ACCULTURATION, YEARS OF RESIDENCY, AND OBESITY IN ARAB AMERICAN MINORITIES

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Master of Arts in Kinesiology

By

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SAN DIEGO STATE UNIVERSITY

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Acculturation, Years of Residency, and Obesity in Arab American Minorities

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December 21, 2010
Approval Date
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By

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DEDICATION

I dedicate this modest work to my beloved grandmother Basha who loved me and taught me how to love. A strong woman who defeated the years of more than one century, while sacrificing and sharing everything she had. She was a river of knowledge to her family, to the neighbors and to whomever met her.

To my parents, my brother and sister, and to my beloved wife Palaton.
ABSTRACT OF THE THESIS

Acculturation, Years of Residency, and Obesity in Arab American Minorities
by
Zakaria El Haoubi
Master of Arts in Kinesiology
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Multiple studies have verified that embracing a western lifestyle has caused different minority groups, such as Asian Americans and Hispanic Americans, to suffer Cardiovascular Diseases. However, these studies do not consider the Arab minority groups which have been growing at a fast pace. Therefore, the current study examined the influence of the degree of acculturation on obesity in a sample of 240 students of Arab origins in the counties of San Diego and Los Angeles. Statistical analysis revealed no relationship between acculturation and weight, thereby suggesting that the theory of selective migration and acculturation are not the only determinants to obesity and related risk factors for these minority groups.
TABLE OF CONTENTS

ABSTRACT...............................................................................................................................v
LIST OF TABLES................................................................................................................. viii
ACKNOWLEDGEMENTS..................................................................................................... ix
CHAPTER
  1 INTRODUCTION .........................................................................................................1
  2 LITERATURE REVIEW ..............................................................................................4
     BMI as Predictor of Morbidity and Mortality .........................................................4
     Use of BMI for Assessing Health in Arab Minorities .........................................5
     Introducing Acculturation .....................................................................................6
     The Theory of Selective Migration and Acculturation .....................................6
     Arab Americans and Acculturation .................................................................8
     Summary ...............................................................................................................10
  3 METHODS ..................................................................................................................12
     Participants ...........................................................................................................12
     Procedure ............................................................................................................12
     Calculation and Interpretation of BMI ............................................................13
     Statistical Analyses .........................................................................................14
  4 RESULTS ....................................................................................................................15
  5 DISCUSSION ..............................................................................................................19
     The Impact of Religion on BMI ........................................................................19
     The Effect of Heritage, Social, and Cultural Factors on BMI .............................20
     The Effect of RI ..................................................................................................21
     Conclusion .........................................................................................................21
     Limitations ...........................................................................................................23
REFERENCES ..................................................................................................................25
APPENDICES
  A FLYER.....................................................................................................................28
B  INFORMED CONSENT FORM ................................................................. 30
C  DEMOGRAPHICS .................................................................................. 34
## LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Residence Index Measures ($n=240$)</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>Gender (Q1 Appendix C)</td>
<td>15</td>
</tr>
<tr>
<td>3</td>
<td>Age, Residency, Height, Weight and BMI (Q2-Q5 Appendix C)</td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td>Descriptive Statistics (Q16-Q27 Appendix C)</td>
<td>15</td>
</tr>
<tr>
<td>5</td>
<td>Independent T-Test for (Q17 to Q27 Appendix C)</td>
<td>17</td>
</tr>
<tr>
<td>6</td>
<td>ANOVA for BMI and Participants Heritage (Q16 Appendix C)</td>
<td>18</td>
</tr>
<tr>
<td>7</td>
<td>ANOVA for New and Long Term Residents</td>
<td>22</td>
</tr>
<tr>
<td>8</td>
<td>Descriptives</td>
<td>22</td>
</tr>
</tbody>
</table>
ACKNOWLEDGEMENTS

I would like to thank Dr. Kahan for giving me the chance to be part of the study he conducted regarding the Arab minorities living in San Diego and Los Angeles, and for the tremendous effort and time he dedicated to me. His modesty and intellect allowed me to learn generously from him and enjoy the whole process of my first academic research. I also thank Dr. Marshall and Dr. Osman for reviewing my work and helping me stay focused during the whole process through their feedback and comments. Finally, my special thanks and gratitude go to all my graduate teachers in the department of ENS, especially Dr. Roger Simmons who taught me the fundamentals of conducting scientific research.

Thank you all for your counseling, support, and encouragement. I wish you the best in your careers, and I will be looking forward to serving you one day so that I may compensate you for what you have done for me.
CHAPTER 1

INTRODUCTION

Multiple studies have clearly documented that overweight and obesity are associated with predetermined chronic morbidities such as, diabetes, hypertension, heart disease, stroke and some types of cancers (Goel, McCarthy, Phillips, & Wee, 2004). At present, globally, there are more than 1.1 billion adults who are overweight, 300 million who are obese, and approximately 18 million people die from cardiovascular disease (CVD) each year (Hossain, Mequid, & Bisher, 2007). In addition to the human losses related to obesity, the financial costs are steep. Out of the gross bill related to health issues, about 2 to 7% is being spent yearly in developed countries on obesity (Hossain et al., 2007).

Nationally, Centers for Disease Control and Prevention (CDC) (2010) reported 696,947 deaths related to Heart Disease in 2002, which accounted for 29% of the total deaths in the United States. CDC also reported that an estimated 258 billion dollars were spent in 2006 in an attempt to combat heart disease. The damage was enormous affecting the health care system, medication, productivity, and other services.

The menacing risk factors of CVD, such as overweight and obesity, were traditionally studied only among the white and African American populations since they represent the two largest demographics in the US; however, the rapid transformation of the population’s racial composition has consequently amplified the interest in the health of ethnic minority groups and the foreign born population (Hummer, DeTruck, Forbes, & Biegler, 1999). According to the US Census Bureau, minority groups are nearly one third of the total population, and are expected to comprise the majority by 2042 (Bernstein & Edwards, 2008).

Among these minorities is the Arab population which has generated major interest, not only for health scientists and demographers but also for politicians and theologians, especially after September 11, 2001 (Kahan, 2003). The first report by the United States Census Bureau on the Arab population living in the United States was released in 2000. The census reported about 1.2 million Arabs living in the United States, a 40% increase over the
last two decades, and representing 0.42% of the total US population (De La Cruz & Brittingham, 2003).

Published data concerning the prevalence of CVD in the Arab population is overwhelmingly lacking in the US; although, a number of studies have examined the health of Arab minorities in Dearborn and Detroit, Michigan, where a huge Arab population is concentrated, few studies have been conducted in California despite the fact that it comprises the largest Arab population compared to any other state, with approximately 190,890 Arabs (De La Cruz & Brittingham, 2003).

Systematically, scientific research demonstrates that certain immigrant groups enjoy an advanced health profile when compared to US-born groups (Antecol & Bedard, 2005; Jasso, Massey, Rosenzweig, Smith, 2005; Singh & Siahpush, 2002) and others, a result of combining beneficial lifestyles in the countries of origin and the selective migration of healthy immigrants (Hummer et al., 1999). Singh and Siahpush (2002) suggested that immigrants usually adopt a different lifestyle in the US and become more engaged in behaviors that are assumed to have a negative impact on health with longer US residence. The damaging behaviors are mainly related to poor diet and lack of exercise. Antecol and Bedard (2005) described this phenomenon as the Healthy Immigrant Effect (HIE) in an attempt to answer why immigrants converge with American health status. To explain these cultural mutations, the concept of acculturation has been extensively used as a research variable to investigate the interaction between two cultures and the course of changes arising from it. Vaeth and Willet (2005) stated that risk factors, such as obesity, dietary fat intake and smoking, increase with acculturation. The Body Mass Index (BMI) can play a leading role in interpreting the (HIE) and acculturation. Thereby, BMI measurement becomes an important tool in studying the health profile of a population.

Increasing rates of obesity are well documented in the American population but are essentially neglected for minority groups (Antecol & Bedard, 2005). However, it appears that Arab minorities are far less studied compared to other groups. A search on ProQuest (an online database of articles and journals for graduate research at San Diego State University) returned only one document for the following criteria: (Acculturation, Arab Americans and BMI) which indicates a crucial need for studying this minority group in more depth.
Accordingly, we assume a similar negative effect of longer US residency on the health profile of Arab minorities. In other words, the longer the Arab immigrants have been in the US the worse their health will be. Poor dietary habits and physical inactivity will systematically lead to overweight and obesity, which are already established risk factors for certain health conditions such as CVD, diabetes and other morbidities.

**Research Question:** The overall purpose of this study was to examine the association between US residency and obesity (BMI) in the Arab American minorities. Consequently, multiple variables were analyzed to determine this correlation since Acculturation is a complex term that is extensively used to evaluate the influence of cultural beliefs and values on health. Beside the traditional focus on the length of residency and the language spoken, this research included other variables such as: the impact of religion on how a person should dress, what to eat and drink, whom to associate with, the choice of social activities and its importance in life and in making decisions. Also included in the questionnaire was the ancestry of close friends, where the early childhood was spent, the language spoken with family, friends and heritage.
CHAPTER 2

LITERATURE REVIEW

BMI AS PREDICTOR OF MORBIDITY
AND MORTALITY

While studying the literature related to obesity, one must acknowledge that BMI measurement is used more frequently than any other method to assess the presence of obesity. In fact, the most conventional approach used to determine whether someone is overweight or obese is the BMI calculation. Centers for Disease Control uses BMI to measure overweight and obesity since the correlation between its number and body fatness is significantly strong. It is also inexpensive and easy for clinicians to use since it requires only the measurement of height and weight. Furthermore, it permits individuals to compare their own weight in contrast to the general public (Centers for Disease Control, 2009). Actually, a number of studies have used the BMI as an indicator predictive of morbidity and mortality. In an attempt to answer the question whether obesity is a significant problem once the level of physical activity is considered, Sullivan, Morrato, Ghushchyan, Wyatt, and Hill (2005) used BMI and physical activity level to determine associations with the prevalence of diabetes and diabetes-related cardiovascular co-morbidities in a nationally representative sample. Their findings proved that being obese increases the risk of having diabetes regardless of physical activity level, and being inactive also increases the risk of having diabetes regardless of the BMI. Additionally, in a large study that was based on the Medical Expenditure Panel Survey, a nationally representative survey of the US population from the years 2000 to 2002, Sullivan et al. (2005) used BMI and physical activity to determine associations with the prevalence of diabetes and diabetes-related cardiovascular co-morbidities in the US. Their study revealed that physical activity and obesity seemed to be independently associated with diabetes and diabetes related cardiovascular co-morbidities. In other words, the chance of having diabetes and diabetes-related cardiovascular co-morbidities rise with BMI regardless of physical activity and also rise with physical activity regardless of BMI. These findings address the question of whether obesity is a significant
health problem when the level of physical activity is taken into consideration, which suggests that an intervention should target fitness and fatness in improving the health of the general population.

In another large, longitudinal study that was conducted in Copenhagen, Denmark, Baker, Olsen, Thorkild, and Sorensen (2007) measured BMI in a population of 276,835 children to verify the consequences of excess weight in childhood on coronary heart disease (CHD) in adulthood. As predicted, the results showed that having a higher childhood BMI value elevated the risk of having a CHD event in adulthood. Additionally, Razinia et al. (2007), in an attempt to establish a relationship between obesity and the discharge outcomes for 805 hospitalized patients with ischemic stroke, used BMI measurements to show that a higher BMI at the time of hospitalization is related to a longer stay in the hospital. In other words, a prolonged hospital stay is consistently associated with obesity.

**USE OF BMI FOR ASSESSING HEALTH IN ARAB MINORITIES**

A number of studies have used BMI as an indicator for assessing the health profiles and well being of Arab minorities. Jaber et al. (2003) used the BMI along with other socio-demographic factors (height, body weight, and hip and waist circumferences) to examine their influence on the prevalence of diabetes and glucose intolerance by age and sex among Arab minorities in Dearborn, Michigan. The results showed an association between higher BMI and abnormal glucose tolerance, especially in women. Another study, conducted by Abou-Mediene and Shamo (2005), also used BMI to examine overweight and obesity among Arab American fifth-graders in Michigan. The findings paralleled the same trends of being overweight or obese as observed in other ethnic groups in the US. Hatahet, Khosla, and Fungwe (2002) were also motivated by the large and growing Arab American population in Southeast Michigan to study the risks of increasing CVD among this minority group. Measurements of certain variables such as BMI, blood pressure, lipid profile, and eating and smoking habits were evaluated to examine the prevalence of CVD risk factors. They concluded that overweight and obesity, high serum lipids and hypertension were all positive risk factors for CVD, and were also more prevalent in older age groups and women. Also, driven by the escalating risks emerging from obesity and cardiovascular disease, specifically among women residing in Michigan, Hatahet and Fungwe (2005) conducted a comparative
study between three different ethnic groups (Arab Americans, African Americans, and Caucasians) in an effort to unravel the prevalence of obesity and CV comorbidities. The study used BMI to measure obesity among the women and used other known factors for CVD such as hypertension, blood lipids, and glucose measurements to assess the health status of these ethnic groups.

**INTRODUCING ACCULTURATION**

Cardiovascular disease remains the leading cause of health disparities and constitutes a major cost for health care in the States (Mensah & Brown, 2007). Multiple components are responsible for causing CVD, and the obesity epidemic is certainly a factor that could aggravate the CVD burden, thereby impairing public health, and causing more damage to the economy (Mensah & Brown, 2007).

Seeing that obesity is a serious public health threat, and that minority groups are growing at a fast pace, risk factors for morbidities and mortality should be considered and studied in-depth among minorities as well. Consistently, scientific studies demonstrate that immigrants enjoy a better health status than US-born persons. During the last two decades, immigrants had a higher life expectancy and a lower overall mortality compared to US-born persons (Gopal & Hiatt, 2006). Thus, the increasing numbers of non-English speaking immigrants to the States have raised researchers’ interest in the relationship between acculturation and health status. Researchers have broadly used acculturation as a research variable in order to evaluate the effects of cultural beliefs and values on health and examine how those effects may change as people integrate values of the prevailing culture (Siatkowski, 2007).

**THE THEORY OF SELECTIVE MIGRATION AND ACCULTURATION**

Multiple studies have documented that immigrants arrive in the US healthier than the US-born population (Antecol & Bedard, 2005; Singh & Siapush, 2002). This advantage has a conventional explanation that suggests a healthier lifestyle in the countries of origin and the selective migration of healthy immigrants. In other words, immigrants enjoy a better health behavior in their countries of origin in terms of diet and activity and do not report health conditions in which language and cultural barriers block health access. In addition, a positive
immigrant self-selection and the immigration authorities’ screening for health and skills might also determine a healthy immigrant effect (HIE) (Jasso et al., 2005; Kennedy, McDonald, & Biddle, 2006). Although a number of studies have examined the theory of selective migration and acculturation for almost every minority group in the States, it is not completely understood if the theory applies to Arab minorities.

The conceptual basis of selective migration theory is not recent. In an early study conducted by Kagan et al. (1974) on coronary heart disease (CHD) in Japanese men living in Japan, Hawaii and the US, the results showed a gradient in both CHD mortality and prevalence. The rates were lowest in Japan, intermediate in Hawaii, and highest in the US. Following the previous study, Marmot and Syme (1976) attempted to investigate the mystery behind the gradient in Japanese ancestry. They conducted a cross sectional study that examined 3809 Japanese Americans in California. Although the gradient was not totally explained by differences in dietary intake, cholesterol, blood pressure or smoking, acculturation factors appeared to be more accountable for CHD differences between the three Japanese groups. The traditional Japanese American group had the lowest rate of CHD prevalence similar to that observed in Japan. However, the acculturated Japanese American group, considered to be more westernized, had a three- to five-fold excess in CHD prevalence. Thereby, they hypothesized that certain cultures may be protected against CHD. These findings suggest that individuals who live among a stable society are more likely to enjoy support from other members in ways that might be protective against forms of social stress that could lead to CHD.

In a recent study, Sander (2008) used a longitudinal survey in 12,000 randomly selected private households with more than 20,000 individuals while studying different ethnic groups in Germany. In her research she used the term: “Healthy Immigrant Effect,” hypothesizing that the possible adoption of a variety of habits and lifestyles in the destination-country alters the health behavior to that of natives. Consequently, a health behavior that is associated with poor diet, smoking, alcohol consumption or physical inactivity may lead to the deterioration of the immigrants’ health with years since migration. To verify the theoretical assumption, BMI was calculated as the dependent variable and the years of residency represented the independent variable. As a result, the hypothesis that changes in lifestyle and environment could lead to increases in weight was supported by the
outcome of the study, which showed that BMI increased with additional years in Germany. Similar to the findings discussed in the previous study by Marmot and Syme (1976), Sander’s research also found that the higher the share of foreigners in the country, the lower is their BMI which conforms to the concept that a higher percentage of foreigners in a region is more likely capable of resisting the influence of acculturation in the host country, and thereby totally adopting or embracing a new health behavior. Additionally, her results also showed that having poor language skills results in a higher BMI for all groups, which contradicts the belief that BMI increases with acculturation.

ARAB AMERICANS AND ACCULTURATION

The association between acculturation and risk factors for CVD is becoming an interesting subject for researchers and scientists who are concerned about the health of minority groups. A number of studies have verified the relation between acculturation and CVD in multiple ethnic groups such as Asian Americans, and Hispanic Americans (Dallo & James, 2000); however, these studies do not account for Arab minorities. Based on a search in Pub Med and other databases related to scientific journals and magazines that are available through the San Diego State University (SDSU) website, a command containing the following keywords (Arab Americans, acculturation and obesity) returned no results. However, when substituting “Arab Americans” with “Latin Americans,” the same command returned more than 60 studies. In fact, two studies related to this subject were retrieved after substituting obesity with CVD. Both studies were conducted among Chaldean minorities, which constitute only a fragment of the Arab population. Research conducted by Dallo and James (2000) studied the influence of acculturation on adverse changes in blood pressure in a community-based sample of Chaldean women living in Detroit, Michigan. Three components were examined to measure acculturation (language preference, parental school involvement, and ethnic identification) along with three physical measurements (blood pressure, BMI, and waist to hip ratio) in order to evaluate risk factors for CVD. The results of their study showed that BMI and waist to hip ratio (WHR) were the most significant predictors of blood pressure, and were also associated with younger age, high levels of education, a preference to communicate in English, and higher parental school involvement. These findings confirm the importance of weight control through diet and exercise for minimizing the risk factors for
hypertension specifically and CVD in general among immigrant populations (Goel et al., 2004). The second study, conducted by Jamil et al. (2008), estimated the prevalence of heart disease and the association between ethnicity and heart disease in a sample of 2084, including Arab and Chaldean American women who were 18 years or older. An African American group of women was used as a reference category for health comparisons instead of non-Hispanic whites since they lived in the same region, and thereby, may be exposed to the same risk factors for heart disease. Since non-Hispanic whites are a diverse group that includes people originally from Europe and the Middle East, using them as a reference may conceal the differences in health status of other minority groups within the category, such as people of the Middle East. The prevalence of heart disease was higher for Arabs (7.1%) and Chaldean Americans (6.6%) than African Americans (1.8%). Based on previous studies, the authors stated that Arab Americans have lower rates of hypertension and high cholesterol, equivalent BMI, but higher diabetes rates when compared to African Americans. The authors concluded that the significant prevalence of diabetes may be the leading factor that is responsible for causing the preponderance of heart disease among Arab Americans. Such findings could be more helpful if estimates of heart disease from the country of origin were available. Only then, could comparison determine if heart disease existed among the Arab American minorities before they immigrated to the States or if it is the product of acculturation (Jamil et al., 2008). Socioeconomic components measured in the study were language, insurance coverage, smoking, and exercise. Only 12.7% of Chaldeans and 11.7% of Arabs spoke English compared to 99% of African Americans. Also, Chaldeans and Arabs were less likely to rate their health as excellent or very good or have insurance compared to African Americans. Although a higher percentage of Chaldeans (57.1%) and Arabs (65.5%) reported never exercising compared to only 21.9% of African Americans, a greater proportion of Chaldeans and Arabs reported never smoking. These factors may play a major role in dictating the outcome of heart disease among the Chaldeans and Arab minorities. Accordingly, one can suggest that having access to insurance coverage, and promoting exercise among Chaldeans and Arabs may improve the health status of these minorities. However, further studies should investigate heart disease in both genders and use more objective measurements.
Contrary to the theory of selective migration, certain studies determined that Arab immigrants’ health is worse or no different from US-born whites. Using data from 2000 and 2001 National Health Interview Surveys (NHIS) in a sample of 201,379 persons, Ghazal, Amick, and Donatod (2005) examined the self-rated health status of Arabs in contrast to US-born whites. The 2000 and 2001 NHIS questionnaires were the first to include a question about the origin of birth, thereby allowing the investigators to compare immigrants with natives. Their data did not include any information on health behavior and could not distinguish the US-born citizens of Arab ancestry, and therefore the researchers were unable to compare immigrants to their second and third generation peers. However, these data remain the most precise national source of information regarding Arab immigrants’ health. Ghazal et al. (2005) concluded that Arab minorities do not differ significantly from US-born whites in their self-rated health. In fact, other investigators detected multiple risk factors for CVD. For example, Jaber et al. (2003) determined the prevalence of high and extreme diabetes and glucose intolerance among Arab American adults living in Michigan and suggested an urgent need for community-based intervention programs to prevent and treat diabetes. Also, Hatahet et al. (2002) confirmed that obesity was a serious health issue among Arab Americans. They stated that overweight was common for men and women and in all age groups including the youngest (30 years and under), which had an overweight prevalence of 37.9%. The overweight ratio reached 60.9% for the group aged 31 to 40 years old, and 73.3% for the group aged 51 to 60 years old. They also found that increased BMI was significantly correlated to high BP, high glucose levels, increased total cholesterol, and decreased high density lipase cholesterol levels. In addition, Jaber, Brown, Hammad, Zhu, and Herman (2004) determined that metabolic syndrome is common among Arab Americans, clarifying that this minority group is susceptible to multiple risk factors for CVD.

**SUMMARY**

Based on the literature, it appears that Arab Americans are at high risk of obesity and other determined factors for CVD and other comorbidities. Despite the lack of studies assessing the level of acculturations and health status for this minority group, there is enough evidence to suggest that Arab minorities are experiencing similar health problems to US-born whites or even worse. Given that Arabs and Chaldeans have higher self-reported heart
disease, even compared to African Americans who experience comparatively higher all-cause mortality and cause-specific mortality risks than other native groups, this minority group is experiencing the worst health profile compared to other ethnic groups in the States (Gopal & Hiatt, 2006).
CHAPTER 3

METHODS

PARTICIPANTS

This research was based on a secondary data analysis of existing data and was approved by San Diego State University’s Institutional Review Board. A group of 240 students between the ages of 18 and 29 were recruited from different colleges and universities in San Diego and Los Angeles (Mage=21.5, SD=2.96). All participants were of Arab ancestry, and either were born or had one parent or grandparent born in one of the 22 Arab league nations. Women in the last trimester of their pregnancy were excluded from the study because the excess weight related to the pregnancy would produce a biased BMI measurement. The recruitment of students was conducted at convenient meeting places, either at school or in other places such as coffee shops or places of worship (mosques or churches).

PROCEDURE

Several methods were adopted for recruitment, such as flyers on campuses (Appendix A), presentation in classes with a potential of having eligible participants and in club meetings and student associations, and snowball sampling. After reviewing his or her eligibility, the student had to read and sign a consent form (Appendix B) and complete a demographic questionnaire of 27 questions (Appendix C). For the measurement of BMI, self-reported height and weight were recorded for questions number 4 and 5. The height was reported in feet and inches and the weight was reported in pounds. The numbers were later converted to kg/m².

It should be noted that self-reported weight and height are subject to random error and systematic reporting bias. The amplitude of bias has differed across studies based on age, sex and education (Ezzati, Martin, Skjol, Vander Hoorn, & Murray, 2006); this study quantified the level of bias of self-reported weight and height and found that women under reported their weight while men did not. Also, young and middle-aged (<65 years) men over-reported
their height compared to women of the same age. The bias in self-reported weight was
greater in telephone interviews than in “in-person interviews” which indicates that the
absence of an interviewer increases the reported body weight, hence decreases the worry in
the present study since students reported their weight in front of the interviewer. However, a
study that was conducted by Villanueva (2001) using a national representative sample
applied logistic regression analysis to link the degree of discrepancies in weight to different
characteristics. In contrast with 30-39 age groups, younger males and also 80 years and older
males tend to overestimate their weight; however, females who were 60 years of age and
older were more prone to overestimate their weight. In general, his study concluded that
while age increases the probability of discrepancies, reporting weight increases, too, which
diminishes the concern of under reporting weight in the present study.

The acculturation Index (AI) was calculated based on the following formulae:
AI= [language preference + ethnic identification + religiosity]*RI. The three variables:
language preference (question 26), ethnic identification (question 16) and religiosity
(question 20) were measured based on a self-rating scale. Language preference and ethnic
identification were measured on 5-point Likert scale while religiosity was measured on a 7-
point likert scale (Appendix C). Since religiosity is negatively correlated to acculturation it
was necessary to reverse the coding of this variable before the calculations of AI. The RI
value was calculated as: years of residency in the US/age from questions 3 and 2
(Appendix C).

**Calculation and Interpretation of BMI**

Since the calculation of BMI requires only height and weight measurements, it is
considered to be the easiest and the least expensive method for clinicians and researchers to
assess risk for CVD. The formula that is commonly used to calculate the BMI is:
BMI=weight in (kg)/ height in m². According to the World Health Organization
recommendations, BMI can be divided into four categories:

1. Individuals with a BMI <18.5 are considered to be underweight.
2. Individuals with a BMI between 18.5 and 24.9 are considered to be a normal weight.
3. Individuals with a BMI between 25 and 29.9 are considered to be overweight.
4. Individuals with a BMI equal or greater than 30 are considered to be obese.
**Statistical Analyses**

Data analyses were conducted using SPSS 16.0 version for windows. T-tests analyses were computed to find the association between eleven independent variables and the BMI. For that, the BMI scale was converted to dichotomous variables: 1 for normal weight (BMI=\(<25\)) and 2 for overweight and obese (BMI>25). Initial ANOVA followed by a Bonferroni post hoc test were computed to determine the effect of heritage on BMI, and a second ANOVA analysis was performed to determine the influence of RI on BMI. Accordingly, the RI variables were also converted to 2 dichotomous variables: new and long term residents. According to the frequencies distribution (Table 1), the median value was 0.87 which allowed recoding the RI to: 1 for variables (0 through 0.87) and 2 for variables (0.88 through 1). The alpha level was set to 0.05 with two tailed tests, and a Bonferroni correction was made (i.e., .05/11 = 0.0045). RI was calculated as years lived in the US/age.

Table 1. Residence Index Measures (n=240)

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<table>
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<tr>
<td>Median</td>
<td>.8709</td>
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CHAPTER 4

RESULTS

Tables 2, 3 and 4 contain descriptive statistics for gender, age, residency, height, weight, BMI and Q16-27 (Appendix C).

Table 2. Gender (Q1 Appendix C)

<table>
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<th>Gender</th>
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<tr>
<td>Female</td>
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Table 3. Age, Residency, Height, Weight and BMI (Q2-Q5 Appendix C)

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<th>Weight (kg)</th>
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<td>1.7</td>
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<tr>
<td>Median</td>
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</tbody>
</table>

Eleven independent T-tests (Table 5) were run for eleven independent variables, such as clothes, food, associates, activities, life, decisions, language fluency, ancestry, childhood, language spoken, and heritage (Q17-Q27, Appendix C) to compare the two groups of BMI scale dichotomous: group 1 (normal weight) and 2 (overweight and obese). None of the tests were significant which indicates that all variables were non-predictors of overweight and obesity (α level equal 0.05/11 = 0.0045). However, the “food” variable could be considered a trend for being so close to significantly registering a value of p = 0.038.

Heritage (Likert scale, very Middle Eastern = 1 to very American = 5) was measured for each subject to evaluate its influence on BMI in a one-way ANOVA analysis (Table 6). The result was insignificant with a p value of 0.74 > .05.
<table>
<thead>
<tr>
<th>Question</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>How would you describe yourself on the following scale?</td>
<td>2.7</td>
<td>1.1</td>
</tr>
<tr>
<td>How much influence do your religious beliefs have on what you wear?</td>
<td>3.6</td>
<td>2.0</td>
</tr>
<tr>
<td>How much influence do your religious beliefs have on what you eat and drink?</td>
<td>4.4</td>
<td>2.3</td>
</tr>
<tr>
<td>How much influence do your religious beliefs have on whom you associate with?</td>
<td>3.6</td>
<td>2.0</td>
</tr>
<tr>
<td>How much influence do your religious beliefs have on your choice of social activities?</td>
<td>3.9</td>
<td>2.0</td>
</tr>
<tr>
<td>How important would you say religion is in your life?</td>
<td>5.4</td>
<td>1.8</td>
</tr>
<tr>
<td>How much influence do your religious beliefs have on important life decisions?</td>
<td>5.2</td>
<td>1.6</td>
</tr>
<tr>
<td>I am a fluent speaker of Arabic or other Middle East language</td>
<td>2.2</td>
<td>1.4</td>
</tr>
<tr>
<td>The ancestry of my current circle of friends is:</td>
<td>2.9</td>
<td>1.1</td>
</tr>
<tr>
<td>My early life (childhood to teenage years) was spent:</td>
<td>3.6</td>
<td>1.6</td>
</tr>
<tr>
<td>When with family and friends, I speak:</td>
<td>3.2</td>
<td>1.2</td>
</tr>
<tr>
<td>In relation to my Middle Eastern heritage, I feel:</td>
<td>1.5</td>
<td>0.8</td>
</tr>
</tbody>
</table>
Table 5. Independent T-Test for (Q17 to Q27 Appendix C)

<table>
<thead>
<tr>
<th>Question</th>
<th>Sig.</th>
<th>T</th>
<th>Df</th>
<th>Mean Difference</th>
<th>Std. Error Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>How much influence do your religious beliefs have on what you wear?</td>
<td>0.3</td>
<td>-1.0</td>
<td>238.</td>
<td>-0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>How much influence do your religious beliefs have on what you eat and drink?</td>
<td>0.2</td>
<td>-2.1</td>
<td>238.</td>
<td>-0.7</td>
<td>0.3</td>
</tr>
<tr>
<td>How much influence do your religious beliefs have on whom you associate with?</td>
<td>0.7</td>
<td>-0.6</td>
<td>238.</td>
<td>-0.2</td>
<td>0.3</td>
</tr>
<tr>
<td>How much influence do your religious beliefs have on your choice of social activities?</td>
<td>0.4</td>
<td>-1.0</td>
<td>238.</td>
<td>-0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>How important would you say religion is in your life?</td>
<td>0.5</td>
<td>-0.3</td>
<td>238.</td>
<td>-0.1</td>
<td>0.2</td>
</tr>
<tr>
<td>How much influence do your religious beliefs have on important life decisions?</td>
<td>0.2</td>
<td>-0.3</td>
<td>238.</td>
<td>-0.1</td>
<td>0.2</td>
</tr>
<tr>
<td>I am a fluent speaker of Arabic or other Middle East language</td>
<td>0.3</td>
<td>0.5</td>
<td>238.</td>
<td>0.1</td>
<td>0.2</td>
</tr>
<tr>
<td>The ancestry of my current circle of friends is:</td>
<td>0.4</td>
<td>0.8</td>
<td>238.</td>
<td>0.1</td>
<td>0.2</td>
</tr>
<tr>
<td>My early life (childhood to teenage years) was spent:</td>
<td>1.0</td>
<td>-0.1</td>
<td>238.</td>
<td>0.0</td>
<td>0.2</td>
</tr>
<tr>
<td>When with family and friends, I speak:</td>
<td>0.3</td>
<td>0.4</td>
<td>238.</td>
<td>0.1</td>
<td>0.2</td>
</tr>
<tr>
<td>In relation to my Middle Eastern heritage, I feel:</td>
<td>0.2</td>
<td>-0.9</td>
<td>238.</td>
<td>-0.1</td>
<td>0.1</td>
</tr>
</tbody>
</table>
### Table 6. ANOVA for BMI and Participants Heritage (Q16 Appendix C)

<table>
<thead>
<tr>
<th></th>
<th>df</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>4</td>
<td>0.494</td>
<td>0.74</td>
</tr>
<tr>
<td>Within Groups</td>
<td>235</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>239</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER 5

DISCUSSION

THE IMPACT OF RELIGION ON BMI

Eleven T-tests showed that none of the variables significantly differentiated weight status. However, the variable “How much influence do your religious beliefs have on what you eat and drink” (Q17, Appendix C), although not significant, trended (p < .05, \(p_{critical} = .0045\)) to be associated with overweight and obesity. That is, more religious students have a lower BMI. This may have numerous explanations; possibly, religious people tend to be more satiated toward food and consider nourishing the soul more than the body, thereby consider fasting more often. These findings are consistent with the majority of studies which depict an association between greater religious involvement, and better mental and physical health (Kim, Sobal, & Wethington, 2003). Also, Hummer, Ellison, Rogers, Moulton, and Romero (2004) stated the association between increased levels of public religious attendance and lower mortality risks among US adults. Accordingly, the concept of religiosity being related to the lack of acculturation suggests that among this minority group, those who are more religious will continue to eat and be more active in a manner that conforms to the Middle Eastern and Arab culture. The other ten variables, including the influence of religion on clothing, social connections and activities, the importance of religion in life and in decision making, language fluency, peers, childhood, language spoken and heritage pride were not predictors of overweight and obesity. The first 5 variables, which are related to religion, indicate that it was not a key factor that could be associated with the Arab Americans’ health. A person’s belief regarding what to wear is clearly not related to weight. Also, people can choose their own social connections, activities and make decisions according to their beliefs without affecting their health and/or weight. The last five variables are strictly related to the concept of acculturation. A lower socioeconomic status and inability to afford health insurance coverage are strictly related to lower levels of acculturation. High levels of acculturation are related to health care access, insurance coverage, preventive services and treatments, and are also associated with greater risk for obesity, dietary fat...
intake and smoking (Vaeth & Willet, 2005). The present study shows no relation between acculturation, and overweight and obesity. However, the acculturation variables could be related directly to the health status without being associated with weight. Gopal and Hiatt (2006), in a longitudinal national study, examined the life expectancy, mortality from most chronic diseases, unintentional injuries, and suicide in order to explain the cause behind the health gaps between immigrants and US-born. Their findings showed a longer life expectancy for immigrants who were experiencing generally a lower mortality rate compared to US born. Therefore, other measurements and characteristics should be taken into consideration in the future in order to get closer to understanding the Arab American minorities.

**The Effect of Heritage, Social, and Cultural Factors on BMI**

The ANOVA analysis computing the effect of heritage on the BMI indicated no association between the two (p= 0.74). It was speculated in many studies that the social and the cultural factors can play a major role in the well being and health of individuals. Marmot and Syme (1976) looked into the causes behind CHD and its mortality rate which was low in Japan, intermediate in Hawaii and high in California. Their intriguing results showed that diet was not the main cause responsible for CHD as it was suspected. Rather, it was suggested that the traditional Japanese culture, community strength, group cohesion and social stability might be stress attenuating, thereby protecting the Japanese from CHD. Based on this analogy, the current study might suggest that the Arab American students living in San Diego and Los Angeles enjoy the support of their fellows and also the support of a secure community, which may protect against overweight and obesity. According to the 2000 Census, California has the largest concentration of Arab minorities, with Los Angeles and San Diego ranking second and seventh of most populous Arab cities. The significant concentration of Arabs in these two cities might be providing just the appropriate social support and stability for most of the individuals migrating to this region as Middle Eastern tradition places great emphasis on group achievement and far less on individual aspirations.
THE EFFECT OF RI

ANOVA Analysis was conducted to measure the effect of Residency on BMI (Table 7). The insignificant $p = 0.16$ value indicates that there is no association between the RI and the BMI. Similarly, it was speculated and also verified in other studies that the length of US residency has no effect on Arab Americans’ health; however, the integration in the American society which is measured by the US citizenship status does (Ghazal et al., 2005). In other words, Arab immigrants who are already citizens registered worse health than their fellow immigrants who are not citizens regardless of the US residency time. However, this concept can have a double standard; first, immigrants with disturbed health could be seeking the citizenship in an attempt to gain access to health care and second, the Americanization of Arabs would lead to acculturation that might have a negative effect on immigrants’ health. Using data from the National Health Interview Survey of 1993-1994, Singh and Siahpush (2002) determined that immigrants’ risk of obesity and other morbidities are lower than US born and positively related to the duration of residency in the US. Their study included Whites, Blacks, Hispanic, Asians and Pacific Islanders. Likewise, Antecol and Bedard (2005) used National Health Interview Surveys from 1989 to 1996 to conclude in their study that Americans are getting less healthy over time. The duration effects were less pronounced for Hispanics and Blacks than Whites. They also concluded that the BMI increased for immigrants with longer US residency. However, Arab minorities were not included in both researches. Contrary to their findings, the present study was inconsistent with the acculturation hypothesis. In other words, acculturation and years of residency did not affect obesity (BMI) in the Arab American student minorities residing in the area of San Diego and Los Angeles as it was hypothesized in this study, thus rejecting the null hypothesis (Table 8). Therefore, the Arab American students’ BMI did not follow the general pattern of selective migration and HIE over time which suggests that Arab immigrants have always maintained a higher life expectancy. Accordingly, the results could be associated with other factors and variables that were not studied in this research.

CONCLUSION

In the last decade, overweight and obesity have plagued most of the developing countries causing a serious threat, next to underweight, malnutrition and other infectious...
Table 7. ANOVA for New and Long Term Residents

<table>
<thead>
<tr>
<th></th>
<th>df</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>1.834</td>
<td>0.162</td>
</tr>
<tr>
<td>Within Groups</td>
<td>237</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>239</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: No significant value was found dichotomous RI dichotomous with respect to BMI (p= 0.16> 0.05). In other words, the residence index had no effect on BMI.

Table 8. Descriptives

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;25 = normal weight</td>
<td>156</td>
<td>1.5</td>
<td>0.5</td>
<td>0.0</td>
</tr>
<tr>
<td>between 25 (including 25) and less than 30 = overweight</td>
<td>67.0</td>
<td>1.5</td>
<td>0.5</td>
<td>0.1</td>
</tr>
<tr>
<td>over 30 = obese</td>
<td>17.0</td>
<td>1.7</td>
<td>0.5</td>
<td>0.1</td>
</tr>
<tr>
<td>Total</td>
<td>240</td>
<td>1.5</td>
<td>0.5</td>
<td>0.0</td>
</tr>
</tbody>
</table>

diseases. The rapid growth of overweight and obesity has caused a sudden rise in diabetes and hypertension which are the main predisposing factors for cardiovascular disease (Hossain et al., 2007). The alarming increase of the epidemic is clearly documented for the American population, however, still omitted for ethnic groups (Antecol & Bedard, 2005), especially Arab minorities which raises an urgent need for studying these minority groups.

In this research, acculturation and residency were examined in an attempt to unravel at least one of the multiple factors that might play a key role in the well being of Arab Americans. The duration of stay is certainly an elementary factor that could have an impact on the Arab minorities’ health. However, other factors should also be taken in consideration. In a recent study conducted in New York City, where the largest Arab population resides compared to any other city, the understanding of practices, attitudes, beliefs and barriers were studied for a better assessment of the Arab minorities’ health status. Factors such as the language barrier, discrimination, fear of immigration enforcement, and stress from family...
were found to be responsible for health deterioration (Shah, Ayash, Pharaon, & Gany, 2008). Therefore, it is mandatory to look into all these components before drawing any conclusions. The literature review concerning Arab immigrants is still extremely limited; therefore, this minority group still hopes for researchers and scientists to unravel all the traits behind their health crisis. However, multiple factors hinder the process of studying the Arab minorities; one of the major elements is that Arabs are classified among the non-Hispanic whites according to the US census bureau. Thus, the specific data related to their health variations is definitely concealed within the white majorities. A new rubric should be allocated to the Arab Americans on the US census ballots in order to have an accurate count of this minority group rather than estimates.

LIMITATIONS

Although the results of this research were not significant, the limitations of the study might conceal a problem of great magnitude. The subjects’ recruitment was exclusively taken from Arab university students living in the areas of San Diego and Los Angeles. Thereby, this might have biased results since students have already some level of awareness and education toward health and nutrition compared to Arab peers who do not go beyond a secondary education. Therefore, seeing that the sample taken for study in this research might not represent the rest of the Arab population, generalization of results to all Arabs is not recommended. Consequently, future studies should consider recruiting Arab Americans on a larger scale from all sectors and layers of society and not only from colleges and universities.

Moreover, the concept of jealousy and the evil eye which is a common belief among Arabs could have interfered with the process of reporting the right information regarding health. Most of the studies used as a reference in this research did not take this perception in consideration. Arabs believe that the evil eye can inflict harm on the individual or a family when jalousie is evoked. Thereby, wearing amulets or burning incense for protection against the evil eye (Papadopoulos, 2006). Some health anomalies are attributed to unseen forces such as Jinn and evil spirits; the evil eye and bad intentions are known to cause people to be ill when another person is envious toward them. Thus, the human consciousness can influence and be influenced by thoughts and intentions of others (Hammad, Kysia, Rabah, Hassoun, & Connelly, 1999).
Likewise, the cultural attitudes and beliefs toward weight in the countries of origin should be taken into consideration since the traditional Arab perspectives toward weight are different from those of US-born. Ford, Dolan, and Evans (1990) reported in a study that was conducted in a westernized school in Cairo, that Arab females selected a body shape that was significantly larger than their American counterparts. Thus, the concept of weight, body shape or beauty is totally relevant here since it bears cultural preferences.

Additionally, the present research uses a cross sectional design, which allowed only the examination of the association between the BMI and some variables of acculturation. It is true that a cross sectional study provides an immediate and easier outcome assessment at a cheaper cost; however, it cannot demonstrate cause and effect relationships. In other words, this study will only open the door for generating other hypotheses for causal links. Other health associated factors related to people’s knowledge, attitudes, and practices should be taken into consideration in addition to adopting repeated measures or a cohort study design in order to have a better understanding of all health problems associated with the Arab minorities.

Smoking should also be considered and studied since there is evidence in the literature of its effects on obesity and CVD. Rice and Kulwicki (1992) conducted a study in the metropolitan area of Detroit which represents one of the largest concentrations of Middle Eastern people in the US. Their findings showed Arab minorities having a smoking rate of 39.8% which is considerably higher than the national and the Michigan average of smokers (28.9% and 29.2%). The extreme number definitely points to an alarming increase in smoking-related health problems. Therefore, it is necessary to examine the smoking habits for Arab Americans and determine if it is mainly adopted in the countries of origin or acquired in the US as part of the acculturation effect.
REFERENCES


APPENDIX A

FLYER
Middle Eastern Heritage* Students

Research Study

(1) Are you of Middle Eastern heritage?
(2) 18-29 years old?
(3) Interested in your health/keeping track of your physical activity for a week using a pedometer?

You can earn between $25 and $50 by participating in a research study investigating physical activity among young adults of Middle Eastern descent.

*You, parent, or grandparent born in:
Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, UAE, Western Sahara, Yemen

For more information and to enroll in the study, contact:

Dr. David Kahan, Associate Professor
SDSU
Dept. of Exercise and Nutritional Sciences
619-594-3887
dkahan@mail.sdsu.edu
APPENDIX B

INFORMED CONSENT FORM
San Diego State University
Consent to Act as a Research Subject

Activity Patterns of Young Adults of Middle Eastern Origin

You are being asked to participate in a research study. Before you give your consent to volunteer, it important that you read the following information and ask many questions as necessary to be sure you understand what you will be asked to do.

Investigator: David Kahan, Ph.D., Associate Professor, Dept. of Exercise and Nutritional Sciences. Purpose of the Study: To understand how gender, acculturation, and religiosity are related to physical activity behavior in a sample of students of Middle Eastern origin. Up to 240 students are being sought; to be eligible you must be between the ages of 18-29, not in the 3'd trimester of pregnancy, residing in San Diego during the week of data collection, and be of Middle Eastern origin (you, parent(s), or grandparent(s) born in an Arabic speaking country).

Description of the Study: To determine if you are eligible to participate, you will be verbally asked your age, pregnancy status, and where you, your parents, and grandparents were born. If your responses indicate that you are eligible, you will be asked to participate in the testing portion of this study. You will be asked to complete a 27-question demographics questionnaire, maintain a physical activity log at home for 7 days, wear a pedometer during waking hours for the same 7 days, and if randomly selected and willing, participate in an 11-question focus-group interview with students similar to yourself. The demographic questionnaire and focus group interview will be administered on campus in ENS 216, ENS 359 or PG 153. Physical activity logs will be maintained at your residence. The initial demographic questionnaire (personal characteristics/background, religiosity items) and instruction for the physical activity log and pedometer should take approximately 30 minutes. Completing your log should be done each night before going to bed and will take 5-10 minutes. The interview should take 2 hours or less. In sum, the total time commitment may take up to 220 minutes over 9 days.
Risks or Discomforts: Some may consider wearing the pedometers as a means of surveillance or as threatening. To alleviate this concern, a thorough demonstration of pedometer functions and usage will be given; you may wear the pedometer with a shirt or blouse covering it. Should you feel uncomfortable during the study, you may discontinue participation, either temporarily or permanently.

Benefits of the Study: You may find value or satisfaction in logging and reflecting on your activity and how your religion, culture, and personal conditions may be related to activity. I cannot guarantee, however, that you will receive any benefits from participating in this study. For society, results could stimulate further research into means for lessening any barriers to physical activity that you report encountering. For science, this study expands the knowledge base of physical activity research by focusing on an understudied group.

Confidentiality: While you cannot participate anonymously in this study, the following procedures will be followed so that confidentiality will be maintained to the extent allowed by law. The questionnaire and physical activity log you fill out do not identify you by name; instead you are assigned a code number, which is linked to your identity in a separate file. For accuracy, the interview you may participate in will be audio taped, however, at the time of the interview you will select and use a pseudonym and after the tape is transcribed it will be destroyed. Upon request, you may receive a copy of the interview transcript and amend/edit any of your statements. Research files will be stored in my locked office for 5 years, after which they will be shredded. Graduate student assistants, Middle Eastern faculty of SDSU, who will assist in analysis, and I may access the data.

Incentives to Participate: Upon completion and return of the physical activity log you will be paid $25 cash. If you participate in the follow-up focus-group interview, upon completion of it you will be paid an additional $25 in cash. If you choose to discontinue participation in the study, you will be paid $3.50 for each day you logged your physical activity.

Volunteer Nature of Participation: Participation in this study is voluntary. Your choice of whether or not to participate will not influence your future relations with San Diego State
University. If you decide to participate, you are free to withdraw your consent and to stop your participation at anytime without penalty or loss of benefits to which you are allowed.

Questions about the Study: If you have any questions about the research now please ask. If you have questions later about the research, you may contact Dr. David Kahan, 619-594-3887. If you have any questions about your rights as a participant in this study, you may contact the Division of Research Administration San Diego State University (telephone: 619-594-6622; email: irb@mail.sdsu.edu).

Consent to Participate: The San Diego State University Institutional Review Board has approved this consent form, as signified by the Board's stamp. The consent form must be reviewed annually and expires on the date indicated on the stamp. Your signature below indicates that you have read the information in this document and have had a chance to ask any questions you have about the study. Your signature also indicates that you agree to be in the study and have been told that you can change your mind and withdraw your consent to participate any time. You have been given a copy of this consent form. You have been told that by signing this consent form you are not giving up any of your legal rights.

____________________________________
Name of Participant (please print)

____________________________________  _________________
Signature of Participant     Date

____________________________________  _________________
Signature of Investigator     Date
APPENDIX C

DEMOGRAPHICS
Subject Code: ________

Survey of Activity and Leisure Among Adult Middle-Easterners • Collegians
SALAAMS • C
Demographics

Q1: What is your gender?
☐ Male
☐ Female

Q2: What is your age? ________ Years old

Q3: How many years have you lived in the United States? ________ Years

Q4: What is your height? ________ ft ________ in

Q5: What is your weight without shoes? ________ lbs

Q6: From where did you graduate high school? (Check one)
☐ San Diego County
☐ Other California county
☐ State other than California
☐ Outside the United States

Q7: Are you married? (Check one)
☐ Yes
☐ No

Q8: Do you have children? (Check one)
☐ Yes
☐ No

Q9: Where do you live? (Check one)
☐ On campus
☐ Off campus (not with parents)
☐ With parents

Q10: What is your employment status? (Check one)
☐ Unemployed
☐ Part-time
☐ Full-time

Q11: What is your class standing? (Check one)
☐ Undergraduate student
☐ Graduate student
Q12. What is your religious faith? (Check one)
- Christianity
- Islam
- Other (Specify) ____________________________

Q13. For the family members listed to the right, check the Arabic-speaking region in which they were born. (Check only one category for each person.)

<table>
<thead>
<tr>
<th>Region</th>
<th>Yourself</th>
<th>Mother</th>
<th>Father</th>
<th>Maternal Grandfather</th>
<th>Paternal Grandfather</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Africa (Algeria, Egypt, Libya, Morocco, Tunisia, Western Sahara)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Africa (Comoros, Djibouti, Mauritania, Somalia, Sudan)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arabian Peninsula (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, UAE, Yemen)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Levant (Iraq, Jordan, Lebanon, Palestine, Syria)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not born in any of the listed countries</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q14. For the family members listed above right, check off any family members born in the United States.

Q15. What is your parents' highest level of education? (Check one response for each parent.)

- Mother
  - Did not graduate high school
  - High school graduate
  - Some college
  - College graduate
  - Graduate work or graduate degree

- Father
  - Did not graduate high school
  - High school graduate
  - Some college
  - College graduate
  - Graduate work or graduate degree

Q16. How would you describe yourself on the following scale? (Check one only.)

- Very Middle Eastern
- More Middle Eastern than American
- Almost fifty-fifty
- More American than Middle Eastern
- Very American
Please circle your responses for questions 17-22.

<table>
<thead>
<tr>
<th>Q17. How much influence do your religious beliefs have on what you wear?</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q18. How much influence do your religious beliefs have on what you eat and drink?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Q19. How much influence do your religious beliefs have on whom you associate with?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Q20. How much influence do your religious beliefs have on your choice of social activities?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q21. How important would you say religion is in your life?</th>
<th>Not at all Important</th>
<th>Extremely Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q22. How much influence do your religious beliefs have on important life decisions?</td>
<td>None</td>
<td>Some</td>
</tr>
</tbody>
</table>

Q23: I am a fluent speaker of Arabic or other Middle East language (e.g., Afro-Asiatic/Semitic, Nilo-Saharan language families): (Check one)
- [ ] Strongly agree
- [ ] Somewhat agree
- [ ] Neither agree or disagree
- [ ] Somewhat disagree
- [ ] Strongly disagree

Q24: The ancestry of my current circle of friends is: (Check one)
- [ ] Almost exclusively Middle Eastern
- [ ] Mainly Middle Eastern
- [ ] Equally Middle Eastern and non-Middle Eastern
- [ ] Mainly non-Middle Eastern
- [ ] Almost exclusively non-Middle Eastern

Q25: My early life (childhood to teenage years) was spent: (Check one)
- [ ] Only in the Middle East
- [ ] Mostly in the Middle East
- [ ] Equally in the Middle East and the United States
- [ ] Mainly in the United States and some time in the Middle East
- [ ] Only in the United States
Q26: When with family and friends, I speak: (Check one)
- Only Arabic or other Middle Eastern language (OMEL)
- Mostly Arabic or OMEL, with some English
- Equal amounts of English and Arabic or OMEL
- Mostly English, with some Arabic or OMEL
- Only English

Q27: In relation to my Middle Eastern heritage, I feel: (Check one)
- Very proud
- Proud
- Somewhat proud
- Little pride
- No pride