



Nicotine and addiction beliefs and perceptions among the US-born and foreign-born populations[☆]

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ABSTRACT

Little is known about nicotine and addiction beliefs held by those who are foreign-born in the US and how these beliefs are associated with acculturation and race/ethnicity. This study attempts to address these research gaps. Data were analyzed from two cycles of the Health Information National Trends Survey, HINTS-FDA 2015 ($n = 3738$) and HINTS-FDA 2017 ($n = 1736$). HINTS-FDA is a tobacco-focused, cross-sectional, nationally representative survey of US non-institutionalized civilian adults aged 18 years or older. We first assessed associations between foreign-born status and beliefs about nicotine and addiction using weighted chi-square analyses. Then, using only the foreign-born sample, we examined the associations of nicotine and addiction beliefs with race/ethnicity and acculturation (i.e., English proficiency and U.S. tenure) using weighted multiple linear regression. Results showed that, compared to US-born respondents, foreign-born respondents were more likely to be concerned with being addicted to nicotine and to believe that low nicotine cigarettes would have much lower lung cancer risk than a typical cigarette. Among the foreign-born, NH-Black and Hispanic respondents were more likely to see low nicotine cigarettes as harmful and addictive compared to NH-White respondents. The relationship between acculturation and nicotine beliefs was complex with lower acculturation associated with elevated misperceived risk of nicotine and also ratings of addictiveness. Further research among key sub-populations may inform communication, education and dissemination strategies, especially among vulnerable populations.

1. Introduction

The US demographic profile is projected to become much more diverse in coming years. Currently, non-Hispanic Whites (NHWs) account for more than 60% of the total population; however, by 2044, the US will become a “majority-minority” nation, with NHWs remaining the single largest racial/ethnic group but comprising less than 50% of the nation's total population (Colby and Ortman, 2014). In addition, the foreign-born population is rapidly growing. In 2015, the US foreign-born population reached 43.2 million, accounting for 13.4% of the general US population (Lopez and Bialik, 2017). Foreign-born individuals are defined as individuals residing in the United States who were not born in the US and were not US citizens at birth (U.S. Census Bureau, n.d.). The foreign-born population is projected to grow to 78 million by 2060, reflecting an 80% increase from 2015 (Colby and Ortman, 2014). This study seeks to study tobacco harm and addiction beliefs held by the foreign-born as our understanding of tobacco health

beliefs among this population is limited.

1.1. Foreign-born populations and smoking behavior

Findings on foreign-born health vary across health outcomes, demographics, socioeconomic status, and other cultural factors (Castaneda et al., 2015). However, many studies have reported the so-called “healthy immigrant effect,” with foreign-born individuals showing better health outcomes compared to their US-born counterparts (Argeseanu Cunningham et al., 2008). A similar pattern is also found in tobacco use studies as foreign-born individuals generally display lower smoking prevalence compared to their US-counterparts (Baluja et al., 2003; Lariscy et al., 2013; Wade et al., 2013). However, the relationship between foreign-born status and smoking behavior is complicated and can vary based on factors such as gender, country of origin, race/ethnicity, acculturation, and the intersections of these factors (Bethel and Schenker, 2005; Kim et al., 2007; National Cancer

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Institute, 2017; Reiss et al., 2015).

Foreign-born smoking behavior is associated with acculturation (i.e., the process through which immigrants gradually adapt to the culture, values, and customs of the host country through contact with the native population) (Berry et al., 2011). While some studies employ multi-item acculturation measures, it is also common to see proxy indicators of acculturation in the literature such as length of residence in the US and English language proficiency (Bethel and Schenker, 2005; Kim et al., 2007; Wallace et al., 2010). Much research on acculturation and smoking behavior is conducted among the Hispanic and Asian foreign-born populations (National Cancer Institute, 2017). Studies on the Hispanic population report a positive relationship between acculturation and cigarette smoking (i.e., as Hispanic foreign-born individuals become more acculturated, smoking prevalence increases) (Bethel and Schenker, 2005; Lorenzo-Blanco et al., 2015; Wilkinson et al., 2005), although the reverse pattern has also been observed in other studies (Cantrell, 2014; Cooper et al., 2011). For Asian foreign-born individuals, research suggests that acculturation is negatively associated with cigarette smoking among Asian men and positively associated with smoking among Asian women (Kim et al., 2007; Choi et al., 2008). Overall, it appears that acculturation plays an important but complex role in smoking behavior among the foreign-born, contributing to either increased or decreased risk depending on racial/ethnic membership. Despite epidemiological evidence about smoking behaviors, less is known about the foreign-born population's beliefs about tobacco use, and specifically, nicotine.

1.2. Nicotine beliefs

Research shows that the public holds inaccurate nicotine beliefs. Previous studies indicate that perceptions of nicotine include the belief that nicotine causes cancer (Bansal-Travers et al., 2010; Cummings et al., 2004; O'Brien et al., 2017; McQueen et al., 2014), that using nicotine in any form is as bad as smoking (Heavner et al., 2009), that lower nicotine content (LNC) and "light" cigarettes are less addictive and harmful than regular cigarettes (Cummings et al., 2004; O'Brien et al., 2017; Denlinger-Apte et al., 2017; Talhout et al., 2018) and can improve one's chances of quitting smoking (Bansal-Travers et al., 2010). It is important to note that while very low nicotine content (VLNC) cigarettes reduce the nicotine content of cigarettes to minimally addictive levels that may reduce tobacco dependence (Food and Drug Administration, 2017; Tidey et al., 2016; Tidey et al., 2013; Hatsukami et al., 2017), VLNC cigarettes are distinct from (a) LNC cigarettes that have less dramatic reductions of nicotine and are not less addictive than regular cigarettes (Hatsukami et al., 2010; Dermody et al., 2015) and (b) "light" cigarettes with design features such as increased ventilation that produce low nicotine yields in machines but do not actually reduce the nicotine content in cigarette tobacco (Talhout et al., 2018; Benowitz and Henningfield, 2013; Donny et al., 2014). Due to these beliefs, non-smokers may be willing to experiment with LNC or "light" cigarettes as research suggests that consumers believe lower nicotine products to pose lower cancer, heart disease, stroke, and addiction risk compared to regular cigarettes (Denlinger-Apte et al., 2017). A systematic review by Pfeffer and colleagues examined smokers' understandings and lay beliefs about addiction to smoking and nicotine (Pfeffer et al., 2017). Findings indicated that most smokers believe that smoking is addictive and that they are addicted to cigarettes. However, it was noted that most of the quantitative studies examined addiction in the context of smoking or cigarettes while little is known about perceptions of the role of nicotine in addiction. This analysis will attempt to address this important research gap.

US studies on knowledge and beliefs about tobacco use among those who are foreign-born have largely focused on tobacco harm perceptions. In general, those who are foreign-born can correctly identify the association between smoking and increased risk of major chronic diseases (Chan et al., 2007; Kim et al., 2000; Maxwell et al., 2007).

Research gaps remain, however, about foreign-born beliefs on nicotine and addiction. One study by Zinser et al. (2011) surveyed a group of non-Latino and Latino adult smokers, including foreign-born Latino smokers, in Colorado and found that compared to non-Latinos, Latino adult smokers were significantly less likely to endorse the belief that, "People who smoke cigarettes regularly are addicted to nicotine" and significantly more likely to endorse the belief that nicotine causes cancer, indicating inaccurate nicotine beliefs among the Latino sample. However, because the sample of Latino smokers in the study was not restricted to the foreign-born (66% of the respondents were born in the US), these results cannot be generalized to the foreign-born population. Overall, the literature on foreign-born nicotine and addiction beliefs is still in its nascence. This analysis will attempt to address this important research gap.

The current analysis examines associations between foreign-born status and nicotine and addiction beliefs. The analysis objectives are (1) to describe and compare nicotine and addiction beliefs between US-born respondents and foreign-born respondents; and (2) to examine the role of race/ethnicity and acculturation in nicotine and addiction beliefs among the foreign-born.

2. Method

2.1. Participants and design

The Health Information National Trends Survey (HINTS) is a cross-sectional nationally-representative survey which has been administered by the National Cancer Institute (NCI) since 2003. The HINTS population is adults aged 18 years or older in the civilian non-institutionalized US population. HINTS-FDA cycles are special cycles of data collection conducted by NCI in partnership with FDA to combine the traditional HINTS topics with additional tobacco-relevant modules. We tested for differences in socio-demographic characteristics, current smoking status, and foreign-born status for the HINTS-FDA 2015 and HINTS-FDA 2017 cycles. Because the two cycles were similar, data from the HINTS-FDA 2015 ($n = 3738$) and HINTS-FDA 2017 ($n = 1736$) were combined for the current study (total $N = 5474$). Data were collected in both cycles through self-administered mail surveys sent to a sample of residential addresses; survey items were identical across both cycles. The weighted response rate was 33% in 2015 and 34% in 2017. All households received materials in English unless Spanish materials were requested. Out of 5474 questionnaires, 42 (1.5%) were completed in Spanish. Additional methodological information is available elsewhere (Westat, 2015; Blake et al., 2016; Westat, 2017).

2.2. Measures

2.2.1. Beliefs and perceptions about nicotine and addiction

Three items assessed nicotine beliefs: "Nicotine is the main substance in tobacco that makes people want to smoke," "The nicotine in cigarettes is the substance that causes most of the cancer caused by smoking," and "Addiction to nicotine is something that I am concerned about." Response categories included *Strongly disagree*, *Disagree*, *Agree*, *Strongly agree*, and *Don't know*. One item assessed perception of cigarette addiction, "Overall, how addictive do you believe each of the following is?... Cigarette smoking." Responses included *Not at all addictive*, *Moderately addictive*, *Very addictive*, and *Don't know*. Four items assessed low nicotine cigarette beliefs, and respondents rated whether a cigarette advertised as "low nicotine" would: (1) be more or less harmful than a typical cigarette; (2) have lower or higher risk of causing lung cancer than a typical cigarette; (3) be more or less addictive than a typical cigarette; and (4) be believable. Items 1–3 had five response options that ranged from [*Much less/Much lower than a typical cigarette to Much more/Much higher*] than a typical cigarette, with a midpoint of *Equally [harmful/risky/addictive]*. Item 4 responses included *Not at all believable*, *A little believable*, *Somewhat believable*, and *Very believable*.

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