LINKS BETWEEN CARDIOVASCULAR DISEASE AND DEPRESSION AMONG HISPANIC/LATINA WOMEN

BY

ANDREA PAOLA RAMIREZ OLARTE

THESIS

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Master's Committee:

Assistant Professor Sandraluz Lara-Cinisomo
Associate Professor Flávia Cristina Drumond Andrade

ABSTRACT

Purpose: Cardiovascular disease (CVD) and depression are significant burdens among Hispanic/Latinos in the U.S. The objective of this systematic review is to examine whether there is an association between depressive symptoms with CVD and CVD risk factors among Hispanic/Latina women in the U.S.

Methods: The following electronic databases were used: PubMed, CINAHL, PsychINFO, PsychARTICLES, Academic Search Ultimate (EBSCO), and Social Services Abstracts to identify articles that examined associations between CVD or CVD risk factors and depression among Hispanic/Latina women. Articles selected for review included Latina/Hispanic women with a focus on the associations between CVD or CVD risk factors and depression in Hispanic/Latina women in the U.S.

Results: Three studies were included in this systematic review. Two articles assessed the associations between CVD risk factors and depression. One examined the associations between CVD and depression in Hispanic/Latina women. One study revealed that there is an association between CVD and depressive symptoms in Hispanic/Latina women compared to Hispanic/Latina women without a history of CVD. The reviewed studies also indicated that depression is associated with different CVD risk factors such as obesity, BMI, and current smoking status.

Conclusion: Hispanic/Latina women and healthcare providers should be mindful that there is an association between depression with CVD and CVD risk factors such as obesity, BMI, and moking. Therefore, early and continuous assessment of these conditions is needed.

Keywords: Cardiovascular disease, cardiovascular risk factors, depression, Latina, Hispanic women.

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CHAPTER 1: INTRODUCTION

Cardiovascular diseases (CVD) are disorders of the heart and blood vessels; many of these are related to atherosclerosis, a condition that develops when plaque builds up in the walls of the arteries, which leads to myocardial infarction, heart failure, and stroke (Frostegard, 2013). The burden of CVD morbidity and mortality is linked to modifiable risk factors that can vary by race and ethnicity (Cooper et al., 2000). Cardiovascular disease accounts for 34.3% of all deaths in the United States (U.S.) (Mensah & Brown, 2007). Cardiovascular disease is also the leading cause of morbidity among Hispanic adults, with 48.3% of Hispanic men and 32.4% of Hispanic women suffering from a CVD currently (Balfour, Ruiz, Talavera, Allison, & Rodriguez, 2016; Rodriguez et al., 2014). Cardiovascular disease risk factors, such as diabetes and obesity, are more prevalent among Hispanic/Latino groups (Flegal, Carroll, Ogden, & Curtin, 2010). Among Hispanic women, prevalence rates of CVD risk factors are: 17% for diabetes, 43% for obesity, 15% for cigarette smoking, 37% for hypercholesteremia, and 24% hypertension (Daviglus et al., 2012).

Another common health condition among adults is depression. The lifetime prevalence for major depressive disorder among the U.S. population is 16.2% (De Oliveira, Cianelli, Gattamorta, Kowalski, & Peragallo, 2017). Additionally, Hispanic women experience depression at about twice the rate of Hispanic males (De Oliveira et al., 2017). High prevalence of depression among Hispanic women may be associated with stressful workplace events, lack of health insurance, discrimination, and living in unsafe neighborhoods (Lewis, Williams, Tamene, & Clark, 2014). Although multiple studies have examined the association between CVD and depression in the general population, few studies analyzed this association among Hispanic/Latina women in the U.S. Hispanics are an important group because they represent the

fastest-growing racial and ethnic group in the U.S. In the year 2013, Hispanics constituted 17% of the total U.S population and are expected to make up 30% of the population by 2050 (Rodriguez et al., 2014). As described above, they also have high rates of depression and CVD.

The objective of this systematic review is to examine whether there is an association between depression or depressive symptoms and CVD risk factors in Hispanic/Latina women in the U.S. A better understanding of these associations will allow professionals from different disciplines to develop early screening and interventions for this vulnerable group of women.

CHAPTER 2: METHODS

This systematic review used the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Checklist (Kyoko, Yoshitoku, & Toyonori, 2011). The screening process began by conducting an extensive search of the published research using various electronic databases, such as PubMed, CINAHL, PsychINFO, PsychARTICLES, Academic Search Ultimate (EBSCO), and Social Services Abstracts. Combinations of keywords were used to identify articles for this study. Search terms included cardiovascular disease, heart disease, high blood pressure, cardiac arrest, congestive heart failure, arrhythmia, peripheral artery disease, stroke, congenital heart disease, depression, major depression, women, Latina, Hispanic, U.S.-born Latina, U.S.-born Hispanic, minority. Abstracts that met the inclusion criteria were selected for further review. Eligibility and selection criteria included peer-reviewed publications that included Latina/Hispanic women, peer-reviewed articles in English, a focus on associations between CVD or CVD risk factors and depression in Hispanic/Latina women in the U.S. Also, articles that were selected analyzed Hispanic women separately by comparing those with and without CVD to compare rates of depression between these two groups. Acceptable study designs included cross-sectional, longitudinal, observational, and randomized trials. Article abstracts that met the initial criteria were saved and tracked in a grid that included the article information (i.e., author, title, abstract, mode of technology used, and measures used). Abstracts identified were reviewed and selected for further review. Discrepancies were discussed with the first and second authors, and a final list of abstracts was selected for full-text review.

CHAPTER 3: RESULTS

A total of 591 articles were identified. Of those, 61 were removed because they were duplicates which left 530 studies to be screened for eligibility (see Fig 1). A total of 484 articles were removed because they did not meet the initial eligibility criteria, which left 46 articles for full-text review. Of those, three studies met the criteria for this systematic review. All three articles selected for full-text review included Hispanics from different backgrounds, including Mexican, Puerto Rican, Cuban, Central American, Dominican, and South American. One study only included females (Zambrana et al., 2016). Castañeda et al. (2016) included 49.9% and Wassertheil-Smoller et al. (2014) had 60% females in their respective sample. Two studies (Castaneda et al., 2016; Wassertheil-Smoller et al., 2014) were part of the Hispanic Community Health Study/ Study of Latinos (HCHS/SOL), which recruited participants at different U.S. metropolitan areas including Chicago, IL; San Diego, CA; Miami, FL, and Bronx, NY. The study by Zambrana and colleagues (2016) recruited participants from the Women's Health Initiative, which is a large, multiethnic, 40-center study funded by the National Heart, Lung, and Blood Institute. The study designs consisted of a stratified random sample design (Castaneda et al., 2016), a cross-sectional study (Wassertheil-Smoller et al., 2014), and an observational and clinical trial at baseline and third-year follow-up (Zambrana et al., 2016).

Table 1 shows the study characteristics and measures used to assess depression or depressive symptoms and CVD diagnosis or CVD risk factors. Two of the studies assessed depressive symptoms through the 10-item form of the Center for Epidemiological Studies Depression Scale (CESD-10) (Castaneda et al., 2016; Wassertheil-Smoller et al., 2014). While Zambrana et al. (2016) assessed depressive symptoms using a psychological questionnaire using 6-items from the CESD scale and two items from the Diagnostic Interview Scale (DIS).

On the other hand, CVD and CVD risk factors were assessed through self-report from the participants and measured as part of the study. Zambrana and colleagues (2016) used of pre-hypertension and hypertension as a measure of a CVD risk factor at baseline and year three. Hypertension was also assigned to women who reported that they were told by a doctor that they had high blood pressure, and/or were prescribed with medication for hypertension, and/or whose blood pressure readings were ≥140/90 mmHg. Pre-hypertension was defined as women with a blood pressure reading of 120-139/80-89 mmHg and no self-report of medication prescribed for hypertension. In the other two studies, CVD risk factors were assessed through a baseline examination of dyslipidemia, body mass index (BMI), current cigarette smoking, diabetes, and hypertension (Castaneda et al., 2016; Wassertheil-Smoller et al., 2014). Wassertheil-Smoller et al. (2014) also included participants that self-reported CVD such as myocardial infarction, coronary artery bypass surgery, and percutaneous transluminal coronary angioplasty or stroke.

Associations between Depression and Cardiovascular Disease

The three articles selected for full-text review reported an association between depression and CVD risk factors. One study (Wassertheil-Smoller et al**.,** 2014) also reported the association between depression and CVD among Hispanic women. Wassertheil-Smoller et al**.** (2014) found that any CVD (e.g., MI, stroke or revascularization/stenting) increased the odds of depression by 77% compared to those with no CVD history even after controlling for demographic characteristics and recruitment site (OR = 1.77, 95% CI [1.35, 2.33]). Wassertheil-Smoller et al**.** (2014) also found that Hispanic women had higher odds of depression with one to five CVD risk factors; OR for one risk factor = 1.48 (95% CI [1.26, 1.74]), OR for five risk factors = 4.65 (95% CI [2.15, 10.05]). Risk factors were hypertension, diabetes, dyslipidemia, diabetes, current smoking, and obesity.

Castañeda et al**.** (2016) found that in an unadjusted analysis, all individual CVD risk factors including, dyslipidemia, obesity, diabetes, current smoking, and hypertension, were positively associated with depressive symptomatology. However, after adjusting for different demographic variables, they found that depressive symptomology was higher (B = 0.67, SE = 0.20, $p \leq 001$) among Hispanic females classified as obese compared to those that were not obese. For current smokers, mean depressive symptomology was higher (B = 1.83, SE = 0.32, $p \leq 001$) compared to women who never smoked or were former smokers.

Lastly, Zambrana et al. (2016) found that 21.7% of hypertensive women were considered depressed, while only 19.2% of normotensive women screened positive for depression at baseline. After adjusting for demographic and clinical variables, those with a history of depression had higher odds of pre-hypertension (OR = 1.27, 95% CI [1.01, 1.61]) and hypertension (OR = 1.23, 95% CI [1.02, 1.49]) at baseline. Also, after adjusting for various demographic variables (e.g., age, education, healthcare insurance, and behavioral factors) the incidence of hypertension at year three was higher among those with a history of depression compared to those without such a history (OR = 1.74; 95% CI [1.10, 2.74]); however, the odds decreased after adjusting for BMI (OR = 1.53; 95% CI [0.95, 2.46]).

CHAPTER 4: DISCUSSION

Results from this systematic review indicated that one study found an association between CVD and depressive symptoms among Hispanic/Latina women compared to Hispanic/Latina women without a history of CVD. The selected studies also indicate that depression is associated with different CVD risk factors such as obesity, BMI, and current smoking status. These results suggest that there could be other factors affecting the association between depressive symptoms and CVD among Hispanic women. A study that assessed the relationship between CVD and depressive symptoms as predictors of CVD events in the general population of women suggests that depression may be related to CVD in combination with CVD risk factors (Rutledge et al., 2012).

What distinguishes this study from others is that this systematic review focuses on the Hispanic/Latina women, a population that is not only growing at a fast rate but also experience high rates of depression and CVD. Psychological stress experienced by Hispanic/Latina women suffering from depression could be associated with different contextual and cultural relevant stressors such as unhealthy dietary lifestyles, poverty, living in unsafe neighborhoods, stressful workplace events, discrimination, isolation, acculturation, among others (Castaneda et al., 2016; Lewis et al., 2014; Zambrana et al., 2016). It could be that these stressors are associated with impairment of immune function, deregulation of the hypothalamic-pituitary-adrenal (HPA) axis, and sympathetic nervous system (Thurston, Rewak, & Kubzansky, 2013). In fact, increased production of pro-inflammatory cytokines such as interleukin-6 and C-reactive proteins seems to be associated with the development and progression of atherosclerosis and CVD (Dhar & Barton, 2016). Also, increase activation of the hypothalamic-pituitary-adrenal axis and the sympathetic nervous system activity release plasma catecholamines that may lead to damage the vascular

endothelium (Dhar & Barton, 2016; Thurston et al., 2013). However, further research on the role of CVD risk factors, the HPA axis, and the sympathetic nervous system on the associations between depression and CVD on Hispanic/Latina women is needed.

Having a better understanding of the associations of CVD and CVD risk factors with depression would be promising for the overall health of the Hispanic/Latina women population, more specifically, their mental and cardiovascular health. This line of research will help professionals such as those in medicine, psychology, and public health to be mindful of mental health issues, specifically depression and its links with CVD among Hispanic women. This could lead to the implementation of early screening programs to allow early intervention by referring patients to counselors, psychologists, or psychiatrists. Also, healthcare professionals can educate Hispanic/Latina women about different coping interventions for stress and depression, and also educating them about obesity and smoking behaviors and its risk for depression.

A major weakness of this systematic review is the number of studies available for review which points to the scant amount of studies that look at the associations between depressive symptoms and CVD in Hispanic/Latina women in the U.S. For example, of the 591 studies found, only three addressed the associations of depression and CVD among Hispanic/Latina women. The results of this systematic review suggest that more research is needed to clarify the associations between depressive symptoms and how CVD risk factors factor into associations between depression and CVD in Hispanic/Latina women.

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APPENDIX: TABLE AND FIGURE

Figure 1. PRISMA flow diagram showing the number of articles identified, screened, excluded, and included in the systematic review

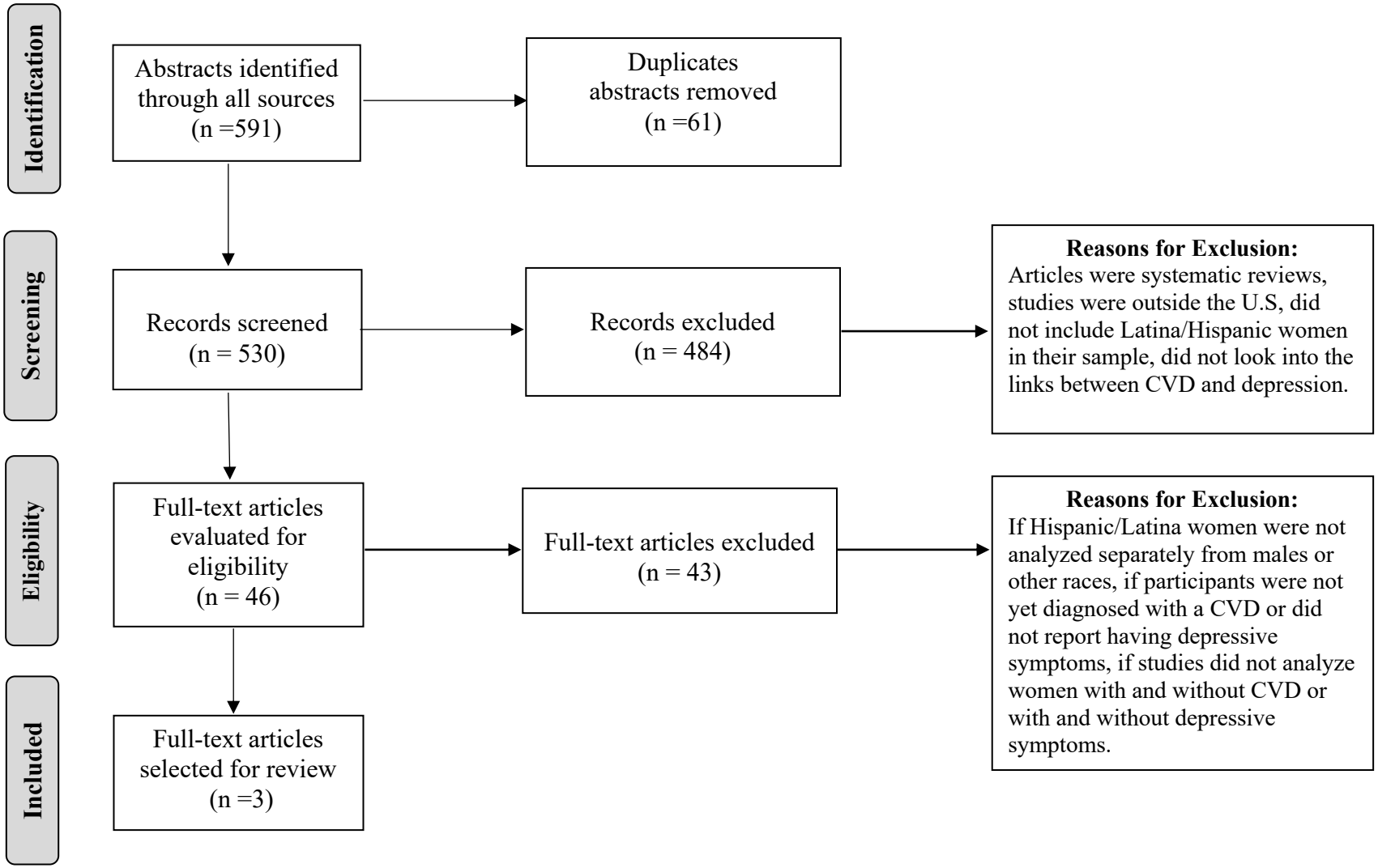

Table 1. Study characteristics and links between cardiovascular disease and depression among Hispanic women (N = 3)

Source	Sample and Recruitment Strategy	Study Design	Measures	Key findings	Quality Rating
Castañeda et al. (2016)	A total of 16,415 Hispanic/Latino adults between the ages of 18–74 years were recruited in four U.S. metropolitan areas (Chicago, Ill; San Diego, CA; Miami, Fl; and Bronx, NY). Around half (49.9%) were female.	Stratified-random sample study design. Included high versus low proportion of residents who were Hispanic/Latino, and high versus low proportion of residents with greater than a high school education. In the second stage of sampling, households were chosen at randomly.	**Depression:** CES-D 10 **Cardiovascular Disease(s) or Risk Factor(s):** Hypertension; dyslipidemia; BMI; current cigarette smoking; diabetes.	Found that in an unadjusted analysis, all individual CVD risk factors, including dyslipidemia, obesity, diabetes, current smoking, and hypertension, were positively associated with depressive symptomatology. However, after adjusting for different demographic variables, it was found that mean depressive symptomology was 0.67 times higher among females classified as obese compared to those that were not obese and 1.83 times higher among those that were current smokers compared to never or former smokers.	GOOD
Wassertheil-Smoller et al. (2014)	A total of 16,415 Hispanic/Latino adults between the ages of 18–74 years were recruited in four U.S. metropolitan areas (Chicago, Ill; San Diego, CA; Miami, Fl; and Bronx, NY). Around half (60%) were female.	Cross-sectional study design	**Depression:** CES-D 10 **Cardiovascular Disease(s) or Risk Factor(s):** Hypertension; dyslipidemia; BMI; current cigarette smoking; diabetes.	CVD (MI, stroke, or revascularization/stenting) was associated with 77% higher odds of depression compared to those with no CVD history, after controlling for age, sex, Hispanic/Latino background and clinical center (OR=1.77, 95%CI: 1.35, 2.33). They also saw that there was a higher association with depression and a number of CVD risk factors ranging from OR= 1.48 (95%CI: 1.26, 1.74) for those with one risk factor to OR=4.65(95%CI: 2.15, 10.05) for those with all five risk factors among Hispanic women.	GOOD

Table 1. (Cont.)

Source	Sample and Recruitment Strategy	Study Design	Measures	Key findings	Quality Rating
Zambraba et al. (2016)	A total of 4,680 Hispanic women aged 50–79 years were recruited from the Women's Health Initiative (WHI). WHI is a large, multiethnic, 40-center study funded by the National Heart, Lung, and Blood Institute (NHLBI).	Observational and clinical trial at baseline and at third-year follow-up. Blood pressure was measured at baseline and year 3	**Depression:** Psychosocial questionnaire using 6-items from CRS-D and two items from DIS **Cardiovascular Disease(s) or Risk Factor(s):** Pre-Hypertension and Hypertension	Found that after adjusting for a full set of demographic and clinical variables, they observed an association between a history of depression and pre-hypertension at baseline (OR 1.27, 95%CI: 1.01, 1.61). A similar association was seen between history of depression and baseline hypertension (OR 1.23, 95%CI: 1.02, 1.49). In addition, hypertension at year three was associated with baseline depression after adjusting for age, education, healthcare insurance, and behavioral factors (OR 1.74, 95% CI:1.10, 2.74) among Hispanic women.	GOOD