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Research report

Panic attacks in minority Americans: The effects of alcohol abuse, tobacco smoking, and discrimination

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ABSTRACT

Background: Lifetime prevalence of panic attacks is estimated at 22.7%, and research on the correlates and causes of depression, anxiety, and other mental illnesses have yielded mixed results in minority groups. Therefore, the purpose of this study is to evaluate the relationship between panic attacks, minority status, and nativity by focusing on the effects of health lifestyle behaviors and discrimination.
Methods: Multivariate analysis was performed using logistic regression, which was used to estimate the probability of meeting the criteria for panic attacks ($n=17{,}249$).
Results: Demographic and socioeconomic variables had significant associations; females had over 2.4 times higher odds than males of meeting the criteria for panic attacks. The more frequently respondents were treated as dishonest, less smart, with disrespect, threatened, or called names, the more likely they met the criteria for panic attacks. Additionally, smoking and alcohol abuse were significant predictors of panic attacks. Those who abused alcohol have over 2 times the odds of having panic attacks. Similarly, smokers had 52% higher odds of panic attacks than non-smokers.
Limitations: The primary limitation of this project was the lack of a true acculturation measure with a secondary limitation being the inability to determine respondents' legal status.
Conclusions: Key findings were that health lifestyle choices and exposure to discrimination significantly affected the chance of having panic attacks. Nativity was protective; however, its effect was ameliorated by exposure to discrimination or engagement in smoking behavior or alcohol abuse. Thus, this study offers insight into contextual factors for clinicians caring for racial and ethnic minorities diagnosed with panic attacks.

1. Introduction

Lifetime prevalence of panic attacks, defined as 'unexplained fearful spells, with accompanying psychophysiological symptoms that are limited to a few minutes duration' (Eaton et al., 1994), is estimated at 22.7% nationally (Kessler et al., 2006). These spells are often debilitating and disruptive. Additionally, since 2000 there has been a rapid growth of minorities in the United States, and currently minorities comprise more than one third of the overall population (US Census, 2011). Racial and ethnic minorities are projected to become the new majority in 2050 (Passel and Cohn, 2008), and research on the correlates and causes of depression, anxiety, and other mental illnesses have yielded mixed results in these groups (Morales et al., 2007; Perez, 2002; Scribner, 1996). Thus, the purpose of this study is to evaluate the relationship between panic attacks, minority status, and nativity by focusing on the effects of healthy lifestyle behaviors (excessive alcohol consumption and tobacco smoking) and discrimination among African Americans, Afro-Caribbeans, Hispanics, and Asians.

2. Background

Past studies have found African-Americans, Hispanics, and Asians have similar or better mental health than Whites regardless of economic disadvantage (Breslau et al., 2005; McGuire and Miranda, 2008; Rosenfield et al., 2006; Asnaani et al., 2010). This pattern is the result of a health paradox wherein those who should

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be less healthy (immigrants) are the most healthy, in part due to a selection bias apparent in those who are able to migrate as compared to those who are not. However, even with a health advantage, some studies have found discrimination to negatively affect certain mental health outcomes (Finch et al., 2001; Szalacha et al., 2003; Pumariega et al., 2005). Other research in minority health has discovered variations in health outcomes attributable to the effects of nativity, socioeconomic status and behavioral risk factors (John et al., 2012; De Castro et al., 2010; Gavin et al., 2010; Kimbro et al., 2008; Leu et al., 2008; Sánchez-Vaznaugh et al., 2009) suggesting that all groups do not react the same way to the same stimuli.

2.1. Panic attacks in minorities

Limited scientific literature is available which specifically looks at panic attacks in minorities, with a much larger body of work available on the larger classification of panic disorders. For example, Asnaani et al. (2009) found White Americans had higher odds of having a diagnosis of panic disorders compared to minorities residing in the United States, even with controlling for gender, age and socioeconomic status. This study also compared frequency of panic attacks between the four racial/ethnic groups but found no significant difference between groups (Asnaani et al., 2009). Kessler et al. (2006) calculated odds ratios of four subcategories of panic attacks (with and without agoraphobia) and panic disorders (with and without agoraphobia) by race, using NCS-R data. They found Hispanic and African-American populations had significantly lower odds of panic attacks compared to the Whites when controlling for demographic characteristics (Kessler et al., 2006). However, even within these racial and ethnic classifications, nativity further differentiated outcomes.

2.2. Panic attacks in immigrants

Specifically, foreign-born individuals (immigrants) often have lower rates of mental illness (Morales et al., 2007; Perez, 2002; Scribner, 1996), which is attributable to the Healthy Migrant Effect (HME). The HME posits that immigrants are healthier than Americans due to structural forces and individual agency facilitating or hampering migration (Morales et al., 2007; Perez, 2002). Research indicates that immigrants tend to be at less risk for any anxiety disorder compared to American-born minorities (Breslau et al., 2009; Alegría et al., 2007; Breslau and Chang, 2006).

One prominent study by Alegría et al. (2007) performed a comparison of American-born and foreign-born Latinos, specifically segmenting by Puerto Rican, Cuban, Mexican and other Latino classifications. When comparing prevalence rates of panic disorders across nativity for each group, no significant differences emerged (Alegría et al., 2008). However, the researchers did find that American-born Latinos had a significantly higher prevalence of any DSM-IV disorder, which included panic disorders (and panic attacks) as compared to those foreign-born (Alegría et al., 2008). Regardless of nativity status, both US-born and foreign-born Latino individuals have the potential of encountering discriminatory behavior.

2.3. Panic attacks and discrimination

A strong association exists between discrimination and poor health outcomes, including mental health (Finch et al., 2001; Szalacha et al., 2003; Pumariega et al., 2005; Williams et al., 2003). Chou et al. (2012) compared perceived racial discrimination and lifetime prevalence of panic disorders in three groups: African Americans, Hispanics and Asians. African Americans when compared to Asians had nearly twice the odds of developing panic attacks when experiencing perceived racial discrimination (Chou et al., 2012). However, comparisons of African Americans versus Hispanics, and Hispanics versus Asians, yielded no significant differences; Asians consistently held the lowest rates of developing panic attacks (Chou et al., 2012) and general anxiety related disorders (Asnaani et al., 2010). Gee et al. (2007) analyzed the association between self-reported racial discrimination and 12-month Anxiety Disorders in Asian Americans. While controlling for contextual factors, self-reported discrimination led to a 1.88 higher odds of developing any anxiety disorder. However, panic attacks do not always lead to more severe forms of psychopathology (Norton et al., 1992, 1985, 1999).

2.4. Alcohol, smoking, and panic attacks

There exists a longstanding association between substance abuse problems and anxiety disorders, including panic attacks (Cox et al., 1990; Kushner et al., 2000; Quitkin et al., 1972; Stewart, 1996; Zvolensky and Schmidt, 2004). However, these studies – more often than not – analyze all anxiety disorders making it impossible to differentiate between panic disorders, panic attacks, generalized anxiety disorder, etc. In some circumstances this cannot easily be disentangled, since substance use may be associated with multiple anxiety disorders, panic disorders, depressive disorders, mood disorders, especially when relying upon self-reported data (Stockwell et al., 1984; Bernstein et al., 2006). However, some work has found a direct relationship wherein alcohol use, abuse dependence and smoking have been found to be associated with panic attacks and disorders (Bernstein et al., 2006; Zvolensky et al., 2005, 2006; Breslau and Klein, 1999).

Historical studies have found panic psychopathology-alcohol associations; individuals seeking treatment of alcohol use problems often meet diagnostic criteria for panic attacks, disorder and agoraphobia (Chambless et al., 1987; Cox et al., 1989; Powell et al., 1982). The vice versa also pertains; persons seeking treatment for panic-related problems often meet diagnostic criteria for alcohol dependence (Bibb and Chambless, 1986; Thyer et al., 1986; Bernstein et al., 2006). Although it difficult to precisely measure both alcohol use, abuse and dependence with panic related problems, many have suggested a strong correlation is likely to exist (Kushner et al., 1990, 1999; Swendsen et al., 1998). The few studies that have separated panic attacks from other anxiety disorders have found results that suggest panic attacks may be expected to precede alcohol use problems, and be a general risk marker for later substance abuse problems (Baillie and Rapee, 2005; Goodwin et al., 2004; Bernstein et al., 2006). However, minority populations were not separated in these studies, and they were not nationally representative.

The association between smoking behavior and panic attacks follow the same directional pattern as alcohol use problems and panic attacks (Bernstein et al., 2007; Breslau and Klein, 1999; Breslau et al., 2004; Isensee et al., 2003; Zvolensky et al., 2006). Those seeking treatment for anxiety related disorders were often significantly more likely to be daily smokers (McCabe et al., 2004; Lasser et al., 2000). Nelson and Wittchen (1998) used a large representative sample ($n=3201$) to analyze panic attacks in smokers versus non-smokers, and found that among those who smoked, 7% met the criteria for panic attacks, versus those who did not smoke, to which only 2% met the criteria for panic attacks. More recently, Bernstein et al. (2007) found the onset of daily smoking preceded the onset of panic attacks in 63.7% of cases, panic attacks preceded daily smoking onset in only 33% of cases, 3.3% reported the onset of daily smoking and panic attacks during the same year.

2.5. Panic attacks, demographics, and socioeconomic status

Socioeconomic status (SES) is often predictive of overall physical and mental health; those with better physical health typically have higher levels of education and income (Antonovsky, 1967; Illsley and Baker, 1991). Education and income have a direct effect on the mental health of racial and ethnic minorities and immigrants, mirroring the same trend found in the general public (Cockerham, 2006; LaVeist, 2005; Williams, 2002; Mościcki et al., 1989). However, immigrants often have lower levels of education and income, yet lower levels of mental illness (Morales et al., 2007; Mościcki et al., 1989). Specific to panic attacks, Kessler et al. (2006) found no difference between level of education and odds of panic attacks or with panic disorders across minority groups. Evaluating income, those with the highest income had significantly lower odds of having panic attacks as compared to families with less income (Kessler et al., 2006).

In terms of gender, White women have higher risk for mental illness than minority women and White males (Harris et al., 2005; Kohn and Hudson, 2002; Williams et al., 1992; Rosenfield, 2012; Bruce et al., 2005; McLean et al., 2011). Women tend to have panic attacks more than men (Eaton et al., 1994); historical research established the trend that regardless of age, women tend to have doubled the prevalence of panic attacks compared to men, and women's odds of having a panic attack were nearly 3 times higher than men (Eaton et al., 1994). A follow-up study found this pattern still held, with women having elevated odds of panic attack (Kessler et al., 2006).

2.6. Summary

Thus, taking into consideration prior work on panic attacks, race, ethnicity, nativity, and contextual experiences and factors (Kessler et al., 2006; Chou et al., 2012; Asslemann et al., 2014; Asnaani et al., 2009; Alegría et al., 2008; Gee et al., 2007), we hypothesize that, using the Collaborative Psychiatric Epidemiology Studies (CPES) data, (1) racial and ethnic minorities with exhibit lower levels of panic attacks as compared to US-born Whites, (2) the health effect will be ameliorated by exposure to discrimination, abusing alcohol, and/or smoking behavior, and (3) these effects on foreign-born minorities will less be than on American-born Whites, and American-born individuals of the same racial/ethnic identity.

3. Methods

3.1. Data

The Collaborative Psychiatric Epidemiology Surveys (CPES), sponsored by the National Institute of Mental Health, is a repository of data with a special focus on race and ethnicity and mental health and illness. The CPES is a result of collaboratively developing and implementing three nationally representative surveys, each focusing on a different racial and/or ethnic minority group: the National Comorbidity Survey Replication (NCS-R), the National Survey of American Life (NSAL), and the National Latino and Asian American Study (NLAAS), ensuring that measures utilized yielded reliable and valid results across different sub-groups.

The NCS-R data provides a pivotal component to the usability of the CPES by providing a sizable comparison group – White Americans, not sufficiently found in either of the other two datasets. Comparatively, a prominent feature of the NSAL was the oversampling of American African-Americans and those of African or Caribbean descent (ISR, 2010). The NLAAS is one of the most exhaustive studies of Hispanic and Asian Americans conducted (CMMHR, 2009). All data was collected between 2001 and 2003; NLAAS surveys were available in multiple languages (ISR, 2010; CMMHR, 2009).

3.2. Outcome measure

The primary outcome variable was binary coded reflecting if the respondent met the criteria for 12 month prevalence of the DSM-IV criteria for panic attacks.

3.3. Independent variables

To assess the validity of the HME's application to panic attacks, block one included race/ethnicity, and nativity. Race/ethnicity was measured with five categories: (1) Non-Hispanic White (referent); (2) Asian; (3) Hispanic; (4) Afro-Caribbean; and (5) African American. Nativity was measured with a single dichotomous variable: American-born (referent) or foreign-born.

Demographics measures included gender and age. Gender was represented by a single dummy variable (female=1; male=0). Age was grouped into five categories: (1) 18–28 years old (referent); (2) 29–40 years old; (3) 41–50 years old; (4) 51–59 years old; and (5) 60 or over. Socioeconomic status incorporated another two measures: education and income. Level of education completed was measured at four incremental levels: (1) primary education; (2) high school graduate; (3) some college education; and (4) college graduate. Annual household income also leveraged four incremental classifications: (1) $0–$49,999 per year (referent); (2) $50,000–$99,999 per year; (3) $100,000–$149,999 per year; and (4) greater than or equal to $150,000 per year.

Healthy lifestyle factors were assessed through two variables: heavy alcohol use and cigarette smoking. To account for heavy alcohol consumption, we used a dummy variable (1="Yes" and 0="No") that represented whether a respondent has ever been diagnosed for the DSM-IV diagnosis of alcohol abuse in his/her lifetime, manifested by one (or more) of the following: within a 12-month period, (1) recurrent substance use resulting in a failure to fulfill major role obligations at work, school, or home; (2) recurrent alcohol use in situations in which it is physically hazardous; (3) recurrent alcohol-related legal problems, continued alcohol use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of alcohol; or (4) the symptoms present have never met the criteria for an Alcohol Dependence diagnosis. To assess smoking status, we used a dummy variable (1="Yes" and 0="No") that indicated whether the respondent currently smokes regularly.

Discrimination was represented by a composite measure constructed by averaging responses across five measures pertaining to how often respondents encountered discriminatory behavior attributed to their minority status. The first item asked how often respondents were treated with less respect than other people; the second asked how often they were threatened or harassed; the third asked how often they were treated as dishonest; the fourth asked how often they were treated as less smart, and the final item asked how often they were called names or insulted. Responses were recorded on a six-point scale: never (0), less than once a year (1), a few times a year (2), a few times a month (3), at least once a week (4), and almost every day (5).

3.4. Analytic techniques

Univariate statistics were used to describe characteristics of individuals in the dataset. Multivariate analysis was then performed using logistic regression, which was used to estimate the probability of meeting the criteria for 12 month prevalence of DSM-IV disorder of panic attacks. The multivariate analysis was

Table 1
Sample characteristics and 12 month anxiety prevalence ($N=17,249$).

	Sample
12 Month prevalence panic attacks	1171/10.27%
Race, ethnicity, nativity	
Born outside of US (*N*/%)	4996/28.96%
Caucasian (*N*/%)	5981/34.67%
Asian (*N*/%)	2211/12.82%
Hispanic (*N*/%)	3369/19.53%
Afro-Caribbean (*N*/%)	1449/8.40%
African American (*N*/%)	4239/24.58%
Race/nativity interactions	
Caucasian × foreign born	195/1.13%
Asian × foreign born	1732/10.04%
Hispanic × foreign born	1920/11.13%
Afro-Caribbean × foreign born	1063/6016%
African American × foreign born	86/0.50%
Socio-demographics	
Female (*N*/%)	9980/57.86%
Age 18–40 (*N*/%)	8533/49.47%
Age 41–59 (*N*/%)	5808/33.67%
Age 60+ (*N*/%)	2908/16.86%
Socio-economic	
College education (*N*/%)	8618/49.96%
Income less than $50,000 (*N*/%)	11,228/65.09%
Income $50,000–$99,999 (*N*/%)	3930/22.78%
Income $100,000–$149,999 (*N*/%)	1184/6.86%
Income $150,000 and greater (N/%)	907/5.26%
Health lifestyles	
Alcohol abuse (*N*/%)	1659/10.13%
Smoking (*N*/%)	1151/63.42%
Discrimination	
Discrimination scale (M/SD)	0.852/0.834

conducted sequentially in five blocks reflecting groups of independent correlates and entered in a stepwise fashion to highlight shifts in explanatory power with the inclusion of each block. Model 1 included race/ethnicity and nativity. Model 2 introduced demographic and socioeconomic variables. The health lifestyles measures, smoking and alcohol abuse, were entered in Model 3. A severity of discrimination index was entered in Model 4. Finally, Model 5 included interactions between nativity and race/ethnicity. Multiple imputations were employed prior to the multivariate regression modeling to minimize missing cases. For each model, we measured the pseudo-R2 using the Tjur R2 since it is more similar to a linear measures of fit and is not based on the likelihood function (Tjur, 2009).

Since the data has been oversampled for racial and ethnic minorities, all univariate and multivariate analyses used weighting of the CPES data, as recommended by ICPSR (2009) to realign the data to national parameters. All analyses were conducted with SAS version 9.3 software.

4. Results

Table 1 provides univariate statistics for the full sample used in this analysis. Our analysis indicates that 10% of the weighted sample met the criteria for the 12 month prevalence of DSM-IV disorder of panic attacks. Approximately 35% of the sample were White, 13% Asian, 20% Hispanic, 8% Afro-Caribbean, and 25% were African-American. More than one quarter of the sample (29%) were born outside of the United States. Additionally, 58% were female, and 49% were between the ages of 18 and 40, 34% between 41 and 59, and 17% greater than or equal to 60 years old. Sixty-five percent of the sample had an average household income less than $50,000, 23% had an annual household income between $50,000 and $99,999, and 12% had an annual household income of $100,000 or greater. Among the healthy lifestyles factors, 10% abused alcohol and 63% were smokers. The mean discrimination score was 0.85.

Nativity and race/ethnicity demonstrated a mixed relationship with meeting the criteria for 12 month prevalence of panic attacks (Table 2). The regression analysis (Table 2, model 1) showed that foreign-born individuals had approximately 45% lower odds of meeting the criteria for 12 month prevalence of panic attacks relative to those born in the US (OR=0.557, $p<0.001$). Relative to Whites, Asians and African-Americans were less likely to meet the criteria for 12 month prevalence of panic attacks. Asians had approximately 34% lower odds and African-Americans had 21% of meeting the criteria for 12 month prevalence of panic attacks compared to Whites (OR=0.658, $p<0.001$; OR=0.796, $p<0.001$). After controlling for demographic and socioeconomic differences, along with healthy lifestyles and discrimination, Asians and African-Americans remain significantly less likely to meet the criteria for panic attacks, and Afro-Caribbeans had about 26% lower odds of meeting the criteria for panic attacks relative to Whites.

Demographic and socio-economic variables had significant associations with meeting the criteria for 12 month prevalence of panic attacks. Once adjusted for the both healthy lifestyles and the discrimination index, females had over 2.4 times higher odds than males of meeting the criteria 12 month prevalence of panic attacks (OR=2.442, $p<0.001$). Both of the socioeconomic variables examined had a significant association with meeting the criteria for panic attacks. Relative to less than high school education, all higher education categories had lower odds of meeting the criteria, with the highest education category, college graduates, having almost 30% lower odds of meeting the criteria for panic attacks (OR=0.713, $P<0.001$). Relative to annual income between $0 and $49,999 per year, the highest income category, $150,000 per year and greater, has around 22% lower odds of meeting the criteria for panic attacks relative to the lowest income category (OR=0.784, $p<0.015$).

Controlling for other characteristics, smoking and alcohol abuse were significant predictors of panic attacks. Those who abuse alcohol have over 2 times the odds of having panic attacks relative to those who do not abuse alcohol (OR=2.142, $p<0.001$). Similarly, those who smoke have about 52% higher odds of panic attacks than those who do not smoke (OR=1.515, $p<0.001$).

The discrimination scale was associated with panic attacks. The more frequently respondents were treated as dishonest, less smart, with disrespect, threatened, or called names, the more likely the respondents met the criteria for panic attacks (OR=1.593, $p<0.001$).

The final model, Model 5, included an interaction term of nativity with race/ethnicity to examine how the nativity and ethnicity combination is associated with meeting the criteria for panic attacks. Only the interaction between nativity and Asian race was significantly associated with meeting the criteria for panic attacks. Relative to American-born Whites, the adjusted odds of meeting the criteria for panic attacks were 0.391 for foreign born Asians and 0.885 for US born Asians ($p<0.01$) (data not shown).

5. Discussion

This study adds to the limited body of work which focuses on panic attacks in racial and ethnic minorities. Key findings were that (1) health lifestyle choices and (2) exposure to discrimination directly and significantly affected the chance of panic attacks. Those individuals who smoked or consumed excessive alcohol were more likely to have panic attacks. Additionally, those who

Table 2
Logistic regression results ($N = 17{,}249$).

	Model 1 odds ratio	Model 2 odds ratio	Model 3 odds ratio	Model 4 odds ratio	Model 5 odds ratio
Race, ethnicity, nativity					
Nativity	0.557 (0.474, 0.654)***	0.543 (0.461, 0.641)***	0.636 (0.538, 0.752)***	0.751 (0.634, 0.889)***	0.707 (0.504, 0.994)
Caucasian	Referent	Referent			
Asian	0.658 (0.527, 0.822)***	0.682 (0.544, 0.856)***	0.659 (0.524, 0.830)***	0.650 (0.516, 0.819)***	0.885 (0.650, 1.206)
Hispanic	1.134 (0.975, 0.1.319)	1.001 (0.865, 1.181)	0.991 (0.847, 1.160)	0.988 (0.843, 1.158)	0.913 (0.763, 1.093)
Afro-Caribbean	0.945 (0.755, 1.184)	0.864 (0.688, 1.085)	0.909 (0.723, 1.144)	0.736 (0.583, 0.930)**	0.862 (0.628, 1.183)
African American	0.796 (0.701, 0.903)***	0.682 (0.598, 0.777)***	0.718 (0.628, 0.820)***	0.625 (0.545, 0.716)***	0.635 (0.554, 0.729)***
Demographics					
Gender (male=0; female=1)		1.891 (1.696, 2.108)***	2.259 (2.016, 2.530)***	2.442 (2.176, 2.74)***	2.447 (2.181, 2.746)***
Age 18–28	Referent	Referent	Referent	Referent	Referent
Age 29–40		1.157 (1.016, 1.318)***	1.068 (0.936, 1.218)	1.079 (0.945, 1.232)	1.083 (0.949, 1.237)
Age 41–50		1.083 (0.935, 1.255)	0.991 (0.855, 1.150)	1.004 (0.864, 1.167)	1.012 (0.871, 1.177)
Age 51–59		1.018 (0.869, 1.193)	1.018 (0.867, 1.194)	1.100 (0.936, 1.294)	1.107 (0.941, 1.303)
Age 60+		0.489 (0.386, 0.619)***	0.527 (0.415, 0.668)***	0.621 (0.488, 0.790)***	0.622 (0.489, 0.792)***
Socio-economic					
Less than high school education	Referent	Referent	Referent	Referent	Referent
High school graduate		0.796 (0.692, 0.917)**	0.832 (0.721, 0.959)*	0.859 (0.743, 0.992)*	0.862 (0.745, 0.996)*
Some college education		0.791 (0.683, 0.917)**	0.818 (0.705, 0.949)**	0.830 (0.714, 0.966)*	0.832 (0.715, 0.967)*
College graduate		0.649 (0.550, 0.765)***	0.706 (0.597, 0.835)***	0.713 (0.602, 0.845)***	0.714 (0.602, 0.847)***
Income $0–$49,999	Referent	Referent	Referent	Referent	Referent
Income $50,000–$99,999		0.942 (0.829, 1.071)	1.033 (0.906, 1.177)	1.006 (0.881, 1.148)	1.008 (0.883, 1.151)
Income $100,000–$149,999		0.781 (0.619, 0.984)*	0.809 (0.640, 1.021)	0.784 (0.620, 0.991)*	0.782 (0.618, 0.989)*
Income $150,000 and greater		0.926 (0.718, 1.193)	0.946 (0.732, 1.221)	0.916 (0.708, 1.186)	0.924 (0.714, 1.197)
Health lifestyles					
Alcohol abuse (no=0; yes=1)			2.607 (2.264, 3.002)***	2.142 (1.853, 2.475)***	2.151 (1.862, 2.486)***
Smoking (no=0; yes=1)			1.609 (1.448, 1.788)***	1.515 (1.360, 1.687)***	1.516 (1.361, 1.688)***
Discrimination and acculturation					
Discrimination scale				0.593 (0.559, 0.628)***	0.593 (0.559, 0.628)***
Race/nativity interactions					
Asian × foreign born					0.442 (0.233, 0.658)**
Hispanic × foreign born					0.842 (0.470, 1.258)
Afro-Caribbean × foreign born					0.550 (0.280, 0.802)
African American × foreign Born					0.390 (0.071, 0.868)
Tjur R2	0.008	0.022	0.041	0.062	0.063

* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

encountered discriminatory sentiments and actions, such as racial and ethnic minorities and women, were also more likely to experience panic attacks. Nativity was protective; foreign born individuals were less likely to have panic attacks as compared to those born in the United States, providing support for the application of the Health Migrant Effect to mental illnesses in addition to physical ones. However, when an interaction term (race/ethnicity by nativity) was included in the analysis, only foreign-born Asians were statistically less likely to have panic attacks, but all groups were directionally less likely to have panic attacks as compared to American-born Whites. Females experienced panic attacks more than males. Although immigrants experienced panic attacks less than non-immigrants, the Healthy Migrant Effect was ultimately ameliorated by exposure to discrimination or engagement in smoking behavior or alcohol abuse, a key finding of this study.

These findings can be practically applied to the work of researchers and clinicians alike. Further research is warranted around the effects of life chances (e.g. experience with discrimination) and life choices (e.g. smoking and alcohol consumption) on mental health outcomes. Additionally, valuable insight can be gained by understanding the proportional effects of one's chosen behaviors and one's accidental experiences, and how these two interact with mental health outcomes. Clinicians may directly apply these results to care for racial, ethnic, and immigrant populations, first by internalizing the different exposures and experiences in the development of treatments plans and, second, by assessing for exposures such as discrimination as a potential correlate to panic attacks.

5.1. Limitations

Four limitations should be noted. First, the CPES was made available in 2007; however, the data were collected between 2001 and 2003. Over the last few years, immigration policies have become more stringent (e.g. HB56 in Alabama) affecting the way immigrants are treated. Second, the HME was formed using Canadian immigration landscape to explain physical health outcomes, not mental health outcomes in the U.S. Third, there are general gaps in the HME in that it does not address the immigration pathway – legal or illegal. Lastly, there are no proper measures of acculturation available in this dataset.

5.2. Future research

Although this research found a significant correlates with 12-month prevalence of panic attacks, questions remain over macro-level versus micro-level determinants. An analysis looking at panic attacks which included family structure in addition to race/ethnicity and nativity may prove insightful. Also, performing an analysis of panic attacks which includes resilience, internal locus of control, and social support may yield relevant results.

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Conflict of interest

Dr. Kristine Ria Hearld, Dr. Henna Budhwani, and Mr. Daniel Chavez-Yenter declare they have no conflict of interest with this study.

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