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Cardiovascular Health of Filipinos in the United States: A Review of the Literature

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Abstract

Purpose—Filipino Americans (FAs) are at high risk for cardiovascular disease. The purpose of this literature review is to enhance understanding of cardiovascular health among FAs.

Design—Databases searched: MEDLINE (via PubMed), Google Scholar, Journals@OVID, and EBSCO databases including CINAHL Complete. Health Source: Nursing/Academic Edition, Academic Search Complete, and Biological Abstracts 1969-Present. Key terms used: FAs and cardiovascular disease. Criteria for inclusion: peer-reviewed empirical articles published in English.

Findings/Results—A total of 51 studies were identified and 27 were selected for the review based on relevance to nursing care for FAs. Three main themes emerged from the literature reviewed: risk factors and disease prevalence, health promotion, and health beliefs/practices.

Discussion/Conclusions—The literature review identified that FAs were at high risk for cardiovascular disease, hypertension, type 2 diabetes, and metabolic syndrome at lower BMI levels.

Implications for Practice—Health care providers should implement prevention strategies and interventions for the FA population to ensure the best outcomes.

Keywords

Filipino Americans; cardiovascular risk; heart disease; metabolic syndrome; diabetes

The United States is an ethnically and culturally diverse nation with ethnic minorities accounting for almost 116 million people or 37% of the population (U.S. Census Bureau, 2013). By the time the 2020 Census is conducted, greater than half of all U.S. children will identify as part of a minority group (Colby & Ortman, 2015). In 2012, the U.S. Census

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Bureau identified that Asian Americans were the nation's fastest growing ethnic group (U.S. Census Bureau, 2013). The 2014 Census Bureau estimates put the prevalence of Asian Americans at 5.4% of the total population (Colby & Ortman, 2015). It is projected that by the year 2060, more than 30.9 million Asians will reside in the United States constituting about 9.3% of the U.S. population (Colby & Ortman, 2015). Estimates for Filipinos, the second largest Asian American and Pacific Islander (AAPI) subgroup are 3.4 million (Centers for Disease Control and Prevention, 2013).

Filipinos first came to the United States in the 1760s in the Louisiana bayous when both Louisiana and the Philippines were Spanish colonies (Palaniappan et al., 2010). A second wave of Filipinos arrived between 1898 and 1946, when many Filipinos went to California and Hawaii as agricultural workers in sugar and pineapple plantations. Prior to 1935, the Philippines were a U.S. colony, but in 1935, the Tydings-McDuffey Act granted the Philippines independence. This move reclassified Filipinos as foreigners and limited entry to the United States to 50 persons from the Philippines per year. The third wave of Filipino migrants arrived during World War II between 1945 and 1965, when thousands of Filipinos were recruited by the U.S. military and offered migration and citizenship privileges for military service. After the approval of 1965 Immigration Act, Filipinos began to migrate to the United States for higher education and employment opportunities. Unlike former immigrants who were mostly military recruits and farm laborers, this fourth wave of Filipino settlers were college graduates and professionals, many of whom were in the medical field.

Cultural groups often differ in terms of response to illness, beliefs about illness, and attitudes toward seeking assistance on health matters. Multiple studies have evaluated cultural differences to better understand why some diseases are more prevalent in certain ethnic groups. Most published studies focus on health disparities of African Americans, Hispanic Americans, and Native Americans. Moreover, research on Asian Americans is often focused on individuals of East Asians descent, namely, Chinese and Japanese Americans (David, Escobar, Haynes, Nadal, & Prado, 2012). There are no national studies regarding the health of Asians Americans similar to the Hispanic Health and Nutrition Examination Survey research. As a result, Filipino Americans (FAs) may feel marginalized and have been referred to as an "invisible minority" (David et al., 2012).

The general status and overall picture of FAs health in the United States is difficult to discern from existing literature because national health surveys generally combine individuals of different Asian groups together. However, from what is available in the literature, the leading causes of death among FAs 65 years and older include the following: (a) diseases of the heart; (b) malignant neoplasms; (c) cerebrovascular disease; (d) chronic lower respiratory diseases; (e) diabetes mellitus; (f) influenza and pneumonia; (g) nephritis, nephrotic syndrome and nephrosis; (h) accidents (unintentional injuries); (i) aortic aneurysm and dissection; (j) hypertension and hypertensive renal disease; and (k) septicemia (Huo & Lauderdale, 2009). Health care providers may not be aware of the specific health risks to FAs because the population is not distinguished from other Asian groups in the broader literature.

The only nationwide representative data on Asian American groups are from the National Health Interview Survey (NHIS) study from 2003 to 2005. The data revealed that heart-related diseases contribute to morbidity and mortality rates among FAs (Ye, Rust, Balrus, & Daniels, 2009). The survey noted that FAs have a high prevalence of obesity and hypertension. The NHIS survey identified three risk factors for heart disease among FAs: elevated blood pressure, diabetes, and metabolic syndrome (Ye et al., 2009).

The United States has taken the initiative on better understanding and addressing the risk factors for morbidity and mortality of Asian Americans. On October 14, 2009, President Barack Obama signed Executive Order 13515 to reestablish the White House Initiative to address issues concerning the AAPI community (The President, 2009). Relevant studies of FAs health are scarce, fragmented, and are gathered from small regional samples. To implement effective services, health care professionals and community agencies require a comprehensive knowledge of their target ethnic groups. Since 2009, research with FAs has begun to emerge. The purpose of this article is to present an integrative review of the literature (Conner, 2014) in an effort to better understand cardiovascular risk factors among FAs. Based on data provided by the NHIS, the three primary risk factors for cardiovascular disease are (a) elevated blood pressure, (b) diabetes, and (c) metabolic syndrome. The current review focuses on published research relevant to these three risk factors. The research question for this review of the literature is what are the current recommendations for managing cardiovascular risk factors among FAs published in peer-reviewed journals?

Method

An integrative review was conducted (see Figure 1) using the following electronic databases: Journals@OVID (1996-present), Google Scholar, MEDLINE via PubMed (1946-present), EBSCO (including CINAHL Complete; 1937-present); Health Source: Nursing/Academic Edition, Academic Search Complete (1887-present), and Biological Abstracts (1969-Present). Database searches were conducted between April and September 2014. Criteria for inclusion were peer-reviewed empirical articles, articles pertaining to FA adults, and articles published in English. Editorials, conference proceedings, legal debates, opinion essays, and books were excluded, although systematic reviews and meta-analyses were included. No foreign papers were translated and no limits were applied for date of publication.

The key search terms used were *Filipino Americans* and *cardiovascular disease*. Alternate terms were added, for example, *heart disease*, *cardiovascular disease*, *hypertension*, *hyperlipidemia*, *metabolic syndrome*, *physical activity*, and *diet*. In PubMed, the following search string was used: filipino[TI] AND (“heart disease” OR “diabetes mellitus” OR “metabolic syndrome”). Later, in an attempt to focus on the Filipino population in the United States, the search string was expanded as follows: “Asian Americans” [Mesh] AND filipino AND (“heart disease” OR “diabetes mellitus” OR “metabolic syndrome”); see Table 1 for PubMed MESH Headings).

Fifty-one studies met the inclusion criteria, 27 studies were selected for review based on the relevance to nursing care for the FA population. Relevance to nursing care included articles related to (a) risk factors and prevalence of diseases, (b) health beliefs and practices, and (c)

health promotion. Seventeen studies from the 27 were specifically selected to present in Table 1, based on their applicability to nursing practice and care related to cardiovascular disease. The articles presented in the tables were described regarding purpose, method, design, sample, findings, strengths, and weaknesses. Tables 2 to 4 summarize the purpose, methods, as well as strengths and weaknesses of the reviewed articles.

Results

Findings and strengths and weakness of the reviewed literature are presented below, organized into the three domains relevant to nursing care: (a) risk factors and disease prevalence, (b) health promotion, and (c) health beliefs and practices. See Tables 2 to 4 for select literature review summary.

Risk Factors and Disease Prevalence

As discussed previously, the NHIS survey identified several risks for cardiovascular disease within the FA population, including hypertension, diabetes, and metabolic syndrome. The prevalence and correlates of each of these conditions related to the cardiovascular health of FAs reported in the literature is reviewed below.

Hypertension—Filipinos are at high risk of hypertension due to high rates of smoking, low levels of high-density lipoprotein cholesterol, physical inactivity, high body mass index (BMI), older age, family history, stress, alcohol, high sodium in the diet, and chronic conditions such as diabetes (Ursua et al., 2013; Ursua et al., 2014). A cross-sectional survey conducted in 2006 to 2010 within 119 communities in New York examined 1,028 Filipino immigrants to predict and assess risk for hypertension (Ursua et al., 2013). The study found that 53% of participants were hypertensive and a number of predictors for hypertension were identified. The risk factors for hypertension in the sample were older age, male gender, an elevated glucose reading, family history of hypertension, living in the United States for more than 5 years, a BMI greater than 23.0 kg/m², and a fair or poor self-reported health status (Ursua et al., 2013).

Diabetes, Metabolic Syndrome, and Body Mass Index—Even without being diagnosed with obesity, FAs are at risk for developing type 2 diabetes (Araneta, Wingard, & Barrett-Connor, 2002). Araneta et al. (2010) also note that applying glycated hemoglobin (HbA1C) to diagnose type 2 diabetes had a low sensitivity among FAs and may delay diagnosis of type 2 diabetes. The Filipina Women's Health Study conducted in San Diego, California compared the prevalence of diabetes, heart disease, hypertension, and osteoporosis among FA women in the United States. The researchers found that female FAs had a significantly higher prevalence rate of diabetes when compared with Caucasian women. The majority of the FA women diagnosed with diabetes were not obese and many were unaware they had diabetes (Araneta et al., 2002). A multiethnic population survey in Hawaii also showed that FAs have the highest rate of metabolic syndrome in spite of a lower BMI compared with other AAPI ethnic groups (Grandinetti et al., 2005). A prospective cohort analysis examining the prevalence and incidence of diabetes of 1,704,363 ethnically diverse adult members of Kaiser Permanente in Northern California, found a considerable

variation among the Asian Pacific Islander subgroups. The researchers found that Pacific Islanders, South Asians, and Filipinos residing in the United States had the highest prevalence (18%, 15.9%, and 16.1%, respectively) and incidence of type 2 diabetes (19.9, 17.2, and 14.7 cases per 1,000-person per year, respectively; Karter et al., 2013).

For all groups, the risk of developing heart disease rises with elevated BMI, yet studies have shown that health risks are markedly higher in Asians. Insulin resistance is a major risk factor for the diagnosis of metabolic syndrome. Additional criteria include elevated fasting blood sugar, elevated triglycerides, elevated waist circumference, reduced high-density lipoprotein, and hypertension (Alberti et al., 2009). One component of metabolic syndrome also observed is increased waist circumference or central adiposity. The International Diabetes Federation (2006) has set criteria for determining a diagnosis of central adiposity applying to specific ethnic groups. Asians have smaller pelvic skeleton dimensions and skeletal muscle mass affecting their waist and hip circumference; therefore, the thresholds for waist circumference measurement are lower than non-Asians (Alberti et al., 2009). The Nurses' Health Study followed patterns of weight gain and hyperglycemia in 78,000 women in the United States (Shai, Jiang, & Manson, 2006). Ancheta, Battie, Tuason, Borja-Hart, and Ancheta (2014) conducted a cross-sectional study ($n = 193$) of FA women and found that the prevalence of cardiovascular risk factors increased at BMIs as low as 23 to 24.9 kg/m². Study results suggest a predictor of increased cardiovascular disease of FA women is BMI (Ancheta et al., 2014). This finding is corroborated by Palaniappan et al. (2011), who compared 43,507 electronic records of Asian Indian, Filipino, Chinese, Korean, Japanese, and Vietnamese patients with the records of non-Hispanic White (NHW) patients. The study results suggested that in spite of lower BMI, Asians had a higher prevalence of metabolic syndrome compared with NHWs.

The World Health Organization expert consultation recommended lower BMI ranges for the diagnosis of overweight and obese in Asian populations. They recommend 23–27.4 for overweight, and 27.5 and higher for obese (WHO Expert Consultation, 2004). Both male and female Asians have been found to have a higher percentage of body fat at any given BMI level when compared to non-Hispanic whites (Wang et al, 1994).

Gender—Filipino women are at higher risk for heart disease. In the past decade, the requirement for percutaneous coronary intervention and coronary artery bypass graft in Filipino women has increased from 3% to 51% (Ryan & Shaw, 2010). Electronic health records were reviewed for 94,423 Asians and NHWs from 2007 to 2010 (Holland et al., 2011). The researchers found that coronary heart disease was significantly higher for Filipino women and men, compared with NHWs. Moreover, the odds ratio of having a stroke were significantly higher for Filipino women (odds ratio = 2.02; 95% CI; Holland et al., 2011). A study using a survey focused on self-reporting of the major risk factors for coronary heart disease (CHD), obesity, decreased exercise, and position on smoking; and the measured waist circumference of FAs was conducted in Southern Nevada ($n = 300$). The results suggested that metabolic syndrome was highly prevalent among FAs (18.3%). More men (21.1%) than women (15.7%) met the criteria for the diagnosis of metabolic syndrome, but the degree of central adiposity was considerably higher in women (84.9%) than men (76.2%); (Dalusung-Angosta & Gutierrez, 2013). However, regardless of waist

circumference, some studies indicate a higher prevalence of metabolic syndrome among Filipino women compared with Caucasians with the same waist circumference (Araneta & Barrett-Connor, 2004).

An extensive survey covering 17 regions and 79 provinces excluding Batanes, a small island at the northern part of the country, representing 42.6 million Filipinos, was conducted in the Philippines to investigate the prevalence of metabolic syndrome among the Filipino population of adults 20 years of age and above. The results suggested the prevalence of metabolic syndrome is 18.6% among Filipinos. The rate was greater in females and in older age groups. However, a decrease in prevalence occurred in participants greater than 70 years of age. In addition, metabolic syndrome was more prevalent in males in the 20- to 29-year and 30- to 39-year age groups (Morales, Punzalan, Paz-Pacheco, Sy, & Duante, 2008).

The University of California San Diego Filipino Health Study measured the prevalence of diabetes and metabolic syndrome among women less than 70 years old (Araneta et al., 2002). Filipino women had a significantly greater prevalence of being diagnosed with diabetes and metabolic syndrome when compared with Caucasians. Araneta and Barrett-Connor (2007) suggested that Filipino women have lower concentrations of adiponectin compared with Caucasians (mean 8.9 $\mu\text{g/ml}$ vs. 15.6 $\mu\text{g/ml}$). Adiponectin is essential in modulation of glucose and lipid metabolism (Chandran, Phillips, Ciaraldi, & Henry, 2003). Paz-Pacheco et al. (2009) stated that when comparing Filipinos diagnosed with diabetes with normoglycemic adult participants, Filipinos had lower levels of adiponectin concentrations.

Health Promotion

Physical Activity—Studies have identified that FA parents tend to support children's after school activities related to tutoring more than sports and physical exercise. FA youth describe how their culture has an effect on decisions related to being active (Nadal, 2011). A study ($n = 300$) by Dalusung-Angosta and Gutierrez (2013) found that 48% of FA participants reported lack of exercise.

Diet—No dietary data exist at the national level for FAs. However, consumption of traditional Filipino foods high in sodium, for example, fish sauce and soy sauce may increase risk for hypertension. Filipino immigrants tend to consume more high-fat foods such as beef, pork, and eggs since arriving in this country because these foods are affordable and easier to access in the United States than in the Philippines (U.S. Department of Health and Human Services, 2003). Traditional Filipino foods are high in sodium and fat, such as deep-fried pork leg (crispy pata), roasted pig (lechon), fried roll with ground pork (lumpia), and deep-fried salted fish (U.S. Department of Health and Human Services, 2003) and rice is included with each meal. Sharing a meal is a traditional Filipino custom to connect with others. However, being offered food at every Filipino gathering makes it difficult for FAs to reduce their caloric intake.

Kim, Park, Grandinetti, Holck, and Waslien (2008) studied dietary patterns of various ethnic groups in Hawaii and related those patterns to diabetes mellitus prevalence among the groups. The results suggested ethnicity is a greater risk factor of diabetes than the diet patterns when the intake of energy is considered (Kim et al., 2008). Serafica et al. (2013)

reported a positive correlation between the consumption of fruits and vegetables by FAs and dietary acculturation. FAs who choose larger numbers of food items in the Western diet had a higher intake of sugar and fats. Anthropometric measurements are usually associated with a Western diet and consuming fat and sugar which could also be related to cultural factors prior to residing in the United States (Serafica et al., 2013).

Smoking—The NHIS revealed that among Asian groups, FAs have a higher percentage of current smokers (17.7%) compared with Chinese (9.2%) and Asian Indians (7.6%); (Ye et al., 2009). Family and friends play a major role in one's decision to stop smoking. Garcia et al. (2009) found that FA men whose social relationships involve mainly Filipinos and whose friends are mostly smokers are less likely to stop smoking. This is partly elucidated in the Filipino value of *pakikisama*, which means getting along with friends to prevent conflict.

Health Beliefs Practice

According to Ursua et al. (2013), it is of utmost importance to reduce cardiovascular health disparities with Filipino community through culturally and linguistically appropriate community-based interventions. Studies have shown poor disease management among Filipinos due to multiple reasons. One reason may be related to the lack of culturally appropriate screening and education techniques and educational materials. Another reason could be related to the low rates of health insurance and limited knowledge on how to access the health care system.

In a study of self-care behaviors of 192 FAs with diabetes in Southern California, younger FAs with type 2 diabetes were less likely to perform optimal self-care behaviors pertaining to medications, diet, and blood glucose monitoring compared with older FA women (Jordan & Jordan, 2010). This finding suggests an increased threat for diabetes complication and cardiovascular comorbidities in younger FAs and perhaps an increased risk of complications later in life. A successful intervention was a randomized control, community-based participatory research project which conducted culturally tailored diabetes education classes with a FA ($n = 40$) in Hawaii. The program was well received with an 88% participation rate and a 93% satisfaction rating from participants. This diabetes education program consisted of eight educational classes. The class times were taught by bilingual facilitators with flexible class times and incorporated culturally appropriate activities, food, and values (Leake et al., 2012).

Dalusung-Angosta (2013) examined the knowledge of cardiovascular disease of highly educated FAs in Las Vegas, Nevada ($n = 120$). This study found that knowledge alone may not prevent CHD, but that cultural and behavioral factors may play a role as well. The participants had adequate knowledge about cardiovascular disease; however, half of the sample did not know about the impact of diabetes, abdominal obesity, and hyperlipidemia on cardiovascular health.

Filipinos traditionally are less likely to complain and do not seek medical attention until their condition becomes extreme (McLaughlin & Braun, 1998). As a result, when FAs appear for care, their arteries may be difficult to treat because of advanced multivessel disease (Ryan & Shaw, 2010).

Risk Factors/Prevalence

To reduce health disparities among the FAs population, more research is needed to identify successful prevention and treatment strategies to reduce CHD. Since CHD is found in FAs at much younger ages, research in this area needs to be a priority (Jose et al., 2013).

Research done by Ryan et al. (2000) identified that FAs have lower rates of obesity and smoking compared with Caucasians, but had a higher prevalence of diabetes and hypertension. FA ethnicity was identified as an independent predictor for elevated mortality rates for catheterization laboratory interventions along with a need for late reintervention. According to the research done by Ryan et al. (2000), FA patients with diabetes who present for coronary artery disease treatment, need to be closely monitored after percutaneous intervention or cardiac surgery procedures.

Conclusion

Studies demonstrate an alarming increase in cardiovascular risk factors in FA that seem to be pushing the disease to epidemic proportions (Ryan & Shaw, 2010). The aim of this literature review was to better understand the cardiovascular risk factors among FAs. This literature review suggests important information for the identification and management of cardiovascular disease of FAs and can assist nurses, nurse practitioners, and other providers in the care of FA patients. Providers need to be aware of the fact that cardiovascular disease is the leading cause of death among Asian Americans. Ye et al. (2009) stated, FAs have a higher prevalence of hypertension; therefore, health care providers should implement prevention strategies and interventions for this population to ensure the best outcomes. Health care providers should not base their decision to screen for type 2 diabetes or metabolic syndrome solely on BMI levels in the FA population. At lower BMI levels, FAs are at risk for type 2 diabetes (Araneta et al., 2010). Ancheta et al. (2014) stated, FA women have an increased risk for cardiovascular disease with a BMI as low as 23. Many unanswered questions remain, including questions pertaining to the culturally adapted interventions, FA health-seeking behaviors, and health outcomes.

This review highlights the need for more in-depth research on factors that influence the prevalence and incidence of cardiovascular disease in this population. Nurses and other health care providers may be able to use results from such research to develop culturally appropriate interventions to improve the health of FAs.

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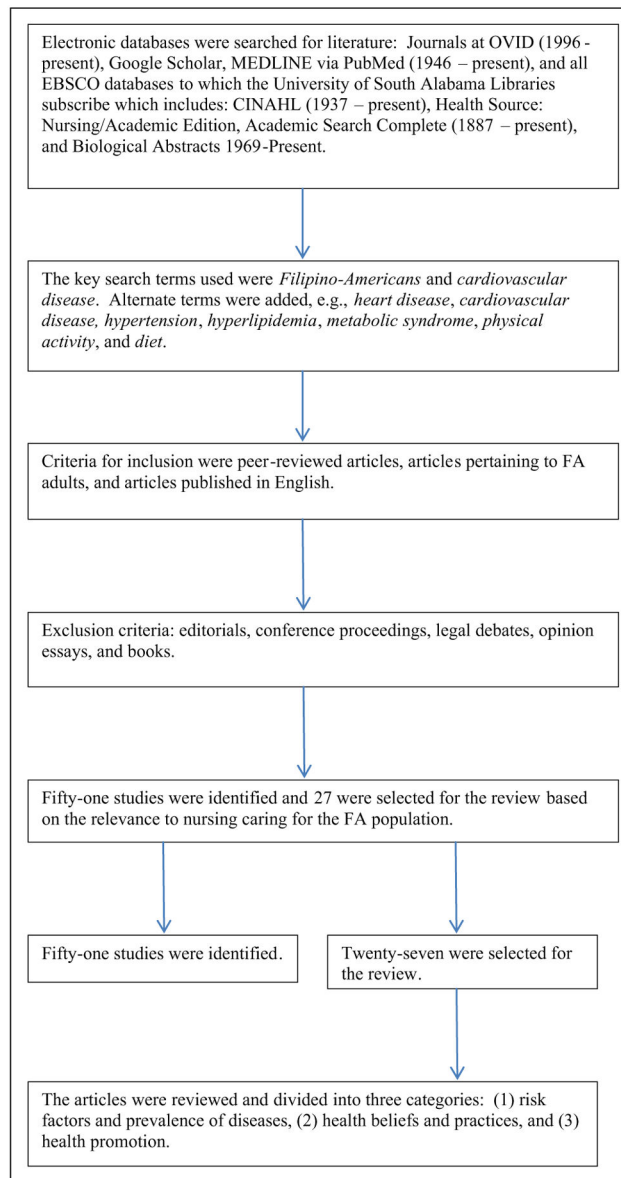


Figure 1.
Flow diagram.

Table 1

PubMed MESH Headings.

-
- Adiposity
 - Adult
 - Aged
 - Asian Americans/statistics & numerical data
 - Asian Continental Ancestry Group/ethnology
 - Body Mass Index
 - Body Size
 - Body Weight
 - Cardiovascular Diseases/epidemiology
 - Cardiovascular Diseases/ethnology
 - Cholesterol
 - Coronary Disease/ethnology
 - Coronary Disease/nursing
 - C-Reactive Protein/analysis
 - Cultural Competency
 - Culture
 - Diabetes Mellitus, Type 2/epidemiology
 - Diabetes Mellitus, Type 2/ethnology
 - Diabetes Mellitus, Type 2/prevention & control
 - Diabetic Angiopathies/epidemiology
 - Diabetic Angiopathies/ethnology
 - Diabetic Angiopathies/prevention & control
 - Emigrants and Immigrants/psychology
 - Emigrants and Immigrants/statistics & numerical data
 - Ethnic Groups
 - Health Behavior
 - Health Knowledge, Attitudes, Practice
 - Health Status Disparities
 - Health Surveys
 - Hypertension/epidemiology
 - Hypertension/ethnology
 - Hypertension/physiopathology
 - Hypertension/prevention & control
 - Insulin Resistance
 - Life Style/ethnology
 - Metabolic Syndrome X/blood
 - Metabolic Syndrome X/epidemiology
 - Metabolic Syndrome X/ethnology
 - Metabolic Syndrome X/etiology
 - Metabolic Syndrome X/metabolism

- Minority Health
 - Obesity, Morbid/epidemiology
 - Obesity, Morbid/ethnology
 - Obesity, Morbid/physiopathology
 - Obesity/epidemiology
 - Oceanic Ancestry Group/statistics & numerical data
 - Overweight/epidemiology
 - Overweight/ethnology
 - Overweight/physiopathology
 - Overweight/prevention & control
 - Philippines/epidemiology
 - Philippines/ethnology
 - Population Groups/statistics & numerical data
 - Prevalence
 - Risk Assessment/methods
 - Risk Factors
 - United States/epidemiology
 - Waist Circumference
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Table 2

Articles Reviewed: Risk Factors and Disease Prevalence.

Author(s), year; Title	Question/purpose	Design and sample size	Findings	Strengths (1) and weaknesses (2)
Araneta, Grandinetti, and Chang (2010); A1C and diabetes diagnosis among Filipino Americans, Japanese Americans, and Native Hawaiians.	Examine the sensitivity and specificity of A1C 6.5% to diagnose diabetes among Filipino Americans, Japanese Americans, and Native Hawaiians.	Cross-sectional design; N = 933 (Filipino Americans, Japanese Americans, Native Americans).	A1C 6.5% had low sensitivity and may delay diagnosis of type 2 diabetes without oral glucose tolerance test.	1 The sample was drawn from large Asian communities in San Diego and Hawaii. Recruitment materials included other general health issues (such as osteoporosis) to reduce self-selection bias. 2 Sample size was insufficient to evaluate A1C measures by ethnicity.
Dalusung-Angosta and Gutierrez (2013); Prevalence of metabolic syndrome among Filipino-Americans: A cross-sectional study.	Examine the prevalence of metabolic syndrome among Filipino Americans, compare the rate of metabolic syndrome between Filipino men and women, and examine the prevalence of central adiposity.	Descriptive correlational, cross-sectional design; N= 300 (Filipino Americans).	Metabolic syndrome and central adiposity are highly prevalent among Filipino Americans residing in Southern Nevada. More men than women had the syndrome, but the rate of central adiposity was significantly higher in women than men.	1 Waist circumference was measured by one person for accuracy and consistency. 2 Convenience sample and small sample size.
Grandinetti, Chang, Theriault, and Mor (2005); Metabolic syndrome in a multiethnic population in rural Hawaii.	Examine the prevalence of insulin resistance and metabolic syndrome among an ethnically diverse, rural population in Hawaii.	Cross-sectional survey; N = 1,450 (diverse ethnicities).	Metabolic syndrome prevalence was high in Asian ethnic groups. After adjustment for body mass index, age, sex, and years of education, the Filipino population appeared to have the highest odds for prevalence of metabolic syndrome.	1 Thorough health screening was performed. Lab values and anthropometric measurements were analyzed. 2 Possible selection bias of Caucasian residing in Kohala may not represent Caucasians elsewhere.
Holland, Wong, Lauderdale, and Palaniappan (2011); Spectrum of cardiovascular diseases in Asian-American racial/ethnic subgroups.	Compare the prevalence of coronary heart disease, stroke, and peripheral vascular disease across Asian American subgroups and non-Hispanic White participants.	Cross-sectional, electronic health record review; N= 94,423 (Asian American and non-Hispanic White).	The adjusted odds ratios of coronary heart disease were significantly higher for Filipino women and men and Asian Indian men and significantly lower for Chinese women and men compared with non-Hispanic White. The odds of stroke were significantly greater for Filipino women. The odds of peripheral vascular disease were generally lower for all Asian subgroups.	1 The sample was drawn from a large mixed-payer outpatient organization with 30% Asian American population. 2 Limited sample size in the smaller Asian subgroups (i.e., Vietnamese and Korean populations).
Palaniappan, Wong, Shin, Fortmann, and Lauderdale (2011); Asian Americans have greater prevalence of metabolic syndrome despite lower body mass index.	Examine the relationship between body mass index and metabolic syndrome for Asian Americans and non-Hispanic Whites.	Cross-sectional health records of 43,507 (Asian American, non-Hispanic Whites).	The results indicate that body mass index ranges for defining overweight/obesity in Asian populations should be lower than for non-Hispanic Whites.	1 The subgroups examined have similar health-care access, socioeconomic status, and geographic location. 2 The study was conducted in a single geographic area and limited sample size in the smaller Asian subgroups (i.e., Korean and Vietnamese populations). The

Author(s), year; Title	Question/purpose	Design and sample size	Findings	Strengths (1) and weaknesses (2)
Paz-Pacheco et al. (2009); Adiponectin levels and its association with hyperglycemia in adult Filipino participants in the 2003–04 National Nutrition and Health Survey.	Determine the association of serum adiponectin levels with the presence of impaired fasting glucose or diabetes mellitus in Filipinos.	Case-control study; <i>N</i> = 160 (Filipino Americans).	The findings conclude that Filipinos with diabetes mellitus had significantly lower adiponectin levels compared with normoglycaemic participants.	<p>participants were insured. This affects the generalizability of the sample.</p> <p>1 A nationally representative population was generated by stratified multistage sampling covering all regions and provinces in the Philippines (except Batanes).</p> <p>2 The blood samples were obtained from retrievable and usable stored sera, which limit secondary analysis.</p>
Ryan et al. (2000); Coronary heart disease in Filipino and Filipino-American patients: Prevalence of risk factors and outcomes of treatment.	The purpose of this study was to analyze prospectively collected data at a center treating coronary artery disease in a large series of Filipino patients.	Descriptive correlational health record review; <i>N</i> = 3,703 (Filipino Americans = 527; Caucasians = 3,176).	Filipino Americans had a higher prevalence of hypertension and diabetes, and a lower prevalence of smoking and obesity compared with Caucasians. Filipino American ethnicity is an independent predictor of higher mortality after cardiac catheterization and increased need for late reintervention.	<p>1 The data were drawn from the largest Filipino Americans community outside Manila (89,000 Filipino Americans reside in San Francisco and 25,000 reside in Daly City).</p> <p>2 Patients were not randomized to the type of revascularization used, which limits comparisons between treatment modalities.</p>
Serafica, Susan, and Ceria-Ulep (2013); Dietary acculturation and predictors of anthropometric indicators among Filipino Americans.	Explore the relationship of the demographic variables, level of acculturation, dietary consumption of fat, sugar, fruits, and vegetables, and dietary acculturation to the anthropometric measurement of Filipino Americans in the United States.	Descriptive statistics analysis; <i>N</i> = 128 (Filipino Americans).	Dietary factors, specifically the Western diet and consumption of fats and sugars, were the strongest predictors of anthropometric indicators among Filipino Americans. The waist hip ratios of the participants were associated with higher body mass index.	<p>1 Anthropometric measurements were physically obtained and not self-reported.</p> <p>2 The study was a convenience sample.</p> <p>3 Participants have high level of education, moderate income, and were middle-aged.</p>
Ursua et al. (2013); Predictors of hypertension among Filipino immigrants in the Northeast US.	Determine hypertension prevalence and risk factors among Filipino Americans in the New York City.	Cross-sectional survey; <i>N</i> = 1,028 (Filipino Americans).	Logistic regression indicated that older age, male gender, living in the United States for more than 5 years, a body mass index greater than 23.0 kg/m ² , an elevated glucose reading, a family history of hypertension, and fair or poor self-reported health status were predictors of hypertension.	<p>1 Samples represent 119 community health screening centers of the target geographical location (New York). Licensed, bilingual clinical nurse obtained the measurements.</p> <p>2 Participants were not randomly selected and a high percentage of the sample population was uninsured.</p>
Ye et al. (2009); Cardiovascular risk factors among Asian Americans: Results from National Health Survey.	Assess the prevalence of major cardiovascular disease risk factors among Chinese, Asian Indians, Filipinos, and other Asian populations compared with non-Hispanic Whites in the United States.	Retrospective review and bivariate analyses from the National Health Intervention Survey data from 2003–2005; <i>N</i> = 77,267 (Asian American).	The physical inactivity was highest among Asian Indians and other Asians. Filipinos are more likely to have hypertension compared with Whites and Asian Indians were more likely to have diabetes.	<p>1 Data from National Health Intervention Survey were collected for 3 years that allowed comparisons across Asian subgroups. The survey oversampled Asian Americans, allowing more precise estimates of factors that might explain cardiovascular disease risks.</p>

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Author(s), year; Title	Question/purpose	Design and sample size	Findings	Strengths (1) and weaknesses (2)
				2 The risk factors, height, and weight
				3 were self-reported.

Table 3

Articles Reviewed: Health Promotion.

Author(s), year; Title	Aim/purpose	Design	Findings	Strengths (1) and weaknesses (2)
Dirige et al. (2013); Siglang Buhay: Nutrition and physical activity promotion in Filipino-Americans through community organizations.	Evaluate nutrition and physical activity intervention tailored to Filipino Americans.	Randomized trial with an active control group; N= 673 (Filipino Americans).	Nutrition and physical activity participants showed significant increase in physical activity, adoption of low-fat diet, and lower dietary fat intake than those in the cancer education participants. Both participants increased their consumption of fruits and vegetables.	<p>1 The intervention was multiple-level approach and targeted changes in individual and organizational level.</p> <p>2 The outcomes were measured by self-report and questions were not culturally tailored to Filipino Americans dietary habits.</p>
Garcia, Romero, and Maxwell (2009); Correlates of smoking cessation among Filipino immigrant men.	Investigate the correlates of successful quitting among Filipino Americans.	Descriptive statistics; N= 318 (Filipino Americans).	Prohibiting smoking in households, creating social networks of nonsmokers, and education or counseling is an important component of a smoking cessation intervention for Filipino immigrant men.	<p>1 The data were drawn from Filipino Americans (N = 318) in the United States.</p> <p>2 The data collected were from a convenience sample which limits the ability to make generalizations.</p>
Leake, Bermudo, Jacob, Jacob, and Inouye (2012); Health is wealth: Methods to improve attendance in a lifestyle intervention for a largely immigrant Filipino-American sample.	Develop a culturally sensitive adaptation to a widely used diabetes prevention lifestyle intervention education program for Filipino Americans, test the feasibility of the adapted program.	N= 40 (Filipino Americans).	The overall program attendance for the experimental and the wait-listed control group was 88% and participant satisfaction was high with 93% very satisfied.	<p>1 The control group received the intervention immediately after the conclusion of the intervention group. The intervention was culturally tailored, reviewed by focus group, and revised based on the focus group results.</p> <p>2 The sample size was too small to detect differences in outcomes between the groups.</p>

Table 4

Articles Reviewed: Health Beliefs and Practices.

Author(s), year; Title	Aim/purpose	Design	Findings	Strengths (1) and weaknesses (2)
Dela Cruz and Galang (2008); The illness beliefs, perceptions, and practices of Filipino Americans with hypertension.	Describes the illness, beliefs, perceptions, and practices of Filipino Americans with hypertension.	Qualitative approach. Exploratory, descriptive design; N = 27 (Filipino Americans).	In general, the explanatory model of Filipino Americans with hypertension corresponds to the biomedical model in relation to causes, consequences, and treatment of hypertension. However, Filipino Americans have difficulty maintaining the required lifestyle changes and adhering to the medication regimen to control illness.	1 Discussions were linguistically tailored and helped uncover invaluable insights and information that were not easily expressed by Filipino Americans in English. 2 Small sample size.
Jordan and Jordan (2010); Self-care behaviors of Filipino-American adults with type 2 diabetes mellitus.	Examine the diabetes self-care behaviors of Filipino American with type 2 diabetes mellitus.	Qualitative; N = 192.	The findings suggest an increased risk for type 2 diabetes mellitus comorbidities and/or complications in younger Filipino Americans, which may require more intensive treatments in later years.	1 The study thoroughly described optimum self-care behaviors for diabetics (dietary habits, exercise, medication, and self-glucose monitoring). The instrument was reliable, usable, and valid. Summary of diabetes self-care activities – Revised and expanded measure was used. 2 Study is cross-sectional and knowledge regarding the participants’ prediabetes behaviors were not obtained, therefore the variations in their prediabetes self-care behaviors are not know.
Ursua et al. (2014); Awareness, treatment and control of hypertension among Filipino immigrants.	Identify rates of hypertension awareness, treatment, and control and factors associated with awareness, treatment, and control.	Cross-sectional survey; N = 566 (Filipino Americans).	Hypertensive Filipinos exhibit poor hypertension management, warranting increased efforts to improve awareness, treatment, and control.	3 First time that the Summary of diabetes self-care activities – Revised and expanded measure was used in Filipino Americans. Cultural differences in Filipino Americans not addressed. 1 The data were drawn from a large community-based sample of Filipino Americans over 4 years. 2 Measures of awareness (treatment and past diagnoses of hypertension) were collected by self-report versus hospital records. 3 Hypertension was defined by using 1 day blood pressure readings (possible white coat effect).
Dalusing-Angosta (2013); CHD knowledge and risk factors among Filipino-Americans connected to primary care services.	Examine the baseline knowledge and risk factors of coronary heart disease and to describe the relationships between knowledge, sociodemographic, and socioeconomic characteristic variables of Filipino Americans.	Descriptive statistics; N = 120 (Filipino Americans).	Most Filipino Americans were knowledgeable about coronary heart disease. When knowledge scores were compared between men and women, women had higher coronary heart disease knowledge scores than men. Filipino Americans were at an increased risk of coronary heart disease. Gender, education, and income were significantly correlated with coronary heart disease knowledge.	1 The findings were presented by dynamic interplay between Neuman’s theoretical framework and empirical findings of the research. 2 Small sample and they were highly educated, limiting generalization.