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UNFAVORABLE VISA STATUS AND INTERSECTING ACCULTURATION FACTORS LINKED TO DEPRESSION

DEZAVANTAJLI VİZE GRUPLARI, DEPRESYON VE KÜLTÜRLEŞME ARASINDAKİ İLİŞKİ

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ÖZ

Amaç: Bu çalışma, vize statüsü ve kültürleşmenin göçmenler arasında yaygın olan depresyonu anlamak için önemli yapılar olduğunu öne sürmektedir. Yöntem: Bu çalışmada Amerika Birleşik Devletleri'nde ikamet eden göçmenler arasında vize statüsü ve kültürleşme ile depresyon durumu arasındaki ilişki New Immigrant Survey (Yeni Göçmen Anketi) kullanılarak incelenmiştir. Vize durumu olumlu ve olumsuz olmak üzere operasyonelleştirilmiştir. Kültürleşme, İngilizce dil yeterliliği ve beslenme şekli değişikliği olarak ölçülmüştür. Depresyon, depresif semptomların veya antidepresanlarla baskılanan semptomların varlığı olarak değerlendirilmiştir. Sonuçlar: Sonuçlar, dezavantajlı vize statüsüne sahip göçmenlerin avantajlı vize statüsü sahiplerine kıyasla daha yüksek depresyon seviyelerine sahip olduğunu ortaya koymuştur. Bununla birlikte, İngilizce dil yeterliliği, avantajlı vize statüsü sahiplerine kıyasla dezavantajlı vize statüsü sahipleri arasında daha yüksek depresyon seviyeleri ile ilişkilendirilmiştir. Beslenme şekli değişikliğinin az olması, sınırsız aile, mülteci, çeşitlilik ve diğer vize sahipleri arasında daha yüksek depresyon düzeyi ile ilişkilendirilmiştir. Farklı vize kategorilerinin, kültürleşme düzeylerine ve türlerine bağlı olarak depresyonla benzersiz ilişki örüntülerine sahip olduğu görülmüştür.

ABSTRACT

Aims: This study proposes that visa status and acculturation are important constructs for understanding depression among immigrants. Method: The association between visa status and acculturation with depression status among immigrants residing in the United States was examined by using the New Immigrant Survey. Visa status was operationalized as favorable and unfavorable. Acculturation was measured as English language proficiency and diet change. Depression was assessed as the presence of depressive symptoms or symptoms suppressed by antidepressants. Results: Results showed that immigrants with unfavorable visa statuses have higher levels of depression compared to favorable visa status holders. Also, English language proficiency was associated with higher levels of depression among unfavorable visa holders compared to favorable visa status holders. Lower dietary acculturation was associated with a higher level of depression among unlimited family, refugee, diversity, and other visa holders. Conclusions: Different visa categories appeared to have unique patterns of association with depression depending on their acculturation level and type.

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Introduction

The US foreign-born population is growing and increasing in diversity. The rapid migration into the US has upsurged the size of the foreign-born population to 47 million, including legal and illegal immigrants (United States Census Bureau, 2021). There are a wide variety of visa categories that immigrants can obtain to enter the United States, such as family, work, diversity, refugee/asylum, and other-type visas (U.S. Citizenship and Immigration Services, 2021). Lawful permanent residents (LPRs), known as green card holders, are defined as non-citizens who are permanently and legally living in the United States due to a permanent resident standing (Legal Immigration and Adjustment of Status Report, 2019). According to the US Department of Homeland Security, approximately 1 million people obtained LPR status in 2019, and the most recent US Department of Homeland Security Report shows the total LPR population at approximately 13.6 million (Baker, 2019). However, in 2020 this number decreased by 18 percent because of COVID-19. Although the number of LPRs has not yet reached pre-pandemic levels, an increase was noted between the third and fourth quarters of the fiscal year 2020 (Lawful Permanent Residents, 2020).

Immigrants to the United States may experience a negative health trajectory due to strict, and in some ways hostile, immigration policies and the stress of assimilation and acculturation. Despite the Patient Protection and Affordable Care Act's passage in 2010, immigrants face health and health-care challenges (Hall & Cuellar, 2016). Research also shows that immigrants from minority racial and ethnic groups have lower overall rates of mental disorders than their native-born counterparts in the United States (Alegría et al., 2017; Budhwani et al., 2015), though variations by specific disorder and immigrant/racial-ethnic background have been noted (Szaflarski et al., 2016; Szaflarski et al., 2017). At the same time, other research has shown that the mental health of immigrants deteriorates over time in the US and with each subsequent generation. Third-generation Latin people for example, have higher rates of mental disorders than first and second generations (Hamilton et al., 2022), while second- and third-generation Asians and Caribbean Blacks have higher rates of psychiatric disorders than first-generation immigrants (David T. Takeuchi, 2016). Also, first-generation immigrants have higher prevalence of dysthymia than US natives (Szaflarski et al., 2016). Furthermore, depression and posttraumatic stress syndrome are more prevalent among refugee populations, particularly among refugee women and children (Henkelmann et al., 2020).

A variety of factors are at work, including stress and marginalization/discrimination, as well as political, socioeconomic, cultural, health care, and language barriers (Hall & Cuellar, 2016; Szaflarski & Bauldry, 2019). Legal status is a particularly sensitive issue for immigrants. Specifically, the fear of deportation can affect health and well-being of undocumented immigrants and others whose legal status is unclear. However, it is difficult to assess the relationship between immigrants' legal status and health in the US because visa status is not typically asked about in public health surveys. Thus, research on mental health relationship with immigrants' admission status in the US is limited. The aim of this study was to fill this gap in the literature by examining relationships between visa status, acculturation, and depression in a nationally representative sample of US adults drawn from the 2003 New Immigrant Survey (NIS). Other researchers continue using these survey data (Jang, 2022; Kathawalla & Syed, 2022; Reed & Barbosa, 2017; Ro & Goldberg, 2017; Tabler & Painter, 2022; Zong & Batalova, 2015), as more recent ones that are similarly rich are not available.

Acculturation and Health

The study was guided by the existing acculturation theory and literature, in particular Berry's fourfold model of acculturation (Berry, 2003) and segmented assimilation theory (Hirschman et al., 1999). The theory of segmented assimilation attempts to describe patterns of different assimilation routes that immigrants experience. According to the segmented assimilation theory, immigrants assimilate into different social levels, which may result in different health outcomes (Portes & Zhou, 1993). For example, employment visa holders are typically fluent in English which positions them, through employment, a more stable economic status and greater economic mobility and access to resources (Portes & Zhou, 1993; Vermeulen, 2010), and ultimately more successful assimilation. Segmented assimilation theory holds that the various levels of human and social capital that immigrants carry from their home countries and the environment in which they are received in their host countries have a significant impact on whether immigrants succeed or fail in assimilation (Portes & Zhou, 1993). Many different assimilation theories were examined and it was found that these theories provide the most theoretically meaningful and comprehensive conceptual framework in line with the scope of the research

questions and explanatory variables. One important factor that impacts the context of reception and the resources available to immigrants in the U.S. is visa status. For instance, legalized immigrants may have faced prior difficulties due to their hostility towards unauthorized immigrants. On the other hand, immigrants on employment visas may face less economic insecurity due to their employment status. Immigrants are also selected into different visa categories based on different skills and attributes. Immigrants with different visa statuses have different levels of education, occupational skills, and English language proficiency levels, all of which determine their assimilation pathways.

In terms of health, assimilation and integration have potential for harming health despite providing significant socioeconomic improvements (Hwang & Ting, 2008; D. T. Takeuchi, 2016). Researchers have used various measures of assimilation and acculturation to understand how different aspects of assimilation and acculturation are correlated with health outcomes. For example, English language proficiency is important for integration, ability to navigate the US health care, and for socioeconomic advancement, all of which can lead to health improvements. However, other measures of acculturation, including adapting a Western diet and eating habits, have been linked to health problems such as obesity (Akresh, 2008; Power et al., 2015; Zhang et al., 2019).

Furthermore, visa status may influence the association between acculturation and health among recent LPRs, including mental health (Hamilton et al., 2019; Ro & Goldberg, 2017). One reason is that employment visa holders are likely to have better English language skills and potentially better access to health care (through employment) than other types of visa holder, which would facilitate both acculturation (through language) and better health care outcomes (through access to care) upon/after arrival. However, there is little data about the role of visa status in mental health among US immigrants while considering various dimensions of acculturation.

Research Aims

This study addresses the implications of different types of immigrants' visa status for immigrants' mental health and examines the role of the acculturation in this relationship. With this aim, we investigated the following specific questions and hypotheses:

1. H1: How is immigrants' visa status associated with depressive symptomology?
    a. H1a: Employment visa holders have lower levels of depressive symptoms than refugee visa holders.
2. H2: How is immigrants' acculturation associated with depressive symptomology?
    a. H2a: Assimilation through English language proficiency is associated with lower levels of depressive symptoms.
    b. H2b: Assimilation through diet adoption is associated with decreased depression.
3. Does the association between acculturation and depressive symptoms vary by visa status?
    a. H3a: The association between language acculturation and depressive symptoms is stronger for refugees and legalized visa holders, than for employment visa holders.
    b. H3b: The association between diet acculturation on depressive symptoms is stronger for refugees and legalized visa holders than for employment visa holders.

Materials And Methods

Participants/Data Collection

In order to address research questions, secondary data analyses of the NIS data was conducted (https://nis.princeton.edu/data.html) for 2003, which is a nationally representative sample of international migrants and their children (Jasso et al., 2004). The NIS offers various measures of immigrant status, health outcomes, and associated factors. As noted earlier, these data are rich and one-of-the kind, and they continue to be used in research studies (Jang, 2022; Kathawalla & Syed, 2022; Reed & Barbosa, 2017; Ro & Goldberg, 2017; Tabler & Painter, 2022; Zong & Batalova, 2015). The first full cohort of the study (NIS-2003-1)[1], which

[1] Between June 2007 and April 2008, the NIS conducted its second round, with a 45.5% re-interview rate. According to the NIS researchers, the hostile environment that immigrants faced after 2003 and the rise in anti-immigrant sentiment are to blame for the

sampled immigrants between May and November 2003, was used to determine adult immigrants' visa status (N=8,573). The adult sample includes all immigrants who are 18 years of age or older at the time of admission to the Lawful Permanent Residence (LPR) program. The survey response rate was 68.6%. Listwise deletion was used to arrive at the analytical sample of 6,928 immigrants who are legalized permanent resident adults aged 18 or above.

Measures

Dependent Variable

The main dependent health outcome in this study is depressive symptoms. This was measured by whether the respondent experienced a time when they felt sad, blue, or depressed for two weeks or more in a row during the last 12 months. According to the American Psychiatric Association (APA 2013), these symptoms are crucial in diagnosing a depressive disorder. Participants responded 1=yes, 2=no, 3= did not feel depressed because on anti-depressant medication. The NIS used the stem question from the World Health Organization's Composite International Diagnostic Interview Short Form (CIDI-SF) (Kessler et al., 1998). This item was dummy-coded as 1=yes/on antidepressant and 0=no.

Independent Variables

The main independent variable in this study is visa status, and the NIS has a direct admission status question. NIS visa categories were: "Spouse of U.S. citizen, Suppose of legal permanent resident, Parent of U.S. citizen, Child of U.S. citizen, Family fourth preference, Employment preferences, Diversity immigrants, Refugee/Asylee/Parolee, Legalization, and Others." According to the US Citizenship and Immigration Services, spouses (married longer than two years), unmarried children (under the age of 21), and parents (21 years or older) of U.S. citizens have priority when it comes to migration, are numerically unlimited, and require sponsorship from the U.S. citizen relation. This category is called unlimited family visa (Morey et al., 2020). The following family members are regarded as numerically limited: spouses and children of lawful permanent residents, children of U.S. citizens over 21, married children of U.S. citizens and their offspring, and other family members with less direct ties to U.S. citizens and family members of lawful permanent residents. As such, this category is called limited family visa holders (Morey et al., 2020). The other categories include employment preferences, diversity/green card (lottery) holders, refugee/asylee/parolee, legalized immigrants, and a residual other category that comprises undocumented immigrants (the latter a clear indication of the difference between the desire to immigrate and the accessibility of visas) and nonimmigrants (who possess lawful temporary documentation) (Jasso, 2008). In this study, categorization of the visa status was dependent on individuals' eligibility criteria and process of obtaining the green card. Employment, unlimited family, and diversity visa holders' green card process is straight forward, their waiting time is shorter, and the application process is less stressful compared to the experience of limited family, refugee, other, and legalized visa holders. Therefore, we considered employment, unlimited family, and diversity visa holders as favorable visa holders while limited family, refugee, other, and legalized visa holders were considered as unfavorable.

Acculturation is measured as language and diet acculturation. English language ability was used to measure language acculturation. Respondents were asked, "How well would you say you speak English? Would you say: very well, well, not well, and not at all." This item is measured on a four-point scale and ranges from 4=very well to 1=not at all.[2]

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significant decline in response rates in the second round of the baseline survey. In 2014, the data for round 2 became available, and the sample size was no longer sufficient to carry out this investigation.

[2] In the literature, there is a contradictory argument about choosing the most appropriate modeling strategy for dealing with ordinal variables in factor analysis Nonetheless, a recent study suggests that the linear factor model, which treats variables as continuous, is defended as a statistically viable method for items with three to six categories. The authors advise finding data constellations where parameter estimates can be obtained similarly using the continuous and ordinal treatments of ordinal variables. We examined this using two different methods. First, we examined whether there was a non-linear relationship between the English language variable and the health outcomes by treating the English language as a categorical variable. These analyses confirmed that the relationship between language and health appeared linear. Second, we examined model fit statistics between models that used language ability as a continuous variable compared to a categorical variable using multiple definitions of categorical (four categories; very well versus all else; not at all

In addition to language proficiency, change in diet was used as an acculturation variable. The respondents were asked, "How would you compare the similarity in the diet in the food you now normally eat in the United States with the food you normally ate in your home country?" Responses were measured on a 10-point scale, where 10=completely different and 0=exactly the same.

We also included control variables: sex, age, employment, occupation, education, country of origin, race, ethnicity, health insurance coverage, and duration of stay in the US. To address research aims, Table 1 provides detailed descriptive information about the study variables.

Analysis

The analytical strategy included estimation of descriptive and bivariate statistics and multivariate regression models. Chi-square and ANOVA analyses were carried out to see if there were any weighted differences in reports of depressive symptoms and acculturation factors based on immigrants' visa status. Binary logistic regression analyses were used to obtain odds ratios (OR) and 95% CI for the association of visa status with depression. Nested multivariate regression are used to examine the relationship between depression and acculturation and visa status net of covariates. Model 1 included visa status and the control variables: sex, age, employment, education, health insurance, and years in the US. Model 2 adds country of origin and the acculturation variable (English language or diet change) to examine how the relationship between visa status and depression changes net of these relationships. Model 3 adds an interaction term between acculturation and visa status to examine whether acculturation factors moderate the relationship between immigrant visa status and health. Support for each hypothesis was determined by the observed direction and significance of each model (significance at .05). For ease of interpretation and illustration, a margins command was used in Stata to calculate the adjusted predicted probabilities of health by visa status and various levels of acculturation. Lastly, Wald chi-square tests were used to compare models with interactions to models without interaction terms to examine whether there was a significant improvement in model fit. Stata version 15.1 was used to conduct all data management and analyses (StataCorp 2015).

Results

The largest group of immigrants in the sample had unlimited family visa (31%), followed by employment visa holders (20%), diversity/green card (lottery) holders (18%), legalized immigrants (8%), refugee/asylee/parolees (7%), and a residual "other" category (e.g., nonimmigrants who have legal temporary documents; 8%) (Table 1). The highest prevalence of depression was noted among those with a legalized visa (19%), followed by refugees (16.7%), with employment visa holders showing the lowest level of depression. In the sample, around half of the unlimited family visa holders and refugees stated that their English language proficiency was very good or good. Legalized visa holders had the lowest proficiency with 25% stating that their English was good and 11% stating that it was very good. The same group also reported most diet change. Diet change after migration varied significantly by visa status ($p<0.001$; Table 1, last column).

versus all else; not at all/not well vs. all else). To do this the "estat ic" command applied in STATA is used to obtain the AIC and BIC estimates. When two models are given, the smaller model's AIC indicates a better fit to the data than the larger model's. Similar to the AIC, a smaller BIC suggested a model that fits better. Since the continuous language variable has the lower BIC, English language proficiency was treated as continuous.

Table 1. NIS Descriptive Table (N=6,928)

Variables	Employment (20%) N=1,380	Unlimited Family visas (31%) N=2,107	Limited Family visas (8%) N=569	Diversity Holders (18%) N=1,220	Refugees (7%) N=485	Other (8%) N=580	Legalized (8%) N=587	Min	Max	Test of Difference
	Mean or % (SD)	Mean or % (SD)	Mean or % (SD)	Mean or % (SD)	Mean or % (SD)	Mean or % (SD)	Mean or % (SD)			
Years in the US	6 (4.7)	4.4 (6.5)	3.1(5.6)	0.8 (2.4)	5.8 (4.2)	3.3 (5.9)	15 (4.2)	0	63	***
Sex								0	1	***
Male	60	37	37	57	50	47	50			
Female	40	63	63	43	50	53	50			
Age	36 (8.3)	42 (18)	45 (10)	32 (8.7)	40 (12)	36 (8.5)	38 (9.6)	18	81	***
Country of Origin								1	4	***
Europe & Central Asia	21.4	41.6	27.4	41.1	38.3	28.6	92			
Latin America & The Caribbean	6.7	18.5	10.1	4.1	26	31.7	6.6			
Africa & Middle East	5.3	9.5	3	42.8	24	5.3	0.7			
Asia	66.4	30.3	60	11.8	12.1	34.31	0.7			
Education								1	4	***
Less than High School	8.6	42	56.7	10.1	31.1	37.4	68.4			
High School	6.8	16.7	11.7	20	23	21	13.4			
Some Collage	36.7	38	24	44.2	31.5	30	14.5			
BA, MA or More	47.8	13.3	7.5	26.3	14.4	13	3.5			
Employment								1	5	***
Blue collar	20	17.7	20	25.7	35.4	28.2	38			
White collar	58	22	18	27.3	33	23.4	34.4			
Not in the labor force	8.5	38.4	26	9.1	17.3	10.1	15.3			
Other	8.4	4.6	3.7	6.3	5.7	8.4	11.2			
Unemployed	5.2	17.3	32.1	31.3	8.4	30	6.3			
Health Insurance								0	1	***
Have an insurance	70.3	40	24	20.4	54.2	22.4	39			
Do not have an insurance	29.7	60	26	79.6	45.7	77.6	61			
Acculturation:										
English Language Proficiency	3.31 (0.8)	2.37 (1.1)	1.87 (0.8)	2.64 (0.8)	2.48 (0.9)	2.23 (0.9)	2.31 (0.9)	1	4	***
Changed Diet After Immigration	6 (2.7)	5 (3.2)	6 (3.1)	5 (2.9)	5 (3.1)	5 (3.2)	3 (3.2)	1	10	***
Mental Health								0	1	***
Depression (yes)	7.3	14	13	9.4	16.7	15.3	19			

*P<0.05, **P<0.01, ***P<0.001 Test of differences based on ANOVA and Chi-square test.

Table 2 presents the nested multivariable regression results for language acculturation and mental health Model 1 demonstrates that, compared to employment visa holders, those with unlimited family, refugee, other, and legalized visa categories were more likely to have depression net of covariates.

Table 2. Interaction Effects of Visa Status and Language Acculturation on Mental Health among U.S. Immigrants (N=6,984)

Variables	Model 1	Model 2	Model 3
	OR (SE)	OR (SE)	OR (SE)
Visa Status (Reference= Employment)			
Unlimited Family Visas	1.572** (0.209)	1.302 (0.178)	0.641 (0.264)
Limited Family Visas	1.297 (0.231)	1.248 (0.223)	0.827 (0.398)
Diversity Holders	1.218 (0.189)	0.925 (0.157)	0.390 (0.190)
Refugees	2.009*** (0.333)	1.496* (0.258)	0.933 (0.484)
Other	1.687** (0.283)	1.375 (0.237)	0.853 (0.405)
Legalized	1.726** (0.297)	1.472* (0.260)	0.788 (0.379)
Sex (Reference=Male)			
Female	1.502*** (0.123)	1.523*** (0.125)	1.520*** (0.125)
Education (Reference= Less than High School)			
High School	0.928 (0.106)	0.900 (0.105)	0.899 (0.105)
Some Collage	0.932 (0.098)	0.938 (0.100)	0.942 (0.101)
BA, MA or More	0.732* (0.099)	0.722** (0.098)	0.733** (0.100)
Employment (Reference=Blue collar)			
White collar	0.983 (0.106)	0.998 (0.109)	1.005 (0.109)
Not in the labor force	0.961 (0.119)	1.001 (0.125)	1.009 (0.126)
Other	1.127 (0.180)	1.132 (0.182)	1.133 (0.183)
Unemployed	1.311* (0.156)	1.357* (0.164)	1.368* (0.166)
Health Insurance (Reference= Do not have an insurance)			
Have an insurance	1.108 (0.088)	1.105 (0.091)	1.108 (0.091)
Age	0.994 (0.003)	0.996 (0.003)	0.996 (0.003)
Years in the US	1.025*** (0.006)	1.022** (0.007)	1.022** (0.007)
Country of Origin (Reference=Europe & Central Asia)			

Latin America & The Caribbean		1.441**	1.428**
		(0.156)	(0.155)
Africa & Middle East		1.280	1.258
		(0.163)	(0.163)
Asia		0.676***	0.675***
		(0.075)	(0.075)
English Language Proficiency (scale)		0.868**	0.718**
		(0.042)	(0.087)
Visa Status x English Language Proficiency (Reference= Employment x English Language Proficiency)			
Unlimited Family Visas X English Language Proficiency			1.272
			(0.169)
Limited Family Visas X English Language Proficiency			1.087
			(0.213)
Diversity Holders X English Language Proficiency			1.347
			(0.216)
Refugees X English Language Proficiency			1.152
			(0.211)
Other X English Language Proficiency			1.148
			(0.196)
Legalized X English Language Proficiency			1.231
			(0.208)
Constant	0.129***	0.139***	0.243**
	(0.031)	(0.034)	(0.100)
Wald chi square tests are used to compare models with interactions to models without interaction to examine whether there was significant improvement in model fit.	155.94***	44.45***	5.09

*P<0.05, **P<0.01, ***P<0.001

Model 2 includes country of origin and language acculturation. English language proficiency is negatively associated with depression (OR: 0.87, p<0.01). Examining country of origin, we find that compared to Europe and Central Asia, LPRs from Latin America and the Caribbean reported higher prevalence of depression, while LPRs from Asia reported lower prevalence of depression. Adding these two variables drastically reduced the coefficients for visa status, though refugees (OR: 1.49, p<0.05) and legalized visa status (OR: 1.47, p<0.05) continue to have higher prevalence of depression compared to employment visa status holders, net of covariates. Differences in depression between unlimited family and the residual other category and employment visa are accounted for by acculturation and country of origin thus, the difference by visa status was accounted for by English language proficiency. Examining the covariates, women, the less educated, and the unemployed were more likely to report depression.

Table 3 Interaction Effects of Visa Status and Diet Acculturation on Mental Health among U.S. Immigrants (N=6,984)

Variables	Model 1 OR (SE)	Model 2 OR (SE)	Model 3 OR (SE)
Visa Status (Reference= Employment)			
Unlimited Family Visas	1.587** (0.210)	1.318* (0.180)	1.211 (0.311)
Limited Family Visas	1.390 (0.245)	1.327 (0.235)	1.559 (0.501)
Diversity Holders	1.271 (0.196)	0.983 (0.165)	0.721 (0.224)
Refugees	2.049*** (0.339)	1.547* (0.266)	1.196 (0.414)
Other	1.782** (0.289)	1.448* (0.247)	1.001 (0.333)
Legalized	1.664** (0.287)	1.428* (0.253)	2.572** (0.879)
Sex (Reference=Male)			
Female	1.548*** (0.125)	1.546* (0.127)	1.567*** (0.129)
Education (Reference= Less than High School)			
High School	0.853 (0.096)	0.843 (0.096)	0.839 (0.096)
Some Collage	0.823* (0.080)	0.848 (0.084)	0.849 (0.084)
BA, MA or More	0.630*** (0.079)	0.637*** (0.081)	0.637*** (0.081)
Employment (Reference=Blue collar)			
White collar	0.950 (0.103)	0.970 (0.105)	0.970 (0.106)
Not in the labor force	0.988 (0.122)	1.028 (0.128)	1.027 (0.129)
Other	1.131 (0.182)	1.138 (0.183)	1.140 (0.184)
Unemployed	1.303* (0.156)	1.357* (0.164)	1.368* (0.166)
Health Insurance (Reference= Do not have an insurance)			
Have an insurance	1.034 (0.084)	1.059 (0.086)	1.062 (0.087)
Age	0.999 (0.003)	1.000 (0.003)	1.000 (0.003)
Years in the US	1.020** (0.006)	1.017* (0.007)	1.016* (0.007)
Country of Origin (Reference=Europe & Central Asia)			
Latin America & The Caribbean		1.426** (0.155)	1.404** (0.153)
Africa & Middle East		1.165 (0.146)	1.131 (0.144)
Asia		0.667*** (0.074)	0.661*** (0.073)

Changed Diet After Immigration (scale)		1.048***	1.036
		(0.012)	(0.037)
Visa Status x Changed Diet After Immigration (Reference= Employment x Changed Diet After Immigration)			
Unlimited Family Visas X Changed Diet After Immigration			1.015
			(0.041)
Limited Family Visas X Changed Diet After Immigration			0.967
			(0.051)
Diversity Holders X Changed Diet After Immigration			1.058
			(0.051)
Refugees X Changed Diet After Immigration			1.046
			(0.055)
Other X Changed Diet After Immigration			1.066
			(0.054)
Legalized X Changed Diet After Immigration			0.923
			(0.044)
Constant	0.059***	0.072***	0.076***
	(0.012)	(0.016)	(0.021)
Wald chi square tests are used to compare models with interactions to models without interaction to examine whether there was significant improvement in model fit.	156.62	50.33***	14.15*

*P<0.05, **P<0.01, ***P<0.001

Interactions between visa status and English language proficiency are included in Model 3, Table 2. The interactions fail to reach significance and model fit statistics indicate that the model with the interactions is not a better fit (Wald chi square=5.09, p=0.53). Results indicated that increasing English language proficiency was associated with a decreased likelihood of being depressed, and this negative relationship was similar across the different visa status groups.

Table 3 presents the results for the nested logistic regression models for visa status and and the acculturation variable diet change. In Table 3, Model 1 presents the odds ratios for immigrant visa status and mental health net of control variables and are presented to illustrate the odds ratios prior to adding the acculturation and country of origin variables. Model 2 includes country of origin and diet acculturation variables. Adding these variables reduced the coefficients for visa status, though unlimited family visa holders (OR: 1.31, p<0.05), refugees (OR: 1.54, p<0.05), other (OR:1.44, p<0.05), and legalized visa holders (OR: 1.42, p<0.05) had high prevalence of depression compared to employment visa holders. Unlike English language proficiency, change in diet is positively associated with the odds of depression, such that increasing changes in diet are associated with higher odds of depression (OR: 1.07, p<0.001). Model 3 included the interactions between visa status and diet acculturation. The interactions failed to reach significance, but model fit statistics in Table 3 indicate that the model with interactions fits the data better than the model without interactions (Wald chi square=14.15, p<0.05). This suggests that the impact of diet acculturation on mental health does differ by visa status. Figure 1 graphs the interactions found in Model 3 and demonstrates that the positive relationship noted above is only found for employment, unlimited family, refugee, diversity, and other visa statuses. Among legalized LPRs increasing dietary acculturation is associated with lower odds of depression. (Figure 1). However, post-estimation commands using margins demonstrate that the association between diet acculturation and mental health is not significant among legalized LPRs. The effect of interaction analysis of visa status and acculturation on depression shows that the measurement of acculturation matters. Although the logistic regression findings for both language and diet acculturation demonstrate a significant relationship between acculturation and depression, the association of visa status and depression differs only by diet acculturation. Language acculturation is indicated as beneficial for LPRs' mental health; however, diet acculturation has a potential detrimental effect on the mental health of LPRs.

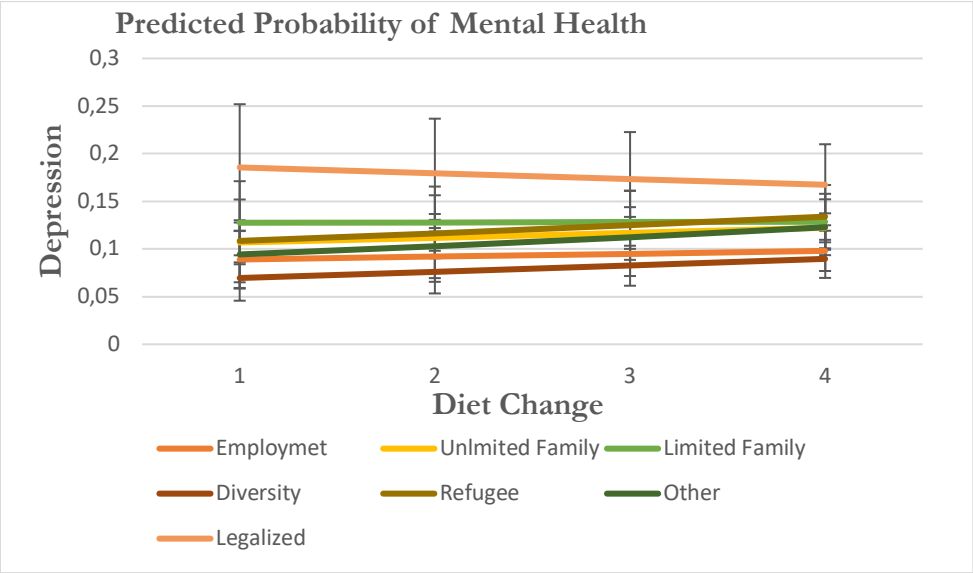

Figure 1. Predicted Margins of Depression by Diet Acculturation

Discussion

This research advances the knowledge of how immigrants mental health is shaped by their visa status and the role of acculturation. We examined seven visa categories, depression as a mental health outcome, and language and diet acculturation variables among 6,984 LPRs in the 2003 NIS. Although original immigration status studies did not show any clear patterns in the exposure of worse health by visa status, more recent studies tend to document nativity, citizenship, legal status differences in mental health, physical health, and self-rated health (Edlund et al., 2018; Henkelmann et al., 2020; Jass & Massey, 2004; Reed & Barbosa, 2017; Szaflarski & Bauldry, 2019). This study's findings support the argument that the concept of visa status is critical in understanding depression among immigrants. Results stressed that acculturation is an important phenomenon and type of the acculturation might have different effects on the relationship between visa status and depression. Also, in this study, consistent with prior research, It is not ideal to combine ethnic minority groups when aiming to assess the healthy immigrant effect and following health trajectories (Jatrana et al., 2018; Kobayashi & Prus, 2012). Categorizing all immigrant subgroups into one group masks the inequalities and differences that must be seen. In this study, we found some proof of differences in mental health according to legal status. Unfavorable visa holders showed higher rates of depression than favorable visa holders. As one of the unfavorable visa categories, refugees leave their countries for different reasons and have different socioeconomic circumstances and migration patterns from other international migrants. The likelihood of trauma experienced by refugees in their home country may have an impact on their capacity to adjust once they reach the host country. (Akhtar, 1999; Schwartz et al., 2010). Furthermore, in contrast to voluntary immigrants, refugees are more likely to be from low socioeconomic backgrounds and to lack established social networks in the host country, such as friends and family. The challenging socioeconomic conditions may contribute to increased stress and difficulties associated with acculturation while not having social supports that buffer these negative effects (Lincoln et al., 2016). Thus, refugees should be considered as an exception to the general immigration population (Baker & Hatipoglu, 2019), because they are forced to flee their own countries and are exposed to pre-migration experiences involving war and violence (Lincoln et al., 2016). Although not every refugee has straight experienced social or political violence, everyone has felt the fear of such violence and harassment, and the majority will have gone through a war or conflict where friends, neighbors, and family members were attacked and places were destroyed (Pumariega et al., 2005). Therefore, their mental health tends to be poorer, and they may have other unique health problems and needs (Lincoln et al., 2016; Revollo et al., 2011; Torres, 2010). This study results are

consistent with other studies (Lincoln et al., 2016; Revollo et al., 2011; Torres, 2010) showing that refugees, as unfavorable visa holders, have higher levels of depression than employment visa holders.

As one of the other unfavorable visa categories undocumented immigrants who entered the country undocumented or overstayed a temporary visa have no legal rights, such as the right to support their family for immigration, the right to work or change jobs, the right to travel in and out of the country, and the right to health insurance, welfare benefits, and student loans (Hamilton et al., 2022)., Past studies on undocumented immigrants' health have also shown how anti-immigration policies and laws limit access to health care and harm health (Martinez et al., 2015). As a result of these policies, undocumented immigrants have an increased risk of having a higher level of mental disorders including depression, anxiety, and PTSD (Martinez et al., 2015). Other studies have found that undocumented immigrants report pervasive fear, stress, and depression related to their legal status (Hamilton et al., 2019; Ro & Goldberg, 2017). In this study, we found that increasing dietary acculturation is associated with decrease odds of depression for those legalized LPR's. These groups also had longest US tenure compared to other visa categories. Longer stay in the US means integrating more into the host society and feeling more accepted and this might be the reason behind the diet acculturation positive influence on legalized people mental health but not other visa groups.

The Association Between Acculturation And Mental Health

The existing literature finds that the effect of acculturation on health varies in terms of the direction and size of influence (Abraído-Lanza et al., 2006). This study confirms the importance of acculturation on immigrants' mental health (Hatipoglu & Szaflarski, 2021), but the mode of acculturation makes a difference, such as thathigher English language proficiency increases the integration to the host society and lowers the stress and isolation. Also, these results show that the effect of the language acculturation is the same for all visa groups. On the other hand, increases in diet change are associated with worse mental health among immigrants. According to the literature (Emerson & Carbert, 2019; Popovic-Lipovac & Strasser, 2015), diet change is associated with loss of connection with the host country, and it exacerbates stress and loneliness, which, in turn, harm their mental health.

Language and Diet Acculturation Interaction with Depression

The two measures of acculturation work in different ways concerning their association with mental health and this impact does vary by visa status category for the measure of diet acculturation. In the literature, the effect of acculturation on mental health is mixed. Even though some studies suggest that with increased acculturation, immigrants are at a higher risk of developing mental illnesses (Berry, 1998; Escobar et al., 2000; Hwang et al., 2005; Hwang et al., 2008; Hwang & Ting, 2008; Vega & Rumbaut, 1991) , much of the research, especially focusing on Asian American population, found that lower level of acculturation is a risk factor of psychological maladjustment In this study, findings support the idea that language acculturation is beneficial for mental health (Abe & Zane, 1990; Hwang & Ting, 2008; Yeh, 2003), however, the association of language acculturation does not vary by visa status. Examining dietary change, however, we found variation in the association of acculturation on mental health by visa groups. In this study, we examined seven different visa categories collapsed into favorable (employment, unlimited family, and diversity) and unfavorable (limited family, refugee, other, and legalized) visa statuses. In addition, experiences after migration tend to be better for favorable versus unfavorable visa holders, since the former are mostly employed and educated (Morey et al., 2020). However, for examination of diet acculturation, the binary visa grouping is not ideal, as indicated by the differences we observed between visa statuses inside the same visa group. Results imply that diet change among different visa groups is positively related with depression for unlimited family, diversity, refugee, and other LPRs and increase of their diet change cause worse mental health for them. However, for legalized LPRs increase of diet change negatively related to depression and higher diet change is causing better mental health. These differences between visa categories might be explained by length of the spending time in the US. Legalized have a longer time spent in the US compared to refugees and other visa holders. Thus, longer time in the US and a moderate change in their diet may facilitate their integration into the new country and help them to feel more adaptive and accepted. There could also be other explanations. For example, Szaflarski and Bauldry (2019) found that

acculturation variables are not as important as discrimination and some other factors. Others have also been advocating for less stress on acculturation and more on structural inequalities (David T. Takeuchi, 2016; Valencia-Garcia et al., 2012). Therefore, other social determinants of health variables should be considered in addition to acculturation.

Some limitations should be recognized. One of the major limitations of this study is that the NIS includes only immigrants who have LPR status. Because of this reason, we were only able to examine green card holders, and the differentiation may depend on their eligibility criteria for the green card. Future research should consider other categories such as undocumented, naturalized, and citizens. Even though English language proficiency and diet change are one of the most common measurements of acculturation in the literature, language proficiency and dietary changes alone may not accurately reflect immigrants' acculturation level. The NIS does not offer an opportunity to develop an acculturation scale.

Conclusion

This study offers a new perspective on the significance of the visa status. for immigrants' mental health. Visas are a mechanism for restricting and controlling the number and type of people who can legally immigrate (U.S. Department of State, 2021). The procedure of applying for and obtaining a U.S. migration visa produces a system of social stratification that can directly and indirectly impact mental health differences among people who obtain visas. Interventions are needed to address mental health disparities due to immigration factors (Alegría et al., 2021). Immigrant visa policies directly affect the visa status of immigrants. The length of the visa processing period may result in longer periods of visa stress, which can have a negative impact on mental health. Furthermore, the impact of the acculturation process on mental health in this immigrant population exposed to visa stress should be considered. This study represents how immigrant visa type shapes health with the contribution of the acculturation and the importance of the different acculturation measurements effect on mental health.

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GENİŞLETİLMİŞ ÖZET

ABD'nin göçmen nüfusu gün geçtikçe artmakta ve çeşitliliği çoğalmaktadır. ABD'ye yönelik hızlı göç, yasal ve yasadışı göçmenler de dahil olmak üzere yabancı doğumlu nüfusun büyüklüğünü 47 milyona yükseltmiştir (United States Census Bureau). Göçmenlerin Amerika Birleşik Devletleri'ne girmek için alabilecekleri aile, çalışma, çeşitlilik, mülteci/sığınma ve diğer tip vizeler gibi çok çeşitli vize kategorileri bulunmaktadır (U.S. Citizenship and Immigration Services). Yeşil kart sahipleri olarak bilinen yasal daimi sakinler (LPR'ler), daimi ikamet statüsü nedeniyle Amerika Birleşik Devletleri'nde kalıcı ve yasal olarak yaşayan vatandaş olmayan kişiler olarak tanımlanmaktadır (Legal Immigration and Adjustment of Status Report, 2019). Bununla birlikte 2019 yılında yaklaşık 1 milyon kişi LPR statüsü elde ettiği ve toplam LPR nüfusunun yaklaşık 13,6 milyon olduğu ifade edilmiştir (Baker, 2019).

Göçmen sağlığı üzerinde stres ve ötekileştirme/ayrımcılıktan siyasi, sosyoekonomik, kültürel, sağlık hizmetleri ve dil engellerine kadar birçok faktör etkilidir. Bu faktörlerle doğrudan ilgili olan göçmenlerin yasal statüleri ise göçmenler için büyük bir hassasiyet içermekte ve bu sebeple çalışmalarda vize statüsü genel olarak sorulmamaktadır. Özellikle sınır dışı edilme korkusu, belgesiz göçmenlerin ve yasal statüsü belirsiz olan diğer kişilerin sağlığını ve refahını etkileyebilme olasılığının yüksek olmasına rağmen ABD'de göçmenlerin yasal statüsü ile sağlık arasındaki ilişkiyi değerlendirmek oldukça zordur ve göçmenlerin yasal statüleri ile ruh sağlığı ilişkisi üzerine yapılan araştırmalar bu sebeple oldukça sınırlıdır. Bu çalışmanın amacı, 2003 Yeni Göçmen Anketi'nden (NIS) alınan ABD'li yetişkinlerden oluşan, ulusal temsili bir örneklemde vize statüsü, kültürleşme ve depresyon arasındaki ilişkileri inceleyerek literatürdeki bu boşluğu doldurmaktır. Daha güncel bir ulusal göçmen statüsü ve sağlık datası olmaması sebebiyle hala diğer araştırmacılar tarafından da bu anket verilerini kullanmaya devam etmektedir (Jang, 2022; Kathawalla & Syed, 2022; Reed & Barbosa, 2017; Ro & Goldberg, 2017; Tabler & Painter, 2022; Zong & Batalova, 2015).

Bu çalışmanın örneklemi 18 yaş ve üzeri yasallaşmış daimi ikamet eden yetişkinlerden oluşan 6.928 göçmenden oluşmaktadır. Temel bağımlı değişken depresif belirtiler ve ana bağımsız değişken vize statüsü olarak belirlenmiştir. Vize statüsünün kategorize edilmesi bireylerin uygunluk kriterlerine ve yeşil kart alma sürecine bağlı olarak yapılmış ve istihdam, sınırsız aile ve çeşitlilik vizesi sahipleri avantajlı vize sahipleri olarak kabul edilirken, sınırlı aile, mülteci, diğer ve yasallaştırılmış vize sahipleri dezavantajlı olarak kabul edilmiştir. Kültürleşme ise, dil ve diyet kültürleşmesi olarak ölçülmüştür. Analitik strateji, tanımlayıcı ve iki değişkenli istatistiklerin ve çok değişkenli regresyon modellerinin tahminini içermiştir. Depresif semptomların ve kültürleşme faktörlerinin raporlanmasındaki ağırlıklı farklılıkların göçmenlerin vize durumlarına göre değişip değişmediğini belirlemek için ki-kare ve ANOVA analizleri yapılmıştır. İkili lojistik regresyon analizleri, vize durumunun depresyonla ilişkisine dair odds oranları (OR) ve %95 CI elde etmek için kullanılmıştır. Depresyon ile kültürleşme ve vize durumu arasındaki ilişkiyi ortak değişkenlerden arındırılmış olarak incelemek için iç içe çok değişkenli regresyon kullanılmıştır.

Örneklemdeki en büyük göçmen grubu sınırsız aile vizesine sahipken (%31) en düşük göçmen grubunun olduğu kategori mülteci/asil/parole (%7)'dir (Tablo 1). En yüksek depresyon düzeyi yasal vizesi olanlarda (%19) görülürken, bunu mülteciler (%16,7) izlemiş, en düşük depresyon seviyesini ise çalışma vizesi sahipleri göstermiştir. Örneklemde, sınırsız aile vizesi sahiplerinin ve mültecilerin yaklaşık yarısı İngilizce dil yeterliliklerinin çok iyi veya iyi olduğunu belirtmiştir. Yasallaştırılmış vize sahipleri, İngilizcelerinin iyi olduğunu belirten %25 ve çok iyi olduğunu belirten %11 ile en düşük yeterliliğe sahiptir. Aynı grup en fazla diyet değişikliği bildirmiştir. Göç sonrası diyet değişikliği vize statüsüne göre önemli ölçüde farklılık göstermiştir ($p<0.001$; Tablo 1, son sütun).

Tablo 2, dil kültürleşmesi ve ruh sağlığı için iç içe geçmiş çok değişkenli regresyon sonuçlarını sunmaktadır. Vize statüsü ve İngilizce dil yeterliliği arasındaki etkileşimler Model 3, Tablo 2'de yer almaktadır. Etkileşimler anlamlılığa ulaşamamıştır ve model uyum istatistikleri etkileşimli modelin daha iyi uyum sağlamadığını göstermektedir (Wald chi square=5.09, $p=0.53$). Sonuçlar, artan İngilizce dil yeterliliğinin depresyonda olma olasılığının azalmasıyla ilişkili olduğunu ve bu negatif ilişkinin farklı vize statüsü grupları arasında benzer olduğunu göstermiştir.

Tablo 3, vize durumu ve kültürleşme değişkeni diyet değişikliği için iç içe geçmiş lojistik regresyon modellerinin sonuçlarını sunmaktadır. Tablo 3'te Model 3, vize durumu ve diyet kültürleşmesi arasındaki etkileşimleri içermektedir. Etkileşimler anlamlılığa ulaşamamıştır, ancak Tablo 3'teki model uyum istatistikleri, etkileşimli

modelin verilere etkileşimsiz modelden daha iyi uyduğunu göstermektedir (Wald chi square=14.15, $p<0.05$). Bu da diyet kültürleşmesinin ruh sağlığı üzerindeki etkisinin vize durumuna göre farklılık gösterdiğini ortaya koymaktadır. Şekil 1, Model 3'te bulunan etkileşimleri grafiklendirmekte ve belirtilen pozitif ilişkinin yalnızca istihdam, sınırsız aile, mülteci, çeşitlilik ve diğer vize statüleri için bulunduğunu göstermektedir. Yasallaşmış LPR'ler arasında artan diyet kültürleşmesi daha düşük depresyon olasılıkları ile ilişkilidir. (Şekil 1). Bununla birlikte, marjları kullanan tahmin sonrası komutlar, diyet kültürleşmesi ile ruh sağlığı arasındaki ilişkinin yasallaştırılmış LPR'ler arasında anlamlı olmadığını göstermektedir. Vize statüsü ve kültürleşme arasındaki etkileşim analizinin depresyon üzerindeki etkisi, kültürleşme ölçümünün önemli olduğunu göstermektedir. Hem dil hem de beslenme kültürleşmesi için lojistik regresyon bulguları kültürleşme ve depresyon arasında anlamlı bir ilişki olduğunu gösterse de, vize statüsü ve depresyon ilişkisi yalnızca beslenme kültürleşmesine göre farklılık göstermektedir. Dil kültürleşmesinin LPR'lerin ruh sağlığı için faydalı olduğu belirtilmektedir; ancak beslenme kültürleşmesinin LPR'lerin ruh sağlığı üzerinde potansiyel olarak zararlı bir etkisi vardır.

Sonuçlar, kültürleşmenin önemli bir olgu olduğunu ve kültürleşme türünün vize durumu ile depresyon arasındaki ilişki üzerinde farklı etkileri olabileceğini vurgulamıştır. Ayrıca, bu çalışmada, önceki araştırmalarla tutarlı olarak, sağlıklı göçmen etkisini değerlendirmeyi ve sağlık yörüngelerini takip etmeyi amaçlarken etnik azınlık grupları birleştirilmemesi grektiğini vurgulamıştır (Jatrana et al., 2018; Kobayashi & Prus, 2012). Çalışmanın sonuçları, dezavantajlı vize sahipleri olarak mültecilerin istihdam vizesi sahiplerine göre daha yüksek depresyon seviyesine sahip olduğunu gösteren diğer çalışmalarla tutarlılık göstermektedir (Lincoln et al., 2016; Revollo et al., 2011; Torres, 2010). Aynı zamanda, artan diyet kültürleşmesinin, yasallaşmış LPR'ler için depresyon olasılığının azalmasıyla ilişkili olduğu bulunmuştur. Bu çalışmanın sonuçlarına göre dil kültürleşmesinin etkisi tüm vize grupları için aynı olsabile, diyet değişikliğindeki artışlar göçmenler arasında daha kötü ruh sağlığı ile ilişkili olduğunu göstermiştir. Böylece bu çalışma, göçmenlerin ruh sağlığı açısından vize statüsünün önemine yeni bir bakış açısı sunmuştur. Ayrıca, vize statüsü, vize verilen ve yasal olarak göç etmesine izin verilen kişilerin sayısını ve türünü sınırlayan ve kontrol eden bir mekanizma olarak karşımıza çıkmaktadır. Bununla birlikte bu çalışma, göçmen vize türünün kültürleşmenin katkısıyla ruh sağlığını nasıl şekillendirdiğini ve farklı kültürleşme ölçümlerinin ruh sağlığı üzerindeki etkisinin önemini ortaya koymaktadır.