Serious Psychological Distress and Self-Rated Health of Arab Immigrants in the United States

by

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DISSERTATION

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Dedication

This dissertation is dedicated to my mother and father, you have inspired me, you have my special honor for the sacrifices you made to help me be here today. To my husband Mohammed, you have helped sustain me throughout these last 5 years - from my master's studies through my doctorate program. I could not have done any of this without your love, patience, and endless support. Your calming spirit quelled my anxieties and self-doubt through many storms. I look forward to the rest of our lives together as we continue to love and support each other in achieving our dreams. To my two beautiful children Natalie and Nabeel, I cannot find words to express my gratitude for your presence in my life. Natalie, you came to our family at the beginning of this journey, in the first quarter of the master's program. You were the joy I had been waiting my whole life for. And Nabeel, we were so happy to have you join us in the summer before the beginning of the doctorate program. Our joy doubled when you came into our lives. Both of you have inspired me to continue progressing forward. I am proud to be your mom and strive always to make you proud of me. And lastly, to our newest family member – our hearts have already grown in anticipation of your arrival in just a few short weeks. Your parents and siblings look forward to sharing with you all the wonderful gifts this life has to offer.

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Abstract

Arab/Middle Eastern immigrants are a fast-growing population in the United States. Research on their physical and mental health is very limited. This descriptive cross-sectional study sought to explore the trends of serious psychological distress and self-rated health of Arab/Middle Eastern immigrants compared to US-born non-Hispanic White population in the past 15 years, and to examine the effect of factors including socioeconomic conditions, acculturation, and family and health related factors. A systematic review of the literature was conducted on SRH of Arab and Middle Eastern immigrants, and data from the National Health Interview Survey (2001-2015) were examined. This study found that greater risk of serious psychological distress among first-generation Middle Eastern immigrants is significantly associated with gender, BMI, and contacting mental healthcare services, and a higher risk of fair/poor SRH in this population is significantly associated with serious psychological distress, aging, alcohol drinking, and presence of a family member with disability. These findings suggest the need for improved immigrants' healthcare policies that support specific healthcare services among immigrant populations. Some of these healthcare plans should focus on cultural and gender-related barriers.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Dissertation Outline

This dissertation aimed to identify serious psychological distress (SPD) and self-rated

health (SRH) of Arab immigrants in the United States (US). It is organized in five chapters; the

first chapter introduced issues related to SPD and fair/poor SRH among Arab immigrants,

provided background information related to Arab ethnicity in the US, and described a theoretical

model of SPD and SRH used to guide this dissertation. The second chapter provided a systematic

review of SRH among Arab immigrants in the US. The third and fourth chapters examined rates

of SPD and fair/poor SRH among Arab immigrants compared to non-Hispanic White US-born

population, and examined factors associated with this SPD and SRH using data from the

National Health Interview Survey (NHIS). The last chapter provided the synthesis and

conclusion of the results in this dissertation research.

Introduction to the Problem

Mental illness is associated with greater risk of disability and lower job performance than

other chronic conditions (Black, Warrack, & Winokur, 1985; McCarthy, Trougakos, & Cheng,

2016; The Conference Board of Canada, 2012). Serious Psychological Distress (SPD) is a status

of stress associated with serious mental illnesses, such as depression and anxiety disorders. SPD

has been frequently used in nationwide general health assessment as well as mental health

assessment surveys for a quick assessment of the presence of a serious mental illness. These

nationwide surveys include the National Health Interview Survey (NHIS) and the WHO World

Mental Health (WMH) survey, (Pratt, 2009). SPD is typically identified by screening questions

about depressive and anxiety symptoms, such as feeling nervous, hopeless, restless, depressed, and sad (National Comorbidity Survey, 2005).

Several types of serious mental illness, such as depression, post-traumatic stress disorder (PTSD), and psychological distress, are significantly associated with poor SRH (Leibson et al., 1999; Zinzow et al., 2011). SRH is a significant predictor of morbidity and mortality (Bombak & Bruce, 2012; DeSalvo, Bloser, Reynolds, He, & Muntner, 2006; Lommel & Chen, 2015), that is strongly related to SPD and other mental disorders (Ambresin, Chondros, Dowrick, Herrman, & Gunn, 2014; Sipsma et al., 2013). The few research studies that were conducted on SRH of Arab immigrants indicated that rates of fair/poor SRH among Arab immigrants varied widely. The rates ranged between 4.7% to 41% (Abdulrahim & Baker, 2009; Barkho, Fakhouri, & Arnetz, 2011; Qahoush, Stotts, Alawneh, & Froelicher, 2010; Read & Reynolds, 2012; Read, Amick, & Donato, 2005; Sarsour, Tong, Jaber, Talbi, & Julliard, 2010). Mostly, these differences are related to the wide variations in socioeconomic conditions of this population (Asi & Beaulieu, 2013). The literature mainly found that lower SRH of Arab and immigrants is significantly related to lower socioeconomic conditions including unemployment, lower education, and lower income (Abdulrahim & Baker, 2009b; Read & Reynolds, 2012; Vaillant & Wolff, 2010). While previous research indicated significant relationship between poor SRH and mental disorders including psychological distress (Cano et al., 2003; Jackson, O'Malley, & Kroenke, 1998), current literature and research on Arab immigrants' health did not examine these connections in this populations, and did not provide a theoretical framework to enhance our understanding of the relationship between SPD and SRH. Therefore, this research study is to address SPD and SRH among Arab immigrant population in the US, and connecting these concepts to some risk factors based on theoretical framework.

Immigrant populations in the US have high risk of developing mental health problems, such as depression, anxiety, stress, SPD and PTSD compared to host populations (Alcántara, Casement, & Lewis-Fernández, 2013; Casimir et al., 2010; Dallo, Kindratt, & Snell, 2013a; Lee & Liechty, 2015; Liddell et al., 2013; Norris, Aroian, & Nickerson, 2011; Snyder, 1987; Wong & Miles, 2014; Zhang & Snowden, 1999) . Studies have found that ethnicity, perceived discrimination, low levels of acculturation, and high cultural visibility are associated with increased risk of chronic psychological distress among immigrants (Liebkind & Jasinskaja-Lahti, 2000; McClure et al., 2010; Wong & Miles, 2014). Moreover, research on SRH has revealed health disparities among immigrant populations in the US, which is significantly associated with socioeconomic disadvantages (Alang, McCreedy, & McAlpine, 2015; Allen, McNeely, & Orme, 2016).

Arab immigrants have higher rates of loneliness and isolation from society, perceived discrimination, stress, depression, anxiety, and PTSD compared to other immigrant groups and host country's populations (Dallo et al., 2013a; Hassan, Rousseau, & Moreau, 2013; Jamil et al., 2002; Norris et al., 2011; Povlsen, 2012; Rousseau, Hassan, Moreau, & Thombs, 2011). A report by the Global Health Middle East, shows that factors such as the immigration experience, challenges of acculturation, language barriers, discrimination, and marginalization secondary to media attention, increase the risk of mental health disparities among Arab immigrants in the US (Ghoneim, Rasoul, & Mouna, 2014). Lacking a specific health database for Arab immigrants is a major contributor to these disparities, which makes Arab Americans an underserved population in mental health services. Empirical evidence has documented significantly higher rates of SPD among Arab immigrants in the US compared to foreign-born and native white populations (Abdulrahim, James, Yamout, & Baker, 2012; Dallo et al., 2013a), whereas rates of SRH vary

extensively among this population (Abdulrahim & Baker, 2009; Barkho, Fakhouri, & Arnetz, 2011; Qahoush, Stotts, Alawneh, & Froelicher, 2010; Read & Reynolds, 2012; Read, Amick, & Donato, 2005; Sarsour, Tong, Jaber, Talbi, & Julliard, 2010).

There are major gaps in the literature regarding SPD and SRH among Arab/Middle Eastern immigrants in the US. This is evidenced by the lack of more recent SPD and SRH rates examination. There is also the need to examine effects of survey years on these rates, and to further examine the associated factors of socioeconomic, acculturation, and family-related factors. Unfortunately, there is no existing theoretical model that guides this vein of research. Therefore, this dissertation study is using a theoretical framework to inform research of SPD, SRH, their association, and the related factors of sociodemographic characteristics, acculturation, and health status of Arab immigrants in the US.

Background of the Arab Ancestry in the US

There are approximately 3.7 million Arabs living in the US (*Handbook of Arab American psychology.*, 2016). Immigrants from the Middle East, including Arabs, are one of the fastest growing populations in the US (Camarota, 2002). In 2000, there were nearly 1.8 million Arabs in the U.S., which constituted less than 1% of the US population (Brittingham & Cruz, 2005). Remarkably, in the year 2010, their numbers reached 3.7 million with a population growth rate of 47% over these 10 years (Zeigler & Camarota, 2014). Arab immigrants share the same ancestry. However, there is diversity in their religion, cultures, and traditions.

Arab immigrants in the US originate from several countries in the Middle East and North Africa. The word "Arab" refers to populations originated from the 22 Arab countries in the Middle East and North Africa (MENA). These countries are Algeria, Bahrain, the Comoros

4

Islands, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Mauritania, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, the United Arab Emirates, and Yemen. While these countries share historical, political, and cultural background including the Arabic language, populations of the Arab world are very heterogeneous in race and religion. There are white Arabs, and black Arabs. There are Muslim, Christian, and Jewish Arabs (American-Arab Anti-Discrimination Committee, 2009; (Amer & Hovey, 2007). Arab immigrants in the US are called Arab Americans. In some research studies on Arab Americans, Chaldeans are an integrated part of Arab samples. "Chaldeans" is a term used to recognize Christians originated from areas in Iraq, east Syria, and south Turkey (Shathaya, 1999). The largest numbers of foreign born, Arab immigrants in the US migrated from Lebanon, Syria, Iraq, Jordan, Morocco and Egypt. About 50% of these populations are women (Asi & Beaulieu, 2013; Terrazas, 2011).

Arabs migrated to the US in three Major waves started in the 19th century, when in 1875 the first group of Christian Arabs came from Lebanon and Syria. Those first wave immigrants were uneducated and often worked as tradesmen and farmers. The first wave resulted in approximately 200,000 Arabs who had been living in the US by 1924. The second wave started after the end of the World War II in the 1940s, when most of those immigrants were Palestinian refugees, who fled the war and conflict with Israel. Other immigrants in this wave came from Egypt, Syria, Iraq, and Jordan. This wave included mainly educated and English fluent immigrants. The third wave of Arab immigration to the US began in 1965 until now, which was right after the end of an Immigration Act that limited immigration from the Middle East. This recent wave is characterized by large numbers of immigrants and refugees, especially from Iraq,

Palestine, Lebanon, and Syria, due to political instability in these areas (Amer & Hovey, 2007; El-Sayed & Galea, 2009).

Arab Americans live in the 50 states, but they live in higher concentrations in the Detroit Metropolitan Area (DMA) (400,000 Arabs), in California (715,000 Arabs), and in New York (405.000 Arabs) (Abdulrahim & Baker, 2009a; El-Sayed & Galea, 2009; Sarsour et al., 2010). When compared to the general US population in the US Census between 2006 and 2010, Arab Americans have higher median annual household income, which is $56,433 compared to $51,914. However, this is perhaps better interpreted by the fact that Arab Americans are a very diverse population. For example, the Median household income of Arab Americans from Lebanon is $67,264, while it is much lower among Yemeni and Iraqi immigrants ($34,667 and $ 32,075, respectively) (Asi & Beaulieu, 2013).

Research on Arab immigrants in the US and other countries sometimes includes non-Arab populations from the Middle East non-Arab countries. The Middle East non-Arab countries are Armenia, Cyprus, Turkey, Iran, and Israel. The Middle East Area hosts more than 300 million Arabs (American-Arab Anti-Discrimination Committee, 2009). It has never been easy to differentiate Arab immigrants from other immigrants from the Middle East countries in the US due to similarities in their appearance and names, and because both Arabs and Middle Easterners identified as Whites in the racial/ethnic classification by the federal statistics (El-Sayed, Lauderdale, & Galea, 2010). Most of Middle Eastern populations in the US are Arabs, and more than 90% of populations in the Middle East countries are Arabs (Dallo, Kindratt, & Snell, 2013b; J. G. Read & Reynolds, 2012) Middle Eastern immigrants from all Middle East Countries in the NHIS are also included in this dissertation study to represent Arab immigrants.

Theoretical Framework

The theoretical framework used in this research study is a combination of three models to address the relationship between SPD and SRH in consideration of the roles of demographic-socioeconomic conditions, acculturation, and health and family related factors Arab/Middle East immigrants in the US (Casimir et al., 2010; Fenta, Hyman, & Noh, 2004; Lee & Liechty, 2015; Liddell et al., 2013; Snyder, 1987). The three theories/models (the Unidimensional Model of Acculturation [UDMA], Cognitive Activation Theory of Stress [CATS], and Symptom Management Theory [SMT]) are integrated into one framework (see Figure 1) to guide this dissertation study to explore SPD and SRH among Arab immigrants in the US. The framework also aids in investigating the associated factors of demographic-socioeconomic conditions, acculturation, family and health related conditions.

The Unidimensional Model of Acculturation (UDMA) was developed to explain the acculturation process. This model, in a single continuum, describes how immigrants acquire a host country's culture and reduce their alignment with the home country's culture and values (Schwartz, Unger, Zamboanga, & Szapocznik, 2010). The UDMA defines three major stages of acculturation: un-acculturated, bicultural, and acculturated (Figure 2; (Ryder, Alden, & Paulhus, 2000). At the first stage of the model, the major characteristics are maintaining one's cultural heritage and not involving oneself in the host society. The second stage of acculturation is when immigrants become bicultural, which means that immigrants are being enculturated by acquiring some of the host country's culture along with maintaining their inherited culture. The last stage of UDMA is when immigrants become acculturated. Assimilation or absorption of the host country's culture is the major assumption of this model. It explains how immigrants step away

from their ethnic or inherited culture as they stay longer in the dominant and hosting culture (Ngo, 2008). In this dissertation study, the UDMA helps explain the relationship of factors of acculturation, and sociodemographic status to SPD.

The Cognitive Activation Theory of Stress (CATS) is the part of the framework that explains the relationship between SPD and SRH. This theory is based on the pathophysiological response to stress and its effect on cognition of pain and a person's health in times of coping and lack of coping (Ursin & Eriksen, 2010). There are four main concepts in the CATS (Figure 3; Ursin & Eriksen, 2010). These concepts are (1) the stress load or "stimuli", (2) "the stress experience" as it is processed by the brain, (3) "the non-specific, general stress response", and (4) "the experience of the stress response", which is the individual's perception or feedback to the brain as the body translates the stress response to a positive or negative experience, and in this study, it is SRH (Ursin & Eriksen, 2004, pp. 570).

The Symptom Management Theory (SMT) was developed to guide clinical nursing in improving patients' symptom management and to guide nursing research in symptom assessment and management (Humphreys, et al. 2014). The 2008 model of SMT is displayed in Figure 4. The model shows three main concepts; symptom experience, symptom management strategies, and symptom status outcomes. These three essential components of the theory interact within the effect of a larger context of three main domains; the person domain, the environment domain, and the health and illness domain. Because of the dissertation study's focus, only the concept of symptom experience (perception, evaluation, and response) and its relationship with the three contextual domains (person, environment, and health and illness) are used to explain the experience of SPD (e.g. feelings of sadness, nervousness, restlessness, or hopelessness). The symptom response in SMT corresponds with "stress response" in CATS. Factors such as income,

8

education, employment, age, and gender represent the persons' domain that shapes the "symptom experience". Acculturation and family factors in the environment domain are also key parts of the model. For example, an individual's acculturation level may influence how SPD symptoms are experienced. Current health status and habits assessment, such as body mass index and smoking and alcohol drinking status, and seeking mental healthcare services, is a factor representing the domain of health and illness in the model. Integrating the three models of UDMA, CATS, and SMT (see Figure 1) provides a framework to understand Arab/Middle Eastern immigrants' experience of SPD and its effects on SRH, considering individual, environment, and health and illness factors.

Statement of the Problem

While research on physical and mental health of Arab immigrants is very limited, the available evidence indicates the vulnerability of this population (Dallo, Schwartz, Ruterbusch, Booza, & Williams, 2012; El-Sayed & Galea, 2009; Hatahet, Khosla, & Fungwe, 2002; Qahoush, Stotts, Alawneh, & Froelicher, 2010; Read & Reynolds, 2012; Siddiqui, Lindblad, & Bennet, 2014). The high rates of SPD and fair/poor SRH among Arab/Middle Eastern immigrants in the US calls for investigating these rates and their associated factors in the recent 15 years. This dissertation study is significant as it examines how ethnicity plays a role in SPD and SRH levels among Arab immigrants, by comparing the rates to US-born non-Hispanic Whites, and considering effects of survey years and specific socioeconomic conditions, acculturation, and family and health related conditions. This examination is based on a theoretical model combining three theories. This dissertation study utilized national data to examine the rates of SPD and SRH among Arab immigrants in the US compared to non-Hispanic

populations during the past 15 years, and to identify factors associated with their SPD and SRH.

Arab immigrants in the US are growing very fast (Zeigler & Camarota, 2014) and this population

has more than doubled during the past 30 years (Arab American Institute, 2015). The most recent

national research on their SRH and SPD is from data acquired around 10 years ago. This

dissertation addresses the critical gaps in the literature, including the lack of recent national

examination of SPD and SRH of Arab/Middle Eastern immigrants in the US, the inconsistent

outcomes on the effect of some associated factors with SPD and SRH, and the lack of examining

further associated factors.

Purpose and Objectives of the Study

The overall goal of this research study is to gain understanding of serious psychological distress

and self-rated health of Arab immigrants in the US.

- **Aim One: a systematic review to better understand self-rated health and factors associated with SRH of Arab and Middle Eastern immigrants in the US:**

1. To identify the rate of fair/poor SRH in Arab and Middle Eastern immigrants compared with non-Hispanic Whites.
2. To determine the relationship of SRH to ethnicity, acculturation, demographic factors, and SES among Arab and Middle Eastern immigrants.

- **Aim Two: Explore factors associated with Serious Psychological Distress of Arab immigrants in the US:**
1. To examine the trends of SPD rates among Arab/Middle Eastern immigrants in the US between 2001 and 2015, compared to US-born non-Hispanic Whites.
2. To compare the odds of SPD among Arab/Middle Eastern immigrants in the US to US-born non-Hispanic White population, considering any effect of survey years from 2001 and 2015.

3. To investigate the associations of age, gender, income, education, acculturation, family and health related factors with levels of SPD among Arab/Middle Eastern immigrants in the US between 2001 and 2015.

- **Aim Three: Explore factors associated with Self-Rated Health of Arab immigrants in the US:**

1. To examine the trends of fair/poor SRH rates among Arab/Middle Eastern immigrants in the US between 2001 and 2015, compared to US-born non-Hispanic Whites.
2. To compare the odds of fair/poor SRH among Arab/ Middle Eastern immigrants in the US to US-born non-Hispanic White population, considering any effect of survey years from 2001 and 2015.
3. To investigate the associations of age, gender, income, education, acculturation, family and health related factors with levels of fair/poor SRH among Arab/ Middle Eastern immigrants in the US between 2001 and 2015.

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Figure 1. A Theoretical Framework of UDMA, CATS, and SMT.
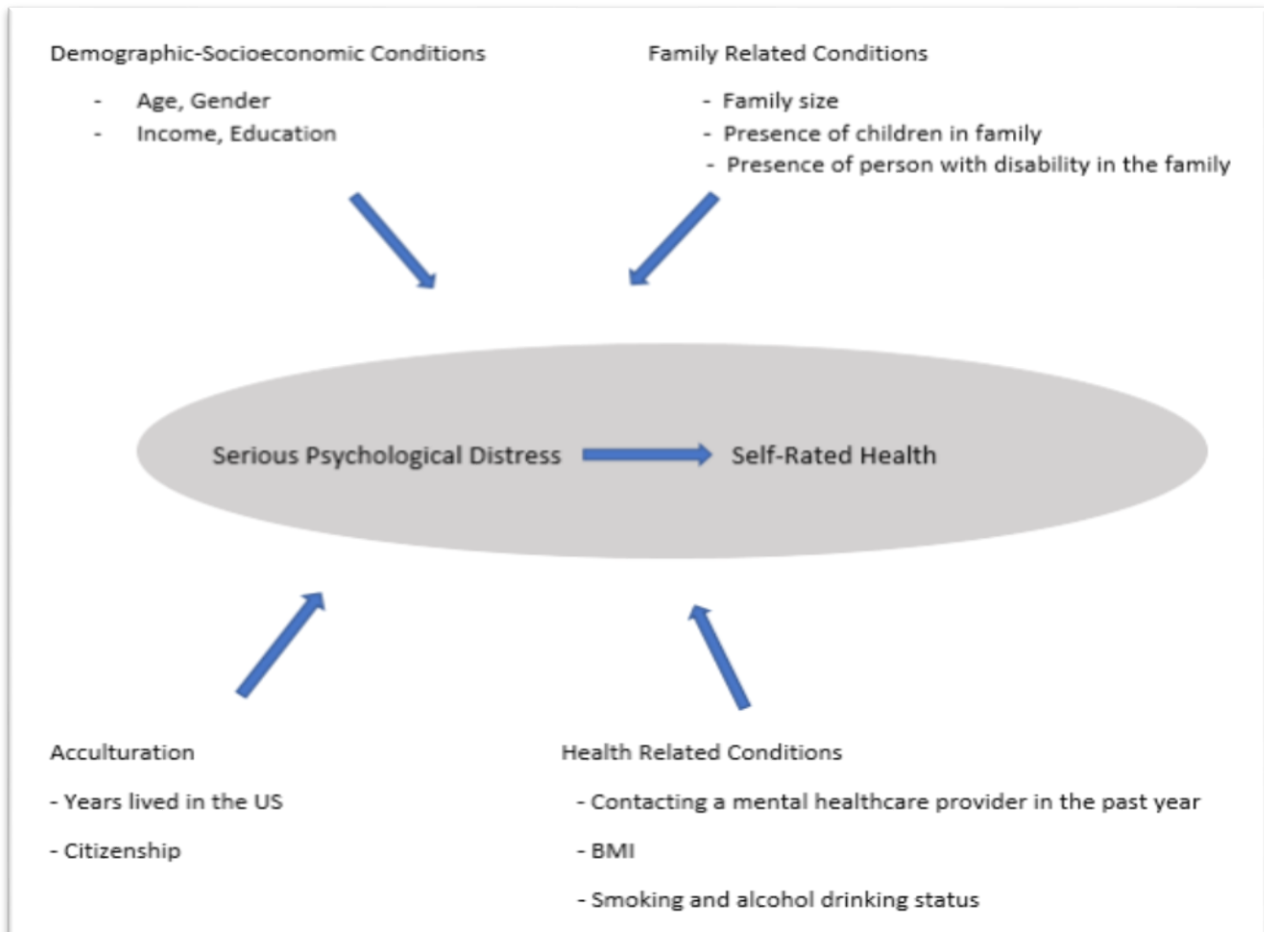
Figure 2. Unidimensional Model of Acculturation.
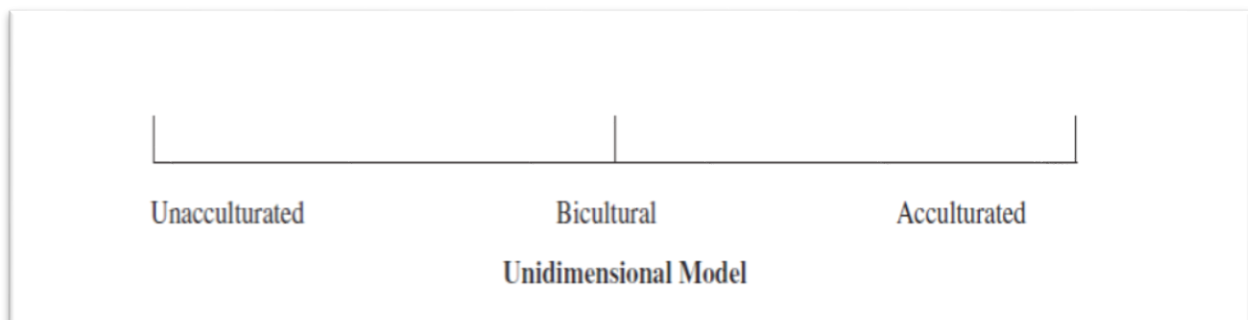
Figure 3. Cognitive Activation Theory of Stress.
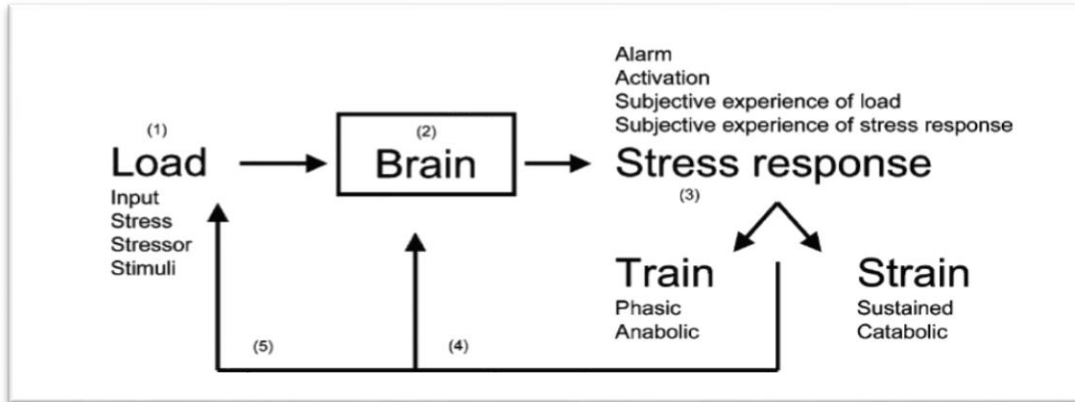
Figure 4. Symptom Management Theory.
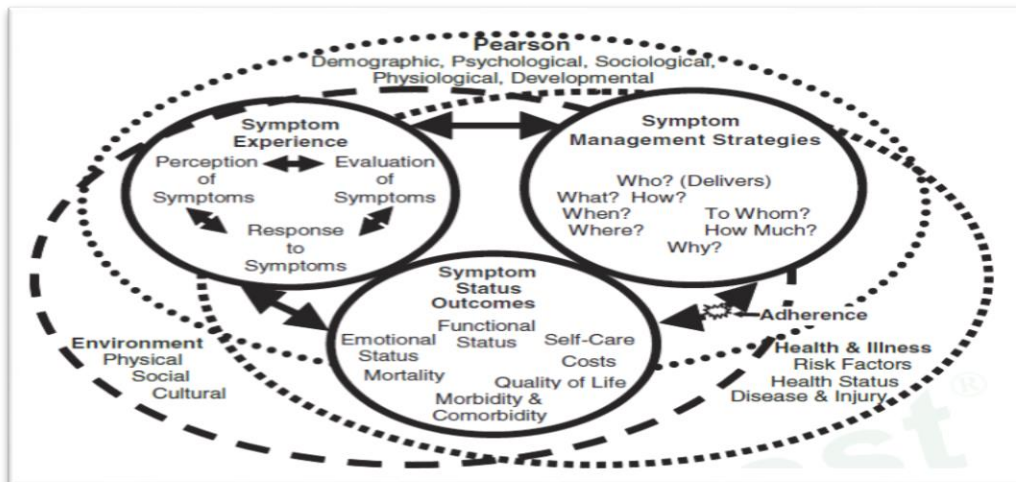
CHAPTER TWO

Systematic Review of the Literature

Self-Rated Health of Arab and Middle Eastern Immigrants

Albqoor, M, Chen, J., Weiss, S., Choi, J., Waters, C

Research highlights:

- Research on health of Arab immigrants in the US is very limited.

- This is the first study to synthesize research on SRH of Arab immigrants.

- There are wide variations in rates of SRH among Arab immigrants in the US.

- Older age, being female and living in lower SES are associated with fair/poor SRH.

- Higher acculturation level is significantly associated with better SRH of Arab immigrants.

Abstract

Purpose: A systematic review was conducted to better understand self-rated health (SRH) and

factors associated with SRH of Arab and Middle Eastern immigrants in the United States (US).

Background: Arab and Middle Eastern immigrants are one of the fastest growing populations in

the US, with a population growth rate of 47% over the past 10 years. There is some evidence that

Arab and Middle Eastern immigrants face challenges and health issues including low SRH. SRH

has been considered a strong predictor of mortality and morbidity. However, no study has been

done to synthesize research on SRH of Arab and Middle Eastern immigrants and the relationship

of their SRH with ethnicity, acculturation, and socioeconomic status (SES).

Methods: The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)

guidelines were used to guide this systematic review. A search was conducted on seven

databases, including a manual search of relevant citations. Criteria for evaluating rigor of the

studies were adapted from recent systematic reviews.

Results: The initial search generated a total of 290 papers. Six studies met the systematic review

criteria. The available evidence indicated that rates of fair/poor SRH among Arab and Middle

Eastern immigrants in the US ranged between 4.66% and 41%. These rates were not significantly

different from those of US-born whites. However, Arabic-speaking immigrants, women, older

immigrants, and socioeconomically disadvantaged immigrants had the highest rates of fair/poor

SRH. In contrast, US-born, English speaking Arabs had better SRH.

Implications: given that poor SRH is associated with mortality and morbidity, health care

providers need to assess patient's SRH and identify barriers to optimal health and health

practices. Future cross-sectional and longitudinal studies should examine other possible factors

related to SRH of Arab and Middle Eastern immigrants and changes in their SRH over time, respectively.

Keywords: Arab, Middle Eastern, immigrants, self-rated health

Background and Significance

The number of Arab Americans has more than doubled since 1980 (Arab American Institute, 2015). Immigrants from the Middle East, including Arabs, are one of the fastest growing populations in the US (Camarota, 2002). In 2000, there were nearly 1.8 million Arabs in the US, which constituted less than 1% of the US population (Brittingham & Cruz, 2005). However, in the year 2010, their numbers reached approximately 3.7 million with a population growth rate of 47% over the last 10 years. From 2010 to 2013, the growth rate was 13%, and is twice those of Asian and Caribbean immigrants in the same period (Zeigler & Camarota, 2014). The word "Arab" refers to populations originating from the 22 Arab countries in the Middle East and North Africa (MENA). The largest numbers of foreign born, Arab immigrants in the US migrated from Lebanon, Syria, Iraq, Jordan, Morocco and Egypt. These immigrants are evenly divided between men and women (Asi & Beaulieu, 2013; Terrazas, 2011). Although not all immigrants from Middle East countries are Arabs, more than 90% of populations in the Middle East countries are Arabs (Dallo, Kindratt, & Snell, 2013), and research conducted among Arab Americans only is scarce. Arab Americans are interchangeably used with Middle Eastern Americans in the literature on Arab Americans. Thus, it is important to include studies on Middle Eastern immigrants in any systematic review on Arab immigrants.

Even though Arab Americans are a fast-growing minority group in the US, research on their health is very limited (Sarsour, Tong, Jaber, Talbi, & Julliard, 2010). While some Arab Americans may have higher income and education than the general US population, many suffer from poor health behaviors and outcomes, including higher rates of smoking, physical inactivity, anxiety and depression, and chronic diseases, such as diabetes, hypertension, ischemic heart disease, cancer, and poor self-rated health (Dallo, Schwartz, Ruterbusch, Booza, & Williams,

2012; El-Sayed & Galea, 2009; Hatahet, Khosla, & Fungwe, 2002; Qahoush, Stotts, Alawneh, &

Froelicher, 2010; J. G. Read & Reynolds, 2012; Siddiqui, Lindblad, & Bennet, 2014).

Self-rated health (SRH) is one of the most common self-reported measures to assess

health status (Spears, 2012). It reflects the perceived health status of individuals, and has been

considered a strong predictive measure of mortality and morbidity (DeSalvo, Bloser, Reynolds,

He, & Muntner, 2006; Kawada, 2003; Todorova et al., 2013). Some minorities in the US have

reported lower SRH compared to the general population (Bombak & Bruce, 2012). For example,

non-Hispanic blacks and Hispanic whites reported significantly higher rates of fair/poor SRH

compared to non-Hispanic whites (NHWs) (Borrell & Dallo, 2008), whereas, Asians were more

likely to rate their health better than other American populations (Bombak & Bruce, 2012). The

level of SRH among Arab Americans has not been systematically examined.

There is substantial recent research that sheds light on the impact of social and physical

environments on SRH of immigrants, including the influence of socioeconomic status (SES),

ethnic background, and acculturation (Bombak & Bruce, 2012). Better SES is associated with

better SRH in specific immigrant groups (Kraus, Adler, & Chen, 2013; Meyer, Castro-Schilo, &

Aguilar-Gaxiola, 2014). For example, literacy, an indicator of the ability of Asian and Hispanic

immigrants to access economic resources in the US, was associated with better SRH, and this

relationship was mostly explained by acculturation and human capital factors like education and

employment (Prins & Monnat, 2015).

One of the important factors related to immigrants' SRH is acculturation, which refers to

a complex process of acquiring and adapting to a new or host culture, and results in social and

psychological changes that are more aligned with the new culture (Schwartz, Unger, Zamboanga,

28

& Szapocznik, 2010). Length of residence, language preference, and immigrant status/nativity have been used as proxy measures of acculturation (Ro, 2014; Todorova et al., 2013). Although immigrants have higher risk for some health issues, not all immigrants suffer from negative or adverse health conditions. For instance, research indicates that more acculturated Arab Americans have better physical and mental health outcomes; albeit, they have also reported a higher rate of alcohol consumption compared to their less acculturated counterparts (Jadalla & Lee, 2012). However, some research studies comparing generations of immigrants have shown that health outcomes worsen from first to successive generations (North, 2009). This phenomenon is called "immigrant paradox", which suggests that generational status of immigrants has a key role in predicting their health, and that the relationships between immigrant generational status and both health behavior and health outcomes are complex. Due to the inconsistency in assessing acculturation, there is scarce evidence of the relationship between acculturation and health outcomes in immigrant populations, including SRH (Alegria, 2009; Organista, Marin, & Chun, 2010).

In particular, there is limited research on SRH of Arab and Middle Eastern immigrants. Little is known about factors might influence their SRH including ethnicity, levels of acculturation, and SES. To our best knowledge, no systematic reviews were conducted to examine SRH of Arab and Middle Eastern immigrants. Understanding the starts of SRH among Arab and Middle Eastern immigrants and factors associated with poor SRH can assist researchers and clinicians to develop and test culturally appropriate interventions to promote health and decrease health disparities. Thus, the goals of this systematic review were (1) to identify the rate of fair/poor SRH in Arab and Middle Eastern immigrants compared with non-

29

Hispanic Whites (NHWs), and (2) to determine the relationship of SRH to ethnicity, acculturation, demographic factors, and SES among Arab and Middle Eastern immigrants.

Methods

Search Strategy

Databases included in the search were PubMed, PsychINFO, CINAHL, SCOPUS, Social Services Abstract, Psychological Abstract, Web of Science, Google search, and scanned bibliographies of relevant articles. "Self-rated health" and "self-reported health" were the two terms used to search studies on SRH. Other search terms used were: ("Arabs"[Mesh] OR "arabs" OR "arab american" OR "arab americans" OR "north africans" OR "middle east" OR "middle easterner" OR "middle easterners" OR "MENA" OR "north africa" OR "middle east"). Words on immigrants and migration were removed from the search, because when they were used in the initial search, many studies on Arab/Middle Eastern immigrants were missing.

Inclusion and Exclusion Criteria

Inclusion criteria were: (1) peer-reviewed articles that were published in English (2) conducted on adult participants, (3) included Arab/Middle Eastern immigrants as participants (or defined as Middle Easterners and/or North Africans), (4) conducted in the US, and (5) included data on SRH. Exclusion criteria were (1) studies that included only special groups of immigrants, such as refugees and/or asylum seekers, students, pregnant women, post-partum women, women in menopause, patients with specific diseases like psychiatric disorders, diabetes, hypertension, or cardiovascular diseases, (2) qualitative studies, and (3) studies focused on specific events, such as September 11th.

Methodological Rigor Assessment

Table 1 shows the quality scoring of each one of the reviewed studies, using assessment criteria was from Lommel and Chen (2015) and Law et al. (1998) Criteria included: probability sampling, response rate ≥50%, national/state representative sample, all participants ≥18 years, sample size justified, validated measures, theoretical framework, and prevalence of fair/poor SRH tested for significance. The total score possible was 8, with the ranges being 6-8(high quality), 3-5 (moderate quality), and 0-2 (low quality). Two anonymous, independent reviewers assessed and consensus was reached for methodological rigor. Studies included in this review provide good evidence on SRH among Arab and Middle Eastern immigrants. Four of the six studies had moderate to high quality scores (Table 1). However, two main limitations were noted based on the quality assessment criteria. Most of the reviewed studies did not report response rate, and did not provide sample size justification.

<div align="center">

Results

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Characteristics of the Studies

The search of the aforementioned databases resulted in 290 studies. After screening and applying the selection criteria, six articles were included in this systematic review. Figure 1 shows the eligibility screening process that resulted in the exclusion of 284 studies. Most reasons for excluding studies were unrelated topic, the setting was in countries other than the US, and no Arab immigrants were in the samples. Of the studies in the analysis, two used a national data survey on Middle Eastern immigrants, while four studies included Arab immigrant samples, two of which included only women. Sample sizes of the studies ranged from 55 to 155,831. Numbers of Arab/Middle Eastern immigrants in the study samples ranged from 55 to 1,016. Table 2 shows the characteristics, SRH measures, and major outcomes of the reviewed studies.

All six studies examined rates of SRH in samples of Arab and Middle Eastern immigrants in the

US. Response rate was reported only in one study, and it was 73.7% (Abdulrahim & Baker,

2009a). Two studies were conducted on Arabs residing in Detroit, national samples were

included in two studies, one study was conducted on Arab women in southern California, and

one study was conducted in Brooklyn, New York. California, Detroit, and New York are the

three areas with the greatest numbers of Arab immigrants (Abdulrahim & Baker, 2009; El-Sayed

& Galea, 2009; Sarsour et al., 2010). In the three studies conducted in Detroit and New York,

Arab immigrants were of lower SES, were older in age, and had a greater percentage of first

generation immigrants, compared to the samples of the other three studies in this systematic

review. Across all of the included studies, SRH was measured by the non-comparative single

question "in general, would you say that your health is excellent, very good, good, fair, or

poor?". The results are organized into two sections: (a) rates of fair/poor SRH in Arab and

Middle Eastern immigrants compared to US-born NHWs and (b) factors associated with

fair/poor SRH in Arab and Middle Eastern immigrants.

Rates of Fair/Poor Self-Rated Health in Arab and Middle Eastern Immigrants

The rates of fair/poor SRH in Arab and Middle Eastern immigrants ranged from 4.7% to

41%. The lowest rate was reported in a group of English speaking, US-born Arab immigrants in

Detroit (Abdulrahim & Baker, 2009a), followed by a rate of 11.2% in a study on physical

activity among Arab women in southern California (Qahoush et al., 2010). In the Qahoush et al.

study, most of the adult Arab women sample was not recent US immigrants, fluent in English,

and 91.1% reported having high school education or higher. Higher rates of fair/poor SRH were

found in a group of Arab immigrants in Detroit (27.5%) and a group of Iraqi women in Detroit

(41%) (Abdulrahim & Baker, 2009; Barkho, Fakhouri, & Arnetz, 2011). Arabs in these two

studies reported lower SES, compared to Arab Americans nationally. A similar high rate of fair/poor SRH (26%) was reported among Arab immigrants in New York City (Sarsour et al., 2010). The sample was comprised mainly of young, recent Arab immigrants with low SES; their rate of fair/poor SRH was higher compared to foreign-born adults (24%) and US-born adults (17%) in New York City.

Two studies, using the same national data from the National Health Interview Survey (NHIS), compared SRH of Middle Eastern immigrants to US-born NHWs. In one study, two years of NHIS data (2000 and 2001) were combined; a statistically significant difference in the rates of fair/poor SRH was found between Middle Eastern immigrants (13.3%) and US-born NHWs (10.9%) (Read, Amick, & Donato, 2005). In the other study, eight years of NHIS data (2000 to 2007) were combined; no statistically significant difference in the fair/poor SRH rates were found between Middle Eastern immigrants (13.1%) and US-born NHWs (12.5%) (Read & Reynolds, 2012). In the study by Read et al, using two years of NHIS data (2000 to 2001), Middle Eastern immigrants had significantly higher odds of reporting fair/poor SRH due to acculturation (citizenship) compared to US-born NHWs (OR = 3.58, 99% CI [1.13–11.33]). In the study by Read et al using eight years of NHIS data (2000 to 2007), Middle Eastern immigrants had significantly lower odds (OR = 0.57, *95% CI* not reported) of reporting fair/poor SRH compared to US-born whites after controlling for acculturation and sociodemographic characteristics (family size, marital status, US region of residence, health behaviors, employment, and education).

Factors Associated with Self-Rated Health of Arab and Middle Eastern Immigrants

Four studies examined risk factors associated with higher rates of fair/poor SRH among Arab and Middle Eastern immigrants (Abdulrahim & Baker, 2009a; Read & Reynolds, 2012;

Read et al., 2005; Sarsour et al., 2010). The major factors can be classified in to the following categories: acculturation (language, nativity, citizenship, and years lived in the US); demographic factors (age and gender); and SES (education, household income, and employment).

Acculturation. The relationship of SRH with acculturation proxies (language preference, nativity, citizenship, and years lived in the US) was examined in three studies (Abdulrahim & Baker, 2009a; Read et al., 2005; Sarsour et al., 2010). In a study conducted in Detroit, Arab immigrants were significantly almost three times more likely to report fair/poor SRH compared to US-born Arabs, after adjusting for sex, age, education, and income (AOR = 2.92, 95% CI [1.56–5.47]). Moreover, Arabic-speaking Arab immigrants and English-speaking Arab immigrants were significantly almost four and two times, respectively, more likely to report fair/poor health compared to US-born Arabs, after controlling for sex, age, education, and income (AOR = 3.52, 95% CI [1.82–6.81] and (AOR = 2.32, 95% CI [1.17–4.6, respectively]). (Abdulrahim & Baker, 2009a). The findings suggested that speaking English and being born in the US were associated with better SRH, and that language preference explains more of the inequality of SRH between Arab immigrants and US born Arabs. Read et al. (2005) found that US citizenship was associated with significantly greater odds of reporting fair/poor SRH, regardless of duration lived in the US (OR = 3.58, 99% CI [1.13–11.33]); however, other studies found no significant effect of duration in the US on SRH (Read et al., 2005; Sarsour et al., 2010).

Demographic factors. As expected, three studies found that older age was significantly associated with poorer SRH compared to younger age (Abdulrahim & Baker, 2009a; Read et al., 2005; Sarsour et al., 2010). In contrast, the effect of sex on SRH have shown inconsistent results. In a national study using NHIS 2000-01data, being a female was associated with significantly

34

lower odds of reporting fair/poor SRH, controlling for SES and ethnicity (Read et al., 2005). In the other national study (NHIS 2000-07 data), the rate of fair/poor SRH was significantly higher for Middle Eastern women (17.5%) compared to Middle Eastern men (9.1%) (Read & Reynolds, 2012). Furthermore, after controlling for SES, Middle Eastern men reported better SRH than Middle Eastern women and had significantly lower odds of fair/poor SRH than US-born NHW men (OR = .45, 95% CI not reported). No statistically significant differences in fair/poor SRH was found between Middle Eastern women and US-born NHW women. Sex was not a significant predictor of fair/poor SRH among Arab immigrants living in Detroit (Abdulrahim & Baker, 2009) and New York (Sarsour et al., 2010).

Socio-economic factors. Three studies examined the association between SES and SRH in Arab and Middle Eastern immigrants (Abdulrahim & Baker, 2009; J. G. Read & Reynolds, 2012; Jen'nan Ghazal Read et al., 2005). Education and income were significant predictors of fair/poor SRH of Arab immigrants living in Detroit (Abdulrahim & Baker, 2009a). The odds of fair/poor SRH among immigrants with less than a high school education were 93% higher than those with more than a high school education (OR = 1.93 [*95% CI*: 1.26-2.96]). In addition, participants with an annual household income of $20,000 or less were 2.96 times [95% CI: 1.96, 4.46] more likely to report fair/poor SRH than those with an annual household income of $20,000 or more. Using NHIS data 2000-2001, no statistically significant difference was found in SRH between Middle Eastern immigrants and US-born NHWs, controlling for SES and acculturation (Read et al., 2005). Yet, using NHIS data 2000-2007, Middle Eastern immigrants had significantly lower odds (AOR = 0.57, *95% CI* not reported) of fair/poor SRH compared to US-born NHWs after adjustments for SES, other demographic characteristics, health behaviors, and acculturation (Read & Reynolds, 2012).

Discussion

The goals of this review were to identify the rate of fair/poor SRH of Arab and Middle Eastern immigrants compared to US-born NHWs, and to determine the relationship of SRH to ethnicity, acculturation, demographic factors, and SES. Factors associated with fair/poor SRH in Arab and Middle Eastern immigrants included acculturation (language, nativity, and citizenship), demographics (age and gender), and SES (income, education, and employment). The prevalence of fair/poor SRH among Arab immigrants varied widely from 4.7% to 41% and they had the highest rate of fair/poor SRH compared to US-born Arabs and NHWs. The rate of variability in the prevalence of fair/poor SRH across studies might be due to variation in sample characteristics and the geographic location where the studies were conducted. The fair/poor SRH prevalence reported in the two national studies (13.1% and 13.3%) (Read et al, 2005; Read & Reynolds, 2012) are likely more reflective of the actual prevalence of fair/poor SRH in the Arab and Middle Eastern population in the US, and thus, more generalizable compared to the regional studies (Abdulrahim & Baker, 2009; Barkho et al., 2011; Qahoush et al., 2010; Sarsour et al., 2010). Perhaps, the wide variability was related to language, which is inextricably linked to sociocultural influences. As with other US populations, SRH in the Arab and Middle Eastern population may have different meanings for different people. One qualitative study indicated that Arabs describe their health based on the social and cultural meaning of their everyday life more than on physical and psychological aspects of their health (Abdulrahim & Ajrouch, 2010). Variables reflecting acculturation (language, nativity, and citizenship) were significantly associated with SRH of Arab and Middle Eastern immigrants. Specifically, we found that Arabic-speaking Arab immigrants had a higher rate of fair/poor SRH compared to English-speaking Arab immigrants. Compared to US-born NHWs, Arab and Middle Eastern immigrants

did not differ significantly in SRH after controlling for sociodemographic and acculturation factors. Similar to other US populations, health is associated with social determinants, and Arab immigrants are equally heterogeneous in terms of income, education, SES, etc. as their US counterparts (Asi & Beaulieu, 2013). Among the Arab and Middle Eastern population, English-speaking, being born in the US, having higher income and education, and being employed appear to be protective factors that were associated with better SRH. Reasons reported in the literature for the relationship between SRH and language and nativity in the Arab immigrant population in the US included acculturative stress and decreased healthcare utilization (Abdulrahim & Baker, 2009). It is presumed that Arabic-speaking foreign-born immigrants compared to English-speaking foreign-born Arab immigrants and US-born Arabs experience more acculturative stress that negatively influences their health and healthcare utilization due to lack of English proficiency. The effect of SES on SRH can contribute to limited resources and access to adequate and timely healthcare as well as support to promote health and health behaviors in this population. These outcomes are consistent with some research on SRH of Hispanic populations in the US (Escarce & Kapur, 2006; González, Haan, & Hinton, 2001).

In contrast, US citizenship, older age, and being female were significantly associated with fair/poor SRH, and years lived in the US did not show significant effect on SRH, indicating these factors may not be as protective for health as the previously discussed sociodemographic and acculturative factors. There is no clear evidence or explanation for why Arab citizens in the US reported lower SRH than non-citizen Arabs in the US. Length of stay in the US, however, was found to be significantly associated with SRH in other immigrant populations living in the US (Lee, O'Neill, Ihara, & Chae, 2013). The age and gender differences in SRH in the Arab and Middle Eastern population in the US was noted to be consistent with the general US population

in which adults of older age and females also have reported higher rates of fair/poor SRH (NHIS, 2014). Read and Reynlods (2012) explained that because of Arab and Middle Eastern women's traditional role of taking care of dependents and other family members, they tend to initiate contact with the healthcare system sooner and more frequent than do men, and thus, perhaps Arab women are more in tune with their SRH than are Arab men.

Limitations and Recommendations for Future Research

This review enhanced an understanding of SRH among Arab and Middle Eastern immigrants; however, it has several limitations. All the studies were cross-sectional, and thus, causality cannot be assumed. Most of the studies had small sample sizes. Data were self-reported, which might have introduced recall bias and social desirability. Acculturation, which is a multidimensional construct, was assessed from a unidimensional approach which limited a critical assessment of specific types of acculturation, such as integration to the new culture or isolation. Although a number of sociodemographic factors were explored in the reviewed studies, other factors might have provided further insight, such as ethnic identity, perceived discrimination, mental health conditions, chronic diseases, and comorbidities.

There is a need for studies that investigate whether SES or acculturation could be a stronger predictor of SRH among Arab and Middle Eastern immigrants. Future studies need to examine further the social determinants of health and ways to improve access to healthcare and increase health literacy among Arab and Middle Eastern immigrants of low SES living in the US. In addition, longitudinal studies are required to further investigate other influential factors with larger samples of Arabs. Furthermore, adding objective measures to SRH would be important to support the data available from self-reported measures. Using objective sources of data on individuals' health will help to segregate cultural and social effects that may confound self-

reports of health (Vaillant & Wolff, 2010). Finally, the most recent available literature on SRH

of Arab and Middle Eastern immigrants is from data acquired 10 years ago, which indicates a

clear need for more current research, using qualitative, quantitative, and mixed methodologies.

Conclusion

This systematic review included a total of six studies in the US. Results found wide

variability for fair//poor SRH in Arab and Middle Eastern immigrants living in the US.

Socioeconomic status, language and immigrant status appear to be important factors associated

with SRH of Arab and Middle East immigrants that may help improve evidence-based practice

with this population.

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Appendix B

Tables and Figures

Table 1. Quality Assessment Scoring.

	Design	Sampling				Measurement		Results	
	Probability Sampling	Response rate ≥50%	National/state representative sample	All participants≥ 18 years	Sample size justified	Using validated measures	Theoretical frame-work	Prevalence of SRH tested for significance	
Abdulrahim &Baker (2009)	1	1	1	1	-	1	-	1	6/8
Read et al. (2005)	1	-	1	1	-	1	-	1	55/8
Sarsour, Tong, Jaber, Talbi, & Julliard (2008)	-	-	-	-	-	1	-	-	1/8
Read, & Reynolds (2012)	1	-	1	1	1	1	1	1	7/8
Qahoush et al. (2010)	-	-	-	1	1	1	-	-	3/8
Barkho, Fakhouri, Arnetz (2010)	-	-	-	1	-	1	-	-	2/8

Note: 1=met the criteria, 0=did not meet the criteria. Adapted from Critical Review Form-Quantitative Studies by Law, M., Stewart, D., Pollock, N., Letts, L. Bosch, J., & Westmorland, M. McMaster University. Retrieved from https://www.unisa.edu.au/Global/Health/Sansom/Documents/iCAHE/CATs/McMasters_Quantitative%20review.pdf. Adapted from The Relationship Between Self-Rated Health and Acculturation in Hispanic and Asian Adult Immigrants: A Systematic Review by Lommel, L. L., & Chen, J.-L. (2015). *Journal of Immigrant and Minority Health / Center for Minority Public Health*. http://doi.org/10.1007/s10903-015-0208-y

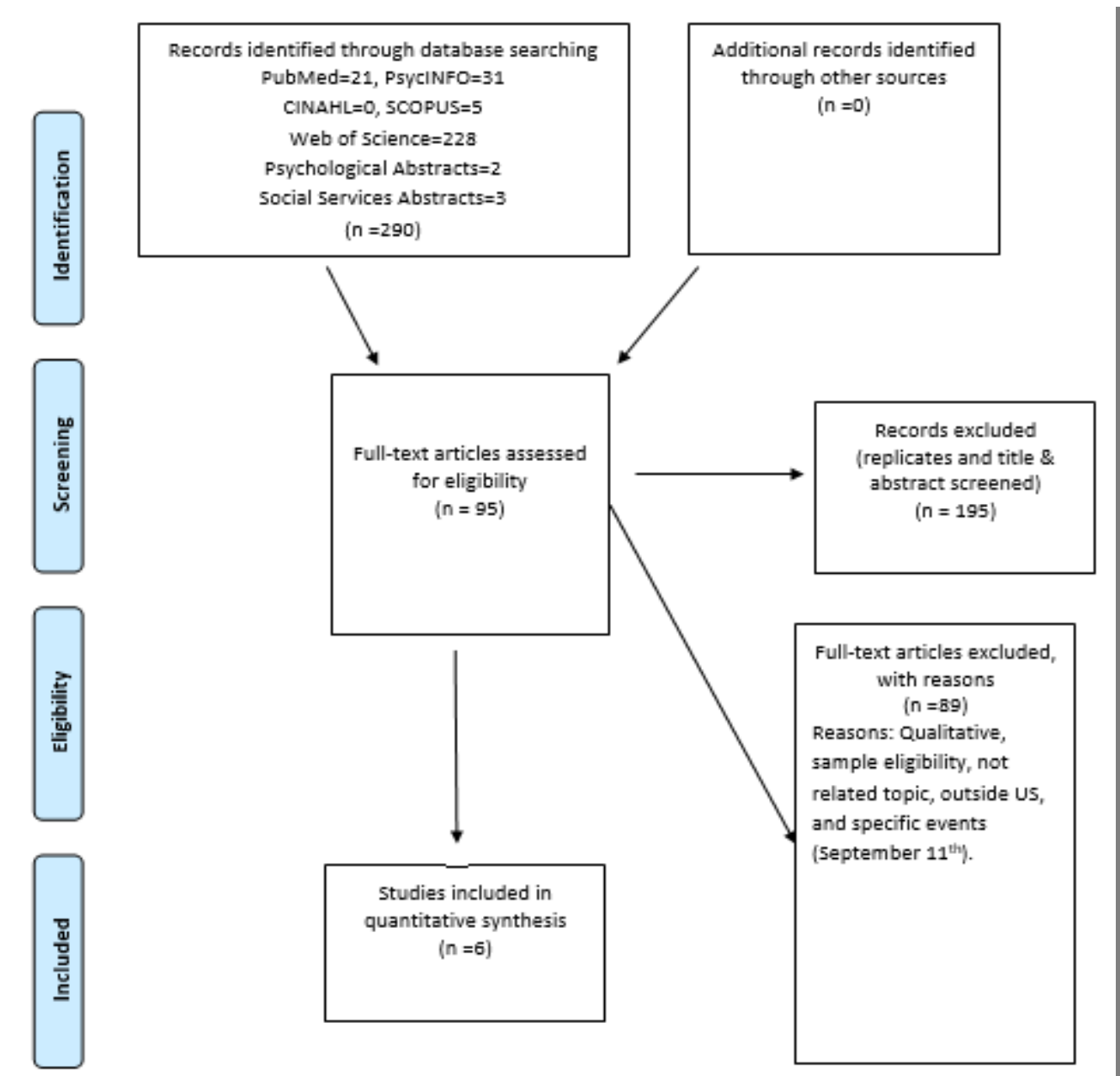*Figure 1*. PRISMA Flowchart of Search Outcomes.

Table 2. Sample Characteristics, SRH Measures, and Major Outcomes.

Authors & Year	Sample Characteristics	Measurement of SRH	Main Outcomes
Abdulrahim &Baker (2009)	1016 adult Arabs or Chaldeans in the Detroit area selected from a large study database of July-November 2003. A three-stage probability sampling design was used. Response rate73.7%. median age 39 years, 54% females, 75% immigrants, 73% had only high school education, and $30,000 to $49,000 median annual household income.	Non-comparative single question (asking respondents to rate their health as excellent, very good, good, fair, or poor).	Fair/poor SRH: the total sample: 16.12% U.S.-born Arab Americans: 4.66% English-speaking Arab immigrants: 11.03% Arabic-speaking immigrants: 27.47% Significant predictors: age, education, immigrant status and language. Non-significant factors: sex and marital status
Vaillant & Wolff (2010)	From NHIS 2000 and 2001, a total sample of 201,379 adult non-Hispanic participants (85,707 US-born whites and 481 Middle Easterners). Compared to US-born whites, Middle East immigrants had significantly lower rates of education, family income, and education, younger in age, and greater family size.	Non-comparative single question (asking respondents to rate their health as excellent, very good, good, fair, or poor).	Significantly higher rate of fair/poor SRH in the Middle East sample (13.3 to 10.9) Middle East immigrants had significantly 46% higher odds of reporting fair/poor SRH after controlling demographics and SES. No significant difference in the odds of reporting fair/poor SRH after controlling demographics and SES.
Sarsour, Tong, Jaber, Talbi, & Julliard (2008)	A convenience sample of 353 Arabs in Southern Brooklyn, New York, U.S. with 4% were 19 years or younger. 92% Arabic speaking, 78% less than 50 years old, 40% came to the U.S. after 2000, 25% unemployed, 42% live at federal poverty level, and 28% had no health insurance.	Non-comparative single question (asking respondents to rate their health as excellent, very good, good, fair, or poor).	Fair/poor SRH in Arab immigrants: 26% Significant predictors: age No significant effect of sex
Read, & Reynolds (2012)	From NHIS 2000-2007, a total sample of 155,831 adult participants (143,962 U.S.-born whites, 11,204 Mexican immigrants, and 665 Middle Eastern immigrants). Compared	Non-comparative single question (asking respondents to rate their health as excellent, very good, good, fair, or poor).	Fair/poor SRH: Middle Easterners: 13.06% U.S.-born whites: 12.51% Mexican immigrants: 12.96% Middle Eastern women: 17.45% Middle Eastern men: 9.07%

Authors & Year	Sample Characteristics	Measurement of SRH	Main Outcomes
	to U.S.-born whites, Middle Eastern immigrants had significantly higher proportion of less than high school education (16.77%, *p* value<0.01), but higher proportion of Bachelor degree or more (43.62%, *p* value<0.001), and higher proportion of young adults (47.06% were 39 years or less, *p* value<0.01).		There is no significant difference in the rate of fair/poor SRH reported by Middle Easter immigrants, U.S.-born whites and Mexican immigrants, after controlling for age and gender. Significant predictors: socioeconomic factors (education and employment), and sex. No significant effect of ethnicity
Qahoush et al. (2010)	A convenience sample of 180 adult Arab women living in Southern California, U.S., 37.3 mean age, 14.7 mean years lived in the U.S., 91.1% having high school education or higher, and 58.3 English is preferred language, 16.8% U.S.-born.	Non-comparative single question (asking respondents to rate their health as excellent, very good, good, fair, or poor).	Fair/poor SRH of Arab women: 11.2%. No examined predictors.
Barkho, Fakhouri, Arnetz (2010)	A convenience sample of 55 Iraqi immigrant women living in the DMA, 43.1 mean age, 44% had less than high school education, 89% Arabic speaking, 63% unemployed, and 60% living in the US for less than 5 years	Non-comparative single question (asking respondents to rate their health as excellent, very good, good, fair, or poor).	Fair/poor SRH in Iraqi immigrant women: 41%. Significant predictor: IPV
Abdulrahim &Baker (2009)	1016 adult Arabs or Chaldeans in the Detroit area selected from a large study database of July-November 2003. A three-stage probability sampling design was used. Response rate73.7%. median age 39 years, 54% females, 75% immigrants, 73% had only high school education, and $30,000 to $49,000 median annual household income.	Non-comparative single question (asking respondents to rate their health as excellent, very good, good, fair, or poor).	Fair/poor SRH: the total sample: 16.12% U.S.-born Arab Americans: 4.66% English-speaking Arab immigrants: 11.03% Arabic-speaking immigrants: 27.47% Significant predictors: age, education, immigrant status and language. Non-significant factors: sex and marital status

CHAPTER THREE

Serious Psychological Distress Among Middle Eastern Immigrants in The United States: A Cross-Sectional Study

Abstract

Purpose: A cross-sectional study was conducted to examine serious psychological distress (SPD), and its associated factors among Middle Eastern immigrants in the US, compared to US-born non-Hispanic White population.

Background: While Middle Eastern immigrants are a fast-growing population in the US, very little research has been done to examine their psychological health. Among this population, there are inconsistent results regarding risk factors for the development of mental health issues.

Methods: Secondary data analyses were conducted using the annual surveys of the National Health Interview Survey (NHIS) from 2001 to 2015. A total sample of 1,246 Middle Eastern immigrants and 232,392 US-born non-Hispanic Whites were included in the analyses. Descriptive statistics and regression analyses were employed to examine differences in SPD rates between Middle Eastern immigrants and US-born non-Hispanic Whites between 2001 and 2015. Factors associated with SPD including age, gender, education, income, family-related factors, health-related factors, US citizenship, and number of years lived in the US were examined among Middle Eastern immigrants.

Results: SPD prevalence was the highest among Middle Eastern immigrants (5.99%) between 2006 and 2010. For the years of 2001 to 2015, Middle Eastern immigrants had 1.51 times significantly higher risk of SPD compared to US-born non-Hispanic Whites. Among Middle Eastern immigrants, being female and being obese were significantly associated with higher risk

of SPD. Higher risk of SPD was also found among Middle Eastern immigrants who have been in contact with mental healthcare providers in the past 12 months.

Conclusion: Middle Eastern immigrants in the US suffer higher rates of SPD compared to US-born Whites. Gender and BMI are factors associated with SPD risk among Middle Eastern immigrants. These outcomes require public health policy attention. Further research is still required to uncover additional associated factors.

Keywords: Arab, Middle Eastern, immigrants, serious psychological distress.

Introduction

Background and Significance

Mental health significantly affects the overall wellbeing of individuals and communities (Shih & Simon, 2008). The Centers for Disease Control and Prevention (CDC) defines mental illness as a condition of "mood, thoughts, and/or behavior dysregulation". This condition includes characteristics identified in the Diagnostic Statistical Manual of Mental Disorders (DSM) criteria, such as sadness, hopelessness, feelings of guilt and worthlessness, lack of energy, and thoughts of suicide. The most common mental illnesses are depression, anxiety, psychological distress, and psychotic disorders (CDC, 2016). Mental illness has been associated with greater disability compared to other chronic diseases in the United States (Reeves et al., 2011). Almost one out of every four adults in the United States suffers from mental illness, and 50% of adults develop at least one mental illness throughout their lifespan (Reeves et al., 2011). Empirical evidence has shown that immigration status is one of the social and cultural determinants that influence individuals' physical and mental health (Castañeda et al., 2015). Research on mental health effects of immigration indicates a high prevalence of deleterious mental outcomes, such as depression, anxiety, stress, and post-traumatic stress disorder (PTSD) among immigrants compared to host countries' populations (Casimir et al., 2010; Fenta, Hyman, & Noh, 2004; M.-J. Lee & Liechty, 2015; Liddell et al., 2013; Snyder, 1987).

Arab and Middle Eastern immigrants have higher rates of loneliness and isolation from society, stress, depression, anxiety, and PTSD compared to other immigrant groups and host country's populations (Dallo, Kindratt, & Snell, 2013; Hassan, Rousseau, & Moreau, 2013a; Jamil et al., 2002; Norris, Aroian, & Nickerson, 2011; Povlsen, 2012; Rousseau, Hassan, Moreau, & Thombs, 2011). A report by Global Health Middle East, suggests several factors that

52

increase the risk of health disparities among Arab immigrants in the United States. These factors include immigration experience, challenges of acculturation, language barriers, discrimination, isolation from society, and marginalization due to media attention (Ghoneim, Rasoul, & Mouna, 2014).

Previous research has also linked immigration circumstances to psychological distress. These circumstances include stressors before migration, such as financial hardship, trauma, and wars, and stressors after migration, such as discrimination and lack of social support (Norris, Aroian, & Nickerson, 2011; Torres & Wallace, 2013). Serious Psychological Distress (SPD) is a status of stress suggesting a serious mental illness (Kessler et al., 2010). SPD can be identified by asking questions about depressive and anxiety symptoms, such as feeling nervous, hopeless, restless, depressed, and sad (National Comorbidity Survey, 2005). Many immigrants, including Arab Americans, report high rates of SPD (Abdulrahim, James, Yamout, & Baker, 2012; Dallo, Kindratt, & Snell, 2013a; Foster, 2001).

Serious Psychological Distress among Arab/Middle Eastern Immigrants

The number of Arab Americans has increased significantly during the past 30 years (Arab American Institute, 2015). In the last 10 years, the numbers of Arab Americans reached 3.7 million with a population growth rate of 47%. Even though Arab Americans are a fast-growing minority group in the US, research on their mental health is very limited (Sarsour, Tong, Jaber, Talbi, & Julliard, 2010). While not all Middle Eastern immigrants in the US are Arabs, all Arabs in the US are Middle Eastern immigrants. The US census and immigration statistics indicate that most immigrants from the Middle East region are Arabs (Dallo, Kindratt, & Snell,

53

2013; Read & Reynolds, 2012). Many studies use Arabs and Middle Eastern immigrants interchangeably. In this study, Middle Eastern immigrants were included as Arabs in the US. The rate of SPD among Middle Eastern immigrants in the US was 6% (Dallo et al., 2013a), and 7% among Arab immigrants (Abdulrahim et al., 2012) compared to 3% in the US general population. Using data from the Detroit Arab American Study (DAAS) in 2003, Abdulrahim et al. (2012) found a significant relationship between SPD and perceived discrimination, stratified by racial identification. The relationship was stronger among Arabs who identified themselves as white, who were Christians, who had dark/medium skin color, and who did not have Arab central ethnicity (Abdulrahim et al., 2012). Using data from the NHIS (2000-2010), Dallo et al. (2013) found that immigrants from the Middle East had significantly greater odds of reporting SPD compared to US-born whites. After adjusting for acculturation, Middle Eastern immigrants who had been living in the US for less than15 years, and were not US citizens, had significantly more than twice the odds of reporting SPD compared to foreign-born European immigrants in the US (Dallo et al., 2013a).

The literature revealed important evidence on SPD among Arab/Middle Eastern immigrants. However, the trend of SPD within the last 15 years and factors including family-related factors, such as family size, presence of children in family, and presence of individuals with a disability in the family have not been examined whether associated with increased the risk of SPD in Middle Eastern population in the US. Therefore, the goal of this study was to better understand SPD among Arab immigrants in the US in the past 15 years in a nationally representative sample. The first aim of the study was to examine changes in the rates of SPD among Middle Eastern immigrants in the US for three survey waves from 2001 to 2015, compared to US-born non-Hispanic Whites. These waves were from 2001-2005, 2006-2010, and

54

2011-2015. The second aim of the study was to compare the odds of reporting SPD among Middle Eastern immigrants in the US compared to US-born non-Hispanic White population along with examining the effect of survey years between 2001 and 2015. The third aim of the study was to investigate the associations of age, gender, income, education, family-related factors (family size, number of children in the family, and presence of individuals with a disability in the family), health-related factors (contacting a mental healthcare provider in the past year, BMI, smoking status, and drinking alcohol status), and acculturation with SPD among Middle Eastern immigrants in the US.

Methods

Data Collection

This study used data from the National Health Interview Survey (NHIS) in the years 2001 to 2015. The NHIS is the one of the largest annual surveys of non-institutionalized populations in the US (NCHS, 2014). The inclusion criteria for this study included adult first-generation Middle Eastern immigrants who have been residing in the US between 2001 and 2015. Middle Eastern immigrants comprise a very small proportion in the NHIS sample, and in previous studies that utilized data from the NHIS, the proportion of Middle Eastern immigrants to non-Hispanic whites was too small (less than 0.4 of the total NHIS sample) (Dallo & Borrell, 2006; Read & Reynolds, 2012; NHIS, 2017). Thus, this study included all the available samples of Middle Eastern immigrants in the NHIS between 2001 and 2015. Data collection for the NHIS data was approved by the NCHS Research Ethics Review Board (ERB). Analysis of de-identified data from the survey is exempt from the federal regulations for the protection of human research participants. Analysis of restricted data through the NCHS Research Data Center was also approved by the NCHS ERB.

Study Procedures

The NHIS is a primary source of data on health issues of the US populations since 1957 (CDC, 2016). The NHIS investigates different health-related issues aimed to identify major health issues in the US populations, to address areas of health disparities, to evaluate the effectiveness of healthcare programs, and to monitor the progress of achieving national health goals (CDC & U.S. Department of Health and Human Services, 2003). The NHIS collects data through interviews conducted by the US Census Bureau staff. The data were collected by in-person interviews in participants' homes. Two major types of questions are presented in the survey every year: core questions, and supplemental questions. The core questions ask major topics on households, families, adults, and children, while the supplemental questions can be added to the core questions to address more specific information on the core topics that depends on any changes in the public health atmosphere in the US (CDC & US Department of Health and Human Services, 2013). In this study, data on first-generation Middle Eastern immigrants in the US and US-born non-Hispanic Whites from three NHIS files were utilized (family file, person file, and sample adult file). The NHIS uses a stratified, multi-stage, cluster sampling technique that reduces selection bias, helps increase the representativeness of ethnic minorities, and includes participants from all regions (CDC & NCHS, 2016). In the NHIS, clusters or primary sampling units (PSUs) are nested within the strata. Detailed study procedure of the NHIS can be found in the CDC-NHIS website (CDC & NCHS, 2016).

Variables and Measures

SPD, the dependent variable, is measured in the NHIS by the Kessler-6 (K-6) scale. K-6 is used as a screening tool to assess the presence of psychological distress symptoms among adult individuals during the last 30 days (Kessler et al., 2003). A score of 13 or higher indicates SPD. K-6 has shown excellent validity in most reported studies (Ataei, Shamshirgaran, Iranparvar, Safaeian, & Malek, 2015; Kessler et al., 2003, 2010). Sensitivity of K-6 items ranges from 0.98 to 0.99, and Cronbach Alpha is 0.89 (Kessler et al., 2003). K-6 also have moderate to high test re-test correlation coefficient in different studies (Kang et al., 2015; S. Lee et al., 2012). In this study, SPD was used as a categorical variable (having SPD versus not having SPD) based on the cut-off score of K-6 scale, which is 13.

The independent variables included ethnicity (Middle Eastern immigrants versus US-born non-Hispanic Whites), sociodemographic variables, family-related variable, health-related variables, citizenship, and years lived in the US. The survey-year was developed by collapsing every five years of the 2001 to 2015 NHIS surveys. Citizenship status and years lived in the US were used as proxy measure of acculturation.US citizenship status was a categorical variable (yes/no), and years lived in the US were classified in three categories (less than five years, five to 14 years, and 15 years or more).

Family-related variables included family size (1 or 2 members, 3 or 4 members, 5 or 6 members, and above 6 members), number of children in the family, and presence of a family member who needs help with activities of daily living (yes/no). Other examined independent variables and covariates were age (18-29, 30-39, 40-49, 50-59, and ≥ 60), sex (male/female), education (< high school, high school graduate, some college, and Bachelor's degree/higher), family income ratio to federal poverty level (FPL), and health-related variables including smoking status (never, current, and former), alcohol drinking status (never, current, and former),

body mass index (normal, overweight, and obese), and seeing a mental health care professional in the past 12 months (yes/no).

Statistical Analyses

Survey analysis procedures were conducted using the SAS program on the NHIS remote access. Descriptive statistics were used to examine frequencies, proportions, and means of the variables in the study. For the first aim of the study, a domain analysis procedure was used to examine the changes in rates of SPD among Middle Eastern immigrants in three waves from 2001 to 2015, compared to US-born non-Hispanic Whites. For the second aim, logistic regression analyses were conducted to examine the significant difference in odds of reporting SPD among Middle Eastern immigrants compared to non-Hispanic US-born Whites, from 2001 to 2015. The influence of the investigated variables was examined among Middle Eastern immigrant groups using multiple regression analyses.

Sampling weights were applied to the analyses to make reliable estimates of the analysis units. This procedure is required to ensure representation of respondents and to eliminate possible effects of non-response and the post-stratification factors. The NHIS variance estimation guidance was used to develop modified variance estimation variables in the conducted procedures on SAS and SAS-SUDAAN. Because the NHIS changed sampling designs between (1997-2005) and (2006-2015), variance estimation variables were modified to develop a pooled variance for the analyzed 15 surveys. The NHIS recommends using variance approximation procedure to account for complex sample design called Taylor Series Linearization, which is set in SAS and SAS-SUDAAN-Callable procedures by default. The NHIS recommends using SAS survey analysis procedures, such as SURVEYFREQ, SURVEYMEANS, and

SURVEYLOGISTIC as not using survey analysis procedures leads to incorrect variance estimates (Moriarity, 2010).

Results

Sample Characteristics

The final number of adult Middle Eastern respondents for the 15 years (2001-2015) was 1,246. The total number of adult US-born non-Hispanic White respondents for the 15 years was 232,392. The total number of strata in the study was 639 and the total number of PSUs was 1278. Table 1 highlights main descriptions of Middle Eastern and US-born non-Hispanic White samples. A significantly greater proportion of females can be seen in the US-born Whites group (p<0.01), compared to those in the Middle Eastern group. Middle Eastern immigrants have significantly higher proportion of participants with Bachelor's degree or higher level of education (p<0.01), while they have significantly higher proportions of low levels of income ratio. Other main differences between the two populations are displayed in Table 1, such as differences in some family characteristics, including family size, number of children in the family, and presence of individuals with a disability in the family, as well as health-related variables, including contacting a mental healthcare provider in the past year, BMI, smoking status, and drinking alcohol status.

The Trends of SPD Rates

In the 2001-2005 wave, the rate of SPD was 5.23% for Middle eastern immigrants and 3.39% for US-born non-Hispanic Whites. The rate went up to 5.99% in the Middle Eastern group in 2006 to 2010 but dropped to 3.29% in US-born non-Hispanic Whites. In 2011 to 2015, the rate dropped to 4.32% in the Middle Eastern group, while it increased to 3.60% in US-born non-

Hispanic Whites (See Figure 1). These changes were not significant within each sample across the survey waves. In the Middle Eastern sample, for 2006-2010 vs. 2001-2005, p= 0.691, and for 2011-2015 vs. 2001-2005, p= 0.569. In the US-born Whites sample, for 2006-2010 vs. 2001-2005, p= 0.417, and for 2011-2015 vs. 2001-2005, p= 0.070. The survey waves did not have a significant influence on the difference of SPD risk between Middle Eastern immigrants and US-born Whites (for 2006-2010 vs. 2001-2005, p= 0.072, and for 2011-2015 vs. 2001-2005, p= 0.104).

SPD Risk among Middle Eastern Immigrants Compared to US-Born non-Hispanic Whites

For the combined 15 years, the rate of SPD among Middle Eastern immigrants was significantly higher than in US-born non-Hispanic Whites (5.10% and 3.43%, respectively [p< 0.01]). The mean of the total score of K-6 was significantly higher among Middle Eastern immigrants than in US-born non-Hispanic Whites (3.04, SD =0.154versus 2.53, SD=0.014, p= 0.001). When the influence of ethnicity on SPD risk was examined, Middle Eastern immigrants had 1.51 significantly higher odds of reporting SPD compared to US-born non-Hispanic Whites (COR= 1.51, 95%CI= 1.12-2.05).

Factors Associated with SPD among Middle Eastern Immigrants

Gender, BMI, and contacting mental health care in the past 12 months were significantly associated with higher SPD risk. Middle Eastern immigrant women had 3.18 significantly higher odds of reporting SPD compared to Middle Eastern immigrant men (95% CI= 1.50-6.77, p= 0.003) (see Table 2). Having obesity among Middle Eastern immigrants was associated with 2.38 significantly higher odds of reporting SPD compared to Middle Eastern immigrants with normal BMI (95% CI= 1.05-5.38, p= 0.038) (see Table 2). Middle Eastern immigrants who have

60

been contacting a mental healthcare provider during the last year had 6.13 significantly higher odds of reporting SPD (95% CI= 2.50-15.05, p< 0.001) (see Table 2).

Discussion

In this study, SPD was examined in a nationally representative sample of first generation Middle Eastern immigrants in the US from the NHIS between 2001 and 2015. The rates of SPD among Middle Eastern immigrants were the highest in the period between 2006 and 2010, and the lowest were between 2011 and 2015. Middle Eastern immigrants had a significantly higher rate and risk of SPD, compared to US-born non-Hispanic Whites in the combined years of 2001 to 2015. We also found that being female, being obese, and contacting a mental health professional in the past 12 months were factors that associated with the risk of having SPD among Middle Eastern immigrants.

The rates of SPD in the two samples of the study were consistent with the available literature; SPD among Middle Eastern immigrants was 6% to 7%, while it was 3% in US-born non-Hispanic whites (Abdulrahim et al., 2012; Dallo et al., 2013a). In the third survey wave (2011-2015), a decrease in the rate of SPD in Middle Eastern group was observed. The most recent available data from the literature on national rate of SPD among Middle Eastern immigrants was for 2010, while this decrease in the rate was noticed between 2011 and 2015. This improvement might be related to the influence of the Affordable Care Act (ACA), which increased populations' access to preventive, screening, and mental healthcare services (Golden & Vail, 2014). Further examination of this pattern is required to find potential factors associated with this change.

Consistent with the previous literature, Middle Eastern immigrants had significantly 1.5 higher odds of reporting SPD than US-born Whites (Abdulrahim et al., 2012; Dallo et al., 2013a;

Siddiqui, Lindblad, & Bennet, 2014; Thapa & Hauff, 2005). Previous research indicated that immigrants are at higher risk of developing psychological distress and mental illness compared to native populations (Casimir et al., 2010; Fenta, Hyman, & Noh, 2004; Foster, 2001, Hr et al., 2006; M.-J. Lee & Liechty, 2015; Liddell et al., 2013; Snyde, 1987).

Middle Eastern immigrant women reported higher risk of SPD than Middle Eastern immigrant men. While women in general suffer more psychological distress than men (Slade, Johnston, Oakley Browne, Andrews, & Whiteford, 2009), literature on immigrants' mental health showed inconsistent outcomes about gender differences in mental illness among immigrants (Kirmayer et al., 2011; Straiton, Grant, Winefield, & Taylor, 2014; Thapa & Hauff, 2005). For the case of Middle Eastern immigrants, previous literature showed that Middle Eastern immigrant women suffer higher rates of psychological distress compared to Middle Eastern immigrant men (Siddiqui et al., 2014; Thapa & Hauff, 2005). Immigrant women are vulnerable to psychological distress and mental illness due to several factors including language burdens, healthcare access burdens, isolation, abuse, and discrimination (Delara, 2016). Cultural identity is a major determinant of immigrant women's mental health; it affects their seeking of mental healthcare, as this help-seeking behavior is controlled by gender role in decision making and stigma of mental illness (Delara, 2016). Future research may need to examine the mental health of Middle Eastern immigrant women.

Obesity was associated with significantly greater risk of SPD in Middle Eastern immigrants. This finding is supported by previous literature on mental health in general and immigrant US populations. Obesity has been linked to some mental health disorders including mood and anxiety disorders as well as SPD (Borges, Benjet, Medina-Mora, & Miller, 2010; Simon et al., 2006; Singh, Rodriguez-Lainz, & Kogan, 2013; Sung, Prochaska, Ong, Shi, & Max,

2011; Zhao et al., 2009). In addition to obesity, contacting a mental healthcare professional in the past 12 months was also associated with greater risk of SPD. It is expected to see SPD reported more often among those who contact mental health services, as they would seek mental healthcare for these symptoms, and they may become more aware of their mental illness conditions.

Unlike results from previous literature on some immigrant groups and general populations (Marko, Linder, Tullar, Reynolds, & Estes, 2015; Thapa, Dalgard, Claussen, Sandvik, & Hauff, 2009), socioeconomic condition represented by education and income, and acculturation were not significantly associated with SPD risk in first-generation Middle Eastern immigrants. It might be that Middle Eastern immigrants who enter the US have previous social, political, and psychological issues, such as wars and political instability in their home countries that may contribute to their psychological wellbeing after migration, regardless of the socioeconomic conditions, length of stay in the US, or US citizenship. Further research on pre-immigration circumstances among Middle Eastern immigrants may be needed to understand this high risk of SPD.

Limitations

While the used two proxies in this study are not the strongest measures of acculturation, the NHIS assesses language as acculturation proxy only for Hispanic populations (NHIS, 2016). This is one of the limitations in the study. The NHIS and other large surveys use proxies of Unidimensional Model of Acculturation (UDMA) to evaluate immigrants' level of acculturation by assessing one dimension of change (assimilation) (Ellison, Jandorf, & Duhamel, 2011). The most common proxies for this model of acculturation are citizenship, language, immigrant status, and years lived in the host culture (Ellison et al., 2011; Schwartz, Unger, Zamboanga, &

63

Szapocznik, 2010). This approach of measuring acculturation has been criticized for the focus only on assimilation and its inability to identify bicultural immigrants who adopt two cultural values simultaneously (Berry, 2009).

Another major limitation in this study is using self-reported techniques for SPD and other examined factors, which increased the possibility of information bias. Accessing the NHIS datasets that include information about immigrants' origins is restricted by the CDC. This resulted in suppressing datasets that included variables in this study. The analysis was also limited to some survey procedures. Finally, the NHIS does not include further variables about important social and cultural factors that might contribute to the association between immigration and SPD, such as family cohesion, neighborhood safety, and a presence of cultural resources for immigrants' support.

As this study was conducted on the largest national dataset of first-generation Middle Eastern immigrants in the US, the outcomes can be generalized to this population. Because most Middle Easterners in the US are Arabs, the study results apply to Arab Americans who were born in the Middle East. However, the NHIS does not identify Arabs or Middle Easterners who were born in the US, which makes the outcomes restricted to those born in the Middle East.

Conclusion

This study adds to the current knowledge of SPD risk among immigrant populations in the US. Middle Eastern immigrants suffer higher risk of SPD compared to US-born White population. The case of first-generation Middle Eastern immigrants reflects distinct findings. While gender and BMI predicted higher risk of SPD, socioeconomic background and acculturation did not predict SPD in this population. Future research needs to address trajectories of Middle Eastern immigrants' psychological wellbeing using longitudinal studies.

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Tables and Figures

Table 1: Descriptive Characteristics.

Characteristics	Middle East Immigrants % (Weighted n)	US-born non-Hispanic Whites % (Weighted n)
Reported SPD	5.10% (14,915)	3.43% (174,7583) **
K6 score mean (SD)	3.04 (0.15)	2.53 (0.01) **
Mean age (SD)	49.4 (0.55)	41.9 (0.09) **
Age group		
18-29	20.42%	19.62% not significant
30-39	22.06%	15.98% **
40-49	20.41%	18.54% *
50-59	17.53%	18.11% not significant
≥ 60	19.58%	27.73% **
Female	47.21%	52.10% **
Marital Status		
Married	65.26%	58.49% **
Never Married	22.14%	23.86% *
Separated/Widow/Divorced	12.60%	17.66% **
Education		
< high school	19.72%	27.23% **
high school graduate	21.37%	24.30% **
some college	21.34%	25.06% **
Bachelor's degree/higher.	37.56%	23.42% **
Ratio of family income to poverty threshold		
(≥400% FPL)	30.06%	34.98% **
(≥100% and <400% FPL)	46.87%	49.96% *
(<100%FPL)	18.93%	9.31% **
Seen/talk to mental health professional in past 12 months (yes)	6.26%	8.66% not significant
Smoking status		

Characteristics	Middle East Immigrants % (Weighted n)	US-born non-Hispanic Whites % (Weighted n)
Never	63.64%	51.69% not significant
Former	18.40%	26.88% **
Current	17.95%	21.44% *
Alcohol status		
Never	42.88%	16.23% **
Former	7.56%	16.80% **
Current	49.57%	66.97% **
Years lived in the US (only for Middle East)		
< 5 years	19.27%	
5 - 14 years	27.43%	
≥ 15 years	53.30%	
U.S Citizen (only for Middle East) (yes)	62.13%	
Family size		
1 or 2 members	38.60%	42.44% **
3 or 4 members	36.15%	37.04% not significant
5 or 6 members	17.17%	13.80% **
> 6 members	8.08%	6.72% **
Number of family members <18		
≤ 1	66.41%	64.31% not significant
2 or 3	26.14%	29.14% **
4 or 5	5.85%	5.65% not significant
> 5	1.60%	0.89% not significant
Any family member need help w/ADL (yes)	5.26%	3.74% **

Notes: Weighted frequencies are shown for the two sub-samples (Middle East-born immigrants) and (US-Born non-Hispanic Whites) from the NHIS 2001-2015. (N =233,638 of the 15 years' sample). * P value <0.05. ** P value <0.01

Figure 1: Trends of SPD Rates.
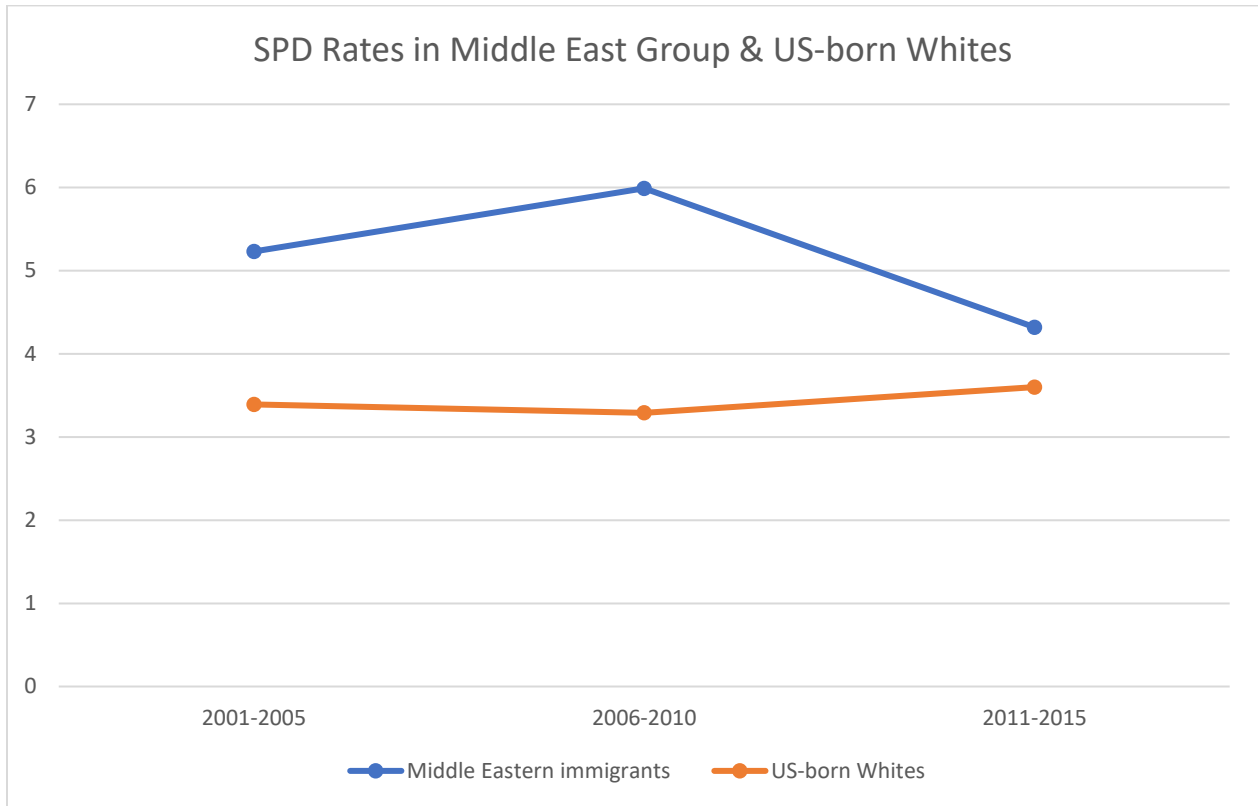
Table 2: Odds Ratios, *P* Values, and 95% CI of Reporting SPD.

Covariates	OR	P Value	95% CI
Age group		0.232	
18-29	1.00		
30-39	0.86	0.826	0.22-3.37
40-49	3.00	0.103	0.80-11.29
50-59	2.52	0.125	0.77-8.19
60+	3.49	0.050	1.00-12.16
Sex		0.003	
Male	1.00		
Female	3.18	0.003	1.50-6.77
Education level		0.233	
< high school	1.00		
high school graduate	1.50	0.506	0.46-4.93
some college	0.76	0.681	0.21-2.79
Bachelor's degree/higher	2.11	0.195	0.68-6.54
Income ratio to FPL	1.02	0.845	0.85-1.23
Seeing a mental healthcare provider in the past year		<0.001	
No	1.00		
Yes	6.13	<0.001	2.50-15.05
BMI		0.000	
Normal	1.00		
Overweight	0.51	0.080	0.24-1.08
Obese	2.38	0.038	1.05-5.38
Smoking status		0.398	
Never	1.00		
Former	1.62	0.287	0.67-3.91
Current	1.61	0.297	0.66-3.92
Alcohol drinking status		0.521	
Never	1.00		
Former	0.73	0.633	0.20-2.68
Current	0.64	0.254	0.30-1.38

Covariates	OR	P Value	95% CI
Presence of member needs help with ADL		0.184	
No	1.00		
Yes	2.14	0.184	0.70-6.55
Number of Children in the family	0.57	0.398	0.15-2.12
Family size		0.842	
1 or 2 members	1.00		
3 or 4 members	1.35	0.466	0.60-3.05
5 or 6 members	1.70	0.480	0.39-7.39
> 6 members	1.27	0.844	0.12-13.54
Years lived in the US		0.612	
< 5 years	1.00		
5 - 14 years	1.08	0.885	0.38-3.08
≥ 15 years	0.62	0.508	0.15-2.59
US citizenship		0.241	
No	1.00		
Yes	1.86	0.241	0.66-5.22

CHAPTER FOUR

Self-Rated Health Among Middle Eastern Immigrants in The United States: Across Sectional Study

Abstract

Purpose: A cross-sectional study was conducted on nationally representative data to examine self-rated health (SRH) among first generation Middle Eastern immigrants in the US compared to US-born non-Hispanic Whites between 2001 and 2015, and to examine factors associated with fair/poor SRH among Middle Eastern immigrants in the US.

Background: Previous research indicated that Middle Eastern immigrants in the US reported high rates of fair/poor SRH, and revealed various factors affecting their SRH. However, literature lacks national data to track the rate of SRH and to identify factors associated with fair/poor SRH within first generation Middle Eastern immigrants.

Methods: Secondary data analyses were conducted on the 2001-2015 waves of the annual National Health Interview Survey (NHIS). A sample of 3,966 Middle Eastern and 731,285 US-born non-Hispanic Whites were included in the analyses. Using survey analysis procedures, descriptive statistics and regression analyses were conducted to examine fair/poor SRH among Middle Eastern immigrants compared to US-born non-Hispanic Whites in three periods between 2001 and 2015. Associated factors including age, gender, education, family-related factors, health-related factors, and acculturation were also examined among Middle Eastern immigrants using multiple regression analyses.

Results: Middle Eastern immigrants had significantly higher rates of fair/poor SRH than US-born Whites across the three survey waves. The highest rate among the Middle Eastern group (12.62%) was observed in the wave of 2011-2015. For the combined years (2001-2015), Middle

Eastern immigrants had 1.24 significantly higher odds of reporting fair/poor SRH compared to US-born Whites. Reporting symptoms of serious psychological distress (SPD), older age (60+), current alcohol drinking status, and having a family member with disability were factors associated significantly with higher odds of reporting fair/poor SRH in first generation Middle Eastern immigrants, while education was significantly associated with lower risk of fair/poor SRH.

Conclusion: Middle Eastern immigrants in the US have significantly higher rates of fair/poor SRH compared to US-born Whites. SPD, older age, alcohol drinking status, and having a family member with disability were factors associated with higher fair/poor SRH risk among Middle Eastern immigrants. This study indicates that Middle Eastern immigrants are one of US immigrant populations that need health policy attention to reduce health disparities.

Keywords: Arab, Middle Eastern, immigrants, self-rated health.

Introduction

Background and Significance

Arab immigration to the US has been growing very fast during the past 30 years. Recent population estimates are around 3.7 million, with a growth rate of 47% between 2000 and 2010 (Arab American Institute, 2015). Arab immigrants originally come from Arab countries in the Middle East and North Africa (MENA). In general, while immigrants from the Middle East have higher rates of high education compared to the US-born population ("AANM-ArabAmericansBooklet-web.pdf," n.d.), they reported some poor health behaviors and chronic diseases that may affect their self-rated health (SRH), such as physical inactivity, anxiety and depression, diabetes, hypertension, ischemic heart disease and cancer (Dallo, Schwartz, Ruterbusch, Booza, & Williams, 2012; El-Sayed & Galea, 2009; Hatahet, Khosla, & Fungwe, 2002; Qahoush, Stotts, Alawneh, & Froelicher, 2010; Read & Reynolds, 2012; Siddiqui, Lindblad, & Bennet, 2014).

Self-rated health is a key indicator of individuals' health behavior and outcomes (Rohrer, Young, Sicola, & Houston, 2007). The single question of SRH has been used globally as an outcome measure in different health research studies and programs (Spears, 2012; Wu et al., 2013). SRH is a strong predictive measure of mortality and morbidity (DeSalvo, Bloser, Reynolds, He, & Muntner, 2006; Kawada, 2003; Todorova et al., 2013). Research on SRH of different ethnic and racial groups showed significant variations on health outcomes in the US. For example, racial minority populations report worse health status compared to the general population (Fatma et al., 2013; Gibbons & Barton, 2016; Santos-Lozada, 2016). Research on factors affecting SRH of ethnic minorities in the US found that income, education, and employment are significant predictors of SRH (Kraus, Adler, & Chen, 2013; Liu & Hummer, 2008; Suresh, Sabanayagam, & Shankar, 2011). Better SES including employment and education

are significantly associated with better SRH (Bombak & Bruce, 2012; Kaleta, Makowiec-Dabrowska, & Jegier, 2008; Prins & Monnat, 2015; Sacker, Wiggins, Bartley, & McDonough, 2007).

Self-Rated Health among Arab/Middle Eastern Immigrants

Rates of fair/poor SRH among Arab and Middle Eastern immigrants in the US in previous research studies varied widely from 4.7% to 41% (Abdulrahim & Baker, 2009; Barkho, Fakhouri, & Arnetz, 2011; Qahoush et al., 2010; Sarsour, Tong, Jaber, Talbi, & Julliard, 2010). The prevalence was reported around 13% in nationally representative studies (Read et al, 2005; Read & Reynolds, 2012). Literature on factors influencing SRH of Arab and Middle Eastern immigrants found that some proxies of acculturation significantly predicted their SRH; US nativity (immigrant status: US-born) and English speaking significantly predicted better SRH, while US citizenship predicted opposite patterns (worse SRH), and number of years lived in the US was not a significant predictor of SRH (Abdulrahim & Baker, 2009; Read, Amick, & Donato, 2005; Sarsour et al., 2010). Previous research on the effect of acculturation on SRH of Asian and Latino immigrants in the US found that US nativity and limited English proficiency were associated with worse SRH (Lommel & Chen, 2015). These outcomes suggest how the effect of acculturation may take different directions on immigrants' health. Higher income, education, and employment predicted better SRH of Arab and Middle Eastern immigrants (Abdulrahim & Baker, 2009).

Previous research on Arab/Middle Eastern immigrants established some evidence on factors predicting higher or lower risk of fair/poor SRH. However, rates of fair/poor SRH varied widely in this population, while no previous studies examined the trends of these rates nationally. Moreover, most of these studies did not focus on first generation Middle Eastern immigrants as a

distinct group; they either compared them based on nativity or did not differentiate their nativity. Further factors including family-related factors such as family size, presence of children in family, and presence of individuals with a disability in the family have not been examined in previous studies on SRH of Middle Eastern immigrants. Literature indicated that immigrant families have special circumstances that affect the overall health of their members, such as the process of transition and adjustment to a new society and culture, changes in the roles of family members, and new financial responsibilities. These conditions have been linked to greater risk of physical and mental health problems among immigrants (Grewal, Bottorff, & Hilton, 2005). Therefore, the purpose of this study was to better understand SRH among Arab immigrants in the US in the past 15 years in a nationally representative sample.

The study aims were (1) to examine trends of fair/poor SRH among Middle Eastern immigrants in the US compared to US-born non-Hispanic Whites for three survey waves from 2001 to 2015 (2) to compare the odds of reporting fair/poor SRH among Middle Eastern immigrants in the US to US-born non-Hispanic White population, besides examining the effect of survey years between 2001 and 2015, and (3) to investigate the associations of variables including age, gender, income, education, family-related factors (family size, number of children in the family, and presence of individuals with a disability in the family), health-related factors (contacting a mental healthcare provider in the past year, BMI, smoking status, and drinking alcohol status), and acculturation with fair/poor SRH among Middle Eastern immigrants in the US.

Methods

Sample

82

We used data from the National Health Interview Survey (NHIS). This survey provides annual data on the health of the US population. It is used for assessing population health, monitoring progress of national health programs, and tracking health behaviors and outcomes (Centers for Disease control and prevention [CDC], 2017). Inclusion criteria for this study were adult aged 18 and above, and self-identified as first-generation Middle Eastern immigrants in the US or US-born non-Hispanic Whites. Because Middle Eastern immigrants account for a small fraction of the NHIS sample in each wave, all the available Middle Eastern immigrants from 2001 to 2015 were included without the need for power analysis (Dallo & Borrell, 2006; Read & Reynolds, 2012; CDC, 2017). Data collection for the NHIS data was approved by the NCHS Research Ethics Review Board (ERB). Analysis of de-identified data from the survey is exempt from the federal regulations for the protection of human research participants. Analysis of restricted data through the NCHS Research Data Center was also approved by the NCHS ERB.

Study Procedures

Following complex sampling design techniques, the NHIS conduct their household interviews throughout the year. The design follows a multi-stage area probability selection that assures selecting the appropriate number of Primary Sampling Units (PSUs) based on population density in these units. PSUs are nested within clusters; each PSU can be a county or a small group of adjacent counties (CDC, 2017). The NHIS collects data through interviews conducted at participants' homes by the US Census Bureau staff. One responsible adult in the household is interviewed to provide the required data for the survey including data on adults, children, family, and household (CDC, 2017). More information about sampling design and data collection

procedures can be found on the main page of NHIS website:

https://www.cdc.gov/nchs/nhis/about_nhis.htm

Variables and Measures

The outcome in the study was SRH. It is measured in the NHIS by the one question that asks individuals to rate their health by choosing one of five Likert scale answers (excellent, very good, good, fair, or poor). SRH measure has been widely tested and validated for individuals' health status, and has been considered a predictor of mortality and morbidity (DeSalvo et al, 2006; Kawada, 2003; Todorova et al., 2013). The independent variables examined in the study were ethnicity (Middle Eastern immigrants versus US-born non-Hispanic Whites), the survey years (2001-2005, 2006-2010, and 2011-2015), and two proxies of acculturation: citizenship status (yes/no), and years lived in the US (less than years, five to 14 years, and 15 years or more).

Other independent factors examined in this study included family-related variables, age, sex, education, income, some health behaviors (smoking, alcohol drinking, body mass index, and mental health care history). Family-related variables included family size, number of children in the family, and presence of a family member needs help with activities of daily living (yes/no). Age was categorized as 18-29, 30-39, 40-49, 50-59, and ≥ 60, sex was categorized as male/female, education was categorized as < high school, high school graduate, some college, and Bachelor's degree/higher, family income was determined as ratio to federal poverty level (FPL), smoking status was categorized as never, current, and former, alcohol drinking status was categorized as never, current, and former, body mass index was categorized as normal,

overweight, and obese, and seeing a mental health care professional in the last year was determined as yes/no.

Statistical Analyses

The NHIS sampling design requires following special weighting adjustment in the data analysis procedures. Adjusted weighting variables for the combined 15 years in person, sample adult, and family files were used. Appropriate variance estimation variables of pooled 15 years for the included PSUs and strata in the study were employed. SAS survey procedures were used to conduct descriptive analysis to examine frequencies, proportions, and means. The domain analysis in survey procedures was used, and changes in rates of fair/poor SRH were tracked among Middle Eastern immigrants in 2001-2005, 2006-2010, and 2011-2015, compared to US-born non-Hispanic Whites. A survey logistic regression analysis was conducted to examine the odds of reporting fair/poor SRH among Middle Eastern immigrants compared to non-Hispanic US-born Whites, and to investigate the influence of tested covariates on SRH of Middle Eastern immigrants. Taylor Series Linearization was used in the procedures to account for appropriate variance estimation. Statistical analyses were conducted using SAS program, and p value was set at a 0.05 significance level.

Results

Sample Characteristics

The final number of adult Middle Eastern respondents for the 15 years (2001-2015) in this study was 3,966, and the total number of adult US-born non-Hispanic White respondents for the same period was 731,285. The total number of strata in the study was 639 and the total number of PSUs was 1278. Table 1 shows descriptive characteristics of the two samples in the study. US-born non-Hispanic Whites had significantly higher proportion of females (p<0.01)

85

than Middle Eastern immigrants. Middle Eastern immigrants had significantly higher proportion of adults with Bachelor's degree or higher, and lower proportion of adults with less than high school education, (p<0.01) than US-born non-Hispanic Whites. They have significantly higher proportions of low levels of income ratio. Middle Eastern immigrants were also significantly younger in age, and have significantly higher proportion of individuals with SPD (p<0.001). Other differences in the characteristics of the two samples are displayed in Table 1.

The Trends of Fair/Poor SRH Rates

In the first examined survey wave (2001-2005), the rate of fair/poor SRH was 11.31% in Middle Eastern immigrants and 8.92% among US-born non-Hispanic Whites. The rate declined to 10.34% in the Middle Eastern group in 2006 to 2010 (p value= 0.538), while it went up significantly to 9.45% among US-born non-Hispanic Whites (p value<0.001). The rate increased to 12.62% in the Middle Eastern group in the second wave from 2011 to 2015 (p= 0.379), and increased significantly to 10.08% in US-born non-Hispanic Whites (p<0.001) (see Figure 1). These changes were significant in US-born non-Hispanic Whites across the survey waves (p<0.001); however, they were not significant in the Middle Eastern group. The survey waves had a significant influence on the difference of SPD risk between Middle Eastern immigrants and US-born Whites (for 2006-2010 vs. 2001-2005, p<0.001, and for 2011-2015 vs. 2001-2005, p<0.001).

Risk of Low SRH Among Middle Eastern Immigrants Compared to US-Born non-Hispanic Whites

Middle Eastern immigrants had 1.24 significantly higher odds of reporting fair/poor SRH compared to US-born non-Hispanic Whites, in the 15 years combined (95%CI= 1.09-1.41, p=

0.001). The rate of fair/poor SRH for the 15 years was also significantly higher among Middle Eastern immigrants (11.49%), compared to US-born non-Hispanic Whites (9.47%, p= 0.001).

Factors Associated with SPD among Middle Eastern Immigrants

Analysis revealed that SPD, age, alcohol drinking, and having a family member needs help with an ADL were associated with higher risk of fair/poor SRH, while higher education was associated with lower risk of fair/poor SRH among first generation Middle Eastern immigrants in the US between 2001 and 2015 (see Table 2). Middle Eastern immigrants who reported having symptoms of SPD had almost three times significantly higher odds of reporting fair/poor SRH than those who did not have SPD (OR= 2.99, 95% CI= 1.40-6.41, p= 0.005). Older age was also a significant predictor of low SRH; Middle Eastern immigrants who were 60 years old or above had 3.52 significantly higher odds of reporting fair/poor SRH, compared to those 18 and 29 years old (95% CI= 1.28-9.67, p= 0.015). Those who reported that they currently consume alcohol had 2.37 significantly higher odds of reporting fair/poor SRH than alcohol abstainers (95% CI= 1.29-4.33, p= 0.005), and having a family member needs help with an ADL was associated with 4.46 significantly higher odds of reporting fair/poor SRH (95% CI= 1.37-14.49, p<0.001). Higher education levels were associated with lower risk of fair/poor SRH compared to having less than high school education; high school graduates had 61% significantly lower risk of reporting fair/poor SRH (95% CI= 0.21-0.71, p= 0.002), having some college degree was associated with 64% significantly lower risk of reporting fair/poor SRH (95% CI= 0.18-0.74, p= 0.006), and having Bachelor's degree or higher was associated with 80% significantly lower risk of reporting fair/poor SRH (95% CI= 0.10- 0.42, p<0.001) among Middle Eastern immigrants.

Discussion

We examined SRH in a nationally representative sample of first generation Middle

Eastern immigrants and US-born non-Hispanic Whites between 2001 and 2015. The highest

rates of fair/poor SRH in both samples were noticed in the period between 2011 and 2015. For

the combined 15 years, Middle Eastern immigrants had 1.24 higher risk of fair/poor SRH than

US-born Whites. We found that having symptoms of SPD, being age 60 or older, being a current

alcohol drinker, and having someone in the family with disability were associated with

significantly higher risk of fair/poor SRH among Middle Eastern immigrants, while education

showed a significant protective effect on the risk of fair/poor SRH.

A significant increase in the rate of fair/poor SRH was observed among US-born non-

Hispanic Whites across the three survey periods, while Middle Eastern immigrants had a drop in

the rate between 2006 and 2010, but then the rate increased to the highest level in the last period

(2011-2015). Tracking the trends of SRH in the US population have shown some discrepancies;

however, the increase in rates of fair/poor SRH was reported in some national surveys, such as

the Behavioral Risk Factor Surveillance system between 1993 and 2007. These discrepancies in

the rates condensed after adjusting for age, education, and ethnicities (Salomon, Nordhagen,

Oza, & Murray, 2009). Although previous literature reported wide variations in rates of fair/poor

SRH among Arab and Middle Eastern immigrants, the national studies on first generation Middle

Eastern immigrants reported rates around 13% (Read & Reynolds, 2012; Read et al., 2005).

Despite healthcare policy improvements in the few recent years, such as implanting plans of the

Affordable Care Act, some previous research indicated deterioration of US immigrants' health,

possibly due to increased sociopolitical tension and anti-immigration attitudes in some US

communities (Hall & Cuellar, 2016; *The New Americans*, 1997). Previous research that

compared SRH between Middle Eastern immigrants and US-born Whites indicated significantly

higher risk of fair/poor SRH among Middle Eastern immigrants (Read et al., 2005). This could

be explained by outcomes of previous research that first generation Middle Eastern immigrants

lack the "healthy immigrant effect," and they have poor general health status compared to the

general US population (El-Sayed & Galea, 2009; Read et al., 2005).

Middle Eastern immigrants who reported having SPD symptoms were at significantly

higher risk of fair/poor SRH compared to those who did not report SPD. There is substantial

evidence on the robust relationship between psychological wellbeing and self-assessed health;

studies found that individuals who report psychological distress, including SPD, have higher risk

of fair/poor SRH (Amstadter et al., 2010; Krieger, Kosheleva, Waterman, Chen, & Koenen,

2011; Torres & Wallace, 2013). Mental health theories also support the fundamental link

between mental illness and chronic physical symptoms, such as cognitive behavioral theory

(White, 2001). We also found that Middle Eastern immigrants who were 60-year-old or above

had significantly higher risk of fair/poor SRH compared to younger ages. This outcome is

consistent with previous research on the relationship between aging and poor self-assessed health

in immigrants and general populations (Arnadottir, Gunnarsdottir, Stenlund, & Lundin-Olsson,

2011; Kawada et al., 2009; Molarius et al., 2007; Wu et al., 2013). While many previous studies

attributed this decline in SRH to the aging process and declining functionality, some other

studies showed opposite outcomes regarding the effect of aging on subjective health assessment.

These studies were based on the "social comparison theory" that suggest people of older ages

tend to rate their health status based on other their age peers' health and norms, which results in

an optimistic assessment of their own health status (better SRH), and lower correlation with

objective health markers (Schnittker, 2003).

In this study, current alcohol drinking status was significantly associated with higher risk of fair/poor SRH among Middle Eastern immigrants. This outcome was consistent with previous research outcomes (Demirchyan, Petrosyan, & Thompson, 2012) on negative influence of alcohol drinking on SRH, including harmful drinking patterns (Jepsen, Dogisso, Dysvik, Andersen, & Natvig, 2014). We also found that having a person in the family who needs help with an ADL was a significant predictor of reporting fair/poor SRH among Middle Eastern immigrants. Significant poor physical and mental health outcomes, including low SRH, depression, anxiety, musculoskeletal disease, and heart disease were found among individuals who provide care to a family member with disability (Lu, Chiou, Chen, & Hsiao, 2016; Pinquart & Sörensen, 2003). A possible explanation for these poor outcomes is that caregivers in families devote a great deal of time caring for the disabled family member, which impacts the quality time they spend in taking care of their personal needs. Emotional distress also has been connected to the presence of disabled individuals in families. Moreover, complex health insurance plans for disabled individuals, expensive home healthcare plans, and quick hospital discharge plans increased pressure and responsibilities on families with disabled individuals, which negatively affected the SRH of family members (Family Caregiver Alliance, 2006).

Finally, we found that education was the only socioeconomic significant predictor of lower fair/poor SRH risk among Middle Eastern immigrants. Evidence on the robust relationship between education and self-assessed health is well-established (Adler et al., 1994; Kitagawa, 1973; Prins & Monnat, 2015). Unlike previous literature on some immigrant populations (Lee, O'Neill, Ihara, & Chae, 2013), years lived in the US and citizenship were not associated with SRH of first-generation Middle Eastern immigrants in this study. A previous national study on first generation Middle Eastern immigrants found no significant effect of years lived in the US

on their SRH, while having US citizenship was associated with poor SRH (Read et al., 2005).

This pattern could be best explained by lacking "immigrant health effect" among this population;

previous literature on the health of first generation Arab and Middle Eastern immigrants

indicated that these immigrants might come to the US with existing poor health status or lacking

protective health behavior patterns, such as physical activity, and consuming healthy food (El-

Sayed & Galea, 2009; Siddiqui et al., 2014).

Limitations

Although we used the largest national dataset on Middle Eastern immigrants in the US,

there were some limitations related to using this survey, such as limitations of secondary data

analysis including the lack of further variables needed to be investigated. For example, there

were no more than two proxies to measure acculturation in the survey. Studying important social

and psychological patterns of immigrants' health requires more than two acculturation indicators

to find significant evidence. While the single question of SRH is considered a strong indicator of

individuals health, some research still finds that this question could be contaminated by the effect

of younger age, lower education levels, and its cultural meaning in different minorities and

immigrant groups SRH and other examined factors (Abdulrahim & Ajrouch, 2010; Schnittker,

2003). The dataset that we accessed included information about immigrants' origins, which is

restricted by the CDC to ensure confidentiality.

The outcomes of this study can be generalized to first-generation Middle Eastern

immigrants in the US, since these data were gathered from the single and largest national dataset

on this population. Because most Middle Easterners in the US are Arabs, the study results apply

to Arab Americans who were born in the Middle East. However, the NHIS does not identify

Arabs or Middle Easterners who were born in the US, which makes the outcomes restricted to whom were born in the Middle East.

Conclusion

The outcomes of this study have important implication on immigrants' healthcare policy. The health of first-generation Middle Eastern immigrants is not affected by some acculturation predictors. In contrast, their mental wellbeing and socioeconomic status are factors which require more attention. This study adds to the current knowledge of SRH of Middle Eastern immigrants in the US. This population has been suffering higher rates of fair/poor SRH compared to the US-born White population; however, trajectories of these findings need further investigation using longitudinal research. Immigrants' health policy needs to focus on their vulnerabilities. For example, the outcomes indicated the need to increase access to mental health screening and care among immigrant populations, and increase the awareness of their physical and mental status.

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Tables and Figures

Table 1: Descriptive Characteristics.

Characteristics	Middle East Immigrants % (Weighted n)	US-born non-Hispanic Whites % (Weighted n)
Reported fair/poor SRH	11.49% (117942)	9.47% (16777223) **
Mean age (SD)	49.4 (0.55)	41.9 (0.09) **
Age group		
18-29	20.42%	19.62% not significant
30-39	22.06%	15.98% **
40-49	20.41%	18.54% *
50-59	17.53%	18.11% not significant
≥ 60	19.58%	27.73% **
Female	47.21%	52.10% **
Marital Status		
Married	65.26%	58.49% **
Never Married	22.14%	23.86% *
Separated/Widow/Divorced	12.60%	17.66% **
Education		
< high school	19.72%	27.23% **
high school graduate	21.37%	24.30% **
some college	21.34%	25.06% **
Bachelor's degree/higher.	37.56%	23.42% **
Ratio of family income to poverty threshold		
(≥400% FPL)	30.06%	34.98% **
(≥100% and <400% FPL)	46.87%	49.96% *
(<100%FPL)	18.93%	9.31% **
Seen/talk to mental health professional in past 12 months (yes)	6.26%	8.66% not significant
Smoking status		

Characteristics	Middle East Immigrants % (Weighted n)	US-born non-Hispanic Whites % (Weighted n)
Never	63.64%	51.69% not significant
Former	18.40%	26.88% **
Current	17.95%	21.44% *
Alcohol status		
Never	42.88%	16.23% **
Former	7.56%	16.80% **
Current	49.57%	66.97% **
Years lived in the US (only for Middle East)		
< 5 years	19.27%	
5 - 14 years	27.43%	
≥ 15 years	53.30%	
U.S Citizen (only for Middle East) (yes)	62.13%	
Family size		
1 or 2 members	38.60%	42.44% **
3 or 4 members	36.15%	37.04% not significant
5 or 6 members	17.17%	13.80% **
> 6 members	8.08%	6.72% **
Number of family members <18		
≤ 1	66.41%	64.31% not significant
2 or 3	26.14%	29.14% **
4 or 5	5.85%	5.65% not significant
> 5	1.60%	0.89% not significant
Any family member need help w/an ADL (yes)	5.32%	3.54% **
Reported SPD	5.10% (14,915)	3.43% (174,7583) **

Notes: Weighted frequencies are shown for the two sub-samples (Middle East-born immigrants) and (US-Born non-Hispanic Whites) from the NHIS 2001-2015. (N =233,638 of the 15 years' sample). *   P value <0.05. ** P value <0.01

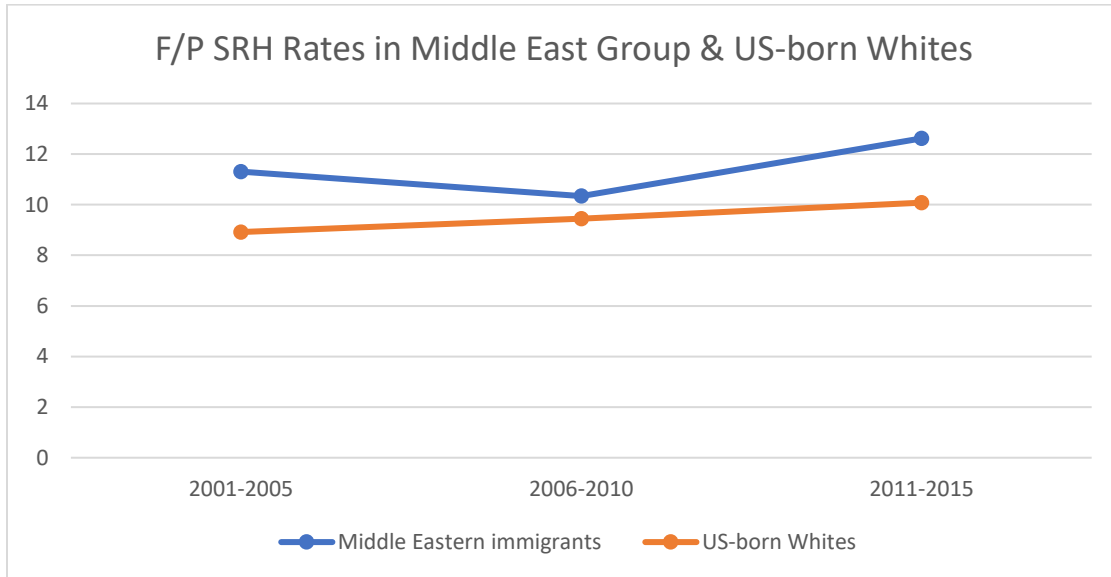*Figure 1*: Trends of Fair/Poor SRH Rates.

F/P SRH Rates in Middle East Group & US-born Whites

Table 2: Odds Ratios, *P* Values, and 95% CI of Reporting Fair/Poor SRH.

Covariates	OR	P Value	95% CI
SPD		0.005	
No	1.00		
Yes	2.99	0.005	1.40-6.41
Age group		0.089	
18-29	1.00		
30-39	1.93	0.143	0.80-4.62
40-49	1.64	0.293	0.65-4.11
50-59	1.47	0.444	0.55-3.97
60+	**3.52**	0.015	1.28-9.67
Sex		0.817	
Male	1.00		
Female	0.94	0.817	0.55-1.61
Education level		<0.001	
< high school	1.00		
high school graduate	0.39	0.002	0.21-0.71
some college	0.36	0.006	0.18-0.74
Bachelor's degree/higher	0.20	<0.001	0.10- 0.42
Income ratio to FPL	0.96	0.099	0.92-1.01
Seeing a mental healthcare provider in the past year		0.899	
No	1.00		
Yes	1.07	0.899	0.37-3.07
BMI		0.471	
Normal	1.00		
Overweight	1.37	0.310	0.75-2.53
Obese	0.92	0.824	0.42-2.01
Smoking status		0.675	
Never	1.00		
Former	1.00	0.995	0.53-1.89
Current	0.72	0.388	0.34-1.53
Alcohol drinking status		0.027	
Never	1.00		
Former	1.14	0.825	0.35-3.74

Covariates	OR	P Value	95% CI
Current	2.37	0.005	1.29-4.33
Presence of member needs help with ADL		<0.001	
No	1.00		
Yes	4.46	<0.001	1.37-14.49
Number of Children in the family	0.89	0.741	0.43-1.82
Family size		0.500	
1 or 2 members	1.00		
3 or 4 members	0.77	0.439	0.39-1.51
5 or 6 members	1.14	0.821	0.36-3.65
> 6 members	2.12	0.330	0.47-9.53
Years lived in the US		0.297	
< 5 years	1.00		
5 - 14 years	0.48	0.132	0.18-1.25
≥ 15 years	0.49	0.153	0.18-1.30
US citizenship		0.457	
No	1.00		
Yes	0.77	0.457	0.38-1.54

CHAPTER FIVE

Conclusion, Implications, and Future Research Recommendations

Summary of the Findings

This dissertation sought to investigate two important physical and mental health aspects of Arab immigrants' life in the United States (US) including self-rated health (SRH) and serious psychological distress (SPD). SRH is an important indicator of morbidity and mortality of populations (Abdulrahim & Ajrouch, 2010; DeSalvo, Bloser, Reynolds, He, & Muntner, 2006; Kawada, 2003; Todorova et al., 2013), and SPD is a key indicator of a serious mental illness (Kessler et al., 2010). However, little is known about the prevalence of poor SRH and SPD and factors associated with these important health indicators among Arab and Middle Eastern immigrants. This dissertation study addresses these specific gaps identified in the literature.

In the systematic review of SRH for Arab and Middle Eastern immigrants, the rates of fair/poor SRH and the associated factors with the risk of reporting fair/poor SRH in this population were examined. After applying inclusion and exclusion criteria and following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, six studies were included in the analysis. The rates of fair/poor SRH among Arab and Middle Eastern immigrants ranged widely from 4.7% to 41%. This variability was probably related to the variations in sample characteristics in the studies; four of these studies were conducted in different local communities in the US that vary in their socioeconomic characteristics. In the two national studies on SRH of Middle Eastern immigrants, rates of fair/poor SRH were approximately 13% (Read et al, 2005; Read & Reynolds, 2012), which most likely reflected an actual rate of fair/poor SRH in Arab and Middle Eastern immigrants.

The factors associated with the risk of fair/poor SRH identified include acculturation proxies (language, nativity, and citizenship), and background and socioeconomic conditions included age, gender, income, education, and employment. English speaking and US nativity predicted better SRH among Arab immigrants, while US citizenship was associated with higher risk of fair/poor SRH. Of the two national studies, one (NHIS data 2000-2007) found that when adjusting for socioeconomic conditions, Middle Eastern immigrant men reported significantly better SRH than US-born white men, while this advantage was not seen among Middle Eastern women (Read & Reynolds, 2012). On the other hand, in the national study on the NHIS data (2000-2001), Middle Eastern immigrants reported significantly lower SRH compared to US-born Whites even after controlling for age, gender, and socioeconomic conditions (Read, Amick, & Donato, 2005).

This systematic review also identified some inconsistencies in the findings of these studies, including the influence of gender, ethnicity, and years lived in the US. The studies included in the review examined data that are over 7-10 years old, and no study has tracked change of SRH over the last 15 years. Thus, this dissertation study examines SRH of Middle Eastern immigrants nationally, in more recent years, and tracking the changes in the rates of fair/poor SRH in this population compared to US-born Whites between 2001 and 2015.

In the study of SPD among Middle Eastern immigrants in the US, the prevalence of SPD in a nationally representative sample of first-generation Middle Eastern immigrants in the US was examined using NHIS data between 2001 and 2015. This dissertation study found that the rate was the highest in this population (5.99%) between 2006 and 2010, while the lowest was between 2011 and 2015. Middle Eastern immigrants also reported significantly higher SPD risk, compared to US-born non-Hispanic Whites in 2001-2015 combined. Being female, having

107

obesity, and contacting a mental health professional in the past year were factors associated with higher risk of SPD in this population. This study indicated that first generation Middle Eastern immigrants, particularly, showed to some extent specific healthcare needs; women, individuals with high BMI, and those with existing mental health issues have the highest need for effective mental health services.

In the SRH study, we examined the trends of SRH rates in a nationally representative sample of first-generation Middle Eastern immigrants and US-born non-Hispanic Whites between 2001 and 2015. We also examined the influence of associated factors with fair/poor SRH among the Middle Eastern group. The highest rates of fair/poor SRH in both groups were in 2011 to 2015, and Middle Eastern immigrants had 1.24 higher risk of reporting fair/poor SRH than US-born Whites for the 15 years combined. Among the Middle Eastern group, having SPD, being age 60 years or older, being a current alcohol drinker, and having a family member with disability were associated with significantly higher risk of fair/poor SRH, while education was a significant protector against the risk of low SRH. Similar to the results of the study of SPD, acculturation measured by years lived in the US and citizenship did not significantly influence the risk of having low SRH. This also indicates specific healthcare needs among this immigrant population, as well as, healthcare policies that address mental health issues, and family centered-healthcare.

Integrating Results to the Theoretical Framework

In the introduction of the dissertation, a theoretical framework was proposed to examine SPD, SRH, the relationship between SPD and SRH, and the roles of associated factors including age, gender, socioeconomic conditions, and some health and family-related factors among first-generation Middle Eastern immigrants in the US. In the beginning of the framework the

Unidimensional Model of Acculturation (UDMA) was used to explain the relationship of acculturation indicators to mental and physical health of Middle Eastern immigrants represented by SPD and SRH. The UDMA was also used to connect socioeconomic conditions with SPD. Cognitive Activation Theory of Stress (CATS) was used to focus on individual mechanisms underlying the experience of psychological distress. CATS explains how different outcomes of psychological distress may occur based on the subjective experience of the stressors and their impact on either positive expectancy, such as coping, or negative expectancy, such as helplessness and hopelessness. According to CATS, these expectancies are manifested in SRH (Eriksen, Murison, Pensgaard, & Ursin, 2005). This dissertation also considers SMT that was used in the model to examine the influence of factors in the person domain (sociodemographic factors) and environment domain (acculturation factors) on symptom perception (SPD) and symptom response (SRH).

The results of the study on SPD indicated that among tested covariates, gender, body mass index (BMI), and being in contact with mental healthcare were significant predictors of SPD in Middle Eastern immigrants. These three predictors apply to two areas of the framework; sociodemographic factors and health-related factors that predict SPD symptoms. However, results revealed that neither acculturation factors nor family-related conditions significantly associated with SPD among Middle Eastern immigrants. Socioeconomic conditions also were not associated with SPD in this population. The results specify a new course of understanding SPD among first generation Middle Eastern immigrants. As discussed in the study, women and individuals with obesity are more vulnerable to psychological distress in a Middle Eastern compared to men and individuals with normal BMI (Borges, Benjet, Medina-Mora, & Miller, 2010; Simon et al., 2006; Slade, Johnston, Oakley Browne, Andrews, & Whiteford, 2009).

In the study on SRH of Middle Eastern immigrants, having SPD, older age (60+), current alcohol drinking status, and having a family member with disability were associated with significantly higher risk of fair/poor SRH, while education showed a protecting influence. These outcomes add different perspectives to the theoretical model to shape the SPD-SRH phenomenon in this population. In the framework, these predictors apply to the demographic-socioeconomic factors (age, education), and family related and health related predictors. As the framework explained an association between SPD and SRH, the study found that SPD was associated with low SRH. Individuals who experience psychological distress have a greater risk of poor SRH. However, in both studies, acculturation predictors did not have an influence on SPD and SRH of first-generation Middle Eastern immigrants. Integrating these outcomes to the framework establishes an indication of a new evidence on mental and physical health of immigrants that needs more investigation in the future.

Significance and Implications

This dissertation has important research, public health, and policy implications. While recent literature lacks a clear understanding of the trends of SPD and fair/poor SRH of Middle Eastern immigrants in the US, higher rates of SPD and fair/poor SRH among Middle Easterners in the past 15 years were revealed. During the past 15 years, there have been challenges in the social, legal, and political life of Arab Americans (Audi, 2008). For example, since September 11th 2001, Arab immigrants have been facing an increase in rates of hate crimes, discrimination acts, and racial profiling (Amer, 2005; Audi, 2008; *Handbook of Arab American psychology.*, 2016; Malos, 2010; Nassar-McMillan, Lambert, & Hakim-Larson, 2011). This significant acclivity of living with stressors has been found to be significantly associated with higher rates of psychological distress and worse health status (Amer & Hovey, 2012; *Handbook of Arab*

American psychology., 2016; Rousseau, Hassan, Moreau, & Thombs, 2011). Tracking the changes in SPD and SRH rates over the past 15 years and investigating the associated factors helped addressing the gaps in the literature and provided essential understanding of this research area for this underrepresented population in research. Finally, the outcomes of this dissertation also orientate the focus of public health interventions to reduce health disparities among growing immigrant groups in the US; for example, mental health of Middle Eastern immigrants has an impact on their overall health status, which indicates the need to focus on promoting mental health services for immigrants.

Recommendations for Future Research

Research on the health of Arab/Middle Eastern immigrants in the US is still in its infancy; more research studies are still needed to support some evidence and add new findings. However, the NHIS is still the single largest dataset that identifies Middle Eastern immigrants in the US, and this dataset does not investigate all required variables to examine health issues among this population. Further reaching this dataset has some restrictions and barriers due to confidentiality purposes. There is also a need for a new systematic dataset that facilitates studying health of Middle Eastern immigrants in the US. Further measures of acculturation are needed to be used in research to develop a more robust evidence to examine the extent to which it could influence physical and mental health of Middle Eastern immigrants. Finally, longitudinal research studies are required to examine individual level and group level trajectories of health outcomes.

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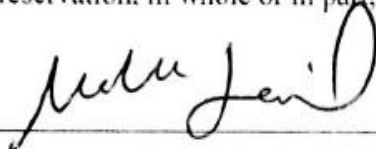of Multicultural Counseling and Development*, *39*(1), 38–47.

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