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Does neighborhood social cohesion modify the relationship between neighborhood social norms and smoking behaviors in Mexico?

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ABSTRACT

The aim of this study was to examine the separate and combined relationships of neighborhood social norms and neighborhood social cohesion with smoking behavior in a cohort of adult Mexican smokers. Neighborhood anti-smoking norms were measured as the proportion of residents in each neighborhood who believed that society disapproves of smoking. Perceived social cohesion was measured using a 5-item cohesion scale and aggregated to the neighborhood level. Higher neighborhood anti-smoking norms were associated with less successful quitting. Neighborhood social cohesion modified the relationship between neighborhood social norms and two smoking behaviors: smoking intensity and quit attempts. Residents of neighborhoods with weaker anti-smoking norms and higher social cohesion had lower smoking intensity and more quit attempts than residents living in other areas. Social cohesion may help buffer smoking behavior in areas with weak social norms.

1. Introduction

Cigarette smoking is the leading cause of preventable death in the world (Organization, 2011). In 2013, cigarette smoking was responsible for more than 43,000 deaths in Mexico (8.4% of the total number of deaths that occurred in Mexico that year) (Pichon-Riviere et al., 2013). The prevalence of smoking in Mexico was 21.7% in 2011; 58.4% of smokers (in 2011) had tried to quit smoking in the past year (Reynales-Shigematsu et al., 2012). Social norms have been shown to influence smoking behavior and cessation across a range of country settings (Christakis and Fowler, 2008; Ahern et al., 2009; Karasek et al., 2012; Arillo-Santillán et al., 2007), and anti-smoking norms are a possible means by which to reduce smoking behavior in Mexico and globally. Social norms are defined as an individual's perception of what is approved or disapproved within a group, thereby promoting or preventing the adoption of health behaviors (Echeverria et al., 2015). To date, most studies that have evaluated the influence of smoking norms on smoking behavior have been conducted among adolescents, including studies conducted in Mexico (Thrasher et al., 2008; Arillo-Santillán et al., 2007). While youth studies are important, particularly for understanding smoking initiation, the influence of social norms on adult smoking behavior is less well studied. However, many of the policies that the World Health Organization's Framework Convention on Tobacco Control (FCTC) promotes are presumed to work by making smoking socially unacceptable. A clearer understanding of how social norms influence cessation behavior among adult smokers may provide the foundation for formulating the next generation of tobacco control policies and programs that promote smoking cessation.

It is possible that area-level social norms may influence individual smoking behavior. For example, previous studies have highlighted the importance of neighborhood-level variables when analyzing smoking intensity and cessation (Ahern et al., 2009; Sapag et al., 2010; Karasek et al., 2012). This suggests that smoking behavior may not only be influenced by individual-level factors, but also by the physical and social environments an individual is exposed to. For instance, studies suggest that neighborhoods may be important environments in which smoking-related social norms are expressed and reinforced (Stead et al., 2001). Ahern et al. (2009) evaluated the association between neighborhood social norms and smoking behavior in New York City and found that neighborhoods characterized by stronger anti-smoking norms had lower smoking prevalence. Furthermore, Karesek et al. (2012) found a curvilinear relationship between social norms and

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smoking cessation rates among people in New York City. In this study, the investigators classified smoking cessation into quartiles (from weak to strong anti-smoking norms). The first three quartiles suggest that as anti-smoking norms became stronger there was an increase in smoking cessation, however, in neighborhoods with very strong anti-smoking norms (fourth quartile), smoking cessation rates decreased (Karasek et al., 2012). The researchers hypothesized that in neighborhoods with the strongest anti-smoking norms, smokers may feel isolated from the social processes of the neighborhoods, thereby making them more resistant to community norms (Karasek et al., 2012).

Furthermore, neighborhood social cohesion may also be an important factor affecting smoking behavior and cessation. For instance, a study that evaluated the influence of neighborhood social cohesion and smoking behavior in Minnesota, United States (US), found that more cohesive neighborhoods had lower prevalence of smoking (Patterson et al., 2012). Similar results were found in a study performed in seven European cities (Miles, 2006). Social cohesion may reduce smoking behavior by heighten the perception of safety and security among the community and therefore reducing the levels of stress that are associated with violence (Reitzel et al., 2013). Additionally, residents of cohesive neighborhoods may have more contact with each other, enhancing the flow of health information among community members. Furthermore, neighborhood social norms may reduce smoking prevalence and increase smoking cessation by making smoking socially undesirable. Although neighborhood social norms and social cohesion have been shown to influence a reduction in smoking behavior through different pathways, it is possible that the joint effect of neighborhood social norms and neighborhood social cohesion may work together to further decrease smoking intensity and increase smoking cessation.

Two previous studies have evaluated whether social cohesion modifies the association between neighborhood social norms and smoking behaviors, with mixed results (Karasek et al., 2012, Ahern et al., 2009). For instance, Ahern et al. (2009) found that in neighborhoods with stronger anti-smoking norms, higher neighborhood social cohesion was protective of smoking behavior among smokers in New York City. However, in neighborhoods with weaker anti-smoking norms, higher neighborhood social cohesion was associated with a higher smoking prevalence. However, Karasek et al. (2012) found that social cohesion did not moderate the association between social norms and smoking cessation among participants of New York City. Hence, studies show a somewhat inconsistent pattern to the potential interaction between neighborhood social cohesion and smoking-related social norms.

To date, there is limited work on the association between neighborhood-level variables and smoking behavior in Latin America, and there are no studies that have explicitly examined the joint effect of neighborhood social norms and social cohesion on smoking behavior. There may be important differences in the social context of Mexico that may alter how the social environment affects smoking. For instance, it is possible that normative beliefs are more important in Mexico compared to other countries, due to Mexico's strong familial orientation (Thrasher et al., 2009). Additionally, Mexico is characterized by lower smoking intensity, where 53% of smokers are non-daily smokers (PAHO-INSP, 2015). It is possible that low levels of smoking intensity and hence low levels of addictions may result due to the importance of social influence among the Mexican society. Therefore, it is important to evaluate how the social environment influences smoking in Mexico and other Latin American countries. Furthermore, a recent study in Mexico suggests that higher neighborhood social cohesion was associated with more quit attempts and more successful quitting, among Mexican smokers (Fleischer et al., 2014a). Given the previous research that suggests that social norms and social cohesion are important predictors of smoking prevalence (Ahern et al., 2009) and cessation (Karasek et al., 2012; Fleischer et al., 2014a; Miles, 2006), mostly in the US, it is important to examine these relationships in the context of Latin America. Therefore, the aim of this study was to examine the separate and combined associations of neighborhood social norms and neighborhood social cohesion on smoking intensity, quit attempts, quit success and smoking relapse among a cohort of smokers in Mexico from 2011 to 2012. We expect that stronger neighborhood anti-smoking norms will be associated with less smoking intensity and relapse, and more quit attempts and quit success. Furthermore, we expect that social cohesion will modify the association between social norms and smoking behavior. We expect that more cohesive neighborhood with strong anti-smoking norms will have lower levels of smoking intensity and relapse and higher levels of smoking cessation.

2. Methods

2.1. Population

We analyzed data from the Mexico administration of the International Tobacco Control Policy Evaluation Survey (ITC), a population-based, longitudinal survey of adult smokers in seven major Mexican cities. Data collection began in 2006, and used a stratified, multi-stage sampling scheme with face-to-face interviews. A more detailed description of the methodology can be found elsewhere (Fleischer et al., 2014b). Participants were eligible to participate in the study if they were adults, 18 years or older, and had smoked at least once during the previous week and at least 100 cigarettes in their lifetime. The data used in this study came from Wave 5 (April-May 2011) and Wave 6 (October-November 2012). The survey included participants living in 170 census tracts (i.e., Areas Geoestadisticas Basicas, or AGEBS), with an average of 26 participants per census tract (range 14–56) in 2012.

Using these data, we created three analytical samples of participants: the smoking intensity sample, the quit behavior sample and the relapse sample. The smoking intensity sample consisted of all Wave 6 participants who were current smokers (n=1669). The quit behavior sample consisted of Wave 6 participants who reported smoking every day or less at Wave 5 (n=1324). The relapse sample consisted of Wave 6 participants who reported having quit at Wave 5 (n=286). Separate analytic samples were constructed based on the subset of participants who were asked the respective questions related to the outcomes of interest.

2.2. Smoking variables

The first dependent variable, smoking intensity, was measured at Wave 6 by comparing participants who smoked six or more cigarettes per day to those who smoked fewer than six cigarettes per day. A previous study suggests that this measure shows evidence of predictive validity when assessing downstream cessation (Swayampakala et al., 2013). We also investigated three dependent variables related to smoking cessation: quit attempts, successful quitting and smoking relapse. A quit attempt was defined as a smoker at Wave 6 answering “yes” to the question, “In the past year, have you tried to quit smoking?” A smoker at Wave 6 was considered to have successfully quit if he/she had made a quit attempt since Wave 5, and had quit for at least one month at Wave 6. A person was considered to have relapsed if he/she had quit smoking at Wave 5 but reported smoking at Wave 6.