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Depression in Racial and Ethnic Minorities: the Impact of Nativity and Discrimination

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Abstract This research examines factors associated with lifetime major depressive disorder in racial and ethnic minorities residing in the USA, with an emphasis on the impact of nativity, discrimination, and health lifestyle behaviors. The Healthy Migrant Effect and Health Lifestyle Theory were used to inform the design of this project. The use of these frameworks not only provides insightful results but also expands their application in mental health disparities research. Logistic regression models were implemented to examine risk factors associated with lifetime major depressive disorder, comparing immigrants to their American-born counterparts as well as to American-born Whites. Data were derived from the Collaborative Psychiatric Epidemiology Surveys (n= 17,249). Support was found for the hypothesis that certain immigrants, specifically Asian and Afro-Caribbean, have lower odds of depression as compared their non-immigrant counterparts. Although, Hispanic immigrants directionally had lower odds of depression, this finding was not statistically significant. Furthermore, engaging in excessive alcohol consumption was associated with higher rates of depression (odds ratio (OR)=2.09, $p<0.001$), and the effect of discrimination on depression was found to be significant, even when controlling for demographics. Of all racial and ethnic groups, foreign-born Afro-Caribbeans had the lowest rate of depression at 7 % followed by foreign-born Asians at 8 %.

Keywords Health paradox · Depression · Immigrants · Discrimination · Nativity

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Introduction

Since 2000, there has been rapid growth of minorities in the USA; these groups now comprise more than one third of the overall population [1], with projections of becoming the majority by 2050 [2]. Minority health is a significant contributor to overall population health, making it necessary for researchers and public health practitioners to understand causes and correlates of health outcomes, such as depression in these groups. Thus, the aim of this study is to evaluate correlates of major depressive disorder (henceforth depression) in racial and ethnic minorities residing in the USA.

A myriad of factors, which affect minorities, interact leading to the outcome of depression. Race, which is based on biological markers; ethnicity, which reflects an ancestry; social, cultural, or national experience; and nativity (birth place—foreign or domestic) are known influencers [3–6]. Studies have found that Blacks have similar or better mental health than Whites regardless of economic disadvantages and discrimination [7–10]. Among Hispanic women, Asian women, and Black women, mental illness rates are lower than those of White women; following the same trend, Hispanic, Asian, and Black men rates of mental illness are generally lower than those of White men [10–17]. Gender has also been directly correlated with the prevalence of depression; women are more likely to be depressed than men, but across gender and race,

black women through self-salience (relative importance of the self and others in social relations) have more protective factors against depression than White women [17]. Gender and race effects on self-salience and mental health are mediated by social class [17]. Not only are women less likely to suffer from depression compared to White women; black men are less depressed than White men in lower-education groups [17, 18]. Furthermore, immigrants (foreign-born) exhibit better physical and mental health outcomes as compared to their American-born counterparts [3–5]; this health paradox has been explained by the Healthy Migrant Effect (HME). The HME asserts that a selection bias exists which limits the ability of individuals to migrate who are in poorer health or have fewer social or economic resources [3, 5, 19]. This health advantage is mitigated by exposure to discrimination, which has consequences on mental health, such as increased rates of depression, increased stress levels, and increased rates of generalized anxiety [20–23].

Thus, this paper contributes to the existing body of health disparities research by offering a holistic analysis of correlates linked to depression in racial and ethnic minorities and leverages the HME in study design rather than applying it post facto to explain unanticipated outcomes. Demographic characteristics (age, gender), socioeconomic status (income, education), and health behaviors (alcohol consumption, smoking behavior) are included in our models. This research evaluates Blacks, Asians (racial classification), Afro-Caribbeans, and Hispanics (ethnic identifiers) with the intent of understanding effects of race and ethnicity separately.

Background

Historical disparities research indicates that women, some racial and ethnic minorities, persons with less than a high school education, those previously married, unemployed individuals, and persons without health care insurance coverage are more likely to have depression [23]. More recent work specifies more nuanced patterns across and within racial and ethnic minorities attributable to nativity, socioeconomic status, and other protective effects and risk factors [24–29]; therefore, all groups do not react the same way to the same stimuli. For our study, we elected to examine the groups, based on their ethnicity or race (Black and Asian as races, Hispanic and Afro-Caribbean as ethnicities) and place of birth (foreign-born as compared to American-born), including other measures known to influence depression, specifically lifetime major depressive disorder. At the most basic level, foreign-born immigrants typically exhibit lower rates of mental illnesses [3–5], which is often explained by the HME. The HME asserts that immigrants are healthier than the American-born due to structural forces and individual agency facilitating or hampering migration [3, 4]. The HME posits an immigrant health paradox; those who immigrate here are healthier than their American-born counterparts. Some researchers suggest that the paradox is a result of protective factors and social support unavailable to non-immigrants in addition to a selection bias, even when controlling for lower levels of education and income [24, 30].

Socioeconomic Status and Demographic Measures

Socioeconomic status (SES) is predictive of overall physical and mental health; those with better physical health outcomes typically have a higher level of education and income [31, 32]. Cockerham [33] found that groups with lower education and income had the highest rates of mental disorders, including depression. Additionally, some research suggests that education and income have a direct effect on the mental health of racial and ethnic minorities and immigrants, reflecting the same trend found in the general public [34–36]. SES is particularly relevant to this project, because although immigrants often have lower levels of education and income as compared to American-born individuals, they also have lower levels of infirmity compared to American-born individuals. [36]. This project seeks to better understand the extent of education and income's relationship with depression controlling for nativity, in addition to demographic measures such as race, ethnicity, gender, and age.

Demographic measures have mixed effects on mental health outcomes. Age correlates with depression; the National Comorbidity Study found that the onset of mental illness (major depressive disorders as well as all mood disorders) was most likely to appear in the ages of 30–44 [37]. The average age of migration in the USA is very fluid but can be estimated to be between 29.4 and 35.9 years [38], and since the duration of stay increases depression risk, these age groups highlight the importance of the use of lifetime depression. Gender also has a direct influence on depression; women are more likely to be depressed than men, but when linking gender and race, Black women exhibit lower rates of depression than White women [17]. Although gender and ethnicity have been well-studied, the effects of the interrelationship of SES, demographics, nativity, and secondary risks (discrimination and health behaviors) on depression have not been fully assessed.

Discrimination and Behavioral Factors

Discrimination is the negative effect felt by one group due to their minority status that may occur at the individual level or may be embedded in a large societal structure and is meant to be harmful [20, 39]. Discrimination has well-documented negative consequences on mental health [20–22], and racial and ethnic minorities feel the effects of discrimination directly. However, American-born minorities report more experiences of discrimination compared to those foreign-born individuals [20, 40–42], due to heightened awareness or a different sense of social justice (compared to foreign-born), ultimately leading to a greater stress effect and higher rate of depression [21,

22, 40]. Consequently, although immigrants may engage in tobacco smoking and excessive alcohol consumption prior to migration, the intensity and frequency may increase as a response to discrimination and socioeconomic stress [43, 44].

The Health Lifestyle Theory (HLT), which asserts that excessive alcohol consumption and tobacco use (as well as other health behaviors) impact physical and mental health outcomes, has been included to inform the design of this analysis [43]. Specifically, cigarette smoking and excessive alcohol consumption have been correlated with increased levels of mental illness [45, 46]. Although there is a decreasing trend of smoking and excessive alcohol consumption in foreign-born minorities as compared to their American-born counterparts, these behaviors still persist and are germane to the outcome of depression [47–51]. Furthermore, discrimination and demographic measures may moderate these relationships [20, 41].

Thus, using the HME and HLT to inform the design of this project, we compared the correlates of major depressive disorder across groups—(a) Hispanics, (b) Afro-Caribbean Blacks (Afro-Caribbeans), (c) African American Blacks (Blacks), and (d) Asians—to American-born Whites and their American-born racial and ethnic counterparts using data from the Collaborative Psychiatric Epidemiology Surveys (CPES). Potential predictive factors based on literature reviewed were included, specifically discrimination, nativity, ethnicity or race, gender, education, income, age, and health behaviors (smoking and alcohol consumption).

Methods

Data

The 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 subgroups.

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 Blacks and those of African or Caribbean descent [52]. The NLAAS is one of the most exhaustive studies of Hispanic and Asian Americans conducted [53]. All data was collected between 2001 and 2003; NLAAS surveys were available in multiple languages [52, 53].

Outcome Measure

The main outcome was lifetime occurrence of major depressive disorder (depression), a psychiatric condition described by the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) as "DSM-IV Major Depressive Disorder w/ hierarchy (Lifetime)." An individual was classified as having lifetime depression if all three criteria were met: (1) presence of a major depressive episode; (2) the major depressive episode is not better accounted for by schizoaffective disorder and is not superimposed on schizophrenia, schizophreniform disorder, delusional disorder, or psychotic disorder not otherwise specified; and (3) there has never been a manic episode, a mixed episode, or a hypomanic episode. The lifetime measure of major depressive disorder was selected to capture a range of time from initial arrival, early settlement, and establishment of residence, specifically for foreign-born individuals. Since the onset of depression often occurs between the ages of 30 and 44 [37], and the estimated age of migration is from about 29 to 36 years [38], this measure covered a range of years wherein foreign-born minorities may first encounter discrimination and may have lower levels of income.

Independent Variables

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

Demographic 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 to 28 years old (referent), (2) 29 to 40 years old, (3) 41 to 50 years old, (4) 51 to 59 years old, and (5) 60 years 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 to $49,999 per year (referent); (2) $50,000 to $99,999 per year; (3) $100,000 to $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 had ever met the criteria 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 smokes regularly. Although other tobacco use measures were available, this was selected due its statistical power. Furthermore, a current measure of smoking may represent a smoking response to discrimination or social disadvantage [43, 44].

Discrimination was represented by a composite measure constructed by averaging responses across five measures pertaining to how often respondents encountered discriminatory behavior, in their current situation, attributed to their race or ethnicity. 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 6-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).

Analytic Tools

Univariate statistics were used to describe variations among individuals in the dataset. The multivariate analysis was performed using logistic regression, which estimates the probability of meeting the criteria for the DSM-IV disorder of lifetime major depressive disorder (depression). Measures were allocated into theoretical blocks and were entered into in a stepwise fashion to illustrate the impact of each set of measures and highlight shifts in explanatory power with the inclusion of each subsequent block. Five models were included. Race/ethnicity and nativity, which are central to this analysis, were included in model 1. SES and demographic variables were entered in model 2. Health lifestyle measures were entered in model 3, since these variables are known to be correlated with socioeconomic and demographic measures entered previously. Model 4 included an index representing severity of discrimination. Finally, model 5 included nativity and race/ethnicity interactions.

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

Results

Sample characteristics are found in Table 1. Approximately 16 % of the weighted sample met the criteria for the DSM-IV disorder of lifetime major depressive disorder (depression). Thirty-four percent were White, 13 % Asian, 20 % Hispanic, 8 % Afro-Caribbean, and 25 % were Black. Twenty-nine percent were foreign-born. 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. Of the health behaviors, 10 % abused alcohol and 63 % were smokers. The mean discrimination score was 0.85.

The rate of lifetime major depressive disorder (depression) varied as a function of nativity in minorities. A lower percentage of foreign-born Asians met the criteria for depression as compared to American-born Asians (15.03 vs. 7.91 %). Similarly, a lower percentage of foreign-born Hispanics met the criteria than American-born Hispanics (19.46 vs. 14.42 %), and a lower percentage of foreign-born Afro-Caribbeans met the criteria for depression than American-born Afro-Caribbeans (15.54 vs. 6.68 %). The lowest levels of depression were found in foreign-born Afro-Caribbeans followed by foreign-born Asians, providing directional support for the notion that nativity and depression are linked.

Table 2 provides the results of our multivariate analysis which implemented stepwise blocks reflecting five models in logistic regression. The 95 % confidence intervals and odds ratios were included. Support was found for the HME; nativity was significant at the $p<0.001$ level. For each model, we measure the pseudo-R2 using the Tjur R2 since it is more similar to linear measures of fit and is not based on the likelihood function [54].

In model 1, immigrants had approximately 37 % lower odds of meeting the criteria for depression as compared to those American-born (odds ratio (OR)=0.632, $p<0.001$). Furthermore, all racial and ethnic groups were significantly less likely to meet the criteria for depression as compared to Whites. Asians and Afro-Caribbeans had approximately 50 % lower odds and 54 % lower odds, respectively, (OR=0.500, $p<0.001$;

Table 1 Sample characteristics and lifetime depression prevalence (N=17,249)

	Frequency (percentage)
Race, ethnicity, nativity	
Foreign-born	4,996 (28.96 %)
White	5,981 (34.67 %)
Asian	2,211 (12.82 %)
Hispanic	3,369 (19.53 %)
Afro-Caribbean	1,449 (8.40 %)
Black	4,239 (24.58 %)
Ethnicity/race and nativity	
Asian, foreign-born	1,732 (10.04 %)
Hispanic, foreign-born	1,920 (11.13 %)
Afro-Caribbean, foreign-born	1,063 (6.16 %)
Black, foreign-born	86 (0.50 %)
With lifetime major depressive disorder (MDD)	2,745 (15.91 %)
MDD, Race/Ethnicity, and Nativity	
White, American-born	1,309 (22.62 %)
Black, American-born	487 (11.72 %)
Black, foreign-born	12 (13.95 %)
Asian, American-born	72 (15.03 %)
Asian, foreign-born	137 (7.91 %)
Hispanic, American-born	282 (19.46 %)
Hispanic, Foreign-born	277 (14.42 %)
Afro-Caribbean, American-born	60 (15.54 %)
Afro-Caribbean, Foreign-born	71 (6.68 %)
Demographics	
Female	9,980 (57.86 %)
Age 18–28	3,775 (21.89 %)
Age 29–40	4,758 (57.58 %)
Age 41–50	3,231 (18.73 %)
Age 51–59	2,577 (14.94 %)
Age 60+	2,908 (16.86 %)
Socioeconomic	
Primary education	3,570 (20.70 %)
High school graduate	5,061 (29.34 %)
Some college	4,523 (26.22 %)
College graduate	84,095 (23.74 %)
Income less than $50,000 ($N$/%)	11,228 (65.09 %)
Income $50,000 to $99,999 ($N$/%)	3,930 (22.78 %)
Income $100,000 to $149,999 ($N$/%)	1,184 (6.86 %)
Income $150,000 and greater ($N$/%)	907 (5.26 %)
Health lifestyles	
Alcohol abuse	1,659 (10.13 %)
Smoking	1,151 (63.42 %)
Discrimination	
Discrimination scale (mean, standard deviation)	0.887, 0.828

OR=0.464, $p<0.001$); Blacks had 55 % lower odds (OR=0.457, $p<0.001$), and Hispanics had 14 % lower odds of meeting the criteria for the disorder of depression relative to American-born Whites (OR=0.862, $p<0.05$). After adjustments for demographic and socioeconomic differences, all race/ethnicities and foreign-born groups remain significantly less likely to meet the criteria for depression, further validating the HME.

Model 2, which included demographic and socioeconomic variables, was statistically significant. Females had approximately 2.2 times higher odds than males of meeting the criteria for depression after adjusting for other covariates (OR=2.199, $p<0.001$). Once adjusting for both health behaviors and the discrimination index, respondents with the age of 51–59 were 25 % more likely to meet the criteria for depression (OR=1.248, $p<0.01$). Of the socioeconomic variables, only annual income had an association with depression. Relative to the lowest income level, all higher income categories had higher odds of meeting the criteria for depression, with the highest income category, $150,000 per year and greater, having almost 30 % higher odds of depression (OR=1.293, $p<0.01$).

The health lifestyle measures also provided insight. Controlling for other characteristics, smoking behavior and alcohol abuse were significant correlates of depression. Those who abuse alcohol had over two times the odds of having depression relative to those who did not (OR=2.146, $p<0.001$), and smokers had about 13 % higher odds of depression than those non-smokers (OR=1.315, $p<0.001$). Model 4 added the discrimination scale, which was statistically significant. The more frequently respondents were treated as dishonest, treated as less smart, treated with disrespect, threatened, or called names was associated with increases in the likelihood of meeting the criteria for depression (OR=1.446, $p<0.001$).

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 depression. None were statistically significant except that between nativity and Afro-Caribbean ethnicity and between nativity and Asian race. Relative to American-born Whites, the adjusted odds of meeting the criteria for lifetime depression were 0.281 for foreign-born Afro-Caribbeans and 0.585 for American-born Afro-Caribbeans ($p<0.01$). Likewise, relative to American-born Whites, the adjusted odds were 0.348 for foreign-born Asians and 0.585 for American-born Asians ($p<0.05$). There were no significant interaction effects between nativity and race/ethnicity on meeting the criteria for lifetime depression for all other race/ethnic groups. The coefficient of discrimination, or Tjur R2, increases slightly with each successive model, indicating that latter models had marginally better predictive power for the data.

Table 2 Logistic regression results (N=17,249)

	Model 1 odds ratio (95 % CI)	Model 2 odds ratio (95 % CI)	Model 3 odds ratio (95 % CI)	Model 4 odds ratio (95 % CI)	Model 5 odds ratio (95 % CI)
Race, ethnicity, nativity					
Nativity	0.632 (0.553, 0.723)***	0.650 (0.567, 0.746)***	0.740 (0.644, 0.850)***	0.820 (0.713, 0.944)**	0.908 (0.736, 1.121)
White	Referent	Referent			
Asian	0.500 (0.417, 0.599)***	0.454 (0.377, 0.547)***	0.478 (0.397, 0.576)***	0.476 (0.394, 0.574)***	0.585 (0.449, 0.763)***
Hispanic	0.862 (0.760, 0.978)*	0.820 (0.719, 0.935)**	0.812 (0.711, 0.926)**	0.824 (0.722, 0.942)**	0.793 (0.682, 0.923)***
Afro-Caribbean	0.464 (0.377, 0.572)***	0.427 (0.346, 0.527)***	0.445 (0.360, 0.550)***	0.388 (0.313, 0.480)***	0.585 (0.438, 0.782)***
Black	0.457 (0.408, 0.510)***	0.438 (0.390, 0.491)***	0.460 (0.409, 0.517)***	0.418 (0.371, 0.471)***	0.437 (0.388, 0.492)***
Demographics			Referent	Referent	Referent
Gender (male=0; female=1)		1.821 (1.666, 1.990)***	2.084 (1.901, 2.286)***	2.199 (2.003, 2.415)***	2.145 (1.955, 2.354)***
Age 18–28	Referent	Referent	Referent	Referent	Referent
Age 29–40		1.053 (0.935, 1.187)	1.066 (0.945, 1.203)	1.124 (0.995, 1.269)	1.123 (0.994, 1.268)
Age 41–50		1.076 (0.944, 1.227)	1.123 (0.975, 1.294)	1.125 (0.985, 1.285)	1.159 (0.995, 1.325)
Age 51–59		1.044 (0.909, 1.199)	1.123 (0.975, 1.294)	1.248 (1.081, 1.440)**	1.250 (1.083, 1.443)**
Age 60+		0.654 (0.564, 0.758)***	0.790 (0.677, 0.921)**	0.960 (0.820, 1.124)	0.936 (0.799, 1.097)
Socioeconomic					
Less than high school education	Referent	Referent	Referent	Referent	Referent
High school graduate		0.947 (0.834, 1.076)	1.020 (0.897, 1.161)	1.025 (0.901, 1.168)	1.021 (0.987, 1.162)
Some college education		1.030 (0.904, 1.174)	1.109 (0.972, 1.266)	1.119 (0.979, 1.279)	1.115 (0.976, 1.274)
College graduate		0.997 (0.868, 1.146)	1.106 (0.961, 1.274)	1.121 (0.973, 1.292)	1.118 (0.970, 1.289)
Income $0 to $49,999	Referent	Referent	Referent	Referent	Referent
Income $50,000 to $99,999		1.189 (1.073, 1.318)***	1.239 (1.116, 1.376)***	1.232 (1.109, 1.369)***	1.248 (1.123, 1.386)***
Income $100,000 to $149,999		1.127 (0.951, 1.335)	1.267 (1.065, 1.508)**	1.220 (1.023, 1.453)*	1.159 (0.75, 1.376)
Income $150,000 and greater		1.286 (1.065, 1.553)**	1.325 (1.095, 1.602)**	1.293 (1.067, 1.567)**	1.300 (1.074, 1.574)**
Health lifestyles					
Alcohol abuse (no=0, yes=1)			2.400 (2.123, 2.715)***	2.146 (1.894, 2.431)***	2.044 (1.802, 2.318)***
Smoking (no=0, yes=1)			1.343 (1.219, 1.479) ***	1.315 (1.193, 1.449)***	1.339 (1.216, 1.475)***
Discrimination					
Discrimination scale				1.446 (1.374, 1.523)***	1.366 (1.297, 1.439)***
Race/nativity interactions					
Asian * foreign-born					0.594 (0.367, 0.961)*
Hispanic * foreign-born					0.946 (0.626, 1.429)
Afro-Caribbean * foreign-born					0.479 (0.284, 0.808)**
Black * foreign-born					1.478 (0.714, 3.059)
Pseudo-R2	0.0237	0.0401	0.0529	0.0529	0.0623

*p<0.05; **p<0.01; ***p<0.001

Conclusion

This study reveals that lifetime major depressive disorder (depression) is correlated with many measures and classifications discussed herein. Nativity was unilaterally protective. When interactions between race/ethnicity and nativity were evaluated, foreign-born Afro-Caribbeans and foreign-born Asians were found to exhibit lower rates of lifetime major depressive disorder, referred throughout as depression. A lower percentage of foreign-born Hispanics met the criteria for depression as compared to American-born Hispanics, but the interaction between nativity and Hispanic was not statistically significant when including discrimination, demographics, and SES. Income and education were associated with depression; higher levels of income and higher levels of education were correlated with higher rates of depression. As predicted, when discrimination was added to the model, the effect of nativity on depression was not as strong. This study, to the knowledge of the research team, reflects one of the few proactive applications of the Healthy Migrant Effect in research design and in combination with Health Lifestyle Theory to any mental health condition across a full set of racial and ethnic minorities.

Limitations

Three limitations should be noted, the first relating to the timing of this research project, the second pertaining to theoretical issues, and the last discussing quantitative issues and gaps.

First, the CPES was publically made available in 2007; however, the data was 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 perceived and treated. Second, the HME was formulated using Canadian culture and their immigration landscape, not those of the USA. Also, there are gaps in the HME in that it does not address the immigration pathway—legal or illegal, and the HME fails to directly account for socioeconomic factors. Lastly, since the CPES was a compilation of three datasets, slight differences in questions/verbiage caused measures to be eliminated from the joint dataset. Although many measures were available, some directly applicable information, such as neighborhood context, may have been available in one or two of the datasets, but not in all three—thus, eliminated from this analysis.

Future Research

Although this research found a number of significant correlates with depression, questions remain over macro-level versus micro-level determinants. Fuwa [55] offered an analysis in which family attitudes were assessed to determine spatial location between very "traditional" and very egalitarian households in respect to opinions of both husband and wife. This in turn was used as a way to assess family structure. An analysis looking at depression which included family structure in addition to race/ethnicity and nativity may prove insightful, especially when attempting to decipher what forces play the largest role in impacting mental health outcomes. Also, performing an analysis of depressive outcomes which includes social support and thereby (potentially) resilience may yield relevant results.

Since immigration is a global phenomenon, replicating the design of this project (with appropriate adjustments) in other nations has the potential to inform the wider body of research. The subsequent information may assist governments, which offer nationalized health care, to prioritize immigrant health and may offer insight to social processes which affect the rates of mental illness in their countries.

In conclusion, support was found to confirm past findings around gender, discrimination, nativity, race, and ethnicity. Nativity did interact with ethnicity, race, and lifetime major depressive disorder. American-born persons, women, and those encountering discrimination had higher rates of depression. By using the Healthy Migrant Effect with Health Lifestyle Theory collaboratively and proactively, a more comprehensive design was adopted which produced these nuanced results, highlighting the impact of each factor individually and in combination with others.

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Ethical Standard Statements

Conflict of Interest Dr. Henna Budhwani, Dr. Kristine Ria Hearld, and Mr. Daniel Chavez-Yenter declare that they have no conflict of interest.

Informed Consent All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000. Informed consent was obtained from all individuals for being included in the study.

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