CONTEXTUAL FACTORS ON HEALTH AND MENTAL HEALTH SERVICE USE
AMONG IMMIGRANTS IN THE UNITED STATES:
MODERATION OF CITIZENSHIP STATUS AND RACE/ETHNICITY

BY

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DISSERTATION

Submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy in Social Work
with a minor in Gender Relations in International Development
in the Graduate College of the
University of Illinois at Urbana-Champaign, 2015

Urbana, Illinois

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ABSTRACT

After the welfare reform in 1996, immigrants' access to social service programs and health services has been largely limited, particularly for non-citizens. Latino and Asian immigrants in the United States as the major growing immigrant populations have been found to under use health and mental health services compared to U.S.-born citizens. While prior literature identifies various individual barriers, contextual influence, such as state and community factors have not been widely examined. Adapted from Andersen's Behavior Model of Health Service Use, this study aims to examine the associations between contextual factors (community cohesion, state funded-programs, and state concentration of immigrants) and immigrants' preventive and mental health service use after controlling for individual-level (predisposing, enabling and needs factors) factors. This study further examines whether the associations of service use and state factors are moderated by immigrants' citizenship statuses and their race and ethnicity.

Data were obtained from the public and restricted data set of the National Latino and Asian American Survey (NLAAS), which consists of a sample of 4,254 Latino and Asian immigrant adults from 18 to 64 years of age living in the U.S. household across 50 states during 2002 and 2003. Binary logistic regression models were estimated to address the questions above. Sampling weights, strata and cluster variables were applied due to the multistage sampling design of this data set and oversampling of higher density areas with immigrant origin groups of interest.

Findings from the study with regard to health care use indicated that immigrants who were female, not in the labor force, being older, had medical insurance or had better English proficiency were more likely to have physical checkups in the previous year. Immigrants who

lived in states with the highest immigrant concentration (more than 20%, such as California, New York and New Jersey) were 60% less likely to have physical checkups than those who lived in non-traditional immigrant states (states that are composed of less than 5% of immigrants). Community cohesion and living in states that offered state-funded health programs to immigrants had no effect on immigrants' preventive health care use and mental health care use year after controlling for individual-level factors.

With regard to mental health care use, being a younger immigrant (18-30 years old), being male, married, or living in poverty were more likely to receive counseling or therapy after adjusting for individual-level factors. Those who were employed, Asian immigrants or naturalized citizens as well as those who perceived to have excellent health and mental health condition had greater odds of seeking mental health professionals' help. Immigrants who lived in states with moderate immigrant concentration (10-14.9%) had 3.64 times greater odds for receiving mental health care than those who lived in non-traditional immigrant states.

In the analyses for the interactions between citizenship status and state immigrant concentration, non-citizens who lived in states with a moderately high concentration of immigrants (e.g. 10% and above) or above had a lot less odds for having physical checkups. On the other hand, naturalized citizens who lived in states with 15-19% of immigrants were nearly 20 times more likely to receive counseling than their US-born counterparts.

In the analyses for the interactions between race/ethnicity and state concentration of immigrants, Asian immigrants had 8-11 times greater odds for having physical checkups than Latino immigrants when they both lived in highly immigrant-concentrated states (e.g. 15% and above). However, this protective factor does not continue to hold true for Asian immigrants in their mental health care use in moderately immigrant-concentrated states. Compared to Latino

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immigrants, Asian immigrants' odds for going to counselors or therapists decreased by 90% when they lived in states such as Illinois, Arizona, Virginia, Connecticut, Rhode Island, Maryland, Washington, and DC (10-14.9% of immigrants).

Neither of the interactions, between citizenship status and state generosity or race/ethnicity and state generosity, were significant. This indicates that living in a more generous state does not affect immigrants differently than US-born counterparts, nor does it differently affect Latino or Asian immigrants in terms of their utilization of health and mental health care.

Based on the findings, the current study suggests that practice, policy and research on the preventive care and mental health care for Latino and Asian immigrants should have more understandings of sociocultural and contextual factors at community and state levels, and how these utilizations differ across different citizenship statuses and racial and ethnic groups in state contexts. By untangling the various effects in research and responding to them through practice, legislation and policy implementation, we can more likely reduce health disparities among immigrant and minority groups and thus enhance better health and mental health well-beings for all in the United States.

ACKNOWLEDGEMENTS

issues in the use of NLAAS. As junior faculty, she has been extremely generous to share with me her precious experiences and coping strategies in academia.

Many other professors have also contributed to my overall development as a researcher and educator. Special thanks go to Drs. Susan A. Cole, Brenda Coble Lindsey, and Chi-Fang Wu for their years of mentorship and friendship. Dean Wynne Korr, who signed off my data application to the University of Michigan, so that I could successfully obtain the restricted data for this study.

I am so grateful for having these office "soul mates", Sungwan Kang, Dr. Chennan Liu (Renmin University of China), and Dr. Seonmi Kim (Ramapo College), for the tears and laughers we have shared together over the past years. Special thanks to Dr. Xiaoling Xiang (Northwestern University), Ching-Husan Lin, Dr. Hui Huang (Florida International University), Dr. Meirong Liu (Howard University), Dr. Jun Sung Hong (Wayne State University), Emily Lux and Chloe Lee, for never saying no to my bombardment of emails, texts, or phone calls for help!

Indeed, it takes a village to raise a doctoral student. I am indebted to the community support from Urbana-Champaign to back me spiritually, emotionally and physically over the years like families, David and Ruth Krehbiel, Ron and Nancy Angerer, Drs. Rebecca Bryant and Marybeth Hallett. In particular, Mei Lu and Shutien Chen, who extended free childcare, meals and rides for my son for years so that I could work on evenings, weekends and attend conferences. And David Nellis, whose assistance throughout my relocation stage helped me make a smooth transition from the Midwest to East Coast in the shortest time.

Without my enlightenment education of social work and law in Taiwan, I would not be who I am now. I would like to acknowledge Dr. Joyce Feng, Dr. Wanyi Lin, Dr. Annie Yu from the Department of Social Work in National Taiwan University and the late Great Justice Fa and

Dr. Hsui-Hsiung Lin in the law school in National Chengchi University, for they have shaped my professional knowledge, values, character and growth so that I could come this far!

My dear friends in Taiwan, no matter where I am, their prayers, sisterhood of love and encouragement follow in times of need. Thank you for always cheering me on, my best friend, Dr. Brenda Hsu (Chinese Culture University), Dr. Renee Meng-Fei Cheng (Cheng-Hua University of Education), Grace Lien, and Lucia Lee.

The dissertation is dedicated to my dear 80-year-old mother and my beloved son, Nathan. My mother has showed me abundant love, courage and perseverance to take on each challenge in life. With the same spirit she passes to me, I would like to pass them on to my son, who has physically and faithfully accompanied me in this long Ph.D. journey since he was five. The motivation and strength he provides me to strive for a better life is absolutely powerful and beyond my capacity!

Finally, I want to thank the Lord for not taking away the cup of hardships, but watching over me in each step with so many of His blessings and grace.

Dedicated to my mother, who gave me life, and my son, to who I passed it on

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CHAPTER 1

INTRODUCTION

With the increase of immigrants to the nation and diversity in its population in the last decade, reducing racial and ethnic disparity in health care in the United States has recently received more attention than it previously has. Many public efforts, such as Healthy People 2020, developed by the U.S. Department of Health and Human Services, and the Institute of Medicine (IOM), both included "improving the health" for all groups and "delivery of health services to all individuals" as their major goals in response to the U.S. Congress's concern about health care quality and experiences of minorities (IOM, 2003; OMH, 2012).

As Latinos and Asians became the majority and the fastest-growing groups in the immigrant populations (respectively due to birth and immigration increase), these two groups have become the primary sources of immigrants and are projected to be the majority by 2060 (U.S. Census Bureau, 2011). In spite of the immigrants' health selection effect and Latino paradox, immigrants' health deteriorates over time in the United States (Frisbee, Cho, & hummer, 2001; Franzini, Ribble, & Keddie, 2000). As their health condition will greatly determine the health status of the population in the society as well as affects other citizens in their communities regardless of their race, ethnicity or citizenship status. As a result, understanding the factors that affect these two immigrant groups' health care access and utilization will provide insight into how communities and states can provide programs to serve them despite their ineligibility in many federal programs.

Immigrants overall are found to underuse health and mental health services. Their individual barriers to service use are well documented in existing literature. For example, at least one immigrant adult in their household had limited English proficiency (LEP) problems. Limited

English proficiency has been found to affect immigrants' receipt of long-term mental health care treatment (Sentell, Shumway, & Snowden, 2007). Additionally, immigrant families were poorer than U.S.-born parents and had lower health insurance coverage despite having a higher percentage of employment (Fortuny, Capps, Simms, & Chaudry, 2009). Besides, their immigration status significantly affects equal protection at their jobs and their work status, which results in lower rates of employment-based insurance, and also restricts their access to social benefits, health, and mental health services (Fortuny et al., 2009).

However, these individual barriers alone do not account for the differences in health and mental health service use among immigrant populations. Factors at the state and local community levels that can possibly influence their service use have not been widely examined yet. A contextual analysis of immigrants' medical care use at state and community levels can deepen our understanding by going beyond individual-level of risks and "blaming the victims" for their lower use (Cristancho, Garces, Peters, & Mueller, 2008).

Welfare reform based on the Personal Responsibility and Work Opportunity Reconciliation Act (PRWOR) in 1996, greatly contributed to curtailing immigrants' access to public assistance through in Temporary Assistance for Needy Families (TANF), Supplemental Security Income (SSI), SNAP (food stamps), and Medicaid. These restrictions also applied to the State Children's Health Insurance Program (SCHIP) by not only excluding non-citizens from welfare rolls but also imposing a requirement of five years of residence in the United States for legal citizens who immigrated after August 22, 1996 (Buff, 2008; Earner, 2007; Yeo, 2013). This legal change has weakened the safety net for immigrants' income maintenance as well as their access to medical care. In addition, the recent health care reform, the Patient Protection and Affordable Act (ACA) of 2010, which intends to provide a universal health care for most people in the United Sates,

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excludes undocumented immigrants from this health plan. Scholars project that after health care reform, more than 30% of the uninsured population will still consist of immigrants (both undocumented and legal residents). This is due to their exemption from the mandated coverage and exclusion from tax credits to reduce medical costs (Buettgens & Hall, 2011).

Although geographically immigrants are concentrated in more traditional immigration states, such as California, New York, Texas, Florida, Illinois and New Jersey, there has been a growing influx of immigrants to non-traditional immigration states, such as Arizona, Georgia, Nevada and North Carolina (Fortuny et al., 2009). Given the growth and spread out of immigrants to more states, states and local communities face challenges in responding to immigrants' needs in delivery of health and mental health care services. States or communities with a higher percentage of immigrants may be a buffering factor for immigrants' vulnerabilities as these states may have developed culturally competent programs and may provide more experienced professionals for serving immigrants (Derose, Escarce, & Lurie, 2007). In response to federal policy restricting the availability of Medicaid to immigrants, several states took the initiative to develop state-funded health programs for immigrants, which may minimize the adverse effect of federal policies on immigrants' access to care (Fremestad & Cox, 2004).

Additionally, living in states where there are more immigrant communities and cohesion in the neighborhoods, such as trust, mutual help to and from neighbors, feelings of security in the communities, etc., may also affect immigrants' use of health services. For example, bureaucratic administrative changes after welfare reform, failure to clarify eligibility (Ku & Matani,, 2001), unfriendly climates for immigrants in neighborhoods and communities (Derose et al., 2007) as well as immigrant populations' fears of and misconceptions about using government assistance

(Buff, 2008; Kandula Grogan, Rathouz, & Lauderdale, 2004) also contribute to lower use of care even when they are eligible for these services.

Furthermore, immigrants as a whole have common vulnerabilities and lower use of medical care; however, the heterogeneity of immigrants in terms of language and citizenship status such as naturalized citizens and non-citizens, may further lead to different responses to service use among immigrant subgroups. Prior studies often aggregate immigrants as a foreign-born group and thus obscure the strength, challenges, and disparities in health care between naturalized citizens and non-citizens. Therefore, one of this study goals is to differentiate immigrants' service use by their citizenship status: naturalized citizens and non-citizen. Naturalized citizens are not U.S. born but later become citizens through a naturalization process, which can be through their employer sponsorship, marriage, investment, military service, etc. (U.S. Department of Homeland Security, 2015). Non-citizens include legal residents (Green Card holders), legal workers, students, refugees as well as illegal residents (e.g., undocumented) in the United States.

Given a growing body of literature on immigrants' service use on individual-level factors (Kang, Howard, Kim, Payne, Wilton, Kim, et al., 2010; Lee, & Matejkowski, 2012; Leclere, Jense, & Biddlecom, 1994), fewer studies are based on a contextual perspective to understand health care use among immigrants, whose choice is beyond individual-level and may be affected by communities and state contexts (Kandilov, 2008; Yeo, 2013).

In line with studies that promote using social determinants to explain health disparities (Marmot, Friel, Bell, Houweling & Taylor, 2008), understanding immigrants' health care and mental health care use from social contexts can help explain service use factors beyond needs and individual preferences that lead to unequal access to care (Suarez-Orozco & Carhill, 2008).

Hence, it can also help practitioners and policymakers to identify appropriate policy and practice interventions for reaching and serving immigrants with diverse backgrounds in local communities across the country.

Purpose of the Study

This study aims to examine the association between contextual factors (community cohesion, state-funded programs and state concentration of immigrants) and immigrants' health and mental health service use. This study further examines whether these associations are differentiated by immigrants' citizenship status (U.S.-born citizens, naturalized citizens, and non-citizens), and across immigrant groups (Asians and Latinos).

The theoretical framework of this study is drawn upon and adapted from Andersen's behavior model of service use (Andersen, 1995; Andersen & Davidson, 2007) which will be explained in more details in Chapter 2. The research questions attempt to examine whether there is an association between health service use (clinic care, and counseling and therapy) and immigrants' contexts (community cohesion, state immigrant concentration, and state-funded programs for immigrants), while controlling for predisposing factors (demographics and immigrant-related factors such as citizenship, age at immigration, and length of stay in the U.S.), enabling factors (social support, health insurance coverage, poverty, and English proficiency), and needs factors (self-rated health and mental health).

 After the welfare reform of 1996, citizenship and the length of residence in the United States became crucial factors in determining Medicaid eligibility for immigrants. Therefore, the National Latino and Asian American Survey (NLAAS) that collected immigrants' service use behaviors after welfare reform is the first and only national dataset to study this population and topic in an era of welfare policy change. Data were collected from public and restricted data

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from the National Latino and Asian American Survey (NLAAS), which consists of 4,254 Latino and Asian Americans, aged 18 to 64 years old living in U.S. households in 2002 and 2003. The remainder of this chapter introduces the major issues that frame this proposed study and concludes with the significance of this study in practice, policy and research for social work.

<div align="center">**Backgrounds of Policy and Practice**</div>

Immigrants' Health and Mental Health Service Use

Access to the U.S. health care system since 1965 is primarily composed of employment-based insurance, self-purchased insurance, and the federal programs of Medicare and Medicaid, as well as state subsidized programs for the uninsured. Immigrants are left out of this safety net in the country, including who are long-term legal residents, older adults, children, disabled, and the poor (Portes, Light, & Fernandez-Kelly, 2009).

The passage of the Patient Protection and Affordable Act (ACA) in 2010 aimed to reduce the uninsured population from 17 percentage to 5 percent by expanding Medicaid, subsidizing purchase of private insurance, and mandating individual coverage. However, undocumented immigrants are still projected to represent more than 25 percent of the uninsured as they are exempt from mandated coverage; legal residents will account for 8 percent because of their ineligibility for Medicaid and CHIP (Jost, 2010; Kominiski, 2014). Therefore, the health care plan does not reduce the widening of disparity in health care access among immigrants.

Prior studies generally point out that immigrants' health care utilization is lower than US-born counterparts, whether it is health care (Leclere et al., 1994) or mental health care (Abe-Kim, Takeuchi, Hong, Zane, Sue, Spencer et al., 2007; Kang et al., 2010). This lower use also holds true for immigrant children (Reardon-Anderson, Capps, & Fix, 2002), older immigrants (Choi, 2006; Yeo, 2013), and work-aged immigrants (Ku et al., 2001). This disparity in access to care

also reflects in the utilization of preventive care, which may largely reduce later cost of acute and chronic health treatment and enhance better management of one's health (Gorman & Dinh, 2013). As minority groups in the United States, Asians and Latinos have consistently been found to be less likely to access mental health services than non-Latino whites (Alegria et al., 2008). When they seek formal medical help, their mental illnesses are usually more severe than non-Latino whites (Abe-Kim et al., 2007; Vargas Bustamante, Morales, & Ortega, 2014). As federal law mandates access to emergency care to all individuals, emergency rooms often become the last resort for the uninsured (Vargas Bustamante et al., 2014) despite the higher cost.

The Impact of Social Contexts on Service Use

While health service use can be a personal care-seeking choice, this choice is often complicated and determined by more than individual preferences alone (Leclere et al., 1994). Decisions to access health care and mental health care for immigrants especially involve more considerations than they do for their U.S.-born counterparts as a result of their limited English fluency (Sentell et al., 2007), cultural concepts of illness and health (Fadiman, 1998), legal immigrant status, lack of insurance (Kim & Keefe, 2010; Ku et al., 2001; Portes et al., 2009), and duration of residence in the United States (Leclere et al., 1994, Fremstad et al., 2004) as well as age at immigration (Lee et al., 2012).

However, even with health coverage, immigrants still tend to underuse health care and mental health care services when they are eligible for these services (Ku & Matani, 2001). This warrants the examination from a different perspective than just personal preference, eligibility, and health coverage. A growing body of studies call for more attention to the impact of social contexts on health outcomes, risk behaviors, and health care use as new directions in research with immigrants, including examining neighborhood effects, social capital, social cohesion, and

discrimination in the environment (Lantz & Pritchard, 2010; Suarez-Orozco et al., 2008). Even the widely used framework of health behavior models developed by Andersen was modified by adding contextual influences (Andersen, 2008).

Since the 1996 welfare reform, immigrants' use of Medicaid has been significantly affected by citizenship status. Those who arrived in this country after August 22, 1996 cannot receive coverage in their first five years of residence in the United States except for emergency care, which was mandated by the Emergency Medical Treatment and Active Labor Act (EMTALA) (Fremstad et al., 2004; Portes et al., 2009). In responding to these restrictions on immigrants' access to care, several states took the initiative to develop state-funded health programs for immigrants in order to respond to the adverse impact of federal policies on immigrants' access to care as of 2004. According to Fremstad and Cox (2004), 23 states used state funds to provide different degrees of coverage to different target groups of immigrants, including children, parents, disabled people, and expectant mothers in need of prenatal care regardless of their immigration status. Some of this state coverage provides the same or similar health care coverage as Medicaid or SCHIP to legal immigrants, some only cover limited categories of immigrants, and still others provide more limited cost sharing, premiums, and enrollment than Medicaid and SCHIP. They found that the uninsured rate among immigrants who live in states with state-funded programs has been largely reduced compared to those who live in states that do not fund their own programs (53% versus 71%). While state assistance to immigrants in health coverage programs increases insured rates in these populations, the question of whether being covered by state-funded programs enhances use of services by immigrants still has not been extensively examined.

State concentration of immigrants may also be another factor that determines how a state responds to its immigrants. A state with more immigrants may be more accustomed to knowing how to serve immigrants as well as have more culturally appropriate and experienced practitioners to work with immigrant populations (Derose et al., 2007). On the other hand, states with fewer immigrants or that are experiencing new growth of immigrants may be less ready to meet the health care needs of immigrants, particularly since many of the newly-arrived immigrants are often uninsured (Cunningham et al., 2006). To my knowledge, as of now no empirical studies test the association of state concentration of immigrants and immigrant's medical care use.

Besides state contexts, communities and neighborhoods are another context in which immigrants reside. Studies of neighborhood effects on health and mental health outcomes or status have flourished in recent years, and findings pointed out that people's health status could be fostered or undermined depending on where they live (Cook et al., 2009; Lee, 2009; Viruell-Fuentes, 2007). Could neighborhoods impact people's health service use in the same way they influence people's health? Given the income inequalities in communities in the United States, access to health care could be another pathway to influence health through neighborhoods, which symbolize different resources of health care, varying degree of socioeconomic disadvantages, social capital and social control in the neighborhood that influence the exchange of health care information and trust in health professionals (Derose & Varda, 2009; Prentice, 2006).

Citizenship Status Matters

Immigrants' legal status is key factor that determines employment, income and chance of receiving employment-related health insurance (Derose, Bahney, Lurie, & Escarce, 2009). Based on citizenship status, immigrants can be further divided into naturalized citizens and non-

citizens, both of whom are foreign-born. Naturalized citizens refer to those who are not U.S.-born but have become U.S.-citizens through a naturalization process such as marriage, family reunification, or employment. Generally, it takes at least five years to become a U.S. citizen after being naturalized. Non-citizen is another category that consists of all other foreign-born individuals, including permanent residents (green card holders), temporary residents (students, temporary workers), and those who are illegal and undocumented (Lee et al., 2012).

Among U.S. citizens, naturalized citizens, and non-citizens, non-citizens are found to be most disadvantaged with the highest uninsured rates and the lowest rates of employment-provided insurance (Buchmueller, Lo Sasso, Lurie, & Dolfin, 2007). Fremstad and colleagues (2004) identified that for non-citizens, as their residence lengthens to six years and more in the United States, their uninsured rate decreased from 52% to 43%. This is also true within Latino subgroups. For example, Puerto Ricans are more likely to be eligible for federal and state health programs than other Latino subgroups as a result of their citizenship by birth, and thus their access to medical care is higher (Vargas Bustamante et al., 2014). Portes et al. (2009) found that citizenship status variations exist within immigrants that cause variation in socioeconomic status as well as access to use health care. For example, immigrants who are professionals are more likely to be naturalized citizens, and their major barrier to accessing health care is the cultural translation of illness rather than English proficiency or income status. As for undocumented labor workers, who are more likely to be non-citizens, fear of deportation and failure to provide local residence often disable them from using services in state and county health agencies.

Changes in the legal context of welfare reform that exacerbates disparities in health care access based on citizenship and length of residence (Ku et al., 2001), further highlight the impact of citizenship status on immigrants' use of health (Choi, 2006; Ku et al., 2001; Yeo, 2013) and

mental health care (Lee et al., 2012). However, most current studies roughly identify immigrants by distinguishing between U.S.-born and foreign-born, which mixes naturalized citizens' and non-citizens' different circumstances and disparities in medical care.

As one-third of Hispanics and two-thirds of Asians in the United States are foreign-born (U.S. Census Bureau, 2011), which illustrates the importance of this study, to understand the correlates of health and mental health use and how they vary among immigrants by citizenship status and their racial and ethnic groups.

Understanding Latino and Asian Immigrants' Disparities in Care

Latinos make up 16 percentage of the U.S. population and are expected to increase to 30 percent by 2050 (Vargas Bustamante et al., 2014). Despite of the diversity across subgroups, Latinos tend to have worse access to health care and poorer quality of care compared to non-Latino whites due to their lower insurance coverage, worse geographic access to care, and language barriers to communicating with medical professionals (Vargas Bustamante & Chen, 2011). Latinos also largely rely on Medicaid (IOM, 2003), and therefore many lost their insurance between 1993 to 1999 when Medicaid coverage eligibility began to change as a result of welfare reform (Shah & Carrasquillo, 2006).

Like Latino populations, Asian populations are also a heterogeneous group from different countries with more diversities in language, religious background, income level, and health status. Since 2000, the Asian American population in the United States increased by 45 percent, making them the fastest-growing immigrant group. Asian Americans are viewed as "model minority" as a result of their higher socioeconomic status (SES), high percentage of advanced educational attainment, and high insurance coverage rates. However, this stereotype often conceals their experiences of discrimination, language barriers, and vulnerability, especially for

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some Asian subgroups such as Hmong, Laotians and Cambodians with 35 to 65 percent poverty

rates, lower education levels, and traumatic histories before their migration to the United State

(Vargas Bustamante et al., 2014; Leong et al., 2001).

In general, studies pointed out better health outcomes among immigrants such as lower

mortality rates from chronic diseases (Singh & Siahpush, 2001), lower risks of low birth weight

(LBW) among black and Hispanic immigrants women (Acevedo-Garcia, Soobader & Berkman,

2005), and the overall better health conditions among Asian immigrants compared with their

U.S. counterparts (Frisbie, Cho, & Hummer, 2001). The Latino paradox is particularly widely

spread and supported: despite lower social economic status, Latinos have better health outcomes

and lower mortality rates than US-born counterparts (Franzini et al., 2000).

Two rationales of are often offered to explain the better health outcomes among

immigrants: health selection effect and cultural protection. The health selection effect among

immigrants refers to that the notion that healthy people immigrate and pass the U.S. immigration

screening whereas unhealthy immigrants tend to return to their country of origins (Frisbie et al.,

2001; Jasso, Massey, Rosenzweig, & Smith, 2005). The cultural protection factor emphasizes

Latino and Asian cultures that promote familial values and also support healthy lifestyles that

produce better health outcomes.

Unfortunately, health selection effect and cultural protection do not retain immigrants'

better health condition as they reside in the United States over time. Studies show that as

immigrants stay longer, their health and mental health deteriorate because the cultural protection

from their country of origin wanes with time (Frisbie et al., 2001; Miranda & Matheny, 2000), or

they experience discrimination (Cook, Alegria, Lin & Guo, 2009).

Studies often attribute immigrants' under use of medical care to lower perceived needs. Latinos and Asians as the two major immigrant groups in the United States have commonalities in distinct health beliefs and practices as well as care-seeking behaviors that partially contribute to disparity in medical care use. For example, both Latino and Asian cultures have their own folk remedies such as treatment for Caida de Mollera (sunken fontanelle) in some Latino cultures, or Gua-sha remedy (using coins to scrape skin in order to stimulate blood low and healing) in some Asian cultures (Davis, 2000; Mudd & Findlay, 2004) and they do not necessarily seek help from medical professionals in mainstream medical services (Ahmad, Shik, Vanza, Cheung, George & Stewart, 2005; Fadiman, 1998; Fung & Wong, 2007). Moreover, shame and stigma are often closely connected with mental health illnesses in Asian cultures, preventing disclosure to health providers, counselors or therapists, or neighbors in the community (Gim, Atkinson, & Whiteley, 1990; Leong & Lau, 2001). Further, both Latino and Asian cultures emphasize dependence on family and intracultural groups and often seek help through their own social networks instead of from professionals, which has the connotation of failure of family and kinship systems (Lee, 2010; Leong et al., 2001). Living in states where immigrant concentrations are high or where ethnic enclaves exist may particularly buffer Latinos' or Asians' care-seeking behavior because of their reliance on informal social networks.

In spite of the lack of existing literature that examines to what extent state contexts are associated with preventive care and health care use across immigrants of different citizenship status and racial/ethnic groups, this study contributes to the literature of reviewing the interactions between citizenship and state factors, as well as interactions between race/ethnicity and state factors by the following questions and hypotheses.

Research Questions and Hypotheses

There are three major research questions in this study aiming to examine contextual predictors for immigrants' health and mental health service use.

- Research question 1: Are contextual factors associated with preventive health care and mental health care use among immigrants, specifically the impact of community characteristics and state factors?

- Research question 2: does citizenship status moderate the association between contextual factors and service use (health care and mental health care)?

- Research question 3: does race/ethnicity (Asians and Latinos) moderate the association between contextual factors and service use (health care and mental health care)?

Based on the review of prior literature, this study has developed research hypotheses below for each question. To question one, when community is more cohesive with a higher sense of collectivism, I hypothesize that more information will be shared and exchanged that foster more preventive care use (Prentice, 2006). However, I hypothesize a negative association between community cohesion and mental health care use, that more cohesive communities provide that sense of safety and mutual aid that immigrants do not need to seek professional mental health help as much (Drukker, Driessen, Krabbendam, & Van Os, 2004). For the rest of hypotheses for question one, I posited that higher state immigrant concentration and more state generosity will increase odds for immigrants of using health and mental health care.

For question two, I hypothesize that living in states with higher immigrant concentration and living in more generous states will be associated with more odds for utilizing health and mental health care among immigrants compared to US-born counterparts.

For question three, to the best of my knowledge, this is one of the first studies to examine whether there is state contextual effect on health and mental health service regarding the comparison of Latino and Asian immigrants (Molina, Alegria, & Chen, 2012). Therefore, given the lack of literature to support a clear direction for this question, I proposed non-directional hypotheses as below.

Q1: Are contextual factors associated with health and mental health service use among immigrants?

	Health service: Doctor visits to clinic/regular/routine care
Community Cohesion	H1: There is a positive association between higher community cohesion and more doctor visit to clinic care (+).
State Immigrant Concentration	H2: There is a positive association between higher state immigrant concentration and more clinic care use (+).
State Generosity	H3: There is a positive association between residence of states that have funded health programs for immigrants and their more visit to clinic care use (+).
	Mental health service: Lifetime receipt of therapy or counseling
Community Cohesion	H4: There is a negative association between higher community cohesion and fewer doctor visits to mental health care (-).
State Immigrant Concentration	H5: There is a positive association between higher state immigrant concentration and more mental health care use (+).
State Generosity	H6: There is a positive association between residence of states that have funded health programs for immigrants and more mental health care use (+).

Q2: Do state factors associated with immigrants' service use vary by their citizenship status?

	Health service
State Immigrant Concentration	H7: For immigrants, living in states with higher immigrant concentration is associated with increased health service use compared with US-born counterparts (+).
State Generosity	H8: For immigrants, living in states with health programs for immigrants is associated with increased health service use compared with US-born counterparts (+).
	Mental health service
State Immigrant Concentration	H9: Living in states with higher immigrant concentration is associated with increased mental health service use more for immigrants than for US-born counterparts (+).
State Generosity	H10: Living in states with health programs for immigrants is associated with increased mental health service use more for immigrants than for compared with US-born counterparts (+).

Q3: Do state factors associated with immigrants' service use (mental health & health service use) vary between Asian and Latino groups?

	Health service
State Immigrant Concentration	H11: State immigrant concentration will have variable associations with odds of health service use across Latino and Asian groups (non-directional).
State Generosity	H12: State-funded programs will have variable associations with odds of health service use across Latino and Asian groups (non-directional).

	Mental health service
State Immigrant Concentration	H13: State immigrant concentration will have variable associations with odds of mental health service use across Latino and Asian groups (non-directional).
State Generosity	H14: State-funded programs will have variable associations with odds of health service use across Latino and Asian groups (non-directional).

According to Phillips, Morrison, Andersen, & Aday (1998), "contextual variables often have complex relationship with other variables and indirect as well as direct association with utilization" (p. 577). My research questions can be conceptualized as the model below.

Figure 1. Conceptual Model (Adapted from Andersen, 1995, 2007)

Determinants of Service Use ⟶ Service Use Behavior

Contextual Factors   Individual-level Characteristics

External environment:

- State percentage of immigrants.
- State-funded programs for immigrants.
- Community cohesion.

Predisposing Factors:

- **Demographics:** age, gender, marital status, employment.
- **Social structure:** race, race/ethnicity, education.
- **Immigrant characteristics:** citizenship, nativity, length of residence, age at immigration.

Enabling Factors:

- Social support
- Health insurance coverage
- Poverty status
- English proficiency

Needs Factors:

- Self-rated Health
- Self-rated Mental health

Service use:

- **Health care.**
- **Mental health care**

H1

Citizenship status & Race/ethnicity

H2 & H3

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Theoretical Framework

Andersen's Behavioral Model of Health Care Services

This study applied and modified Andersen's behavioral model of health care services to examine factors that influence immigrant families' utilization of mental health care and health care. Andersen's behavioral model of health care services has been widely used to understand care-seeking behaviors because it was developed to understand and to explain decisions about health care service use as a result of multiple influences of individual characteristics, resources to care, perceived needs for care, and contextual factors (Phillips et al., 1998).

Andersen's original Behavior Model of Health Services Use was initially developed in 1968 to measure equitable access to health care in order to inform health policies. Over the years it has been evolved and expanded to include more levels of factors to explain service use beyond health care (Andersen, 1995). While three primary categories of constructs constitute the behavioral model, this model is "a framework for analysis rather than a mathematical model, and therefore it does not dictate the precise variables …that must be used" (Phillips et al., 1998, p.574).

This model has three primary constructs that explain health behavior (practices and use of health services): predisposing characteristics (socio-demographic characteristics), enabling resources (availability, accessibility, affordability, and acceptability), and perceived need for services (Andersen, 1968; Babitsch, Gohl, & Von Lengerke, 2012).

The predisposing characteristics include demographics, social structure, and health beliefs (Andersen, 1968). Demographics consist of age, sex, marital status, and family size. The social structure refers to status that exists before one's use of health care, such as education, occupation, and race and ethnicity. In the revised model (1995), Andersen added social

networks, social interaction, and culture in the predisposing characteristics. However, it has been criticized for lacking a contextual perspective of how service utilization is affected by the external environment such as physical, political, and economic components (Choi, 2006).

Despite the fact that environmental factors such as health system (policy, resources, and organization) were added shortly in 1970s, the more extensive concept and term of "contexts" of heath care utilization were not extensively acknowledged and adopted until 2000s (Andersen, 1995; Andersen, 2008; Andersen et al., 2007; Phillips et al., 1998) and the inclusion of environmental variables vary depending on the "the extent of prior research, the research question, the purpose of the study and data availability" (Phillips et al., 1998, p. 574). This explains why most studies from 1998 to 2011 using Andersen's behavioral model rarely examined contextual factors of medical care use (Babitsch et al., 2012). In addition, many datasets either do not have available data or because this information is often embedded in restricted data and takes additional procedures to obtain.

According to Andersen (2008), contextual characteristics are often measured at aggregate levels and include healthcare delivery system, provider-related factors, external environment factors, and community-level characteristics. However, "they can be measured at the individual level when they identify the context in which the individual 'lodges', for instance, whether a patient lives in an urban or a rural area" (Phillips et al., 1998, p.576) and The Andersen's model makes it applicable to varying populations and different kinds of service use (Phillips et al., 1998). In studies on immigrant populations, this model has been used to include immigrant-related variables such as duration of residence (Chen, Kazanjian, & Wong, 2008; Hochhausen, Le, & Perry, 2011; Leclere et al., 1994), immigration status (Afilalo, Marinovich, Afilalo, Colacone, Leger, Unger, & Giguere, 2004; Brown, Davidson, Yu, Wyn, Andersen, Becerra, &

Razack, 2004; Insaf, Jurkowski, & Alomar, 2010), and country of origin (Choi, 2006; Yeo, 2013) as predisposing characteristics.

Significance for Social Work

This study makes contributions in practice, policy and research. In practice, it increases understanding of immigrants' patterns of accessing medical care utilization in a contextual perspective. The inclusion of neighborhood characteristics in the study can help practitioners in the communities better serve these populations with diverse citizenship statuses in program design and service delivery. In policy, the study will extend the range of inquiry by elaborating how state policies may influence immigrants' medical care use. The findings will also serve as a reference for other states experiencing new growth of immigrants in planning and implementing their services for immigrants.

In research, this empirical study utilizes data from a nationally representative data set that could generalize its results to Asian and Latino immigrant population in the United States. This study also identifies three citizenship statuses in its sample and thus could inform social policies and interventions in relation to improved programs and services for different legal status subgroups of immigrants. This study also applies Andersen's later modified behavior model of service use that includes contextual characteristics of health service use that will provide insights at a macro level of impact on the care-seeking patterns of this population in the United States.

CHAPTER 2

LITERATURE REVIEW

In this chapter, I will review existing empirical literature on service use for this population.

Current Empirical Studies

The following review of current empirical literature is primarily based on Andersen's behavior model to organize findings from prior studies on factors that affect health and mental health service use, with a special focus on contextual factors. Given the paucity of studies specifically on immigrant population, literature that may include immigrants in their samples when focusing on racial and ethnic minorities will be included as well.

Predisposing Factors

Age and ethnicity are often found to be significant predisposing factors when examining immigrants' health care and mental health care use.

Age.

Age is often associated with ability to pick up a new language in order to communicate with health professionals. It often is related to whether not immigrants keep their cultural practices and or beliefs, and thus affects health care choices (Lee et al., 2012; Yeo, 2013).

Race/Ethnicity.

Very few studies compared Latino immigrants to Asian immigrant populations in terms of their health or mental health service use. Instead, most studies chose one racial or ethnic group and compared that to its native-born counterparts or the white group. For example, Abe-Kim et al. (2007), Kang et al. (2010) both suggested that US-born Asian Americans had higher rates of mental health service use than their immigrant counterparts. Alegria et al. (2007) identified a

similar pattern among Latino immigrants compared to US-born Latinos in their lower rates of mental health service use.

Very limited studies attempted to compare the health care use across racial/ethnic minority groups. Sentell and colleagues (2007) studied the effect of English language proficiency on the access to mental health treatment among white, black, Asian/Pacific Islanders, and Latino groups in the 2001 California Health Interview Survey (CHIS). They found that other than English proficiency, discrimination, differences in communications, mistrust and fear of treatment also contributed to racial/ethnic groups' access to mental health care.

Alegria et al. (2008) compared depression treatment among 8,762 racial and ethnic minorities (Asian, Latinos, African Americans) and non-Latino white groups from three combined samples in the Collaborative Psychiatric Epidemiology Surveys (CPES). Among those with depressive disorders in the past 12 months, Asians had the highest (68.7) percentage that did not receive any treatment, followed by Latinos (63.7%). Among those who received adequate treatment, Asians and African Americans were still significantly less likely to receive adequate treatment than non-Latino whites. In this study, given the fact that the sample included minority groups, their nativities were not identified in the analysis.

Using the Health Belief Model, Johnson, Mues, Mayne and Kiblawi (2008) reviewed 55 articles about cervical cancer screening among immigrants and ethnic minorities and found beliefs across several cultural groups that affected their susceptibility to cancer screening. For example, Hispanics' notions for childbirth and sex behaviors often determined their health-related beliefs, while African Americans identified discrimination and red tape in the system and Asian immigrants were heavily influenced by their communities and health providers. Therefore, when dealing with different racial and ethnic groups, especially minorities in the United States,

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their sociocultural factors should be addressed when developing strategies to address their health and mental health care utilization.

Lee, Martinez, Ma, Hsu, Robinson, Bawa, and Juon (2010) conducted focus groups with 174 adults from 13 Asian American communities in Maryland and identified financial, physical, communication and cultural attitudes as the four major obstacles to their access to health care. Among them, the use of complementary and alternative medicine (CAM) was the recurrent theme in every community, especially for those who were less educated, with poor English proficiency and fewer years of residence in the United States as well as those who had less trust in Western medicine. CAM is also used for a temporary remedy before seeking Western medical care. In addition, participants reported that having routine checkups is not a cultural norm.

These studies concluded that studies on the health care or mental health care use among racial and ethnic groups could be beyond the typical predisposing, enabling and needs factors that Andersen's model originally proposed for the general public. Cultural norms, influence from communities, CAM, and trust/mistrust in Western medicine may be correlated with immigrants' unique utilization of care in the United States.

Immigrant-related factors such as age at immigration, length of residence in the United States, citizenship, and nativity are often included in studying immigrants' service use.

Age at immigration.

Age at immigration is also significant in immigrants' health service use (Afilalo et al., 2004; Chen et al., 2008; Hochhausen et al., 2011; Kang et al., 2010; Lee et al., 2012). Kang et al. (2010) point out that for those who immigrated to U.S. before they turned 12 years old, lifetime mental health service use was no different than their U.S.-born counterparts, while those who immigrated after adulthood exhibited rapidly declining rates of mental health service use. Lee et

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al. (2012) also had the same results regarding immigrants' age of immigration and mental health service use. Those who immigrated to the U.S. at older ages were half as likely to use any mental health services as those who came at younger ages. Age of immigration is a significant factor in immigrants' health service use as older immigrants might have established health and wellness beliefs and practices, whereas younger immigrants might more easily adopt health beliefs of the country of destination.

Nativity/Citizenship.

Nativity or citizenship is consistently found to be associated with health and mental health service use and consistently non-citizens often least utilize most health service use compared with U.S.-born citizens.

For example, in mental health service use, using NLAAS data set, Abe-Kim et al. (2007) studied 2,095 Asian Americans' mental service use in the previous 12-month period and found that U.S.-born Asian Americans had a significantly higher rate of any service use and specialty mental health care than foreign-born Asians in the United States. Lee et al. (2012) examined 4,226 Latino and Asian Americans' mental health use over the previous 12 months and also found noncitizens were 40% less likely than U.S.-born citizens to use any mental health service.

Yeo & Johnson (2013), using National Health Interview Survey (NHIS) data set, compared how older adult immigrants' health service use (doctors' visits and overnight hospital stays) differed before welfare reform and post-welfare reform by citizenship status. They found those with citizenship were 1.3 times more likely to visit doctors and 1.08 times more likely to stay in a hospital overnight.

Enabling Factors

English proficiency.

Examining existing literature, some included English proficiency as one of the predisposing factors while others incorporated it as an enabling factor (Babitsch et al., 2012). Regardless of viewing it as a predisposing factor or enabling factor, the effect of English proficiency on health care has also been extensively examined but results vary across type of health care and the length of care. Pippins and colleagues (2007) identified that 1, 792 insured Latino adults with LEP were more likely to report not having a regular source of care or continuity of care than insured Latinos with good/excellent English proficiency.

The effect of English proficiency on mental health service use is not consistent. English proficiency does not seem to be a predictor for a short-term (previous 12 months) mental health use but seems to be a predictor of immigrants' lifetime mental health use. Two studies on a national scale did not find a significant effect of English proficiency on short-term mental health use. Abe-Kim et al. (2007) studied 2,095 Asian Americans' mental health use over the past year from the NLAAS data set and found English proficiency was not associated with short-term mental health use. Lee et al. (2012) suggested the same findings in their study of Asian Americans and Latino Americans' short-term mental health use. On the contrary, Kang et al. (2010), using the same dataset on the same sample size of Asian Americans, instead found those who reported better English proficiency were more inclined to have higher *lifetime* mental health services use.

Based on the California Health Interview Survey in 2001, Sentell and colleagues (2007) divided 41, 984 participants into three groups: English-speaking only, bilingual, and non-English speaking group and examined how English proficiency impacted immigrants' receipt of mental health treatment in the previous 12 months. Their findings showed that non-English speaking individuals significantly received much lower rates of mental health care than those who speak

English alone regardless of their ethnicities/races. For racial/ethnic minorities, Latinos and Asians who do not speak English receive much lower mental health treatment than their counterparts who spoke English alone. Even though racial/ethnic groups are more likely to be in lack of English proficiency as indicated by this study, this study does not identify nativities within Latino and Asian groups.

Health insurance coverage.

Having health insurance coverage largely enhances immigrants' access to care. As insurance coverage is often connected with employment or eligibility for public assistance, non-citizens are consistently found to be least likely to be insured, and the difference between U.S.-born and naturalized citizens are not significant (Carrasquillo, Carrasquillo, & Shea, 2000; Choi, 2006; Ku et al., 2001). Among non-citizens, undocumented immigrants are the most vulnerable. Their uninsured rates are projected to be the highest among all immigrants (Goldman, Smith, Sood, 2005; Prentice et al., 2005). The uninsured rate among Latino non-citizens rapidly increased during 1993 to 1999 as a result of Medicaid coverage limits on immigrants and loss of employment-based insurance (Shah et al., 2006).

Lee and colleague (2012) studied Latino and Asian Americans' mental health use and also echoed these findings about health care use among immigrants. A significantly lower rate of insurance coverage was found among noncitizens (52.8%) than U.S.-born citizens (77.5%) and naturalized citizens (81.7%). Insurance coverage was significantly correlated with any mental health service use and specialty mental health care. In another study on mental health care use, Alegria, Mulvaney-Day, Woo, Torres, Gao, & Oddo (2007) focused on 2,554 Latinos aged 18 or older in the NLAAS. In specialty mental health use for the previous year, those without insurance had a significantly lower rate of service use. When they compared participants with psychiatric

disorders, insurance coverage continued to be the only significant predictor of Latinos' use of mental health service.

State-funded health programs for immigrants varied in their level of immigrants' health coverage (Fremstad et al., 2004), which reinforces the notion that state policy might be a crucial factor in offsetting the lack of insurance coverage as an individual condition, particularly among non-citizens, who would have ruled out from the federal safety net as a result of welfare reform.

Social support.

The measures of social support vary greatly in studies, therefore findings of the effect of social support on health and mental health service use across studies show great variability (Derose et al., 2009; Weng, 2013). Social support typically refers to emotional support (trust, caring, empathy, and affirmation), instrumental support (tangible services and economic assistance) and informational support (advice and information). In terms of the social networks in which social support is obtained, this can be from families, friends, relatives, colleagues, social groups, and communities (O'Reilly, 1988).

Findings on the effect of social support on *mental health service* use are generally quite consistent in that, when social support is stronger, there is less likelihood of mental health service use because of less perceived need to seek professional services (Dhingra, Zack, Strine, Pearson, & Balluz, 2010; Karlin , Duffy, Gleaves, 2008; Stiffman et al., 2001; Thoits, 2011).

On the other hand, the literature on social support on health service use seems to point out an opposite direction, which shows a positive association between social support and health service use. When there is more social support, greater use of preventative health services was found, such as breast cancer screening (Katapodi, Facione, Miaskowski, Dodd, & Waters, 2002)

or cervical cancer screening (Johnson et al., 2008), cancer screening for African American and Latino women (Kang et al., 1993).

Community Effects

A growing body of literature expands their focus from individual factors such as age, income, insurance coverage and health status to neighborhood effects when they find that individual factors alone cannot sufficiently explain the disparities of people's access of health care across different neighborhoods, which affect one's access to care (Derose et al., 2009; Prentice, 2006). Previous studies on neighborhood effects often include neighborhood socioeconomic disadvantages, racial diversity or residential stability that requires tract-level data from the U.S. Census Bureau (Andersen et al., 2007; Chen et al., 2008; Drukker, Dressen, Krabbendam, & Van Os, 2004; Kirby & Kaneda, 2005; Prentice, 2006).

For instance, based on 2000-2001 Los Angeles Family and Neighborhood Survey (L.A. FANS), Prentice (2006) tested several objective neighborhood-level predictors such as community healthcare resources, which included income level, dependent population in neighborhoods, and neighborhood disadvantages (unemployment and poverty) in tracts. While none of the objective factors had an effect on the regular source of care (RSOC), only older population ratio and neighborhood disadvantage significantly predicted the odds of receiving a check-up in the last two years.

More recent studies also attempted to incorporate individual's subjective perception of their community environments or personal interaction experiences that influence their health care use (Chi & Carpiano, 2013; Perry, Williams, Wallerstein, & Waitzkin, 2008; Prentice, 2006). For example, how people feel about their neighbors, and their neighborhoods; if they trust their neighbors, get along with each other, or help each other. Some studies refer these characteristics

to social cohesion or connectedness in the neighborhoods (Chi et al., 2013; Drukker et al., 2004; Lantz et al., 2010; Sampson, Raudenbush, & Earls, 1997) and others define them as part of neighborhood social capital (cognitive capital or bonding capital) in a broader sense (Derose et al., 2009; Perry et al., 2008; Prentice, 2006).

For instance, a regional study conducted by Prentice (2006) also resulted in similar results. She examined how neighborhood environments, such as information networks, health behavior norms, social capital (e.g. close-knit, help each other, share same values, neighbors can be trusted) and health resources in Los Angeles counties could affect one's ability to access primary care. Based on a sample of 2,623 adults from 18 to 64 during 2000-2001, using multilevel logistic regression her study suggested that when people are more likely to report to have a regular source of care and preventive checkup when they live in neighborhoods where neighbors are more helpful to each other.

In Perry and colleagues' (2008) study on 1,216 low-income people's self-report of health care service use in New Mexico, when there was greater social support, people were less likely to report barriers to care. Nevertheless, the rest of the social capital measures (neighborhood social support, interconnectedness among neighbors, and community participation) did not predict the use of health care.

Positive characteristics in the neighborhoods, such as social trust and more reciprocity in six villages in China with a sample of 2,380 people from Guizhou Province also generated more purchases of community-based health insurance (Zhang, Wang, Wang, & Hsiao, 2006), which in turns increased one's access to health care.

Nevertheless, the finding of social cohesion effect on mental health service is different in Drukker et al. (2004) study in Maastricht city, Netherlands. Using Sampson's social cohesion

and trust scale (Sampson et al., 1997) to test the effect of trust and bond in neighborhoods on longitudinal mental health service use, they found that 909 outpatients' mental health service use in the past five years in the Netherlands was higher when their social cohesion was lower in neighborhoods. However, after controlling for individual level of demographic variables, and social economic status, this association disappeared.

However, none of these studies above particularly focused on immigrant populations. In terms of their sample size, most studies either used regional or state-wide samples instead of nationally representative samples (Derose et al., 2009). The operationalization of social cohesion also lacks consistency, which makes it difficult to compare the findings.

State-Level Factors

 State-funded programs.

State policies could possibly offset federal policy restrictions on immigrants' eligibility for Medicaid, particularly after 1996. Fremstad et al. (2004) documented 22 states that offered state-funded health programs for different populations of immigrants such as the elderly, women, children or general immigrants and reported that state-funded programs do have an effect on reducing immigrants' uninsured rate. They attributed this difference not only to the state-funded programs, but also to state's efforts to create an "immigrant-friendly environment" for providing public assistance and benefits. However, a higher insured rate does not necessarily increase the higher utilization of medical care. The fear that using social welfare would impact immigration status may deter immigrants from utilization as external anti-immigrant sentiment is very hostile to immigrants and portrays them as people who take advantage of public assistance and also affects low-level bureaucrats' discretion in approving Medicaid benefits (Bhuyan, 2010).

Another study conducted by Kandilov (2008) obtaining data from the March supplements to the Current Population Survey from 1998 to 2006, she used cross-state variation to compare the provision of Medicaid as a result of the five year residence requirement of PRWORA and how living in different states impacts non-citizen immigrants' actual Medicaid use, private health insurance coverage and labor supply between more-generous states versus less-generous states More-generous states are those that provide Medicaid coverage to immigrant adults who are not eligible after 1996 versus less-generous states without such coverage for immigrants. More-generous states consist of the District of Columbia and twelve states such as California, Connecticut, Delaware, Indiana, Maine, Massachusetts, Minnesota, Nebraska, New Jersey, New York, Pennsylvania, Rhode Island, and Washington (Chin, Dean, and Patchan, 2002). The rest of 37 states are grouped as less-generous states. Note that traditional immigrant states such as Illinois and Texas are considered less-generous states in spite of the fact that they provide coverage for immigrant children.

Using difference-in-differences-in-trends linear probability model, Kandilov (2008) concluded that for non-citizen immigrants living in more generous states, each additional year of such residence in generous states significantly increases their chance of utilizing Medicaid by seven percent in the first five years of residence in the United States. By contrast, for those who live in less generous states, there is no growth in their Medicaid use. Once they reach the five-year residence requirement, there is no increase in Medicaid use for immigrants in either type of states. This trend also applies to private health insurance coverage for immigrants after their first five years of residence in both generous and less generous states in spite of a significance increase of private health insurance coverage in the first five years of residence. Overall, living

in more generous states lead to 4.18 percentage points increase in overall health insurance coverage compared to 1.95 for those in less generous stats in the first five years.

Yeo & Johnson (2013), based on a national sample, compared how federal welfare reform contributed to differences in older adult immigrants' health service use and how residence of state differentiated immigrants' service use. Their results did not show a significant relationship between residence of state and older immigrant adults' visits to doctors and overnight stays in hospitals. While this study did attempt to measure state effect, residence of states is the only variable they used. This might not be an extensive measurement to examine state effect, for we do not know what it is measured across states.

State concentration of immigrants.

A state with more immigrants may be more accustomed to knowing how to serve immigrants and may have more culturally appropriate and experienced practitioners to work with immigrant populations as studies have argued (Derose et al., 2007). Nevertheless, there is dearth of empirical studies directly testing the association of state immigrant concentration and immigrants' service use.

Cunningham et al. (2006) studied 60,000 Latinos in 60 communities sampling from the country based on the data in a phone survey from the Community Tracking Study between 1996 and 2003. Using multivariate regression analysis, after controlling for individual characteristics and size of communities, they compared individual Latino's health insurance coverage and access to health care across three types of Latino communities: new growth of Latino communities (less than 5 percent of Hispanic), traditionally Hispanic centers (greater than 20 percent) and other areas (those with between 5 to 20 percent of Hispanic).

They found that living in states that provide funded programs for immigrants increases the insured rate among immigrants, but does not necessary increase their service use due to eligibility limitation or household income thresholds. In addition, their findings also suggest that for 66.4 percentage of Hispanic living in major Hispanic centers have a regular source of medical care compared to 53.7 percent living in the new growth communities. In terms of their physician visit during the year, those who lived in areas of 5-20% of Latinos in 1996 had the lowest percent of people, compared with those who lived in new growth communities or major Hispanic centers. In their ED visits, those who lived in new growth communities were more likely to visit ER than those who live in major Latino centers.

While this study addressed Latino concentration in communities and compared their differences in health care access, state-level concentration of immigrants was not identified. Therefore, the results cannot generalize to state effect on individual use of health care.

Summary of Prior Literature

As the evolvement of Andersen's model from individual factors to contextual factors influencing health service use since 1968, prior literature also echoes with this trend that substantial studies can be found to have conducted to examine individual-level of predisposing, enabling or immigrant-related factors compared with much fewer studies that include contextual factors. This trend also reflects in the population of study. More studies on the individual factors have included immigrants as their target population, while fewer studies on contextual factors particularly focusing on immigrant communities or neighborhoods.

Thanks to welfare reform limit on immigrants' eligibility for public assistance, quite a few existing studies have examined the impact on immigrants' insured rate or Medicaid coverage (Fremstad et al., 2004; Kandilov, 2008) from states' responses to immigrants.

However, while Kandilov (2008) study contributes to our knowledge of immigrants' health insurance coverage and Medicaid use in both types of states, we do not know if actual service use would follow the same pattern in generous states versus less generous states. While state-funded health programs for immigrants would directly benefit Medicaid recipients, being in a state context friendly to immigrants might make a difference to the actual care-seeking behavior, whatever insurance coverage you have.

As for the effect of state immigrant concentration, even though Cunningham et al., (2006) study sampled nation-wide 60 communities, their results were based on local community concentration of Latinos, but not state immigrant concentration. Yeo et al. (2013) attempted to measure state effect on older immigrants' health care use, but they only identified the residence of state for immigrants, not state policy for immigrants or immigrant percentage of states.

Study Contribution

This study fills this gap in the current literature, going above and beyond individual factors, that expands the understanding of the association between contextual factors (community cohesion and state-funded programs & state concentration of immigrants) and immigrants' health and mental health service use. It further examines if this association is differentiated by immigrants' citizenship status (US-born citizens, naturalized citizens, and non-citizens), and by their race/ethnicity, Asians and Latinos.

As Andersen's Behavior Model did not officially add contextual factors until 2007, this study contributes to test this modified framework by focusing on contextual factors at community and state levels. Insights gained from these results can be helpful in developing community and state programs for immigrants in order to reduce their disparity to health care

access as well as their adverse health outcomes. The findings may also help policy makers reconsider their health and immigration policies. This study will also provide insights into the health service use for two prominent immigrant groups in the United States, Latino as the largest group, and Asian Americans as the fast-growing group.

CHAPTER 3

METHODS

Data and Sample

Data from this study are drawn from the 2002-2003 National Latino and Asian American Survey (NLAAS), which is one of the three surveys that comprise the Collaborative Psychiatric Epidemiology Surveys (CPES), collected by the Survey Research Center (SRC) of the Institute for Social Research at the University of Michigan. This national data set provides extensive information on the life-time and 12-month prevalence of mental disorders and formal service use of Latinos and Asian Americans with a context focus and is the first and only national data set that specifically targets these two immigrant groups. Interviews were administered between May 2002 and November 2003 and were conducted in the respondents' choice of languages such as English, Spanish, Chinese, Vietnamese, or Tagalog by bilingual interviewers.

This data set fits the study topic well for the following reasons. First, this study obtained data from the first national data set that collected health care utilization information on Latino and Asian Americans and immigrants. Second, the sample size is large enough for statistically rigorous analysis. Third, this data set provides geographic identifiers to test whether state-level factors affect immigrants' service use. Fourth, the data set provides rich information on community characteristics in which immigrants live as well as their social networks in their country of origin, which is not often investigated on a national scale in other studies.

The survey population consists of Latino and Asian American adults that resided in households in the U.S. states and Washington, DC. People who are institutionalized or living on military bases were excluded. The NLAAS is based on a multistage, stratified area probability sampling design that involved a four-step sampling process: (1) primary stage sampling of U.S.

metropolitan statistical areas (MSAs) and counties (2) area segments (3) housing units within selected area segments; (4) random selection of eligible respondents from housing units. High density sampling was used in areas with a 5% or more residential density of Asian American and Latino households (CPES, 2011).

The total sample is 4,649 participants, including 2,095 Asian Americans and 2,554 Latino American. The selection of sample criteria for this study includes respondents who were aged 18-64, which results in a sample of 4,250 respondents. The missing value exhibited in very few variables clustered in four variables, language proficiency (0.3%, N=11), Medicaid (0.3%, N=12), social support (0.3-0.6%, N=12-27) and community cohesion[1] (2.8-3.8%, N=119-162). Due to the missing data less than 5% (Tabachnick & Fidell, 2007), I used listwise deletion to exclude cases that had missing values on the dependent variable and independent variables (Molina et al., 2012), the final sample size is 3,910, with 1,738 Asians and 2,172 Latinos. The advantage of using listwise deletion is that computed statistic is based on the same subset of cases, compared to pairwise deletion that some participants would be included in one analysis and excluded in another analysis, which could bias the findings (Bannon, 2013).

Human Subjects

Data for analysis in this study came from public use data and restricted data from the NLAAS. Public use data are available online for the public to retrieve, and the information includes respondents' demographic information as well as service use, social networks, and neighborhood quality. Restricted data requires an additional online application that includes

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[1] The major missing value is in community cohesion variable. I did the missing value pattern analysis and the results shows that the respondents who did not answer this question were more likely to be older (39.66 vs. 37.78, p=0.006), to be non-citizen (49.7% vs. 37.5%, p=0.001), to be Asians (33.8% vs. 25.3%, p=0.005), more likely to stay in the US for more than 11 years and above (47.9% vs. 40.8%), more likely to reside in less immigrant-concentrated states (states with less than 15% of immigrants) (21.8% vs.13.4, p=0.008).

more sensitive or confidential information such as participants' geographic identifiers. However, no participants can be identified directly or individually. I merged public data and restricted data (which is the state variable) in order to analyze the impact of each participant's residence of state on their service use.

To obtain the restricted data release, I first acquired approval from the University of Illinois Institutional Review Board (IRB) committee's exemption for the proposed study (IRB Protocol Number: 14468). Then I applied online to ICPSR (Inter-University Consortium of Political and Social Research) for the access to restricted data of NLAAS (http://www.icpsr.umich.edu/icpsrwe/ICPSR) with a signed agreement, supplement agreement, a data security plan, IRB exemption letter and signed confidentiality affidavits. Students cannot be principal investigators to access restricted data and have to be supervised by faculty members. Therefore my advisor acted as the principal investigator in the application and the Dean of the School of Social Work also signed off as the representative of the University of Illinois. The approval number for this application is 20256.

Measures

Dependent Variables

The dependent variables are two binary variables, mental health service use and health service use respectively. Mental health service use and health service use are measured by two different questions as below.

Mental health service use:

- Receipt of professional counseling or therapy (mental health service) in the past 12 months. Service use will be coded 0 if respondent did not have any use at all, otherwise coded as 1 if the service was ever used once.

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Health service use:

Doctor visits for regular care, clinic, and routine care for the past 12 months. Service use will be coded 0 if Service use will be coded 0 if it use was not utilized at all and 1 if the service was ever even once used.

Independent Variables

This study includes a rich set of independent variables that capture predisposing factors, enabling factors, needs factors, and contextual factors (community cohesion and state-level factors).

Predisposing characteristics.

Demographics. These consist of caregiver's age, gender, and marital status.

Marital status is divided into three categories, including married or cohabiting, divorced or separated and widowed. Married or cohabiting is the reference group.

Social structure. This definition is based on Andersen's model that consists of employment status and race/ethnicity.

Employment status includes three categories, employed, unemployed, and not in labor force. Being employed is the reference group.

Race/Ethnicity indicates race or ancestry groups. Latinos are coded as 0 and Asians are coded as 1. The reference group is Latinos. *Subethnic groups* identify eight categories into Vietnamese (coded as 1), Filipino (coded as 2), Chinese (coded as 3), all other Asian (coded as 4), Cuban (coded as 5), Puerto Rican (coded as 6), Mexican (coded as 7) and all other Hispanic (coded as 8).

Immigrant-related variables include immigrants' age at immigration, length of residence in the U.S., nativity, and citizenship status.

Immigrants' age at immigration is coded as a categorical variable. Except for those U.S. born that were coded as 0, those who immigrated less than 12 years old are coded as 1, those that immigrated between 13-17 years old are coded as 2, those that immigrated between 18-34 years old are coded as 3 and those who immigrated at 35 years old or above are coded as 4.

Enabling factors. This includes four variables: English proficiency, household poverty status, health insurance coverage, and perceived social support.

English proficiency is measured by one question that asks respondents "how well do you speak English?" The categorical variable response ranges from 1 (poor) to 4 (excellent).

Household poverty status is based on the income-to-needs ratio in the Census 2001, which takes into consideration of the number of family members. Families living in poverty are coded 1, and those living above the poverty line are coded 0 as a reference group.

Health insurance coverage combines all insurance coverage including military, employer-based, privately-purchased insurance, Medicaid, Medicare and others. Those who have insurance coverage are coded as 1, and those living without any insurance are coded as 0 as a reference group.

Perceived Social support is measured by four questions asking respondents about their perceived emotional support from their extended family and friends (Masood, Okazaki, & Takeuchi, 2009). Cronbach's alpha shows internal reliability is 0.749.

The two questions comprised the Extended Family Support scale (Kessler et al., 2003) ask of the emotional support from non-household relatives: "how much can you rely on relatives who do not live with you for help if you have a serious problem?" and "how much can you open up to relatives who do not live with you if you need to talk about your worries?".

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The other two questions from the Friend Support scale (Kessler et al., 2003) measures the emotional support from respondents' friends. "How much can you rely on your friends for help if you have a serious problem?" and "How much can you open up to your friends if you need to talk about your worries?"

Contextual factors.

This is measured by two variables, community characteristics and state factors.

Community characteristics. This is measured by four questions to construct *community social cohesion* that uses from three different instruments (Mulvaney-Day, Alegria, & Sribney, 2007; Alegria et al., 2004). The reliability test shows 0.81 in Cronbach's Alpha.

- People in this neighborhood can be trusted and people in this neighborhood generally get along with each other. These two items were adapted from the Social Cohesion and Trust subscale by Sampson, Raudenbush, and Earls (1997).

- I have neighbors who would help me if I had an emergency. This item was adapted from UNOCCAP questionnaire from the National Institute of Mental Health (1995).

- Neighbors look out for each other. This item was adapted from the Neighborhood subscale used in the National Longitudinal Study of Adolescent Health (Bearman, Hones, & Udry, 1997).

State-funded health program. This refers to states with funded programs for immigrant adults (more generous states) versus states without funded Medicaid programs for immigrants who arrived after the 1996 welfare reform and who have been living in the U.S. for less than five years. More-generous states are code as 1, including the District of Columbia and 13 states including California, Connecticut, Delaware, Indiana, Maine, Massachusetts, Minnesota, Nebraska, New Jersey, New York, Pennsylvania, Rhode Island, and Washington (Chin et al.,

2002; Kandilov, 2008). The other 37 states that are less generous are coded 0 as a reference group.

State concentration of immigrants. This is based on the portion of foreign-born in each state according to the latest Census Survey report in 2010 (U.S. Census Bureau, 2012), which divides fifty states into five geographic categories. Three states that have 20% or higher percent immigrant populations are coded 5 (CA, NY, NJ), five states with 15 to 19.9% immigrant populations are coded 4 (FL, HI, MA, NV, TX), seven states with 10-14.9% are coded 3 (AZ, CT, IL, MD, RI, VA, WA), fifteen states with 5 to 9.9% are coded 2 (AK, OR, ID, UT, CO, NM, NE, KS, OK, MN, MI, PA, GA, NC, DE, NH), and the last group is coded 1 with less than 5% immigrants population living in 19 states (MT, TN, SC, KY, IN, OH, WV, VT, ME, WY, ND, SD, IA, MO, AR, LA, MS, AL, WI). States with the lowest concentration of immigrants ($< 5\%$) are the reference group.

Data Analysis

The analysis consists of three parts. First, a descriptive analysis will be run for all variables. Second, a bivariate analysis will be conducted to test the relationships between service use and each independent variable. Third, I will use multivariate logistic regression to test the effects of contextual factors on service use.

Descriptive Analysis

I ran a descriptive analysis for all sample to illustrate an overall picture of immigrants' socioeconomic characteristics and their service use. In the descriptive analysis, weighted percentage distributions for categorical variables, and mean and standard deviations for continuous variables are presented. There are also two separate descriptive analyses for health and mental health service use.

Bivariate Analysis

In bivariate analysis, Chi-Square tests were conducted to test the associations between each of the independent variables and health care use, as well as mental health care respectively, before controlling for any factors. There are only three continuous variables in this study, such as age, social support, and community cohesion. The age was broken down into three age groups based on prior health studies (Lee et al., 2012). Social support and community cohesion were categorized into high and low categories.

Multivariable Analysis

In the multivariable analysis, the dependent variables are health care use and mental health care use respectively. For each care use, there are two values, service user and non-users. The association between individual- and contextual predictors and each of service use is estimated using logistic regression, which is appropriate when the dependent variable is a binary response (Wong & Mason, 1985). In logistic regression, one value of the dependent variable is designated as the reference group. In my models, the comparison category is non-users for each service use.

Based on Andersen's framework, individual factors include predisposing, enabling and needs factors and contextual factors include community and state variables. Therefore, in my model 1, I entered all individual predictors including predisposing factors (demographics variables, social structure and immigrant factors), enabling factors, and needs factors. In my model 2, in order to look at the effect of contextual factors on service use, I added contextual factors, including community and state factors, after controlling for individual factors. In order to answer the second and third questions that look at different interaction effects, in model 3 I entered interaction of citizenship status and each contextual factor (community and state) to

model 2, respectively for mental health service and health service use. In model 4, I placed interactions between race/ethnicity and each contextual factor (community and state) for mental health service and health service use.

Model 1: Baseline model with individual-level variables

Model 2: Model 1+ community and state factors

Model 3: Model 2+citizenship status × contextual factors

Model 4: Model 2+race/ethnicity × contextual factors

Adjusting Sampling Weights

Because of the multistage stratified sampling design of this data set and oversampling of geographic areas that were used for high density areas (greater than 5% for individual national origin groups of interest), I applied sampling weights (NLAASWGT), strata (SESTRAT) and cluster (SECLUSTER) variables to conduct analyses in all my analysis (CPES, 2011). According to CPES user guide, weights and Complex Survey measures should always be used in order to estimate the variance correctly unless the sample size is less than 200. The weight variable for using both Latino and Asian samples in NLAAS is NLAASWGT (CPES, 2011). This weighting variable is to take into account the unequal probabilities, non-respondents characteristics and post-stratification. Applying sampling weights will reduce selection bias and to ensure national representation of Asian Americans and Latinos so that CPES suggests using sampling weights throughout all analysis (Abe-Kim et al., 2007; Alegria et al., 2007; CPES, 2011; Kang et al., 2010; Takeuchi et al., 2007).

Non-response was accounted for using geographic factors. Demographic factors such as age, gender, and census region were used to calculate the post-stratification weights, ensuring

that the distribution of the sample resembles the distribution of the U.S. on these demographic characteristics.

The advanced function, Complex Samples, embedded in the newer version of SPSS (version 21) is designed to include features of multiple stages of sampling and has been tested to produce identical results using other software such as STATA, SAS and SUDDAN using the method of Taylor series linearization (Siller & Tompkins, 2005). This software version is capable of analyzing the complex sampling data in the NLAAS as instructed by its own data set provider (CPES, 2011) as well as in published articles using SPSS Complex Samples to analyze data from the same data set (Kang et al., 2010).

CHAPTER 4

RESULTS

Descriptive Analysis

Characteristics of All Sample

Descriptive results of all sample are presented in Table 1 in weighted percentage.

Table 1 presents descriptive statistics of the entire sample, including their demographics such as their predisposing, enabling, needs factors and contextual factors. In terms of the service use, nearly 11% reported having used at least once of counseling or therapy in their lifetime, while almost 60% indicated having had a routine physical checkup in the previous 12 months. Interestingly, about one-fifth of people did not use either kind of service at all.

Among the predisposing factors, age was broken down into three age groups, 18-30, 31-45 and the last group 46-64. The mean age of the entire sample was 35.74 (SD=0.35), about 40% of the sample were 31-45 years old, another 40% were aged 18-30. More than half of them (66%) lived with a partner or a spouse. Nearly 40% went to some college or held a college degree and above, with one third not completing high school. Almost 70% of them were employed, nearly 24% were not in labor force. About 14% of the sample lived in poverty. In terms of race/ethnicity, one-fourth were Asian immigrants, while the rest were Hispanic immigrants. Chinese origin accounted for the largest single group (6.8%) among Asian immigrants, and Mexican origin accounted for the largest portion (42.5%) among Hispanic immigrants.

In terms of immigrant-related factors, one-third of the sample came to the United States in their adulthood (18-34 years old), and about one-fifth immigrated to this country when they were minors. About 40% of the sample lived in this country for more than ten years, while about

11% would be classified as newly arrived (less than five years). In total, 40.5% were US-born citizens, while noncitizens accounted for nearly 40% with 22% of naturalized citizens.

Among enabling factors that facilitate immigrants to use services, more than 50% reported their English proficiency as good to excellent. Nearly 70% of the sample reported having medical insurance, which could be insurance from any private company, military, employer, Medicare, Medicaid or/and any other insurance. In terms of social support, this variable is composed of four ordinal questions, from 1=a lot to 4=not at all. The total raw scores ranged from 4-16 by adding the scores of four questions. In order to break them down into low and high social support group, I used one half a standard error above the mean score as the cut-off point for high level of social support (Bannon, 2013). The results showed that the mean score for social support was 8.36 (SE=0.071, 95% CI [8.22, 8.50]). Based on this, 82% of the immigrants indicated receiving a high level of social support from their relatives and friends.

Among needs factors, on a self-reported scale from one (poor) to five (excellent), the average score of health condition was 3.36 (S.E. =0.29), and the average mental health score was 3.83 (S.E.=0.31).

When it comes to context factor, community cohesion was measured by four ordinal questions, from 1=very true to 4=not at all true. The total raw scores ranged from 4-16 by adding the scores of four questions. In order to break them down into low and high social cohesion group, I used one half a standard deviation above the mean score as the cut-off point for high level of social support (Bannon, 2013). The results showed that the mean score for social support was 7.90 (SE=0.071, 95% CI [7.76, 8.04]). Based on this, 83.5% rated their neighborhoods and communities as highly cohesive with neighbors trusting each other, getting along, helpful and looking out for each other.

Over half of the sample lived in states with highly-concentrated immigrants (more than 20% of immigrants in the state) such as California, New York and New Jersey; over one-thirds lived in states with at least 15% of immigrants such as Texas, Florida, Massachusetts, Nevada and Hawaii. Only about 2% of the sample lived in states where very limited immigrants were located (less than 5% of immigrants in the state). As for states' generosity to immigrants in that they provided Medicaid coverage to non-citizen adult immigrants who arrived after 1996 and those who have been living in the US for less than 5 years, 60% of the sample lived in generous states, while the rest lived in states that did not provide such generosity to non-citizen adult immigrants.

Table 1. Characteristics of All Sample N=3,910 (Weighted %)

Variable	%	M	SE
Predisposing Factors			
Age		35.74	0.35
18-30	39.2		
31-45	38.3		
46-64	22.5		
Gender			
Male	51.6		
Female	48.4		
Marital status			
Married/Cohabiting	66.1		
Divorced/separated/ Widowed	10.3		
Never married	23.5		
Education			
< High school	34.4		
High school graduate	23.7		
Some college	23.0		
≥College degree	18.8		
Employ status			
Employed	68.2		
Unemployed	8.0		
Not in labor force	23.8		

Table 1 (cont.)

Variable	%	M	SE
Race/Ethnicity			
Asian	25.3		
Hispanic	74.7		
Origin			
Vietnamese	3.2		
Filipino	5.5		
Chinese	6.8		
All other Asian	9.9		
Cuban	2.9		
Puerto Rican	7.4		
Mexican	42.5		
All other Hispanic	21.8		
Living in Poverty	13.9		
Age at Immigration			
US-Born	37.5		
<12years	13.0		
13-17years	10.0		
18-34years	32.8		
35+years	6.7		
Length of Residence in the US			
US-Born	37.5		
<5 years	11.5		
5-10 years	10.2		
11-20 years	21.1		
20+years	19.7		
Citizenship			
US-born citizen	40.5		
Naturalized citizen	21.7		
Noncitizen	37.5		
Enabling Factors			
Medical Insurance Coverage			
Yes	68.6		
No	31.4		
English Proficiency			
Poor	23.7		
Fair	18.9		
Good	23.7		
Excellent	33.7		
Perceived Social Support		8.36	0.07
Low social support	17.9		
High social support	82.1		

Table 1 (cont.)

Variable	%	M	SE
Needs Factors			
Self-rated Health		3.36	0.29
Poor	2.8		
Fair	20.0		
Good	32.2		
Very good	28.0		
Excellent	17.0		
Self-rated Mental Health		3.83	0.31
Poor	0.7		
Fair	9.5		
Good	28.0		
Very good	30.0		
Excellent	17.0		
Contextual Factors			
Community Cohesion		7.90	0.07
Low cohesion	16.5		
High cohesion	83.5		
State Generosity			
Less Generous	39.8		
More Generous	60.2		
State Concentration of Immigrants			
<5%	1.7		
5-9.9%	4.7		
10-14.9%	7.1		
15-19.9%	33.1		
20%+	53.5		
Service Use			
Mental health	10.9		
Routine doctor checkup	59.3		
No Utilization	21.0		

Bivariate Analysis

Health Care Use

Table 2 presents the bivariate analysis for each independent variable and the dependent variable, preventive care use (having a routine physical checkup in the previous year). Contingency tables were used to identify whether the variables were significantly correlated to health service use before controlling for other factors. All independent variables for the final analysis were categorical. Chi-Square test was used to examine if service use was significantly associated to each of immigrants' predisposing, enabling, needs factors as well as environmental factors. All predictors showed different degree of significance with health care use except immigrants' marital status.

With regard to predisposing factors, age, gender, education, employment status, race, ethnicity, living in poverty, age at immigration, length of residence in the United States and citizenship status were found to be significant in immigrants' use of physical checkups. In terms of enabling factors, whether or not immigrants had medical insurance, better English proficiency, and social support were associated with health care sue. In terms of contextual or environmental factors, community cohesion, state concentration of immigrants and state generosity showed a significant association with immigrants' health checkups.

As shown in Table 2, the mean age of health care users (36.69) were a little older than the non-users' group (33.73). Immigrants aged between 46 to 64 years old seemed more likely to have checkups than the younger age group from 18 to 30. Female immigrants were a lot more likely to have physical checkups than male immigrants (80% vs 56%). Highly-educated immigrants (those who had a college degree or above) were more likely to have physical checkups than those who did not complete high school (75.6% vs 60.4). Interestingly, about 66% of employed immigrants had a physical checkup, while 74.8% of those not in a labor force were

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more likely to use physical health checkups. 64.4% of people living in poverty reported having used health care in the previous year. Asian immigrants were more likely to have physical checkups than Hispanic immigrants (74.6% vs. 65.4%). When breaking down into the origins of subgroups, Filipinos (78.5%) and Puerto Ricans (77.4%) were a lot more likely to have physical checkups than Cubans (66%) or Mexicans (59.6%).

In terms of immigrant-related factors, US-born counterparts, immigrants who came to this country before they turned 12 years old and those who came here during their middle-age (35 years old and above) were more likely to have physical checkups than immigrants who came to this country as teenagers or early adults. Compared to those who lived in this country for more than 20 years (73.5%), newly-arrived immigrants (less than five years) were less likely to have physical checkups (54%). Being US-born citizens and naturalized citizens were also far more likely to use preventive care than those who were non-citizens (72% vs 75.6% vs 58.2%).

In terms of enabling factors, 80% of those with medical coverage reported to have checkup, with only 20% of those without medical insurance used checkup in the previous year. More than 70% of Immigrants who reported good and excellent English proficiency used preventive health care, while only 56% of the immigrants with poor English did so. Nearly 70% of immigrants with a higher level of social support from their families, relatives and friends were found to utilize health care compared with 61.3% of those with a lower level of social support.

As for contextual factors, immigrants who reported their communities more highly cohesion also reported a higher percentage of using health care (84.7% vs 15.3%). Living in states where very few immigrants lived (less than 5%) were more likely to have physical checkups than those who lived in New York, New Jersey and California (more than 20% are immigrants). Living in states that were less generous to immigrants in their provision to health

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care were more likely to have a routine checkup than those who lived in generous states (71.4% vs 65.3%).

Mental Health Care Use

As for lifetime mental health service use, Table 3 presents the bivariate analysis for each independent variable and the dependent variable, mental health care use in their life time. Chi-Square test found that having used therapy or counseling for at least once in their life time was significantly associated with immigrants' gender, marital status, education, employment status, race, ethnicity, poverty status, age at immigration, length of residence in the United States, citizenship status, English proficiency, and self-rated health and mental health condition.

As shown in Table 3, just like preventive care use, female immigrants seemed more likely to use mental health service than male immigrants (17.8% vs. 11.6%). Divorced, separated or widowed immigrants were more likely to talk to therapists or counselors than those who were married, cohabitated or single ones. Just like in the use of health care, more highly-educated immigrants (those who had a college degree or above) were also more prone to use counseling or therapy than those who did not complete high school (19.1% vs 10%). Unemployed immigrants and those were not in labor force combined had a higher rate of using mental health care than those who were employed (37.9% vs 12.6%). Latino immigrants were more likely to use mental health service than Asian immigrants (16.0% vs. 10.6%). When breaking down into subgroups' origins, more than one-fourth of Puerto Rican immigrants used mental health service, with nearly 20% of Cuban immigrants did so, however, while only 4.7% of Vietnamese immigrants and about 10% of Chinese immigrants that had counseling or therapy before. Living in poverty increased the likelihood to use mental health service than those who did not live in poverty (18.9% vs. 13.9%).

In terms of immigrant-related factors, US-born counterparts and those who came to this country as minors (less than 12 years old) were a lot more likely to have mental health care, nearly one-fifth of respective group received counseling or therapy. Except for the U.S. born, those who lived in this country for more than 20 years were far more likely to go to therapists or counselors than any group that stayed in this country for less than 20 years. Only about 6% of those who newly arrived (less than 5 years) have been to therapists or counselors. Among two groups of citizens, the percentage of US-born citizens that went to therapists outweighed that of naturalized citizens (22.3% vs 12.2%), with only 7.8% of non-citizens reported having been to therapists or counselors.

In terms of enabling factors, more than 20% of immigrants who reported good and excellent English proficiency used such mental health care, with only 5.7% of those with poor English proficiency did so. Immigrants who rated themselves as poor health (36.9%) and poor mental health conditions (56%) were a lot more likely than those in excellent health (9.5%) and mental health condition (1.3%) to seek help from mental health professionals. The effect of medical insurance only showed marginal significance. Chi-Square test did not find significant associations between *mental health care* use and immigrants' age, marital status, social support, or any environmental factors.

In sum, age, social support and all environmental factors were found to be significant for having a physical checkup were not associated for mental health service use. On the other hand, marital status, self-rated health and mental health conditions were not found to be significant for health service use were found to be significantly associated with mental health service use.

Table 2. Characteristics of Sample for Health Service Use (Weighted %, N=3,899)

Variable	Health Care User(N=2,792)	Non-user (N=1,107)	Adjusted F	Sig.
Predisposing Factors				
Age***	M=36.69 (0.30)	M=33.73 (0.60)	19.61	p<.001
18-30	63.2	36.8		
31-45	66.5	33.5		
46-64	77.8	22.2		
Gender***			128.72	p<.001
Male	56.0	44.0		
Female	80.3	19.7		
Marital status			2.02	p=0.139
Married/Cohabiting	68.6	31.4		
Divorced/separated/ Widowed	72.6	27.4		
Never married	63.4	36.6		
Education***			13.46	p<.001
< High school	60.4	39.6		
High school graduate	66.7	33.3		
Some college	73.3	26.7		
≥College degree	75.6	24.4		

Table 2. (cont.)

Variable	Health Care User(N=2,792)	Non-user (N=1,107)	Adjusted F	Sig.
Employment status**			8.92	p<.01
Employed	66.3	33.7		
Unemployed	59.8	40.2		
Not in labor force	74.8	25.2		
Race/Ethnicity***			23.26	p<.001
Asian	74.6	25.4		
Hispanic	65.4	34.6		
Origins***			11.78	p<.001
Vietnamese	74.0	26.0		
Filipino	78.5	21.5		
Chinese	72.2	27.8		
All other Asian	74.4	25.6		
Cuban	66.0	34.0		
Puerto Rican	77.4	22.6		
Mexican	59.6	40.4		
All other Hispanic	72.7	27.3		
Living in Poverty+	64.4	36.0	3.53	p=.065
Age at immigration***			6.80	p<.001
US-Born	71.5	28.5		
<12years	70.8	29.2		
13-17years	53.8	46.2		
18-34years	65.5	34.5		
35+years	73.1	26.9		
Length of Residence in the US**			6.30	p<.01
US-Born	71.5	28.5		
<5 years	54.8	45.2		
5-10 years	59.1	40.9		
11-20 years	66.9	33.1		
20+	73.5	26.5		
Citizenship Status***			13.58	p<.001
US-born citizen	72.3	27.7		
Naturalized citizen	75.6	24.4		
Noncitizen	58.2	41.8		
Enabling Factors				
Medical insurance***	79.9	44.6	248.92	p<.001
No insurance	20.1	55.4		
English proficiency***			19.32	p<.001
Poor	56.0	44.0		
Fair	63.5	36.5		
Good	72.8	27.2		
Excellent	74.8	25.2		

Table 2. (cont.)

Variable	Health Care User (N=2,792)	Non-user (N=1,107)	Adjusted F	Sig.
Perceived Social support*			6.85	p<.05
Low social support	61.3	38.7		
High social support	69.2	30.8		
Needs Factors				
Self-Rated Health+			2.12	p=.102
Poor	79.3	20.7		
Fair	62.5	37.5		
Good	68.4	31.6		
Very Good	69.4	30.6		
Excellent	68.0	32.0		
Self-Rated Mental Health+			2.51	p=.065
Poor	72.0	28.0		
Fair	59.4	40.6		
Good	66.4	33.6		
Very Good	69.1	30.9		
Excellent	70.1	29.9		
Environmental Factors				
Community cohesion*			4.71	p<.05
Low cohesion	62.7	37.3		
High cohesion	68.8	31.2		
State concentration of immigrants+			2.50	p=.073
<5%	84.5	15.5		
5-9.9%	71.0	29.0		
10-14.9%	73.0	27.0		
15-19.9%	70.0	30.0		
20%+	64.9	35.1		
State Generosity+			3.62	p=.061
Less generous state	71.4	28.6		
Generous state	65.3	34.7		

+p<0.10,*p <.05; ** p <.01; *** p <.001

Table 3. Characteristics of Sample for Mental Health Service Use (Weighted %, N=2,944)

Variable	Mental Health Care User (N=2,506)	Non-user (N=438)	Adjusted F	Sig.
Predisposing Factors				
Age	M=36.41 (0.63)	M=35.26 (0.49)	1.30	p =.274
18-30	13.2	86.8		
31-45	14.6	85.4		
46-64	17.1	82.9		
Gender***			13.52	p<.001
Male	11.6	88.4		
Female	17.8	82.2		

Table 3 (cont.)

Variable	Mental Health Care User (N=2,506)	Non-User (N=438)	Adjusted F	Sig.
Marital status***			8.47	p<.001
Married/Cohabiting	12.4	87.6		
Divorced/separated/ Widowed	23.6	76.4		
Never married	16.8	83.2		
Education**			6.73	p<.01
< High school	10.0	90.0		
High school graduate	12.5	87.5		
Some college	19.7	80.3		
≥College degree	19.1	80.9		
Employ status***			9.60	p<.001
Employed	12.6	87.4		
Unemployed	19.3	80.7		
Not in labor force	18.6	81.4		
Race/Ethnicity*			5.62	p<.05
Asian	10.6	89.4		
Hispanic	16.0	84.0		
Origins**			4.62	p<.01
Vietnamese	4.7	95.3		
Filipino	11.5	88.5		
Chinese	9.7	90.3		
All other Asian	12.8	87.2		
Cuban	19.6	80.4		
Puerto Rican	26.1	73.9		
Mexican	13.3	86.7		
All other Hispanic	17.2	82.8		
Living in Poverty*	18.9	81.1	4.27	p<.05
Above poverty	13.9	86.1		
Age at immigration***			15.96	p<.001
US-born	21.8	78.2		
<12 years	19.6	80.4		
13-17 years	7.6	92.4		
18-34years	7.7	92.3		
35+years	8.7	91.3		
Length of Residence in the US***			14.13	p<.001
US-Born	21.8	78.2		
<5 years	5.9	94.1		
5-10 years	6.2	93.8		
11-20 years	8.9	91.1		
20+	16.7	83.3		
Citizenship***			13.75	p<.001
US-Born citizen	22.3	77.7		
Naturalized citizen	12.2	87.8		
Non-citizen	7.8	92.2		
Enabling Factors				
Medical insurance+	16.3	83.7	2.90	p=0.093
Not insured	10.9	89.1		

Table 3 (cont.)

Variable	Mental Health Care User (N=2,506)	Non-User (N=438)	Adjusted F	Sig.
English Proficiency***			18.70	p<.001
Poor	5.7	94.3		
Fair	10.3	89.7		
Good	17.2	82.8		
Excellent	21.2	78.8		
Perceived Social support+			0.14	p=0.707
Low social support	14.0	86.0		
High social support	14.7	85.3		
Needs Factors				
Self-Rated Health***			6.06	p<.001
Poor	36.9	63.1		
Fair	16.3	83.7		
Good	13.6	86.4		
Very Good	15.8	84.2		
Excellent	9.5	90.5		
Self-Rated Mental Health***			8.07	p<.001
Poor	56.0	44.0		
Fair	20.6	79.4		
Good	15.4	84.6		
Very Good	16.0	84.0		
Excellent	1.3	90.1		
Environmental Factors				
Community cohesion			0.002	p=0.963
Low cohesion	14.5	85.5		
High cohesion	14.6	85.4		
State concentration of immigrants			1.56	p=0.193
<5%	20.1	79.9		
5-9.9%	15.8	84.2		
10-14.9%	8.1	91.9		
15-19.9%	15.6	84.4		
20%+	14.5	85.5		
State Generosity			0.001	p=0.978
Less generous	14.6	85.4		
Generous states	14.6	85.4		

+p<.10; * p <.05; ** p <.01; *** p <.001

Multivariate Analysis

Before proceeding to multivariate analysis, I did a mulitcollinearity test among independent variables. The majority of tolerance statistics included in the models ranged from 0.377 to 0.985, except race/ethnicity variable is 0.20 and ethnic origin variable is 0.19. As tolerance values less than 2.0 cutoff point is a concern, I dropped the variable ethnic origin in my regression model (Bannon, 2013).

Health Care Use

Table 4 presents estimates from four logistic regression models for health care use as well as a set of coefficient, standard errors, odds ratios and 95% confidence intervals from the models estimating the effects of different factors on immigrants' physical checkups. Model 1 included immigrants' predisposing, enabling and needs factors without any community or state factors. Model 2 added community and state factors to existing Model 1. Model 3 incorporated interactions of citizenship and state factors to model 2, while the last model (Model 4) included all predisposing, enabling, needs, environment factors and interactions of race/ethnicity and state factors.

As shown in Table 4, model 1 results indicated that some of immigrants' predisposing, (including immigrant-related factors) and enabling factors were statistically significant with their use of health care. Among predisposing factors, gender, employment status, age at immigration, citizenship status were significantly related to health checkups. For instance, female immigrants were 3.44 times more likely to have physical checkups relative to male immigrants (OR=3.44, $p<.001$, 95% Cl [2.77, 4.29]). Immigrants to this country that are 35 years old or older were 2.19 times more likely to use health care than US-born (OR=2.19, $p<.05$, 95% Cl [1.08, 4.45]). Non-citizens were less likely to have physical checkups than their US-born counterparts (OR=0.59,

p<.10, 95% Cl [0.34, 1.03]). Noticeably, immigrants' age, education, race/ethnicity, poverty status, and the length of residence in the United States were not statistically significant with their use of routine checkups.

Among enabling factors, medical insurance and English proficiency were found to be positively significant with their health care. Immigrants with medical insurance had 4.28 times greater odds of receiving physical checkups than those without medical insurance (OR=4.28, p<.001, 95% Cl [3.41, 5.38]). Those with excellent English proficiency were 2.2 times more likely to have physical checkups compared to immigrants who identified their English as poor (OR=2.20, p<.001, 95% Cl [1.49, 3.24]).). Even for those who reported their English as fair, still their odds for having preventive care were 1.52 times greater than whose English was poor (OR=1.52, p<.01, 95% Cl [1.13-2.05]). However, none of the needs factors were found to be statistically significant related to their use of physical checkups.

Model 2 added the block of contextual factors that included community cohesion and state factors in addition to predisposing, enabling, and needs factors. After adding contextual factors, coefficient estimates of these variables slightly increased, and most of the significant factors remained significant except for the citizenship status (non-citizen). Besides, immigrants who came to this country between 18 to 34 years old approached significance in their use of physical checkup (OR=1.67, p<.10, 95% Cl [0.91, 3.07]) compared to US-born counterparts.

Among contextual factors, immigrants that lived in states of a higher concentration of immigrants (more than 20%) were less likely to use physical checkups than those living in non-traditional immigrant states (OR=0.40, p<.05, 95% Cl [0.16, 0.99]). In other words, living in non-traditional immigrant states (less than 5%) increased the use of physical checkups for

immigrants. Community cohesion and living in states that offer state generosity to immigrants in health care provision were not found to be significantly associated with health care use.

Moderating Effects

The second hypothesis examined whether the association between state factors and health care use varies by immigrants' citizenship status. When interactions between citizenship status and state factors (state generosity and state concentration of immigrants.) were separately entered into health care use model 3, results showed only the interactions between citizenship status and state concentration of immigrants were statistically significant. Particularly for non-citizens who live in states with a higher concentration of immigrants (e.g. 10% and above), they were less likely to use physical checkups. For instance, when non-citizens living in states with more than 20% of immigrants (NY, NJ, CA), they were less likely to have physical checkups (OR=0.07, p<.001, 95% Cl [0.01-0.54]). The model showed no significant association between the interaction of citizenship and state generosity to immigrants' health care.

The third research question examined whether the association between state factors and health care use varies by immigrants' race/ethnicity. In Model 4, interactions between race/ethnicity and state factors were placed, after controlling for predisposing, enabling, needs factors and contextual factors.

After adding another block of interactions, most of the individual factors (predisposing and enabling factors) remained significant, however, two significant changes occurred. First of all, Asian immigrants were less likely to use health care than Latino immigrants (OR=0.11, p<.05, 95% Cl [0.01, 0.89]). In other words, Latino immigrants were almost 9 times more likely to have physical checkups. Another significant change was that state concentration of

immigrants showed significance in immigrants' health care use. Those who lived in states with a higher percentage of immigrants (more than 10%) were less likely to use physical checkups.

However, interactions showed a different result. Based on prior results, being Asian immigrants and living in immigrant-concentrated immigrant states reduced immigrants' likelihood to have preventive checkups. However, when Asian immigrants lived in highly immigrant-concentrated states (15-19.9%), they were actually 8.82 times more likely to use physical checkups (OR=8.82, p<.05, 95% Cl [1.02, 76.26]); for Asian immigrants who lived in states with more than 20% of immigrants, they were 11.12 times more likely to use physical checkups (OR=11.12, p<.05, 95% Cl [1.27, 97.22]). Nevertheless, the study results showed that the Asian immigrants living in generous states had no effect on their health care use.

Mental Health Service Use

Table 5 presents estimates from four logistic regression models for mental health care use and the coefficients, standard errors, odds ratios and 95% confidence intervals from the models estimating the effects of different factors on immigrants' lifetime use of counseling or/and therapy. Model 1 included immigrants' predisposing, enabling and needs factors without any community or state factors. Model 2 added on community and state factors to exiting Model 1. Model 3 incorporated moderators of citizenship and state factors to model 2, while the last model added interactions of race/ethnicity and state factors to predisposing, enabling, needs factors as well as contextual factors.

As shown in Table 5, model 1 results indicated some of immigrants' predisposing, immigrant-related factors, enabling and needs factors were statistically significant with their use of mental health care.

Among predisposing factors, being older immigrants (46-64 years old), being female, being divorced, separated or widowed and had a higher education degree were less likely to receive mental health care. Those who were employed, being Asian immigrants (OR=2.11, p<.01, 95% Cl [1.33, 3.35]) and being naturalized citizens (OR=2.23, p<.05, 95% Cl [1.08, 4.63]) were more likely to seek mental health professionals. Immigrants' age of immigration and their length of stay in the United States were not significantly related to mental health care use.

Among enabling factors, immigrants with better English proficiency had less odds of receiving mental health help. Those with excellent English proficiency had fewer odds to seek mental health professionals compared to immigrants who identified their English as poor (OR=0.24, p<.001, 95% Cl [0.14, 0.43]). Unlike physical health checkups, having medical coverage was not associated with mental health care use. Social support did not have an effect on mental health care use for immigrants.

Needs factors were positively related with mental health care use. Those who self-rated their health as excellent were 1.97 times more likely to go to therapists or counselors (OR=0.24, p<.001, 95% Cl [1.02, 3.79]), and those who self-rated excellent mental health were 19.04 times more likely to go to therapists or counselors (OR=19.04, p<.001, 95% Cl [10.59, 55.78]).

Model 2 added the block of contextual factors that included community cohesion and state factors in addition to predisposing, enabling, and needs factors. After adding contextual factors, two more predictors approached significance, with all of the previously significant factors still remained significant. First, immigrants whose age between 31 to 45 years old were slightly significant in predicting their use of mental health care. Second, immigrants living in poverty was found to have 1.43 times greater odds to receive therapy or counseling than those who did not live in poverty (OR=1.43, p<.10, 95% Cl [0.93, 2.19]).

In terms of contextual factors, community cohesion was not found to be significantly associated with mental health care use. However, living in states of concentration of immigrants had an effect on receiving counseling or therapy. The results suggested that living in states with moderate percentage of immigrants (10-14.9%) was 3.64 times more likely to receive counseling or therapy (OR=3.64, p<.05, 95% Cl [1.15, 11.57]) than living in non-traditional immigrant states (less than 5%). However, living in states with a higher percentage of immigrants (15% or above) was not a significant predictor of mental health care use.

Moderating Effects

In Model 3, interaction terms were entered to examine whether the association between state factors and mental health care use varies by immigrants' citizenship status, after controlling for their predisposing, enabling, needs factors and contextual factors. The interaction terms included citizenship status with state generosity and citizenship status with state concentration of immigrants. After adding the block of interactions, most of the predisposing, enabling factors and needs factors remained significant, but poverty effect disappeared. Being naturalized citizens was not significantly different than US-Born counterparts in their use of mental health care. Living in states of different percentage of immigrants was not associated with mental health care use. However, immigrants living in states that were *more generous* to immigrants in their provision of health care appeared less likely for immigrants to receive therapy or counseling (OR=0.42, p<.05, 95% Cl [0.21, 0.86]). In other words, living in less generous states to immigrants increased 2.38 times odds going therapists or counselors for immigrants (β=0.87, OR=2.38).

The interaction effects between citizenship status and state factors on mental health service use suggested that only the interaction between naturalized citizens living in states with a

higher concentration of immigrants (states with 15-19.9% immigrants) was statistically significant (OR=19.8, p<.05, 95% Cl [1.75, 225.391]). The odds can be up to almost 20 times greater to receive mental health care for naturalized citizens living in a highly-concentrated immigrant state. The model, however, showed that the interaction between citizenship status and state generosity was not statistically significant.

In Model 4, interactions between race/ethnicity and state factors were placed into, after controlling for predisposing, enabling, needs factors and contextual factors. After adding another block of interactions, most of previously significant factors remained significant. Poverty status appeared marginal significant in this model. Those who lived in poverty were 1.44 more likely to receive mental health care (OR=1.44, p<.10, 95% Cl [0.94, 2.20]). Naturalized citizen were 2.27 times more likely to use mental health care relative to US-born counterparts (OR=2.27, p<.05, 95% Cl [1.04, 4.96]). Immigrants living in states with moderate percentage of immigrants (10-14.9%) were 4.92 time more likely to go to therapists or counselors (OR=4.92, p<.05, 95% Cl [1.31, 18.46]) than those who lived in non-traditional immigrant states.

The interaction terms between race/ethnicity with state factors suggested that Asian immigrants living in a state with a higher percentage of immigrants (AZ, IL, CT, MD, VA, RI, WA) decreased their use of mental health care (OR=0.10, p<.10, 95% Cl [0.01, 1.16]). The results showed that the whether Asian immigrants living in generous states to immigrants had no effect on their mental health care use.

Table 4. Logistic Regression on Health Service Use during a 12-Month Period (N=3,895)

Variable	Model 1		Model 2		Model 3		Model 4	
	B(SE)	OR (95% CI)	B(SE)	OR (95% CI)	B (SE)	OR (95% CI)	B (SE)	OR (95%CI)
Predisposing Factors								
Age (18-30)								
31-45	-0.02(0.15)	0.99 (0.74, 1.32)	-0.03(0.16)	0.97 (0.71, 1.33)	-0.02(0.16)	0.98 (0.71, 1.35)	-0.02(0.16)	0.98 (0.71, 1.32)
46-64	0.30(0.19)	1.35 (0.92, 1.99)	0.35(0.22)	1.42 (0.92, 2.18)	0.36(0.22)	1.43 (0.92, 2.21)	0.36+(0.22)	0.70 (0.93, 2.19)
Gender (Male)								
Female	1.24***(0.11)	3.44 (2.77, 4.29)	1.25***(0.11)	3.50 (2.80, 4.40)	1.26***(0.11)	3.54 (2.82, 4.45)	1.25***(0.11)	3.50 (2.79, 4.39)
Marital status (married)								
Divorced/separated/ Widowed	-0.24(0.16)	0.79 (0.57, 1.09)	-0.20(0.21)	0.82 (0.54, 1.24)	-0.21(0.21)	0.81 (0.53, 1.22)	-0.20(0.21)	0.82 (0.54, 1.23)
Never married	-0.14(0.19)	0.87 (0.60, 1.26)	-0.12(0.19)	0.89 (0.61, 1.30)	-0.12(0.19)	0.89 (0.60, 1.31)	-0.11(0.19)	0.89 (0.61, 1.31)
Education (less than high school)								
High school graduate	-0.02(0.13)	0.98 (0.76, 1.27)	-0.08(0.14)	0.93 (0.70, 1.23)	-0.08(0.14)	0.93 (0.70, 1.22)	-0.07(0.15)	0.86 (0.64, 1.15)
Some college	-0.05(0.14)	0.95 (0.72, 1.26)	-0.11(0.15)	0.90 (0.66, 1.21)	-0.11(0.15)	0.89 (0.66, 1.21)	-0.11(0.15)	0.89 (0.66, 1.21)
≥College degree	-0.08(0.14)	0.93 (0.71, 1.21)	-0.14(0.14)	0.87 (0.65, 1.16)	-0.16(0.15)	0.86 (0.64, 1.15)	-0.15(0.15)	0.93 (0.70, 1.24)
Employ status (Unemployed)								
Employed	0.11(0.19)	1.12 (0.77, 1.63)	0.16(0.20)	1.17 (0.79, 1.73)	0.13(0.20)	1.14 (0.76, 1.70)	0.17(0.19)	1.18 (0.80, 174)
Not in labor force	0.34+(0.19)	1.40 (0.95, 2.05)	0.36*(0.19)	1.44 (1.0, 2.08)	0.33+(0.20)	1.40 (0.94, 2.07)	0.37*(0.18)	1.45 (1.01, 2.08)
Race/Ethnicity (Latino)								
Asian	-0.13(0.11)	0.88 (0.71, 1.09)	-0.12(0.11)	0.89 (0.72, 1.10)	-0.11(0.11)	0.90 (0.73, 1.11)	-2.24*(1.07)	0.11 (0.01, 0.89)
Living in Poverty	-0.17(0.11)	0.85 (0.69, 1.05)	-0.17(0.11)	0.85 (0.69, 1.05)	-0.18(0.11)	0.84 (0.67, 1.05)	-0.17(0.11)	0.84 (0.69, 1.05)

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Table 4. (cont.)

Variable	Model 1		Model 2		Model 3		Model 4	
	B (SE)	OR (95% CI)	B (SE)	OR (95% CI)	B (SE)	OR (95% CI)	B (SE)	OR (95% CI)
Age at immigration (US-born)								
<12years	0.05(0.42)	1.05 (0.45, 2.44)	0.11(0.40)	1.12 (0.50, 2.47)	0.13 (0.40)	1.14 (0.51, 2.54)	0.11(0.40)	1.11 (0.51, 2.45)
13-17years	0.05(0.38)	1.05 (0.50, 2.23)	0.05(0.38)	1.05 (0.49, 2.25)	0.06(0.39)	1.06 (0.49, 2.30)	0.05(0.38)	1.05 (0.49, 2.25)
18-34years	0.52(0.33)	1.68 (0.88, 3.20)	0.52+(0.30)	1.67 (0.91, 3.07)	0.53+(0.31)	1.69 (0.92, 3.13)	0.50+(0.30)	1.66 (0.90, 3.04)
35+years	0.78*(0.36)	2.19 (1.08, 4.45)	0.81*(0.35)	2.25 (1.11, 4.54)	0.81*(0.37)	2.24 (1.08, 4.65)	0.79*(0.35)	2.20 (1.09, 4.43)
Length of Residence in the US (US born)								
<5 years	0	1	0	1	0	1	0	
5-10 years	0.09(0.16)	1.09 (0.79, 1.50)	0.12(0.17)	1.13 (0.80, 1.59)	0.14(0.18)	1.15 (0.80, 1.65)	0.14(0.18)	1.15 (0.81, 1.63)
11-20 years	0.26(0.26)	1.29 (0.77, 2.16)	0.27(0.27)	1.31 (0.77, 2.25)	0.29(0.27)	1.34 (0.78, 2.28)	0.29(0.27)	1.33 (0.78, 2.28)
20+	0.40(0.33)	1.48 (0.77, 2.86)	0.37(0.34)	1.45 (0.73, 2.87)	0.35(0.34)	1.43 (0.72, 2.82)	0.37(0.34)	1.45 (0.73, 2.84)
English proficiency (Poor)								
Fair	0.42**(0.15)	1.52 (1.13, 2.05)	0.40**(0.15)	1.50 (1.11, 2.03)	0.39**(0.15)	1.48 (1.09, 2.01)	-0.40**(0.15)	0.67 (0.49, 0.91)
Good	0.56***(0.15)	1.75 (1.29, 2.37)	0.66***(0.17)	1.93 (1.39, 2.68)	0.68***(0.16)	1.97 (1.42, 2.71)	-0.66***(0.17)	0.52 (0.37, 0.72)
Excellent	0.79***(0.19)	2.20 (1.49, 3.24)	0.86***(0.22)	2.37 (1.52, 3.71)	0.88***(0.22)	2.42 (1.55, 3.78)	-0.87***(0.23)	0.42 (0.27, 0.66)
Citizen status (US-born)								
Naturalized	-0.32(0.22)	0.72 (0.47, 1.11)	-0.34(0.21)	0.71 (0.47, 1.08)	-1.42(0.93)	0.24 (0.04, 1.53)	-0.33(0.21)	0.72 (0.47, 1.10)
Non-citizen	-0.53+(0.28)	0.59 (0.34, 1.03)	0.48(0.30)	0.62 (0.34, 1.12)	1.70+(0.98)	5.46 (0.77, 38.72)	-0.48(0.30)	0.62 (0.34, 1.12)
Enabling Factors								
Medical insurance coverage	1.45***(0.11)	4.28 (3.41, 5.38)	1.49***(0.11)	4.42 (3.56, 5.48)	1.50***(0.11)	4.50 (3.61, 5.60)	1.48***(0.11)	4.40 (3.53, 5.47)
Social support	0.12(0.12)	1.12 (0.88, 1.43)	0.15(0.12)	1.16 (0.91, 1.48)	0.15(0.13)	1.16 (0.90, 1.49)	0.15(0.12)	1.16 (0.91, 1.48)

Table 4. (cont.)

Variable	Model 1		Model 2		Model 3		Model 4	
	B (SE)	OR (95% CI)	B (SE)	OR (95% CI)	B (SE)	OR (95% CI)	B (SE)	OR (95% CI)
Needs Factors								
Perceived Health (Poor)								
Fair	-0.35(0.32)	0.71 (0.37, 1.34)	-0.30(0.32)	0.74 (0.39, 1.39)	-0.25(0.32)	0.78 (0.41, 1.48)	-0.29(0.32)	0.75 (0.39, 1.43)
Good	-0.27(0.28)	0.76 (0.43, 1.35)	-0.27(0.28)	0.76 (0.44, 1.32)	-0.22(0.28)	0.80 (0.46, 1.40)	-0.27(0.28)	0.77 (0.44, 1.34)
Very Good	-0.28(0.31)	0.75 (0.41, 1.40)	-0.29(0.30)	0.75 (0.41, 1.37)	-0.24(0.31)	0.79 (0.42, 1.47)	-0.28(0.31)	0.75 (0.41, 1.40)
Excellent	-0.25(0.33)	0.78 (0.40, 1.52)	-0.23(0.33)	0.79 (0.41, 1.53)	-0.21(0.33)	0.81 (0.42, 1.57)	-0.23(0.34)	0.80 (0.41, 1.57)
Perceived Mental Health (Poor)								
Fair	-0.23(0.78)	0.79 (0.17, 3.73)	0.21(0.46)	1.24 (0.49, 3.12)	0.19(0.47)	1.21 (0.48, 3.07)	0.18(0.48)	1.20 (0.46, 3.13)
Good	-0.05(0.71)	0.96 (0.23, 3.92)	0.37(0.44)	1.45 (0.61, 3.45)	0.36(0.45)	1.44 (0.59, 3.53)	0.34(0.45)	1.41 (0.58, 3.43)
Very Good	-0.10(0.74)	0.91 (0.21, 3.98)	0.31(0.45)	1.36 (0.56, 3.33)	0.28(0.46)	1.32 (0.52, 3.33)	0.28(0.46)	1.33 (0.53, 3.31)
Excellent	-0.03(0.72)	0.97 (0.23, 4.10)	0.39(0.44)	1.48 (0.61, 3.55)	0.38(0.47k)	1.46 (0.58, 3.70)	0.36(0.45)	1.44 (0.58, 3.55)
Environmental Factors								
Community cohesion			-0.03(0.18)	0.97 (0.68, 1.39)	-0.05(0.18)	0.96 (0.68, 1.35)	-0.04(0.18)	0.96 (0.68, 1.38)
State concentration of immigrants								
5-9.9%			-0.59(0.56)	0.56 (0.18, 1.69)	-0.61(0.92)	0.54 (0.09, 3.42)	-1.23(0.76)	0.29 (0.06, 1.34)
10-14.9%			-0.54(0.44)	0.58 (0.24, 1.39)	0.89(0.75)	1.09 (0.24, 4.89)	-1.14+(0.65)	0.32 (0.09, 1.16)
15-19.9%			-0.70(0.47)	0.50 (0.19, 1.27)	-0.09(0.72)	0.91 (0.22, 3.82)	-1.37*(0.69)	0.25 (0.06, 1.00)
20%+			-0.91*(0.45)	0.40 (0.16, 0.99)	-0.39(0.68)	0.68 (0.17, 2.62)	-1.64*(0.66)	0.19 (0.05, 0.72)
State generosity			-0.04(0.20)	0.97 (0.65, 1.45)	-0.41(0.31)	0.67 (0.36, 1.22)	0.01(0.25)	1.01 (0.62, 1.65)

Table 4. (cont.)

Variable	Model 1		Model 2		Model 3		Model 4	
	B (SE)	OR (95%CI)	B (SE)	OR (95%CI)	B (SE)	OR (95%CI)	B (SE)	OR (95%CI)
Moderators (Citizenship× State Generosity)								
Naturalized× generosity					0.43(0.57)	1.54 (0.49, 4.8)		
Non-citizen× generosity					0.68(0.38)	1.98 (0.92, 4.24)		
Moderators (Citizenship × State Concentration of Immigrants)								
Naturalized× state 5-9.9%					1.43(1.28)	4.19 (0.33, 53.44)		
Naturalized× 10-14.9%					0.63(0.96)	1.87 (0.27, 12.72)		
Naturalized× 15-19.9%					0.73(0.93)	2.08 (0.33, 13.28)		
Naturalized× 20%+					0.79(0.96)	2.21 (0.33, 15.07)		
Non-citizen× 5-9.9%					-1.48(1.21)	0.23 (0.02, 2.57)		
Non-citizen× 10-14.9%					-2.78*(1.18)	0.06 (0.01, 0.65)		
Non-citizen × 15-19.9%					-2.76**(1.00)	0.06 (0.01, 0.46)		
Non-citizen × 20%+					-2.65**(1.02)	0.07 (0.01, 0.54)		
Moderators (Race/Ethnicity × State Generosity)								
Asian× state generosity							-0.20(0.44)	0.82 (0.34, 1.96)
Moderators (Race/Ethnicity× State Concentration of Immigrants)								
Asian× state 5-9.9%							2.08+(1.09)	7.98 (0.92, 69.66)
Asian× state 10-14.9%							1.88(1.16)	6.57 (0.65, 66.26)
Asian× state 15-19.9%							2.18*(1.08)	8.82 (1.02, 76.26)
Asian × state 20%+							2.41*(1.09)	11.12 (1.27, 97.22)
Intercept	-0.995 (0.60)		-0.69(0.67)		-0.97(0.78)		-0.01(0.86)	
Likelihood Ratio	27877475.61		25794545.46		25589004.30		25738970.43	
df	34		40		50		45	
	p<.0001		p<.0001		p<.0001		P<.0001	

Reference groups are in parentheses. $+\rho<.10$; $*\rho<.05$; $**\rho<.01$; $***\rho<.001$

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Table 5. Logistic Regression on Lifetime Mental Health Service Use (N=2,942)

Variable	Model 1		Model 2		Model 3		Model 4	
	B(SE)	OR (95% CI)	B(SE)	OR(95%CI)	B (SE)	OR (95%CI)	B (SE)	OR (95%CI)
Predisposing Factors								
Age (18-30)								
31-45	-0.34 (0.23)	0.71 (0.45, 1.12)	-0.37+(0.22)	0.69 (0.45, 1.08)	-0.38+(0.22)	0.68 (0.45, 1.05)	-0.38+(0.22)	0.69 (0.44, 1.06)
46-64	-0.43*(0.21)	0.65 (0.43, 0.98)	-0.38*(0.18)	0.68 (0.48, 0.98)	-0.42*(0.18)	0.66 (0.46, 0.95)	-0.39*(0.17)	0.68 (0.48, 0.96)
Gender (Male)								
Female	-0.33*(0.15)	0.72 (0.54, 0.96)	-0.34*(0.15)	0.71 (0.53, 0.95)	-0.32*(0.16)	0.73 (0.54, 1.00)	-0.34*(0.15)	0.71 (0.53, 0.95)
Marital status (married/cohabitate)								
Divorced/separated/ Widowed	-0.42*(0.17)	0.66 (0.47, 0.92)	-0.43*(0.19)	0.65 (0.45, 0.94)	-0.38*(0.19)	0.69 (0.47, 1.00)	-0.42*(0.19)	0.66 (0.45, 0.95)
Never married	-0.17+(0.22)	0.85 (0.54 1.33)	-0.16(0.21)	0.86 (0.56, 1.31)	-0.18(0.21)	0.84 (0.55, 1.27)	-0.16(0.21)	0.85 (0.56, 1.31)
Education (less than high school)								
High school graduate	-0.10(0.24)	0.91 (0.56, 1.46)	-0.14(0.24)	0.87 (0.54, 1.40)	-0.11(0.23)	0.90 (0.57, 1.41)	-0.14(0.24)	0.87 (0.54, 1.39)
Some college	-0.65**(0.21)	0.52 (0.35, 0.79)	-0.77** (0.23)	0.46 (0.29, 0.73)	-0.79*** (0.23)	0.45 (0.29, 0.72)	-0.78***(0.23)	0.46 (0.29, 0.73)
≥College degree	-0.98***(0.26)	0.38 (0.22, 0.63)	-1.14*** (0.26)	0.32 (0.19, 0.53)	-1.11*** (0.25)	0.33 (0.20, 0.54)	-1.15***(0.26)	0.32 (0.19, 0.53)
Employ status (Unemployed)								
Employed	0.38*(0.17)	1.47 (1.05, 2.06)	0.41*(0.17)	1.51 (1.08, 2.11)	0.44*(0.18)	1.55 (1.10, 2.2)	0.40*(0.17)	1.49 (1.06, 2.10)
Not in labor force	-0.07(0.19)	0.93 (0.64, 1.35)	-0.02(0.18)	0.98 (0.69, 1.40)	-0.02(0.18)	0.98 (0.69, 1.40)	-0.02(0.18)	0.98 (0.69, 1.40)
Race/Ethnicity (Latino)								
Asian	0.75**(0.23)	2.11 (1.33, 3.35)	0.81*** (0.23)	2.24 (1.41, 3.57)	0.82*** (0.24)	2.27 (1.41, 3.66)	2.45+(1.31)	11.53 (0.84, 158.34)
Living in Poverty	0.29(0.21)	1.34 (0.89, 2.03)	0.36+(0.22)	1.43 (0.93, 2.19)	0.35(0.23)	1.42 (0.91, 2.23)	0.36+(0.21)	1.44 (0.94, 2.20)

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Table 5. (cont.)

Variable	Model 1		Model 2		Model 3		Model 4	
	B (SE)	OR (95% CI)	B (SE)	OR (95% CI)	B (SE)	OR((95 % CI)	B (SE)	OR (95% CI)
Age at immigration (US-born)								
<12years	-0.19(0.69)	0.83 (0.21, 3.26)	-0.36(0.71)	0.70 (0.17, 2.89)	-0.41 (0.70)	0.67 (0.17, 2.69)	-0.39(0.71)	0.67 (0.16, 2.81)
13-17years	0.39(0.69)	1.48 (0.38, 5.80)	0.35(0.72)	1.42 (0.34, 6.04)	0.37(0.74)	1.44 (0.33, 6.26)	0.33(0.72)	1.39 (0.33, 5.82)
18-34years	0.30(0.61)	1.35 (0.40, 4.55)	0.16(0.63)	1.17 (0.33, 4.14)	0.08(0.62)	1.09 (0.31, 3.76)	0.14(0.63)	1.15 (0.32, 4.07)
35+years	-0.12(0.58)	0.89 (0.28, 2.85)	-0.14(0.60)	0.87 (0.26, 2.90)	-0.21(0.60)	0.82 (0.25, 2.69)	-0.15(0.60)	0.87 (0.26, 2.86)
Length of Residence in the US (US born)								
<5 years	0	1	0	1	0	1	0	1
5-10 years	0.14(0.39)	1.05 (0.48, 2.28)	0.14(0.43)	1.15 (0.49, 2.70)	0.14(0.42)	1.15 (0.50, 2.64)	0.15(0.44)	1.16 (0.49, 2.76)
11-20 years	-0.17(0.38)	0.84 (0.40, 1.79)	-0.11(0.41)	0.90 (0.40, 2.01)	-0.05(0.40)	0.95 (0.43, 2.09)	-0.11(0.40)	0.90 (0.40, 2.01)
20+	-0.62(0.51)	0.54 (0.20, 1.49)	-0.51(0.54)	0.60 (0.20, 1.79)	0.49(0.53)	0.61 (0.21, 1.75)	-0.49(0.54)	0.61 (0.21, 1.79)
English proficiency (Poor)								
Fair	-0.86**(0.29)	0.43 (0.24, 0.75)	-0.91** (0.29)	0.40 (0.23, 0.72)	-0.89** (0.29)	0.41 (0.23, 0.74)	-0.91**(0.30)	0.40 (0.22, 0.72)
Good	-1.25***(0.26)	0.29 (1.73, 0.48)	-1.30*** (0.28)	0.27 (0.16, 0.47)	-1.29*** (0.28)	0.28 (0.16, 0.48)	-1.30***(0.28)	0.27 (0.16, 0.47)
Excellent	-1.42***(0.29)	0.24 (0.14, 0.43)	-1.43*** (0.30)	0.24 (0.13, 0.43)	-1.46*** (0.30)	0.23 (0.13, 0.42)	-1.44***(0.30)	0.24 (0.13, 0.43)
Citizen status (US-born)								
Naturalized	0.83*(0.37)	2.23 (1.08, 4.63)	0.80*(0.39)	2.23 (1.03, 4.83)	-1.74(1.14)	0.18 (0.02, 1.72)	0.82*(0.40)	2.27 (1.04, 4.96)
Non-Citizen	0.46(035)	1.59 (0.79, 3.17)	0.52(0.36)	1.68 (0.81, 3.45)	0.15(1.22)	1.16 (0.10, 13.15)	0.53(0.36)	1.70 (0.82, 3.52)
Enabling Factors								
Medical insurance coverage	-0.10(0.30)	0.90 (0.50, 1.64)	-0.04(0.31)	0.97 (0.52, 1.80)	-0.06(0.31)	0.94 (0.50, 1.75)	-0.03(0.32)	0.97 (0.51, 1.82)
Social support	0.14(0.22)	1.15 (0.75, 1.79)	0.15(0.22)	1.16 (0.75, 1.80)	0.19(0.22)	1.21 (0.78, 1.87)	0.15(0.22)	1.17 (0.75, 1.82)

Table 5. (cont.)

Variable	Model 1		Model 2		Model 3		Model 4	
	B (SE)	OR (95% CI)	B (SE)	OR (95%CI)	B (SE)	OR (95%CI)	B (SE)	OR (95%CI)
Needs Factors								
Self-Rated Health (Poor)								
Fair	0.47+(0.27)	1.60 (0.93, 2.76)	0.51+(0.28)	1.66 (0.95, 2.88)	0.51+(0.28)	1.67 (0.95, 2.93)	0.51+(0.28)	1.66 (0.94, 2.92)
Good	0.68+(0.36)	1.97 (0.96, 4.02)	0.71+(0.39)	2.04 (0.93, 4.46)	0.75+(0.39)	2.12 (0.97, 4.60)	0.72+(0.40)	2.05 (0.92, 4.56)
Very Good	0.47(0.33)	1.61 (0.83, 3.11)	0.48(0.36)	1.62 (0.79, 3.29)	0.52(0.36)	1.68 (0.82, 3.43)	0.49(0.36)	1.63 (0.79, 3.37)
Excellent	0.68*(0.33)	1.97 (1.02, 3.79)	0.75*(0.36)	2.11 (1.02, 4.36)	0.72+(0.38)	2.06 (0.97, 4.36)	0.74*(0.37)	2.09 (1.01, 4.36)
Self-Rated Mental Health (Poor)								
Fair	1.68***(0.41)	5.37 (2.37, 12.14)	1.84***(0.45)	6.32 (2.6, 15.35)	1.70*** (0.45)	5.47 (2.21, 13.51)	1.86***(0.44)	6.43 (2.66, 5.54)
Good	2.15***(0.46)	8.57 (3.44, 21.34)	2.33***(0.46)	10.32 (4.09, 26.01)	2.20*** (0.49)	9.03 (3.42, 23.84)	2.36***(0.46)	10.54 (4.24, 26.23)
Very Good	2.36***(0.40)	10.64 (4.78, 23.66)	2.64***(0.43)	14.05 (5.94, 33.27)	0.53*** (0.44)	12.51 (5.21, 30.07)	2.67***(0.43)	14.41 (6.14, 33.86)
Excellent	2.95***(0.40)	19.04 (8.60, 42.18)	3.19***(0.42)	24.30 (10.59, 55.78)	3.09*** (0.43)	21.90 (9.26, 51.79)	3.22***(0.42)	24.95 (10.86, 57.33)
Environmental Factors								
Community cohesion			-0.03(0.20)	0.97 (0.68, 1.45)	-0.05(0.21)	0.95 (0.63, 1.44)	-0.04(0.20)	0.96 (0.64, 1.44)
State concentration of immigrants								
5-9.9%			0.41(0.66)	1.51 (0.40, 5.64)	-0.08(0.72)	0.92 (0.22, 3.87)	0.55(0.80)	1.73 (0.35, 8.53)
10-14.9%			1.29*(0.58)	3.64 (1.15, 11.57)	0.85(0.75)	2.35 (0.53, 10.44)	1.59*(0.66)	4.92 (1.31, 18.46)
15-19.9%			0.27(0.59)	1.31 (0.41, 4.20)	-0.76(0.69)	0.46 (0.12, 1.83)	0.37(0.68)	1.45 (0.37, 5.62)
20%+			0.72(0.66)	2.05 (0.55, 7.59)	0.48(0.73)	1.62 (0.38, 6.89)	0.97(0.75)	2.63 (0.59, 11.81)
State generosity			-0.29(0.25)	0.75 (0.45, 1.25)	-0.87*(0.36)	0.42 (0.21, 0.86)	-0.37(0.29)	0.69 (0.38, 1.24)

Table 5. (cont.)

Variable	Model 1		Model 2		Model 3		Model 4	
	B (SE)	OR (95% CI)	B (SE)	OR (95% CI)	B (SE)	OR (95% CI)	B (SE)	OR (95% CI)
Moderators (Citizenship× State Generosity)								
Naturalized× generosity					1.28(0.71)	3.60 (0.88, 14.76)		
Non-citizen× generosity					2.49(0.85)	12.06 (2.23, 65.28)		
Moderators (Citizenship × State Concentration of Immigrants)								
Naturalized × State 5-9.9%					2.22(1.48)	9.23 (0.49, 175.61)		
Naturalized × State 10-14.9%					1.67(1.37)	5.34 (0.35, 81.29)		
Naturalized × State 15-19.9%					2.99*(1.23)	19.8 (1.75, 225.39)		
Naturalized × State 20%+					1.07(1.43)	2.92 (0.17, 50.39)		
Non-citizens × State 5-9.9%					-0.88(1.32)	0.42 (0.03, 5.84)		
Non-citizens × State 10-14.9%					-0.81(1.46)	0.45 (0.02, 8.23)		
Non-citizens × State 15-19.9%					0.59(1.21)	1.81 (0.16, 20.33)		
Non-citizens × State 20%+					-2.27(1.49)	0.10 (0.01, 2.01)		
Moderators (Race/Ethnicity × State generosity)								
Asian× state generosity							0.48(0.44)	1.61 (0.61, 4.30)
Moderators (Race/Ethnicity× State Concentration of Immigrants)								
Asian× state 5-9.9%							-1.60(1.55)	0.20 (0.01, 4.46)
Asian× state 10-14.9%							-2.34+(1.25)	0.10 (0.01, 1.16)
Asian× state 15-19.9%							-1.49(1.40)	0.23 (0.01, 3.71)
Asian × state 20%+							-2.25(1.41)	0.11 (0.01, 1.73)
Intercept	-0.10 (0.564)		-0.761 (0.83)		0.222(0.842)		-0.91(0.90)	
Likelihood Ratio	14237327.20		13281395.77		13082730.39		13258253.40	
df	34		40		50		45	
	p<.0001		p<.0001		p<.0001		P<.0001	

Reference groups are in parentheses.

+ρ<.10; *ρ<.05; **ρ<.01; ***ρ<.001

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Summary of Results

With regard to my first research question, I examined the association between contextual factors (community and state factors) and immigrants' respective health and mental health service use, after controlling for all individual-level factors (predisposing, enabling, and needs factors).

In health service use among immigrants who had a routine physical checkup in the previous year, findings indicated who immigrants that lived in states with a very highly concentration of immigrants (more than 20% such as CA, NY and NJ) were less likely to use physical checkups than those living in non-traditional immigrant states (composed of less than 5% of immigrant population). Community cohesion and living in states that offered state generosity to immigrants in health care provision were not found to be significantly associated with health care use.

Among predisposing factors, being female, not employed, and immigrating at an older age made subjects more likely to have physical checkups. For instance, female immigrants were 3.44 times more likely to have physical checkups relative to male immigrants. Immigrants who came to this country after they were 35 years old or older had 1.66 to 2.19 times greater odds to use health care than their US-born counterparts.

Among enabling factors, medical insurance and English proficiency were found to be positively associated with using their health care. Immigrants with medical insurance had 4.28 times greater odds of receiving physical checkups. Those with excellent English proficiency were 2.2 times more likely to have physical checkups. Noticeably, none of the needs factors (self-rated health and mental health condition) were found to be statistically significant related to their use of physical checkups.

In sum, age, education level, marital status, length of stay in the U.S., poverty status, and self-perceived health and mental health condition were not associated with immigrants' physical checkup use.

Similar to the result in health care, in mental health service use community cohesion was not found to be significantly associated with life time mental health care use. However, living in states with higher immigrant concentrations had a positive effect on receiving counseling or therapy. The results suggested that immigrants living in states with a moderate percentage of immigrants (10-14.9%, such as IL, AZ, VA, CT, RI, MD and WA) had 3.64 times greater odds to receive counseling than those living in non-traditional immigrant states (less than 5%).

As for individual predicators for mental health care use, among predisposing factors, being an older immigrant (46-64 years old), being female, being divorced, separated or widowed and having a higher education degree meant they were less likely to receive mental health care. Immigrants living in poverty had 1.43 times greater odds of receiving therapy or counseling. Those who were employed, being Asian immigrants, or being naturalized citizens were more likely to seek mental health professionals.

Among enabling factors, immigrants with better English proficiency actually had reduced odds of receiving mental health help. While needs factors had no effect on immigrants' health checkup use, they did have an effect on immigrants' use of therapy or counseling. Immigrants with excellent health condition had 2.11 times greater odds of using mental health care, and those with excellent mental health had 24 times greater odds of going to therapists or counselors.

With regard to my second research question, I examined if interactions between citizenship status and state factors had an effect on immigrants' respective health care and mental health care use. Results indicated that when non-citizens lived in states with a higher

concentration of immigrants (e.g. 10% and above), they were less likely to use physical checkups.

In mental health service use, findings suggested a different direction for naturalized citizens. When naturalized citizens lived in states with a higher concentration of immigrants (states with 15-19.9% immigrants), the odds were almost 20 times greater that they would receive mental health care (OR=19.8, p<.05, 95% Cl [1.75, 225.39]) compared to their US-born counterparts. However, the interaction between citizenship status and state generosity was not statistically significant for either health or mental health care use.

With regard to my third research question, I investigated if immigrants' race/ethnicity moderates the association between state factors and service use (health care and mental health care). Results in health care utilization suggested that compared to Latino immigrants who lived in states with high concentration of immigrants (more than 15%), Asian immigrants who lived in the same conditions of states had 8-11 times greater odds for having physical checkups. Nevertheless, the results in mental health care showed a reverse effect. Compared to Latino immigrants living in states with 10-14.9% of immigrants, Asian immigrants who lived in same conditions of states were less likely to go to therapists or counselors.

CHAPTER 5

DISCUSSION

The current study utilizes Anderson's behavioral model of health care services to examine how individual (predisposing, enabling, needs) factors and contextual factors influence preventive care (routine physical checkup) and mental health care utilization among Asian and Latino immigrant adults. The findings showed that various aspects of factors influence immigrants' use of health care and mental health care and that such utilization could further vary by immigrants' citizenship status and race/ethnicity in highly-concentrated immigrant states. The following discussion intends to interpret these results in relation to prior research with a focus on contextual factors.

Findings

Health Care

Individual factors.

The study found that female immigrants were about 3.5 times more likely to have physical checkups than male immigrants as supported by previous studies on the general public and immigrant groups in the United States (Canto & Shankar, 2000; Weisman, Rich, Rogers, Crawford, Grayson, & Henderson, 2006). Age at immigration is rarely identified as a predictor in prior studies on immigrant's health care use compared to length of residence in the United States. This study found that older immigrants to this country (35 years old or older) are more likely to have physical checkups. This is probably due to their higher health-related awareness. While quite a few studies in previous literature suggested that the length of stay in the United States was significant for immigrants' preventive care such as Pap test (Kagawa-Singer et al., 2007;), mammography (Kandula, Wen, Jacobs, & Lauderdale, 2006), and endoscopy (Swan, Breen,

Coates, Rimer & Lee, 2007), this study did not find such an association between length of residence in the United States and preventive care for Latino and Asian immigrants as a whole. Given that most existing studies often used women as participants to look at their screening or routine checkups, the results of prior studies may not generalize to male immigrants or immigrants as a whole.

As for enabling factors that examine medical insurance and English proficiency, immigrants with medical insurance were found to be 4.28 times more likely to receive physical checkups after adjusting for differences in sociodemographics, needs factors, and contextual factors. This is consistent with other research that insurance coverage remains a strong predictor of preventive care for immigrants in the United States (Carrasquillo & Pati, 2004).

As suggested by previous research (Choi, 2006; Pippins et al., 2007), immigrants with better English proficiency were more likely to utilize preventive care. The Health Belief Model (Becker, 1974) argues that obtaining preventive care requires one's self-efficacy in making an appointment in English, filling out screening forms, following administrators' instructions to do tests, and understanding physicians' advice and test results.

Contextual factors.

The finding showed that community-level factor, community cohesion, had no effect on immigrants' preventive care use. In bivariate analysis community cohesion showed significance for those who used health care, compared to those who did not; however, it was not found significantly associated with health care use for immigrants when other variables were controlled. The result is consistent with Perry et al. (2008) that living in a more cohesive community was not correlated to immigrants' health care use. Unlike Prentice's (2006) study that found community or neighborhood cohesion increased preventive care use or reduced

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barriers to health care, this discrepancy may be due to the measure difference that conceptualizes community cohesion.

The study also did not find that living in a more generous state was significantly associated with immigrants' use of physical checkups. This finding supports with previous studies conducted by Fremstad et al. (2004) and Cunningham et al. (2006) that living in states with funded programs alone does not necessary increase immigrants' health care use because other eligibility issues such as household income can be other possible determinants of whether or not immigrants can utilize these state-funded programs and services (Cunningham et al., 2006). Even if immigrants are eligible for states funded programs, if preventive care is not fully covered by these programs or if the co-pay is high, either could hinder immigrants from actual utilization of physical checkups (Hirota, Garcia, Silbr, Lamirault, Penserga, & Hall, 2006). The accessibility of health providers, available health providers or transportation may also affect immigrants' willingness to use preventive care when state-funded programs are provided (Lee et al., 2010).

With respect to the effect of state concentration of immigrants on immigrants' health care use, the findings indicated that immigrants living in states with the highest concentration of immigrants such as California, New York, and New Jersey were least likely to have physical checkups. This result could be explained by the fact that living in highly immigrant-concentrated states may provide more access to home or folk remedies, herbal therapies in the communities or within states at large, more support of informal medical information, or other physical activity groups within one's own ethnic groups (e.g. Tai-chi) that reduced the likelihood of immigrants going to a routine checkups. Hsiao, Wong, Goldstein, Becerra, Cheng and Wenger's (2006) study on Asian subgroups' complementary and alternative medicine use (CAM) such as herbal

therapies, pointed out that over 75% of Asian subgroups reported that they used some form of CAM in the past year, which is higher than the national prevalence. In Canto et al.'s (2000) study on Latino women living in Washington DC also found that about 6% of Latino women had visited a folk healer in the past three years.

Studies have well documented the fact that the views of health and illness of Latino and Asian immigrants are oftentimes largely impacted by the cultural beliefs in their communities (Canto et al., 2000; Johnson et al., 2008; Liang, Yuan, Mandelblatt, & Pasick, 2004). For example, Liang et al (2004) interviewed 54 Chinese women living in the United States with an average length of residence in the U.S. of 15 years. When these women were asked about maintaining good health, none of them spoke about having medical checkups or cancer screenings but rather about having outdoor exercise in the fresh air, having a healthy diet or that fatalism determines life and death, and cancer screening is not necessary, all of which are deeply rooted in their cultural perspective of wellness. Johnson et al. (2008) examined 55 articles regarding sociocultural factors that affect cervical cancer screening among immigrants and ethnic minorities in the United States and suggested that health-related beliefs are very crucial in immigrants' health care utilization. Unique beliefs about one's susceptibility to cancer held by Hispanic immigrants tended to focus on their body, believing risk factors such as intercourse after child-birth, having abortions, having too many children, etc. Some Asian communities have a misunderstanding that cervical cancer is caused by wind or the result of karma, and some believe only women who were married or had illness symptoms need such screening (Johnson et al., 2008). Therefore, when living in states with a large number of immigrants, such beliefs may be reinforced and thus in turn discourage immigrants from receiving routine checkups.

The current finding, however, contrasts with the findings in Cunningham et al.'s (2006) study on Latino communities which pointed out that living in areas of less than 5% and more than 20% of Latinos were more likely to have physician visits compared to those who lived in communities with 5-20% of Latinos. In Cunningham et al. study (2006), it is not clear whether physical visits include preventive checkups or treatment visits. Preventive care patterns can be different from treatment appointments. As this study only measured the concentrations of Latino immigrants within communities, their results cannot be generalized to immigrant concentrations at a state level.

Moderator effects.

To my second research question, I had two hypotheses. One was that compared to US-born counterparts, immigrants who lived in a more generous state were more likely to utilize the health service use. The second hypothesis was that compared to US-born counterparts, immigrants who lived in states with a higher immigrant concentration will buffer the effect of citizenship status on their service use.

Contrary to my first hypothesis above, immigrants (naturalized citizens and non-citizens) living in a more generous state in their health care programs was not associated with increased preventive care use among immigrants. This implies that having state-funded coverage alone is not enough to enhance preventive care; issues such as having access to regular routine care, affordable co-pay cost, trust in the Western medicine, wait time for appointments, and so forth may also influence immigrants' ability and willingness to have physical checkups (Lee et al., 2010). Given the fact that more than 87% of the sample had lived in the United States for more than five years (37.5% were US-born), this finding also supports Kandilov's (2008) study that

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the effect of living in more generous states on Medicaid use for non-citizens was only significant for their first five years of residence. After the fifth year, this association disappeared.

In addition, the results do not support the hypothesis that living in states with a higher concentration of immigrants would increase preventive care use more among immigrants. Instead, the results show a reverse direction that living in states of with a 10% or higher concentration of immigrants actually reduced non-citizens' use of preventive care, but did not reduce the use of preventive care by naturalized citizens. A possibility is that some of the non-citizens may just newly arrive this country, therefore, they probably just had their physical checkups before coming to the United States as a result of a visa requirement (e.g. Green card holders, students, etc.). As a result there was no need to have a physical checkup in the previous 12 months. In addition, living in more highly immigrant-concentrated states would allow them to access and to be exposed to more folk or non-medical methods to enhance their wellness or self-care and possibly reduced their need to utilize preventive care in their first few years in the United States.

To my third research question, I hypothesized that living in a more generous state and states with a higher concentration of immigrants would increase preventive care may have variable association with their health care use across Latino and Asian immigrant groups. The results suggested that living in a more generous state has no buffer effect on preventive care use for either Latino or Asian immigrants.

However, living in states with a higher concentration of immigrants (15% and above) largely increased use of preventive care for *Asian immigrants* more than for Latino immigrants. These states are California, New York, New Jersey, Texas, Florida, Massachusetts, Nevada and Hawaii. Several explanations for this phenomenon are plausible. First of all, states with more

immigrants may have more extensive medical networks and medical providers that will result in closer proximity and more ethnic backgrounds similar to Asian immigrants. Prior studies on Asian communities' access to health care found that Asian immigrants generally prefer having Asian physicians (Jenkins, Thao, McPhee, Stewart & Ngoc, 1996; Lee et al., 2010) while this was not significant for Latino immigrants' preference. Canto and her colleagues interviewed El Salvadorian immigrants living in Washington, D.C. and found that Latino immigrants preferred Spanish-speaking health care providers, but did not particularly require a background of Latino descent (Canto et al., 2000).

Living in states with more Asian immigrants may mean more bilingual physicians or other medical professionals to provide services in their languages. It is also conceivable that states with more immigrants may have more ethnic communities, which often is the source of health education and information for immigrants. Past studies found Asian immigrants often utilize health fairs and other health screening activities held by churches, community organizations, ethnic clubs or associations at no cost for participants (Choi, 2006; Johnson et al., 2008; Lee et al., 2010).

Mental Health Care

Individual factors.

The findings show that being a younger immigrant, male, married or cohabitated, employed, and less highly-educated increased immigrants' likelihood of seeking counseling or therapy in their lifetime. In addition, Asian immigrants and naturalized citizens were more likely to see mental health professionals after adjusting for individual and contextual factors.

Immigrants' age at immigration had no effect on their mental health care use in this study, which supports Abe-Kim et al.'s (2007) study on Asian immigrants' any mental health service use and specialty mental health use, but this result did not support other previous studies

that the older they immigrated to the United States, the less likely they were to use mental health services (Kang et al., 2010; Lee et al., 2012).

The findings also indicated that medical insurance had no effect on immigrants' mental health case use, which contrasts with some prior studies (Alegria et al., 2007; Lee et al., 2012) that found insurance to be correlated with Latinos' and Asians' mental health care use. The different results might be a result of measure difference of mental health care use including any mental health care service, specialty care, care for the previous year or lifetime care. Additionally, even with insurance coverage, they may still need to pay out of pocket.

Contrary to the positive association between English proficiency and health care use among immigrants in some studies, immigrants with better English proficiency were found to be less likely to use counseling or therapy in this study. This result does not support Kang et al.'s (2010) study on Asian Americans' lifetime mental health use or Sentell et al.'s (2007) findings on four racial and ethnic groups that better English proficiency was associated with more use of mental health care in the past 12-month. English proficiency was not a significant factor in Abe-Kim et al.'s (2007) finding when adjusting for immigrant generations and their diagnoses with DSM-IV disorder. In this study, after adjusting for where immigrants live by their state concentration of immigrants, this association disappeared. It is plausible that if immigrants live in states where there are more immigrant enclaves, having English proficiency or not might matter less or even would decrease their need for mental health care due to support from their immigrant communities. Another reason may be that the majority of the sample in this study have lived in this country for more than 10 years and thus may have developed a stronger social support system locally. Instead of seeking local counselors or therapists, those with a good command of English may turn to their own social support networks rather than to mental health

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professionals. This could be supported by previous studies that when social support is stronger, there is less likelihood of mental health service use because of less perceived need of seeking professional services (Dhingra et al., 2010; Karlin et al., 2008).

Prior studies found that when Asian immigrants' self-perceived health and mental health condition are poorer, the odds are higher that they would use mental health service (Kang et al., 2010). When Latino and Asian immigrants had with a psychiatric disorder, they were more likely to use mental health care (Lee et al., 2012). The result in the study found that those who self-rated health and mental health conditions excellent were more likely to use mental health care. This discrepancy might be because having a disorder is based on a physician judgment, which might be different from self-perceived health and mental health condition. Another reason is that the time order between receiving mental health services and self-perception of health condition in this cross-sectional survey is unclear. Participants might receive services first and then feel their health and mental health improved.

Contextual factors.

The effect of community cohesion on mental health service use was not found in this study after controlling for predisposing, enabling and needs factors, which is consistent with a previous study (Drukker et al., 2004).

With respect to state concentration of immigrants, findings suggested that immigrants living in states with more immigrants (10-14.9%) increased their likelihood of seeking mental health help, which supported the argument that states with a higher number of immigrants may have more culturally and linguistically competent practitioners to work with immigrant populations and thus facilitate more utilization among immigrants (Derose et al., 2007).

Immigrants living in states with more immigrants may also enhance the referrals or information on practitioners, which lead to increased use of mental health care.

Moderator effects.

To my second research question, I also had two hypotheses. One was that living in a more generous state would increase immigrants' utilization of mental health service compared to their US-born counterparts. The second hypothesis was that immigrants living in states with a higher immigrant concentration would buffer the effect of citizenship status on their mental health service use.

Contrary to my first hypothesis, living in a more generous state did not increase the mental health care use more for immigrants (including naturalized citizens and non-citizens) than for US-born counterparts.

However, my second hypothesis was supported by the finding that living in states with a higher concentration of immigrants was associated with 20 times greater odds of using mental health care for naturalized citizens than for US-born. For non-citizens, the same buffer effect was not found. The possible explanation could be that naturalized citizens are also citizens; their rights and eligibility for welfare benefits are the same as US-born (Kandilov, 2008). In addition, in this study sample, naturalized citizens seemed to have more resources to facilitate mental health care use, such as more people employed, and more people having insurance coverage than US-born citizens (see Appendix Table 1). Based on Andersen's behavior model of health care service use, having more resources may facilitate more health care use.

To my third research question, I hypothesized that there would be variable associations between living in a more generous state and mental health service use across Latino and Asian immigrant groups. As for states with higher concentration of immigrants, I hypothesized that

there would variable association with mental health service use across Latinos and Asian immigrants. The first hypothesis was not supported by the result, which indicated that living in a more generous state does not operate differently for Latinos and Asians.

However, as expected by my hypothesis, the effect of living in states with a higher concentration of immigrants (10-14.9%) on mental health care use would vary by race and ethnicity, even though this difference was very marginal ($p<0.10$). The results suggested that Asian immigrants who lived in moderately-concentrated immigrant states (e.g. Illinois, Arizona, Virginia, Connecticut, Rhode Island, Maryland, and Washington) were 90% less likely to use mental health care compared to Latino immigrants.

A possible explanation for this may be that immigrant-concentrated states are not necessarily Asian immigrants' concentrated areas. Also living in a state with immigrant-concentrations does not mean living close to Asian communities in the state. Both situations do not guarantee a higher number of Asian culturally sensitive or Asian languages competent mental health professionals for Asian immigrants.

In addition, Asian cultures tend to seek out for mental health help as the last resort after they have turned to family and friends for help and often consider seeking mental health care as shameful for the family (Leong et al., 2001). Therefore, when living in states where a higher percentage of immigrant communities reside may in turn discourage Asian immigrants from seeking professional help and encourage them to instead seek out their subgroups' support system first. Future research will need to untangle the effect of specific racial and ethnic neighborhood contexts on their own subgroup's mental health care seeking behaviors.

Limitations

There are several limitations of this study, partially due to the use of secondary data, which could be addressed through further research in the future. First of all, the data set,

NLAAS, is a cross-sectional survey, which conducted its interviews during 2002 and 2003. Longitudinal effects such as examining the influence of service use on health outcomes or mediating effects that need more time to manifest are not appropriate for this study. Besides, the causal relationships cannot be established due to the cross-sectional data and the nature of the observational study.

Second, another limitation is the small number of community-level and state-level factors in this study, which might not fully capture the various contextual effects on immigrants' health care and mental health care use. The lack of census tract for neighborhoods prohibits the analysis of objective neighborhood-level factors such as neighborhood healthcare resources, poverty, unemployment rate, or racial-ethnic minority proportions.

Third, respondents' use of health and mental health services is self-report and coded as dichotomous variables. The frequencies of utilization may be oversimplified and cannot reflect a more detailed utilization pattern. Health care use was based on the short-term (the previous 12 months) physical checkup in this study, and therefore the generalization of their care-seeking behavior cannot apply to a longer-term preventive care pattern. Mental health care was based on their lifetime mental health service. There might be service use in their home country, but not in the country of immigration, the United States, especially for those newly-arrived immigrants.

Furthermore, in spite of a comparison of immigrants of Latino and Asians in this study, it should be noted that some Asian immigrants with Hispanic descents were not identified or singled out in this study.

In addition, the years of comparison in the study are not consistent. The data were retrieved from the National Latino and Asian American Survey (NLAAS) conducted during 2002 and 2003. However, the two state-level factors were based on information from different

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periods of time frame. The state-funded program information was based on Chin et al. study in 2002, while the five categories of state concentration of immigrants revealed by the Census Bureau were from the results of the Census Survey in 2010.

Implications

This study addresses multifaceted factors that influence immigrants' use of preventive health care and mental health care. As hypothesized by Andersen's Behavior Model of Health Services Use, the examination of predisposing, and enabling, needs as well as contextual factors highlight the various aspects of impact on immigrants' service use, which may further vary by immigrants' citizenship status and race/ethnicity. The following sections discuss policy, practice and research implications based on research findings.

Practice Implications

Preventive care is an effective public health intervention that detects illness at an early stage, which helps save more cost in treatment later on and decrease mortality. Unfortunately, immigrant and minority groups are found to account for half of some mortalities that could be reduced by preventive care such as cervical cancer (Seeff & Mckenna, 2003). In mental health care, foreign-born individuals are even 40% less likely than US-born to use any mental health services (Lee et al., 2012). Immigrants that utilize preventive care and mental health care are important not only for immigrants' health well-being, but also for those of the US-born who live in the same households, communities and states, regardless of their citizenship status or race and ethnicity.

As the current study findings suggest, individual factors and contextual factors influence immigrants' use of preventive care. Immigrants who are female, not in the labor force, immigrating to the U.S. after 35 years old and older, being non-citizens, have medical insurance

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and have better English proficiency have increased the odds of having physical checkups in the previous year. However, immigrants who were Asian immigrants or those who lived in states with a very high concentration of immigrants such as California, New York and New Jersey, were less likely to use physical checkups.

The results draw attention to the need for practitioners to address both individual and environmental factors that can affect barriers to effective services for immigrants. Some measures to eliminate individual barriers to preventive care for immigrants include expanding immigrants' health insurance coverage and increasing their English proficiency. For instance, since the Patient Protection and Affordable Care Act (ACA) mandates citizens to maintain coverage, this should reduce the number of people who rely on state-funded services and thus the expansion of Medicaid may benefit non-citizens (Garfield, Lave, & Donohue, 2010). This study found that when citizenship status is taken into consideration in highly immigrant-concentrated states, non-citizens are less likely to have insurance coverage. In terms of increasing immigrants' English proficiency or verbal communications with medical providers, as it takes time to improve one's language proficiency, having bilingual people or interpreters as well as educational materials in immigrants' languages in clinics, hospitals or health centers would large help (Lee et al., 2010; Ngo-Metzger, Massagli, Clarridge, Manocchia, Davis, Iezzoni, & Phillips, 2003).

Likewise, racial and ethnic specific programs and interventions are much needed as my results suggested. Asian immigrants tend to prefer traditional health practices over Western medicine; their lack of familiarity with Western preventive concepts is often one of the perceived barriers to preventive checkups (Johnson et al., 2008). Immigrants' misunderstanding of West medicine cannot be altered overnight, but through educational outreach interventions from local

schools, families, communities and ethnic organizations and associations as well as through culturally competent medical providers, their fear, distrust, and stigma could be reduced over time. This holds true for Latino immigrants as well. Latino immigrants who live in states with at least 15% immigrants are 91% less likely to have physical checkups compared to Asian immigrants after adjusting for individual factors. Practitioners should note this disparity to health care use within immigrant groups by their race and ethnicity.

These findings also suggest the higher need to attend to Latino immigrants' preventive care use in highly immigrant-concentrated states, where they might have policies, measures, or enacted laws that restrict services for immigrants and eventually harm Latino immigrants in some traditional immigrant states where Latino immigrant population is larger (Broder, 2007). Using Arizona as an example, after Proposition 200 was approved in Arizona in 2004, immigrants' visits in clinics and medical appointments dropped even though the proposition did not aim to reduce this medical service use, but the impact somehow expanded to medical health care utilization (Diaz & Sherwood, 2005).

It is incumbent to reduce hostility in the state or local areas that prevent immigrants from securing and accessing services. Johnson et al. (2008) interviewed Latinos, Asians, African Americans and those from Middle-East and found their perceived barriers to cancer screening were very different. For instance, Latino immigrants were the only group that reported to have fear of not being treated because of their immigrant status. Avoiding services because of their immigrant status may more likely to happen to non-citizens, who could be undocumented or illegal workers, or even to legal workers and legal permanent residents (LPR) who are in the process of applying for citizenship. Community agencies that provide services or programs

should be aware of this distinct barrier for non-citizens and thus reassure them that getting services will not affect their application for citizenship or legal residence in the U.S.

About 85 percent of immigrant households have at least one U.S. citizen, which implies that any measures that targets to ban immigrants' access to care would inevitably affect US-citizens' well-being as well (Fix, Zimmerman, & Passel, 2001). Such messages could be delivered to the public through public education or community outreach programs in health clinics, health centers, hospitals, health screening fairs, or in the social media. Improving immigrants' health is improving communities' well-being because illness has no boundary. Only when all residents are healthy and given equal access to health care is a safe and healthy community secured, regardless of residents' citizenship or race and ethnicity.

Meanwhile, practitioners can also advocate for immigrants' contributions to the country and states, such as in the economy, labor force, diversity in the society, etc., as well as document that using preventive care will lead to the reduced cost at emergency visits (Broder, 2007).

This study's findings also indicated a different set of predictors for the lifetime mental health use for immigrants. Being older, female, more educated, divorced, and having better English proficiency significantly reduced the use of lifetime mental health care after adjusting for individual and context factors.

Living in states with a higher concentration of immigrants tripled immigrants' use of mental health care, which implies that there may be more bilingual or bicultural providers in those states or just more access and proximity to counselors in general. On the other hand, practitioners in non-traditional immigrants states (e.g. those with less than 10% of immigrants) should be aware of immigrants' unmet needs as the immigrants' population is smaller and may be more dispersed and less visible. Living in states where immigrant population is disperse may

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make local service delivery more difficult and less efficient; there might be fewer competent professionals who are prepared to address immigrants' special mental health needs in terms of their language barriers, acculturation, separation from families, and so on (Cunningham et al., 2006).

Regarding combating the stigma and shame feelings of Asian immigrants using mental health care, practitioners could reduce this stigma through health educational programs in Asian communities or combine mental health care in physical checkups or primary care where Asian immigrants feel less stigma and more prone to (Sentell et al., 2007).

Policy Implications

This study identifies the influences of state factors on immigrants' access to preventive care and lifetime mental health services. It provides evidence that state generosity for immigrants' health programs alone is not enough to increase immigrants' service use. There may be other factors that affect immigrants' access to services, such as proximity to health care providers, availability of health professionals, distrust of Western medicine, unfamiliarity with preventive procedure, etc. However, state and federal policies still play an important role in immigrants' access to health care from eligibility regulations, community friendliness to immigrants at large to ongoing programs that attempt to overcome linguistic barriers for immigrants.

States with rising immigration populations have different effects on immigrants' health and mental health care use. In terms of preventive care use, living in a highly-concentrated immigrant state discouraged immigrants' health care use. It is imperative for policy makers to know if this disparity is due to a lack of enough resources for the rising immigrants' population or to an anti-immigrant environment within the states. By understanding immigrants' individual

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and contextual barriers to the use of health and mental health care services, the findings help

policy-makers develop and advocate policies at local and state levels to integrate immigrants

more effectively into communities and to benefit society as the demographics of U.S.

communities are transforming.

As noted earlier, policies that aim to restrict immigrants' access to services or increase

the anti-immigrant atmosphere within states impact immigrants' willingness to seek help as well

as the well-being of immigrant families with US-born citizens (Broder, 2007). Policy makers at

state and city levels should promote and implement policies that enhance more integration and

collaboration rather than isolation in communities that have immigrants. Measures include

developing offices that coordinate immigration policies, support immigrant programs, and help

newly naturalized citizens participate civically. Examples are Immigrant Relations and

Integration Services (IRIS) in Santa Clara County, California, the Office of New Americans in

Illinois or the Office for Refugees and Immigrants in Massachusetts (Broder, 2007).

Policies that promote safety in communities and to protect the privacy of all residents can

especially help immigrants. For example, New York City's executive Order 41 in 2003 that

protects all people seeking help from hospitals, schools, and social services from being asked

unnecessary questions about their immigrant status, sexual orientation, etc. The city of New

Haven, Connecticut implemented a municipal system for immigrants to safely work with local

police and government agencies to obtain identity cards, getting assistance in tax forms, etc.

(Medina, 2007).

Research Implications

The results of the study made contributions to the understanding of the impact of

contextual factors on immigrants' health care and mental health care use, which has received

little attention and discussion in empirical studies over the past decade. It is important that future studies continue to examine additional contextual factors such as county level factors of immigrants' concentration, ethnic enclaves effect on service use, local polices and state policy on immigrants' access to services, co-pay expenses in state programs, etc. in addition to existing individual factors which have been widely discussed in the previous literature.

Furthermore, it is highly suggested that future studies attend to the heterogeneity within and across immigrant subgroups and examine within-group differences among Asian and Latino subgroups, which may indicate different patterns of service use and disparities. This also holds true for non-citizen groups. There are great variations among noncitizens' residence of stay in the United States and their legal status, ranging from undocumented immigrants, legal permanent residents (LPR), legal and illegal workers, students and possibly refugees, which implies they have different experiences and challenges in accessing health care (Lee et al., 2012). Further research may want to differentiate these subgroups and make different policy implications for people of different statuses.

As proposed by Andersen's behavior model of health service use, factors for service use could be very complex. Qualitative studies are needed to further understand multi-faceted factors of immigrant's underuse of preventive care and mental health care. Regarding Andersen's behavior model of health service use, this model was not originally developed particularly for immigrant populations. As more and more studies use this model with immigrants in recent years, more predictors that are specifically significant for these populations, such as cultural belief about wellness and self-care, migration experiences and histories, may need to be incorporated into this model. While state-funded programs for immigrants are not found to have

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statistical significance with health care or mental health care use, further practice significance may need to be explored and discussed.

As NLAAS is a cross-sectional dataset, health effects after using health care and mental health care cannot be measured. It is imperative that NLAAS continues to follow up with immigrants in surveys and expand their study to a longitudinal study in order to shed light on the effect of service use on health outcomes, which is reflected in Andersen's behavior entire model of health service use.

The study of contextual factors did not differentiate urban, rural or suburban areas. This limitation might obscure the density of immigrants as well as how much resources are allocated in communities. Future studies may want to control for urban, suburban, or rural areas and the actual immigrant density locally in order to examine immigrant concentration effect.

In conclusion, the current study suggests that practice, policy and research on Latino and Asian immigrants should have an understanding of individual factors, cultural and contextual factors at community and state levels that are associated with their preventive care and mental health care, with consideration of citizenship status and race/ethnicity differences. By untangling the various effects in research, responding to them in practice, and legislation and policy implementation, we could reduce health disparities among immigrant and minority groups in the United States and thus pursue better health and mental health well-being for all.

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APPENDIX

Table A1 Characteristics of All Sample by Citizenship Status (N=3,910, weighted %)

Variable	US-Born (N=1,404)	Naturalized Citizen (N=1203)	Non-Citizen (N=1,299)
Predisposing Factors			
Age	34.0 (0.64)	41.3(0.53)	34.4 (0.37)
18-30	47.6	21.3	40.5
31-45	32.5	40.2	43.4
46-64	19.8	38.4	16.1
Gender			
Male	51.9	49.5	52.2
Female	48.1	50.5	47.8
Marital status			
Married/Cohabiting	55.4	75.4	72.3
Divorced/separated/ Widowed	12.3	9.4	8.9
Never married	32.4	15.2	18.9
Education			
< High school	23.5	23.6	52.3
High school graduate	29.9	21.4	18.5
Some college	30.1	26.6	13.2
≥College degree	16.5	28.4	15.9
Employ status			
Employed	67.5	72.0	66.6
Unemployed	9.3	7.3	6.9
Not in labor force	23.2	20.7	26.5
Race/Ethnicity			
Asian	15.4	50.7	21.4
Hispanic	84.6	49.3	78.6
Origin			
Vietnamese	0.3	10.2	2.2
Filipino	4.6	10.8	3.4
Chinese	3.1	15.2	6.0
All other Asian	7.4	14.6	9.9
Cuban	1.4	5.0	3.4
Puerto Rican	17.8	0.8	0.2
Mexican	43.5	22.6	53.0
All other Hispanic	21.9	20.9	22.1
Living in Poverty	13.2	9.6	17.3
Age at Immigration (Immigrants only)			
<12years		30.9	12.7
13-17years		12.8	17.5
18-34years		46.7	57.2
35+years		8.8	12.3
Length of Residence in the US (Immigrants only)			
<5 years		2.3	28.8
5-10 years		6.8	22.4
11-20 years		37.8	32.1
20+years		52.3	16.5

Table A1 (cont.)

Variable	US-Born	Naturalized Citizens	Non-Citizens
Enabling Factors			
Medical Insurance Coverage			
Yes	77.0	81.6	52.2
No	23.0	18.4	47.8
English Proficiency			
Poor	3.1	15.9	50.4
Fair	9.1	24.6	25.7
Good	25.3	32.6	17.0
Excellent	62.5	26.9	6.8
Perceived Social Support	7.7(0.12)	8.7(0.14)	8.9(0.10)
Low social support	12.2	20.9	22.3
High social support	87.8	79.1	77.7
Needs Factors			
Self-rated Health	3.36(0.04)	3.48(0.05)	3.31(0.05)
Self-rated Mental Health	3.88(0.04)	3.90(0.05)	3.72(0.05)
Community Cohesion	7.60(0.13)	7.70(0.15)	8.30(0.15)
Low cohesion	14.1	14.2	20.5
High cohesion	85.9	85.8	79.5
State Generosity			
Less Generous	36.9	44.4	40.6
More Generous	63.1	55.6	59.4
State Concentration of Immigrants			
<5%	1.8	1.7	1.5
5-9.9%	5.2	4.6	4.3
10-14.9%	7.2	7.5	6.7
15-19.9%	29.9	37.2	34.4
20%+	55.9	49.1	53.1
Service Use			
Mental health (lifetime counseling)	16.6	9.2	5.9
Routine doctor checkup	59.6	68.4	53.6
No Utilization	15.4	15.8	30.2

Table A2 Characteristics of All Sample by Race/Ethnicity (N=3,910, weighted %)

Variable	Asian (N=1,738)	Latino (N=2,172)
Predisposing Factors		
Age	37.5 (0.41)	35.2(0.40)
18-30	33.5	41.1
31-45	38.9	38.1
46-64	27.6	20.8
Gender		
Male	49.0	52.5
Female	51.0	47.5
Marital status		
Married/Cohabiting	68.4	65.4
Divorced/separated/ Widowed	5.8	11.9
Never married	25.8	22.8
Education		
< High school	12.3	41.9
High school graduate	17.5	25.8
Some college	26.5	21.9
≥College degree	43.7	10.4
Employ status		
Employed	69.0	67.9
Unemployed	7.3	8.2
Not in labor force	23.7	23.9
Origin		
Vietnamese	12.5	
Filipino	21.6	
Chinese	27.0	
All other Asian	38.9	
Cuban		3.9
Puerto Rican		10.0
Mexican		57.0
All other Hispanic		29.2
Living in Poverty	10.5	15.1
Age at Immigration (Immigrants only)		
<12years	14.1	12.5
13-17years	5.7	11.5
18-34years	44.0	29.0
35+years	11.7	4.9
Length of Residence in the US (Immigrants only)		
<5 years	14.7	10.4
5-10 years	11.7	9.7
11-20 years	27.1	19.0
20+years	22.3	18.8
Citizenship		
US-born citizen	24.7	45.9
Naturalized citizen	42.6	14.3
Noncitizen	31.7	39.4

Table A2. (cont.)

Variable	Asian (N=1,738)	Latino (N=2,172)
Enabling Factors		
Medical Insurance Coverage		
Yes	85.5	62.8
English Proficiency		
Poor	9.4	28.5
Fair	19.8	18.6
Good	32.5	20.7
Excellent	38.3	32.2
Perceived Social Support	7.4(0.13)	8.3(0.7)
Low social support	10.9	18.5
High social support	89.1	81.5
Needs Factors		
Self-rated Health	3.6(0.04)	3.3(0.03)
Poor	1.6	3.1
Fair	11.0	23.1
Good	34.5	31.4
Very Good	34.2	25.9
Excellent	18.6	16.4
Self-rated Mental Health	4.0(0.04)	3.8(0.03)
Poor	0.9	0.6
Fair	6.6	10.5
Good	23.9	29.3
Very Good	33.6	28.9
Excellent	35.1	30.7
Community Cohesion	7.42(0.13)	8.06(0.07)
Low cohesion	14.1	14.2
High cohesion	85.9	85.8
State Generosity		
Less Generous	40.6	39.6
More Generous	59.4	60.4
State Concentration of Immigrants		
<5%	1.3	1.8
5-9.9%	5.4	4.5
10-14.9%	7.2	7.0
15-19.9%	33.3	33.0
20%+	52.8	53.7
Service Use		
Mental health	8.2	11.9
Routine doctor checkup	68.6	56.2
No Utilization	16.7	22.5