The influence of perceived neighborhood disorder on smoking cessation among urban safety net hospital patients

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ABSTRACT

Background: Although research has shown that objective neighborhood characteristics are associated with health behaviors including smoking, little is known about the influence of perceived neighborhood characteristics on a smoking cessation attempt.
Methods: Participants (N = 139) enrolled in a Dallas safety-net hospital smoking cessation program were followed from 1 week pre-quit through 4 weeks post-quit. Logistic regression analyses were conducted to evaluate the impact of perceived neighborhood order and disorder on the likelihood of achieving biochemically verified point prevalence and continuous smoking abstinence 4 weeks following a scheduled quit attempt. Analyses were adjusted for demographic characteristics, cigarettes per day, intervention group, and pharmacological treatment.
Results: Participants were primarily non-White (72.7%) and female (56.8%) with a mean age of 52.5 (SD = 3.7) years. Most reported an annual household income of ≤$25,000 (86.3%). Logistic regression analyses indicated that greater neighborhood physical (p = .048) and social order (p = .039) were associated with a greater likelihood of achieving point prevalence smoking abstinence at 4 weeks post-quit. Greater perceived physical (p = .035) and social disorder (p = .039) and total neighborhood disorder (p = .014), were associated with a reduced likelihood of achieving point prevalence abstinence. Social disorder (p = .040) was associated with a reduced likelihood of achieving continuous abstinence at 4 weeks post-quit, while social order (p = .020) was associated with an increased likelihood of continuous abstinence.
Conclusions: Perceptions of neighborhood order and disorder were associated with the likelihood of smoking cessation among socioeconomically disadvantaged smokers making a quit attempt. Findings highlight the need to address perceptions of the neighborhood environment among disadvantaged smokers seeking treatment.

1. Introduction

Smoking is the leading cause of premature death in the U.S. (Fenelon and Preston, 2012), primarily due to cancer, cardiovascular diseases, and respiratory diseases (CDC, 2008). Tobacco use in the U.S. costs an estimated $289 billion per year in health care expenditures (USDHHS, 2014). Although the prevalence of smoking has declined to 17.8% among adults in the U.S., 29.2% of those living in poverty continue to smoke (Jamal et al., 2014). Unfortunately, socioeconomically disadvantaged smokers are less likely to successfully quit smoking than smokers of higher socioeconomic status (SES), despite similar numbers of cessation attempts (Kotz

and West, 2009). Thus, more research is needed to understand the factors that influence cessation and tobacco-related health disparities in socioeconomically disadvantaged populations.

Numerous studies have shown that individual-level socioeconomic attributes (e.g., education, income, employment) are associated with smoking relapse among those trying to quit (Businelle et al., 2010; Fernández et al., 2006; Finney Rutten et al., 2005; Foulds et al., 2006; Kendzor et al., 2010, 2012; Marti, 2010; Siahpush and Carlin, 2006; Wetter et al., 2005). More recently, residential contextual factors have been linked to tobacco use, even after accounting for individual socio-demographic attributes (Chuang et al., 2005; Datta et al., 2006; Diez Roux et al., 2003; Duncan et al., 1999; Fleischer et al., 2015; Kandula et al., 2009; Kleinschmidt et al., 1995; Miles, 2006; Öhlander et al., 2006; Pickett and Pearl, 2001; Reijneveld, 1998; Ross, 2000; Shohaimi et al., 2003; Stimpson et al., 2007; Van Lenthe and Mackenbach, 2006). Prior work has indicated that

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neighborhood socioeconomic characteristics (Chuang et al., 2005; Datta et al., 2006; Diez Roux et al., 2003) neighborhood social environment (Kandula et al., 2009; Shareck and Ellaway, 2011), and neighborhood physical conditions (Chuang et al., 2005; Henriksen et al., 2008; Miles, 2006; Reitzel et al., 2012) have a significant impact on the prevalence of smoking and smoking level.

In addition to smoking behavior, recent studies have shown that objective neighborhood characteristics may also influence smoking cessation (Giskes et al., 2006; Kendzor et al., 2012; Reitzel et al., 2011; Turrell et al., 2012). For example, Kendzor et al. (2012) showed that area-level unemployment adversely impacted smoking cessation attempts among African Americans. Other studies have shown that residents of disadvantaged neighborhood are less likely to quit smoking (Giskes et al., 2006; Turrell et al., 2012), and that closer proximity to tobacco outlets was associated with relapse among smokers making a quit attempt (Reitzel et al., 2011).

Although studies have examined the association of objective neighborhood-level characteristics with smoking behavior, little is known about the influence of subjective perceptions of the neighborhood environment on smoking and smoking cessation. According to Hill and Maimon (2013), perceptions of the neighborhood environment may be a key mechanism linking objective neighborhood disadvantage with health behavior. Importantly, they note that the objective neighborhood environment must be perceived in order to cause distress and negatively influence health. Previous research has shown that perceptions of the neighborhood environment are associated with modifiable health risk factors such as obesity, heavy drinking, and poor sleep quality, and distress may function as a key mechanism linking neighborhood perceptions with modifiable health risk factors (Burdette and Hill, 2008; Hill and Angel, 2005; Hill et al., 2009). Perceptions of neighborhood problems and social cohesion have also been linked with greater smoking prevalence and increased nicotine dependence (Ellaway and Macintyre, 2009; Jitnarin et al., 2015; Patterson et al., 2004; Reitzel et al., 2012; Shareck and Ellaway, 2011), and initial research has indicated that perceptions of neighborhood disadvantage, particularly neighborhood social cohesion, may indirectly influence smoking cessation (Businelle et al., 2010; Reitzel et al., 2013). However, overall, very little is known about the impact of the perceived neighborhood environment on smoking cessation. Neighborhood perceptions may be a particularly relevant influence among socioeconomically disadvantaged smokers, and may contribute to an explanation of tobacco-related health disparities.

Neighborhood disorder refers to objective characteristics that reflect diminished social control in a neighborhood or community, while perceptions of neighborhood disorder reflect an individual's subjective experience of living in a neighborhood (Hill and Maimon, 2013). According to Ross and Mirowsky (1999) perceived neighborhood disorder includes two main components: physical disorder (e.g., vandalism, abandoned houses) and social disorder (e.g., crime, drug and alcohol use). Negative perceptions of the neighborhood environment (including neighborhood physical and social disorders) may increase the likelihood of modifiable health risk factors through psychosocial variables including increased negative affect and stress and decreased social support (Businelle et al., 2010; Galea et al., 2003; Hill and Maimon, 2013; Kendzor et al., 2013; Scribner et al., 2010).

The primary goal of the current study was to evaluate the influence of perceived neighborhood physical and social order and disorder on smoking cessation among socioeconomically disadvantaged smokers making a quit attempt. Specifically, we hypothesized that neighborhood physical and social disorder would be associated with a reduced likelihood of smoking cessation following a quit attempt, while physical and social order would be associated with an increased likelihood of achieving abstinence. Gaining a better understanding of the impact of perceived neighborhood

disorder on smoking cessation may facilitate the development of more effective interventions for socioeconomically disadvantaged smokers.

2. Methods

2.1. Participants

Data were collected as part of a randomized controlled trial designed to evaluate the effectiveness of offering financial incentives for smoking abstinence among socioeconomically disadvantaged smokers making a quit attempt (for details, see Kendzor et al., 2015). In brief, participants were recruited from a safety net hospital tobacco cessation clinic in Dallas, TX between August, 2011 and April, 2012. Individuals were eligible to participate in the study if they: (1) were willing to quit smoking 7 days from their first visit, (2) had >6th grade English literacy level, (3) were ≥18 years of age, (4) had an expired carbon monoxide (CO) level ≥8 ppm suggestive of current smoking, (5) reported smoking ≥5 cigarettes per day, and (6) were willing to attend all study visits. Participants assigned to usual care (UC) were offered weekly group support sessions, pharmacotherapy, and physician follow-up, while those assigned to adjunctive financial incentives (contingency management; CM) received all components of UC with the addition of small financial incentives for biochemically-verified abstinence from smoking. Pharmacotherapies included nicotine replacement therapy (NRT), varenicline, or bupropion/bupropion + NRT. Demographic characteristics and smoking history were collected during a computerized survey completed at the baseline visit, pharmacological treatment information, and the neighborhood disorder measure were collected on the scheduled quit day (1 week after the baseline visit). Smoking abstinence was assessed 4 weeks after the quit day. Although the primary study sample included 146 participants, a total of 7 participants were excluded from the current study because they did not complete the neighborhood disorder measure. The remaining 139 participants were included in the present analyses.

2.2. Measures

2.2.1. Demographic characteristics.
Demographic variables were measured including years of age, gender (male or female), race/ethnicity (White or non-White), education (<high school or ≥high school), partner status (married/living with significant other or single/divorced/separated/widowed), household income in the past year, insurance status (any type of insurance or uninsured) and intervention group (CM or UC). Race was dichotomized into White and non-White in all analyses due to the low frequency of participants from racial groups other than White or Black. The current study focuses on the impact of *perceptions* of neighborhood order and disorder rather than objective neighborhood characteristics; however, please note that participants resided in 49 different zip codes within the Dallas metropolitan area. The median number of participants living in each zip code was 2 with a range of 1–11. Thus, individuals from a variety of neighborhoods are represented in the current study.

2.2.2. Smoking characteristics.
Smoking characteristics were assessed at the baseline visit including average pre-quit cigarettes smoked per day (CPD), years of smoking, and expired CO level (ppm). Pharmacological treatment included nicotine replacement therapy (NRT), varenicline and others (i.e., bupropion or bupropion + NRT).

2.2.3. Neighborhood disorder.
The Perceived Neighborhood Disorder and Decay Questionnaire (Ross and Mirowsky, 1999) is a 15-item self-report measure of neighborhood disorder. The measure generates a total score, along with four subscales including neighborhood physical order (e.g., 2 items including the neighborhood is clean, people take care of their houses) and disorder (e.g., 5 items including graffiti, noise, vandalism, abandoned houses), and neighborhood social order (e.g., 4 items including people in the neighborhood watch out for each other, feel safe, trust each other, and have adequate police protection) and disorder (e.g., 4 items including people hanging around, drug use, alcohol use, crime). Items are rated on a 4-point scale from 1 to 4 (strongly disagree to strongly agree) and summed. Higher total scores indicate greater disorder and decay, and higher subscale scores indicate greater order or disorder. Cronbach's alpha ≥0.75 within each domain indicates good internal consistency.

2.2.4. Smoking abstinence.
Seven-day point prevalence abstinence at 4 weeks post-quit was defined as a self-report of abstinence from smoking over the past 7 days in combination with an expired CO level of <8 ppm. In cases where abstinence status could not be determined due to missing data, participants were considered non-abstinent. Participants were considered continuously abstinent at 4 weeks post-quit if they reported that they had been abstinent since the quit date assessment (with a 12-h grace period) and demonstrated expired CO levels of <8 ppm at all attended visits. Participants who self-reported abstinence since the quit date, but had missing smoking status data (due to non-attendance) at some time points were considered continuously abstinent if they missed no more than 2 consecutive assessments and the data at the surrounding time points indicated abstinence.