

Prevalence of Overweight among the Middle Eastern Adult Population in the United States

The striking increase in the prevalence of being overweight and/or obese continues to be the leading public health concern in the United States. In 2017-2018, the prevalence of overweight and obese adults rose dramatically in the U.S. and was estimated at 73.6 percent, an increase of 2.4 percent since 2015-2016. Seventy-seven point one percent of men and 69.4 percent of women were either overweight or obese.¹ The overall prevalence of obesity was highest among non-Hispanic black adults as compared to Hispanic, non-Hispanic white, and non-Hispanic Asian adults.² The immigrant population in the U.S. has increased in the past five decades. In 2019, there were 44.9 million immigrants in the U.S., comprising 13.7 percent of the U.S. population.³ It is projected that by 2050, almost one in five U.S. residents will be an immigrant.⁴ Given such a rapid immigrant population increase, it is crucial to study their health status. Research has shown that, in general, immigrants have better health profiles compared to their U.S.-born counterparts when they arrive in the U.S., a phenomenon known as “healthy immigrant effect.” Yet, the longer they stay in the U.S., the more their health deteriorates.⁵

Immigrants in the U.S. are disproportionately affected by being overweight and obese among other chronic conditions. Research on immigrant health indicates a high prevalence of overweight and obese immigrants in the U.S.⁶ Previous studies have shown that Hispanic immigrants have higher odds of reporting obesity compared to non-Hispanic whites and Blacks.⁷ On the contrary, Asian adult immigrants reported the lowest rate of obesity compared to non-Hispanic white, Black, and Hispanic adults.⁸ Additionally, prior research has shown that being overweight and/or obese is associated with many health conditions such as hypertension, heart diseases, and type 2 diabetes.⁹ Past work has also shown that the prevalence of being overweight and/or obese is positively associated with time in the U.S.¹⁰

Sex has been reported to have a strong relationship with being overweight and obese among immigrants. Among Hispanic populations in the U.S., the prevalence of being overweight and obese were higher among men than women,¹¹ and higher than the national average, 77.9 percent of Hispanic men and 76.2 percent of Hispanic women were overweight or obese.¹² Among non-Hispanic Asians, overweight rates were higher among men (42.4 percent) compared to women (34.4 percent).¹³ Contrarily, a more recent study found no significant sex differences among non-Hispanic Asian and Hispanic adults with regard to the prevalence of obesity.¹⁴ However, these studies have only focused on Hispanics, Blacks, and Asians.

Although one of the rapidly growing immigrant groups in the U.S., there is limited research about Middle Eastern (ME) immigrants¹⁵ in the public health literature. Middle Eastern (ME) immigrants come from a rich and diverse cultural heritage including different ethnicities, religions, education levels, socioeconomic status, and languages. The relatively few studies that examine health outcomes of ME immigrants in the U.S. provided mixed results. While some studies found that ME immigrants are healthier than U.S.-born, non-Hispanic whites,¹⁶ other studies found the prevalence of obesity among ME immigrants does not differ significantly from that of non-Hispanic whites.¹⁷ Community-based studies found that they are at risk of a high prevalence of obesity/BMI.¹⁸ The one study that compared the prevalence of being overweight and obese among ME men and women utilized a community based sample of ME immigrants in Michigan.¹⁹ This study found that ME women had higher prevalence of being overweight and obese compared to ME men.

From the research reviewed above, it can be seen that there is a need for empirical studies that investigate the prevalence of being overweight/obese among immigrants in the U.S. Therefore, using eighteen years of nationally representative data from the National Health

Interview Surveys, the current study extends previous literature on immigrant health by examining the estimated prevalence of being overweight among Middle Eastern (ME) immigrant men and women in the U.S. Moreover, this study examines the factors that are associated with being overweight in this population.

Data and Methods

This study analyzes pooled data from the 2000-2017 National Health Interview Surveys (NHIS). The NHIS is a multipurpose health survey conducted annually since 1957 by the National Center for Health Statistics (NCHS) and Centers for Disease Control and Prevention, and is administered by the U.S. Census Bureau. The NHIS is a multi-stage, stratified, cluster sample that is designed to manage information on the non-institutionalized, civilian population in the U.S.²⁰ Using face-to-face interviews, data on health, health care services, and behaviors are collected for all individuals of sample households. The NHIS data are available as public domain. Detailed information about the NHIS can be found on the CDC_NHIS website (<https://www.cdc.gov/nchs/nhis/index.htm>). To improve the reliability of statistical estimates, eighteen years of data was pooled. The analyses for this paper mainly draw data from the sample adult files of individuals eighteen years and older. These files were linked with corresponding person, household, and family files when necessary. The analyses were limited to non-Hispanic, Middle Eastern immigrants ($N=1622$).

Middle Eastern Immigrants

Foreign birth was considered a proxy for immigrant status.²¹ In 2000, the NHIS included a question about global region of birth. This, in turn, helps to distinguish the ME immigrant population. Respondents were asked to choose their region of birth from the following categories: United States, Mexico/Central America/Caribbean Islands, South America, Europe,

Russia, Africa, Middle East, Indian subcontinent, Asia, Southeast Asia and elsewhere, and unknown. They were also asked whether or not they considered themselves Hispanics/Latinos. Middle Eastern immigrants are individuals born in the Middle East region and are non-Hispanic; all other groups are dropped from the analysis.²²

Measures

Using the National Institute of Health cut offs, overweight and obesity are combined into one category and defined as a body mass index (BMI; weight in kilograms divided by height in meters squared) of 25 kg/m² or more among adults. Demographic variables include age, recoded into four different age groups (18-24, 25-44, 45-64, and 65-85), marital status (married, coded 1), and sex (female, coded 1). Socioeconomic variables include level of education ($\leq$ high school or some college, coded 0 and college graduate or advanced degree, coded 1), employment status (employed, coded 1), and homeownership (own their home, coded 1 and rent or other arrangements, coded 0). Healthcare utilization was measured by two questions, whether participants have health insurance (yes, coded 1) and have seen or talked to a doctor in the past twelve months (yes, coded 1).

General self-rated health was measured with the question: “Would you rate your health as excellent, very good, good, fair, or poor?” Similar to prior research,²³ responses were recoded as excellent, very good, or good = 0, and fair or poor = 1. Respondents with any activity limitations were coded as 1. Respondents were also asked whether they were diagnosed with diabetes (yes = 1), hypertension (yes = 1), and heart disease (yes = 1) and whether they smoke (yes = 1). To measure length of residence in the U.S., respondents were asked “About how long have you been in the U.S.?” Responses were dichotomized into less than 10 years = 0 and 10 years or more = 1. Respondents who were U.S. citizen, coded as 1.

Statistical Analysis

To account for the sampling design of the NHIS, sampling weights for the years 2000-2017 were adjusted. That includes using the weighted estimates and taking strata and clusters into account when calculating the standard errors.²⁴ Data analyses are carried out with SAS 9.4 Software using listwise deletion to deal with missing values.²⁵ To account for the complex multistage nature of the NHIS data, SAS survey procedures were used. Chi-square tests were used to assess differences in sample characteristics.

Table 1. Weighted Descriptive Statistics of Middle Eastern (ME) Immigrants, Aged 18 and above, NHIS 2000-2017

Characteristics (percent)	Non-Hispanic, ME Immigrants (N=1622)
Body Weight Status	
Normal/healthy weight	43.16 (1.43)***
Overweight [§]	56.85 (1.43)
Age Groups (years)	
18-24	11.93 (0.93)***
25-44	42.18 (1.51)
45-64	33.72 (1.31)
65-85	12.18 (0.98)
Sex	
Female	43.83 (1.47)***
Male	56.17 (1.47)
Marital Status	
Married	65.43 (1.11)***
Not married/divorced/widow	34.57 (1.11)
Education	
≤ High School or some college	51.28 (2.20)
College or Advanced Degree	48.72 (2.20)
Employed	63.54 (1.51)***

Own their home	52.06 (1.80)
Have fair/poor health	10.99 (1.12) ^{***}
Diabetes	6.07 (0.57) ^{***}
Hypertension	19.54 (1.11) ^{***}
Heart Disease	4.58 (0.53) ^{***}
Have any Activity Limitations	24.92 (1.11) ^{***}
Smoke	17.50 (1.16) ^{***}
Have Health Insurance	81.07 (1.23) ^{***}
Seen/talked a Doctor past year	62.68 (1.46) ^{***}
Been in the U.S. for 10 or more years	68.13 (1.37) ^{***}
U.S. Citizen	64.28 (1.31) ^{***}

Standard errors in parentheses

[§]Overweight (BMI ≥ 25).

Significance: *** $p < 0.001$

Results

Table 1 presents the weighted characteristics of non-Hispanic, ME adult immigrants along with the standard errors and *P*-values. As shown in table 1, ME immigrants in this sample are at risk. The prevalence of being overweight, although it was below the national average (73.6 percent),²⁶ was high (56.85 percent). The majority of the sample was between 25-44 years old (42.18 percent) and 45-64 years old (33.72 percent). There were more male participants than female in this sample (56.17 percent vs. 43.83 percent). ME immigrants were more likely to be married (65.43 percent), highly educated, (48.72 percent) have a college or an advanced degree, employed (63.45 percent), and own their homes (52.06 percent). Only 10.99 percent reported their health as fair or poor, 6.07 percent had diabetes, 19.54 percent had hypertension, and 4.58 percent had heart disease. Almost 25 percent of the sample reported having activity limitations. Table 1 also shows that 81.07 percent of ME immigrants in this sample had health insurance and 62.68 percent reported having seen or talked to a doctor in the past year. Lastly, the majority of

ME immigrants in this sample have resided in the U.S. for ten years or more (68.13 percent) and were U.S. citizens (64.28 percent).

Table 2. Prevalence Rates of Overweight Among Middle Eastern Immigrants, Aged 18 and above, by Characteristics, NHIS 2000-2017

	Non-Hispanic, ME Immigrant (N=1622)
	Overweight [§]
Sex percent	
Female	35.11 (1.84) ^{***}
Male	64.89 (1.84)
Age Groups (years) percent	
18-24	5.86 (0.71) ^{***}
25-44	38.21 (1.91)
45-64	41.93 (1.66)
65-85	14.01 (1.39)
Married percent	70.94 (1.38) ^{***}
Education percent	
<=High School graduate & some college	51.68 (3.00) [†]
College & Advanced Degree	48.32 (3.00)
Employed percent	66.21 (2.27) [*]
Own their Home percent	53.62 (1.91)
Have fair/poor health percent	14.87 (1.45) ^{***}
Diabetes percent	8.27 (0.93) ^{**}
Hypertension percent	26.66 (1.77) ^{***}
Heart Disease percent	5.45 (0.73) [*]
Have any Activity Limitations percent	28.92 (1.63) ^{***}
Smoke percent	18.17 (1.52)
Have Health Insurance percent	80.86 (1.62)
Seen/talked a Doctor past year percent	65.19 (1.64) [*]
Been in the U.S. for 10 or more years percent	73.57 (1.37) ^{***}
US Citizen percent	68.84 (1.54) ^{***}

Standard errors in parentheses

§ Overweight (BMI ≥ 25)

Significance: † $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

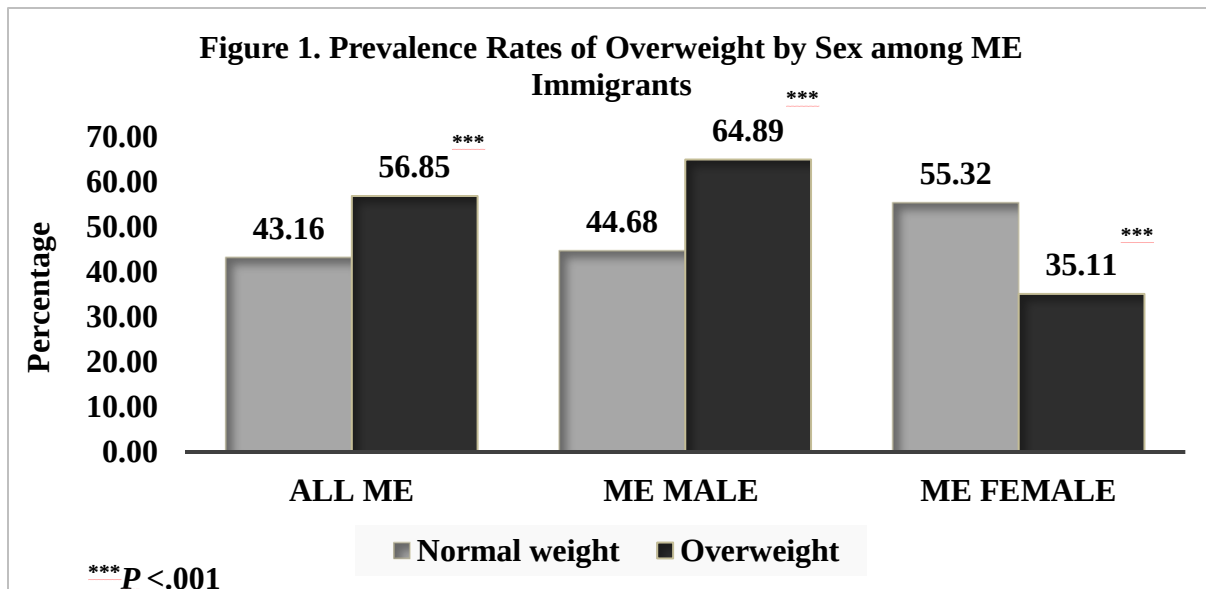


Table 2 shows the chi-square tests of independence of the prevalence rates of being overweight among ME immigrants by different characteristics. As shown, ME men were significantly more likely to be overweight compared to their female counterparts, 64.89 percent and 35.11 percent, $p < 0.0001$, respectively (also shown in Figure 1). Additionally, overweight rates were significantly higher among those who were between 24-44 and 45-64 years of age, 38.21 percent and 41.93 percent, respectively. Moreover, married (70.94 percent) and employed (66.21 percent) ME immigrants had higher prevalence rates of being overweight than those who were not. Furthermore, nearly 15 percent of the participants who reported their overall health as fair or poor, 8.27 percent of ME immigrants who had diabetes, 26.66 percent of those who had hypertension, 5.45 percent of those with heart disease and 28.92 percent with activity limitations were overweight. Table 2 also shows that ME immigrants who were overweight were significantly more likely to report seeing a doctor in the past year (65.19 percent). Finally, those who have been in the U.S. for 10 or more years (73.57 percent) and were U.S. citizens (68.84 percent) were significantly more likely to be overweight.

Table 3. Prevalence Rates of Overweight Among Middle Eastern Immigrant Men and Women, Aged 18 and above, by Characteristics, NHIS 2000-2017

Non-Hispanic, ME Immigrant (N=1622)		
	Overweight	
	Male	Female
Age Groups (years) percent		
18-24	6.84 (0.94)	4.04 (1.00)***
25-44	41.57 (2.22)	32.00 (2.68)***
45-64	39.72 (2.04)	46.00 (2.86)***
65-85	11.87 (1.50)	17.96 (2.22)***
Married percent	72.12 (1.75)	68.74 (2.76)
Education percent		
<=High School graduate & some college	47.30 (3.10)	59.78 (4.08)
College & Advanced Degree	52.70 (3.10)	40.22 (4.08)***
Employed percent	77.39 (2.10)	45.53 (3.61)***
Own their Home percent	53.78 (2.24)	53.34 (3.09)
Have fair/poor health percent	10.01 (1.28)	23.86 (3.06)***
Diabetes percent	8.08 (0.99)	8.62 (2.05)
Hypertension percent	25.01 (2.22)	29.69 (2.69)
Heart Disease percent	4.92 (0.82)	6.43 (1.55)
Have any Activity Limitations percent	19.53 (1.59)	46.26 (3.14)***
Smoke percent	22.96 (2.02)	9.33 (2.18)***
Have Health Insurance percent	77.75 (2.04)	86.60 (2.12)**
Seen/talked a Doctor past year percent	59.59 (2.04)	75.55 (2.54)***
Been in the U.S. for 10 or more years	72.68 (1.64)	75.22 (2.28)
percent		
U.S. Citizen percent	65.82 (1.90)	74.42 (2.72)**

Significance: † $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

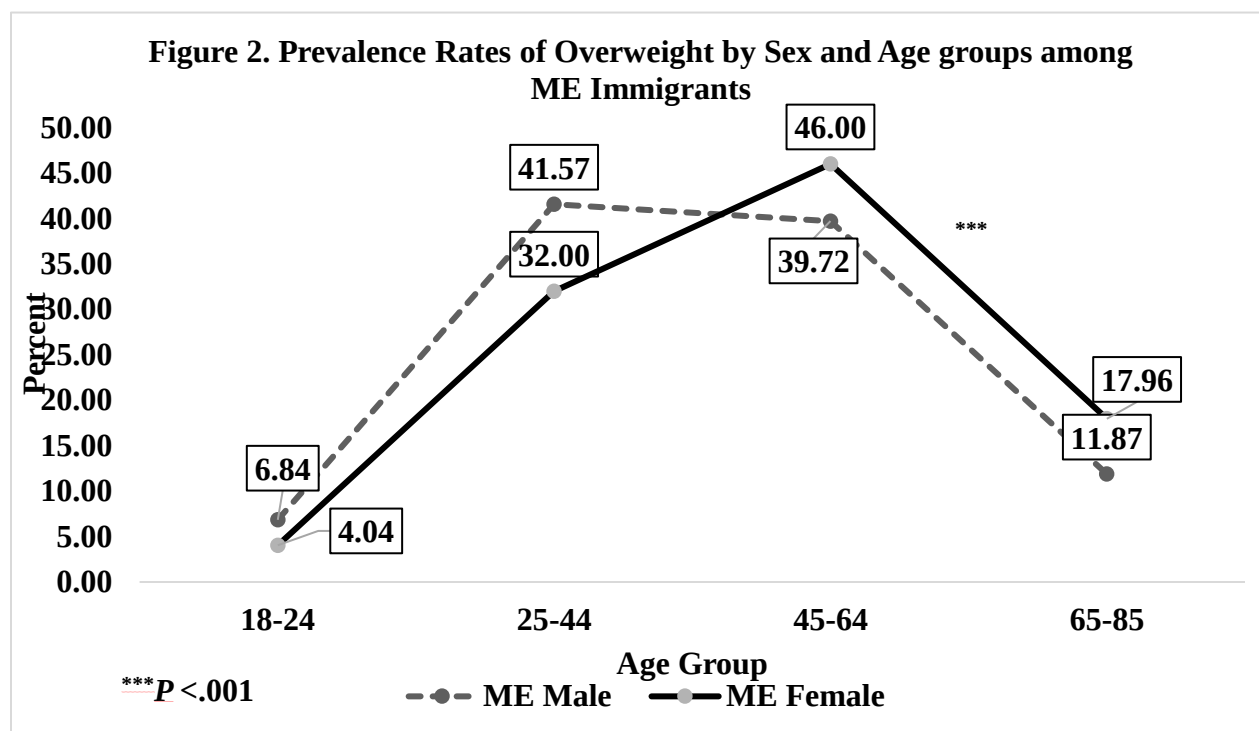


Table 3 demonstrates the chi-square tests of independence of the prevalence rates of being overweight among ME immigrant men and women by different characteristics. While ME men who were 18-24 and 25-44 years of age had significantly higher rates of overweight than ME women in the same age groups (6.84 percent & 41.57 percent vs. 4.04 percent & 32.00 percent, respectively), ME women who were 45-64 & 65-85 years old had significantly higher rates of overweight than their male counterparts (46.00 percent & 17.96 percent vs. 39.72 percent & 11.87 percent, respectively) (also shown in Figure 2). Prevalence rates of being overweight were significantly higher among ME women with a high school diploma and some college (59.78 percent) than among ME male counterparts (47.30 percent) whereas ME men with college or advanced degrees (52.70 percent) were significantly more likely to be overweight compared to ME women (40.22 percent) with similar degrees. Employed ME men (77.39 percent) were significantly more likely than women (45.53 percent) to be overweight.

ME women who reported fair and poor health status, had activity limitations, had health insurance, saw a doctor in the past twelve months, and were U.S. citizens were significantly more likely than ME men to be overweight. Conversely, ME men who smoke were significantly twice more likely to be overweight compared to their female counterparts (22.69 percent vs. 9.33 percent). Surprisingly, there were no statistically significant sex differences of the prevalence of being overweight among participants who were married, owned their homes, had diabetes, hypertension, heart disease, and had been in the U.S. for ten years or more.

Discussion and Conclusion

The objective of this study was to estimate and compare the prevalence rates of being overweight among ME immigrant men and women in the U.S. In addition, the current study examined the factors that are associated with being overweight among this group. Overall, this study showed that ME immigrants had a high prevalence of being overweight (56.85 percent), although it was below the national average (73.6 percent).²⁷ This high overweight prevalence among ME immigrants could be attributed in part to the changes in lifestyle (e.g. diet, physical activity, and smoking) that many immigrant populations adopt in western societies.²⁸ The analysis of this study found that the estimated prevalence of being overweight was significantly higher among ME men (64.89 percent) than ME women (35.11 percent). This finding is in agreement with prior research that found immigrant men, regardless of their ethnicities, had constantly higher rates of overweight compared to their female counterparts.²⁹ Yet, the sex gap among ME immigrants is the largest when compared to those of other immigrant groups.³⁰ The lower rates of overweight among ME women may be due to, as past studies suggested, the fact that women, because of the biological differences in reproductive health, are more likely than men to interact with the health care system. Thus, they are more aware of their health

conditions.³¹ However, this finding was opposite to Hatahet et al.³² who found that ME women were more likely to be overweight compared to ME men.

When adjusting by age groups, it was found that younger ME men had significantly higher rates of overweight compared to younger ME women in the same age groups, whereas older ME women had higher rates of overweight compared to older ME male counterparts. These findings did not align with recent findings from the National Health and Nutrition Examination Survey that found no significant sex differences between men and women in the U.S. among all adults or by age groups.³³ These findings underscore the significance of implementing health education and overweight/obesity prevention programs that target ME immigrants in these age groups (younger men and older women).

Similar to prior immigrant health studies, many factors were found to be associated with being overweight among ME immigrants. For example, the estimated prevalence of being overweight among ME immigrants were significantly high among those with fair or poor health, diabetes, hypertension, heart disease, activity limitations, and those who utilized the health care system, had health insurances and reported seeing a doctor in the past year.

In terms of sex, ME women who were overweight were significantly more likely to utilize the health care system compared to their male counterparts. This finding mirrors previous work that showed ME men were less likely than ME women to seek health care.³⁴ Moreover, there were sex differences among those with fair or poor health and activity limitations where ME women had higher rates of overweight than men. Also, ME men who smoke were significantly twice more likely to be overweight compared to women. Surprisingly, there were no sex differences among ME immigrants who had diabetes, hypertension, and heart disease.

This finding does not align with prior research that found that overweight or obese men have higher prevalence of these diseases compared to their female counterparts.³⁵

ME immigrants who have been in the U.S. for ten years or more and those who were citizens had higher rates of overweight. These findings support prior research that suggested the negative impact of length of stay in the U.S. on immigrants' health including the development of overweight or obesity.³⁶ Across different age groups, the estimate prevalence of being overweight among ME women increased as age increased except for in the oldest age group (65-85). Among ME men, gaining weight started to decline at an earlier age than women, (45-63 years of age).

This study is subject to a few limitations. First, the NHIS data are cross-sectional; as such, this study could not examine the changes of bodyweight of ME immigrants over time. Second, for confidentiality issues, this study was unable to differentiate ME immigrants by country of origin. Given the distinct differences within this group, future studies should explore these differences. Third, this study did not compare ME immigrants to other immigrant groups. Future studies should also compare overweight/obesity rates among ME immigrants to other immigrant groups such as Latinos and Asians. Finally, there is an ongoing debate about the use of BMI alone as an indicator of some health conditions. Future research should combine BMI with other anthropomorphic measurements such as waist circumference (WC) and a body shape index (ABSI) when examining the prevalence of being overweight/obese and its associated risk factors, as recommended by some health scholars.³⁷

Despite its limitations, this study contributes to the extant research on immigrant health disparities in several ways. First, this study contributes to understanding the health profile of ME immigrants in the U.S. and adds to the limited body of the literature about this understudied

population. Moreover, this study uses eighteen years of nationally representative data to estimate and compare the prevalence of being overweight among ME immigrant men and women in the U.S. In addition, this study further extends previous research on the topic of overweight among immigrants in the U.S. Finally, results from this study also highlight the importance of considering sex and age group differences when examining overweight and obesity of immigrants. Yet, further research is still needed to explain the relatively high rates of overweight among ME immigrants, particularly men. Further studies should also investigate how the lifestyle of this group in the country of origin impacts/might impact being overweight/obese after coming to the U.S.

In conclusion, the notable high prevalence of being overweight among ME immigrants is concerning as they could worsen their overall health. Communities of ME immigrants in the U.S. should put their best efforts toward supporting healthy lifestyles among men and women throughout all age groups. The current study provides important implications for health care programs and policies designed to address health issues among immigrants in the U.S. In addition, findings from the current study highlight the significance of implementing community-based health education and overweight/obesity prevention programs that are targeted toward ME immigrant communities in the U.S. These community-based programs should focus on educating ME immigrants on the significant negative impact of being overweight on their overall health. In particular, these programs should help ME immigrants to maintain healthy lifestyles by encouraging them to eat a healthy diet (both men and women), promoting the crucial benefits of regular physical activity (especially for women), and helping them to quit smoking (especially for men). Early onset of overweight/obesity among ME immigrant communities can be treated

and prevent other health conditions that are found to be associated with being overweight/obesity, such as hypertension, heart disease, and type 2 diabetes, from developing.

Endnotes

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¹³ Ogden et al.

¹⁴ Hales, “Prevalence of Obesity and Severe Obesity Among Adults: United States, 2017–2018.”

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