider if features of neighborhoods themselves, separate and apart from availability of alcohol, were associated with individual alcohol consumption. We are aware of only one study that has considered whether particular neighborhood characteristics are associated with risk of adult alcohol use. In that study, women residing in neighborhoods characterized by high levels of disorder, drank more heavily or got drunk more often than those living in a more orderly neighborhood (Hill et al., 2005). This study was limited by reliance on self-reports for both alcohol use and neighborhood conditions and was restricted to women.

The urban built environment can be thought of as all of the characteristics of an area or neighborhood that cannot be reduced to the people that live in that area (Weich et al., 2002, 2001). This includes not only the buildings of a neighborhood, but the streets, parks, public spaces, etc. There is growing interest in the notion of the built environment and its potential influence on health, and there is no one definition of what constitutes the built environment. For example, land use, urban sprawl, residential proximity to playgrounds and fast food establishments have been examined within the context of obesity (Burdette and Whitaker, 2004; Ewing et al., 2006; Gordon-Larsen et al., 2006). Indoor air quality has been extensively studied in relation to respiratory and other illnesses in both workplaces and homes (Apte et al., 2000; Bornehag et al., 2005; Mendell et al., 2002; Sundell et al., 1995; Wargocki et al., 2002). Additionally, the role of new road construction has been explored in the context of injuries, noise pollution, air and sleep quality (Egan et al., 2003). Although there is no consensus in the literature about a single definition of the built environment, leading thinkers in the area have urged that the role of multiple dimensions of the built environment need to be explored in concert, and that study designs that objectively assess the built environment are key next steps for the field (Frumkin, 2006).

In this analysis we expand upon the growing body of literature examining the potential health consequences of poor built environment. This work examines the relation between characteristics of the neighborhood built environment and alcohol use in a large urban area. We make a distinction here between the internal and the external built environment and make use of an objective assessment of the built environment using archival data combined with survey self-report data to assess use of alcohol. In this paper we define the internal built environment as the internal characteristics of individual homes and the external built environment as characteristics of the façade or structure of the home.

2. Methods

2.1. Sample

A random digit dial telephone survey was conducted between March and June of 2002 among residents of the New York City (NYC) metropolitan area. Non-institutionalized adult residents of the NYC metropolitan area aged 18 years and over were eligible for the study (Tardiff et al., 1986). The study was intended to document mental health in the aftermath of the September 11, 2001 attacks. Residents living closest to the World Trade Center site were oversampled. While the telephone survey sampled from the larger metropolitan area, this analysis was restricted to residents of the five boroughs of NYC. The cooperation rate for the 35 min survey was 64.3%; the sample of respondents did not differ significantly from the 2000 census estimates of New York City with respect to age, gender, race/ethnicity, or income. The Institutional Review Board of the New York Academy of Medicine reviewed and approved this work.

Using a structured questionnaire, respondents were interviewed regarding demographic characteristics such as age, race/ethnicity, sex, educational attainment and income. For this analysis, alcohol use was assessed in two ways: report of drinking any alcohol in the past 30 days and report of drinking five or more drinks at one sitting in the past 30 days (heavy alcohol use).

2.2. Built environment assessment

The 59 community districts of NYC represent the neighborhood units in this study. The community district boundaries represent efforts of the New York City Office of City Planning in the 1970s to define neighborhoods through the residents' own descriptions and community involvement was critical in their development. While these districts may no longer represent the homogenous units initially described three decades ago, they do represent neighborhoods that are meaningful for local residents and relevant to resident health and behavior. Examples of these community districts include well-recognized neighborhoods like the Upper West Side, or Bedford-Stuyvesant (Galea et al., 2005, 2003; Marzuk et al., 1997; Tardiff et al., 1986).

Information describing characteristics of the neighborhood built environment was obtained from the 1999 NYC housing and vacancy survey (NYCHVS) (U.S. Census Bureau, 1999) and the fiscal 2002 NYC mayor's management report (New York City Mayor's Office of Operations, 2004). The NYCHVS is sponsored by the NYC Department of Housing Preservation and Development and is conducted approximately every 3 years. In the NYCHVS, trained field staff visits a sample of housing units in each neighborhood; the 1999 NYCHVS included over 15,000 occupied units. For each housing unit, the field staff assess the physical condition of the unit as well as interview one adult member. This analysis includes only occupied housing units to allow for comparison between the relative roles of external and internal built environments. The median number of housing units sampled per neighborhood was 245 (range of 187–702).