Maturitas 112 (2018) 18–23

Contents lists available at ScienceDirect

Maturitas

journal homepage: www.elsevier.com/locate/maturitas

Religiosity and faith in relation to time to metabolic syndrome for Hispanic women in a multiethnic cohort of women—Findings from the Study of Women's Health Across the Nation (SWAN)

Amanda A. Allshouse[a,*], Nanette Santoro[b], Robin Green[c], Jason Y.Y. Wong[d], Dawn M. Upchurch[e], Genevieve Neal-Perry[f], Rebecca C. Thurston[g], Carol A. Derby[c,h]

[a] Department of Biostatistics and Informatics, Colorado School of Public Health, Aurora, CO, United States
[b] Department of Obstetrics and Gynecology, University of Colorado School of Medicine, Aurora, CO, United States
[c] The Saul R. Korey Department of Neurology, Albert Einstein College of Medicine, Bronx, NY, United States
[d] National Cancer Institute – National Institutes of Health, Division of Cancer Epidemiology and Genetics, Rockville, MD, United States
[e] Department of Community Health Sciences, UCLA Fielding School of Public Health, Los Angeles, CA, United States
[f] Division of Reproductive Endocrinology and Infertility, Department of Obstetrics and Gynecology, University of Washington, Seattle, WA, United States
[g] Departments of Psychiatry, Psychology and Epidemiology, University of Pittsburgh, Pittsburgh, PA, United States
[h] Department of Epidemiology and Population, Health Albert Einstein College of Medicine, Bronx, NY, United States

ARTICLE INFO

Keywords:
Faith
Religion
Metabolic syndrome
Stress
Hispanic
Midlife
Women's health

ABSTRACT

Objectives: We investigated whether faith was associated with a difference in time to incident metabolic syndrome (MetS) among midlife Hispanic women vs women of other ethnicities.
Study design: The Study of Women's Health Across the Nation (SWAN) is a community-based, longitudinal study of a cohort of midlife women. Social, demographic, psychosocial, anthropometric, medical, and physiological measures, and incident MetS were assessed in near-annual intervals using questionnaires and assays. Each participant answered key questions related to religion and meaning in her life. Differences in time to MetS were modeled by Hispanic ethnicity (vs. otherwise) among women reporting low and high levels of faith.
Main outcome measure: Incident MetS in the 7 years after the SWAN baseline assessment.
Results: Among 2371 women, average baseline age 46, Hispanic women (n = 168) were more likely to have higher perceived stress and financial strain than non-Hispanic women (n = 2203). Nevertheless, Hispanic women were far more likely than non-Hispanic women to report that faith brought them strength and comfort in times of adversity, that they prayed often, and that their faith was sustaining for them. Hispanic women had the highest incidence rate of MetS of any racial/ethnic group. However, among women with high levels of faith, the incidence rate of MetS was similar in the Hispanic and non-Hispanic groups. Conversely, among women with low levels of faith, Hispanic women had a faster progression to MetS than did non-Hispanic women.
Conclusions: Faith might be associated with a different risk of MetS among women of Hispanic vs other ethnicities. Among women who are not part of a faith community, Hispanic ethnicity might be a risk factor for MetS.

1. Introduction

Heart disease is the leading cause of mortality among women in the United States (22.6%) [1]. Metabolic syndrome (MetS) contributes significantly to cardiovascular morbidity and mortality, and is present in nearly a third of the US population [2]. Hispanic women are particularly vulnerable to cardiometabolic disorders, including MetS [3]. Low socioeconomic status (SES), of which financial strain is a component, is associated with increased prevalence of MetS, particularly among women [4,5]. Adverse psychosocial factors, including stress, have also been linked to elevated rates of MetS [6] and are conceptualized as one pathway by which low SES may be associated with elevated MetS risk [7]. Enduring discrimination and prejudice [8], adverse social circumstances such as higher poverty rates, less education, and worse access to health care, have been associated with negative physical and mental health outcomes [9]; Hispanics experience these circumstances disproportionately, with Hispanic women overly represented in low SES positions [10].

Although women of Hispanic ethnicity have a higher prevalence of MetS (38.6%) than non-Hispanic White (37.4%) and non-Hispanic

* Corresponding author.
E-mail address: amanda.allshouse@ucdenver.edu (A.A. Allshouse).

https://doi.org/10.1016/j.maturitas.2018.03.008
Received 16 August 2017; Received in revised form 26 February 2018; Accepted 12 March 2018

Black women (35.5%) [2], Hispanic women have a lower mortality from cardiovascular disease (20%) [1] compared to women of non-Hispanic white (22.8%) and non-Hispanic black (23.5%) ethnicity and race. Thus even though MetS is a risk factor for cardiometabolic and coronary heart disease and mortality, it is less so for Hispanic persons. The 'Hispanic Paradox' [11] is the phenomenon of people of Hispanic ethnicity having equal or better health outcomes and lower mortality rates compared to non-Hispanics, despite a host of economic and social disadvantages, including higher levels of poverty, lower levels of education, and less health care coverage [12]. That the Hispanic community participates in religious services and has high faith is one explanation of this unexpected effect.

The positive association between religious faith and better overall health is recognized by many scientists, but how it affects health is has not been established. One recognized pathway by which religious faith might affect health is through reduction of psychological stress and associated psychophysiological processes [13], given that prayer, like hypnosis, is considered a highly focused state of relaxation. Other research suggests attendance at religious services is associated with lower allostatic load in women and among older adults [14,13]. This association is not be explained by higher physical functioning or greater social integration. Hispanic women have been documented to endorse and have more frequent attendance at religious services compared with women of other ethnicities. That religiosity and faith are important components of health, play a role in health beliefs, and influence participation in one's own health has been documented through focus group research among Hispanic women [15]. Thus, a higher level of faith, or different practices among Hispanic women could be a part of what buffers this population from the level of cardiovascular disease incidence expected given their physical risk profile.

Our hypothesis is that the difference in the incidence rate of MetS for women of Hispanic vs other ethnicities differs in the presence of religious faith.

2. Methods

Analyses are based on data from the Study of Women's Health across the Nation (SWAN). SWAN is a multi-site, longitudinal, prospective cohort study of women traversing menopause. Enrollment criteria included being aged 42–52 years; ≥1 menstrual period within the past 3 months; not pregnant, breastfeeding or taking sex steroid hormones over the past 3 months; and having at least one ovary and an intact uterus [16]. Race/ethnicity was self-reported. Each of seven sites included non-Hispanic white participants as well as a racial/ethnic minority group; all Hispanic women were from the New Jersey site. Institutional Review Board approval at each site was obtained, and all women provided written consent. Our analysis includes outcome data through SWAN follow-up 7 (1996–2005) when data collection for women at the New Jersey site was continuous. Among 3302 women who were enrolled in SWAN at baseline, we excluded women missing race/ethnicity (n = 12), or with prevalent or missing baseline MetS or diabetes mellitus (Fig. 1).

Hormones were included in adjusted analysis to account for associations between hormones and MetS. Laboratory and assay procedures for SWAN are previously published for 17β-estradiol (E_2), and Testosterone (T).

MetS was defined according to the Adult Treatment Panel III criteria as having at least three of the following metabolic abnormalities: 1) blood pressure > 130/85 or self-reported use of antihypertensive medications, 2) HDL cholesterol < 1.295 mmol/L (50 mg/dL), 3) triglycerides ≥1.695 mmol/L (150 mg/dL), 4) Fasting glucose ≥5.55 mmol/L (100 mg/dL)and/or type 2 diabetes, and 5) Waist circumference ≥80 for Chinese and Japanese women or ≥88 cm for women of other ethnicities [17,18]. Two sequential values of seated blood pressure were averaged. Diabetes was defined as a fasting blood glucose level ≥6.993 mmol/L (126 mg/dL) or self-reported use of insulin or any other antidiabetic agent, or self-reported diabetes diagnosis.

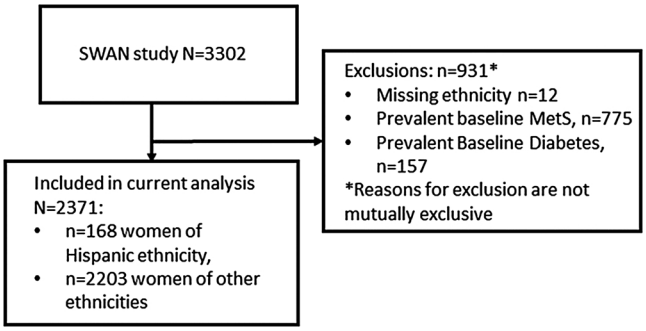

Fig. 1. Population for Analysis.

Self-reported data were collected using standard questionnaires for depression, smoking, economic strain, and perceived stress. A Center for Epidemiologic Studies Depression (CES-D) scale score of ≥16 defined 'depressive symptoms'. Smoking history was defined as never smoking (< 20 packs of cigarettes in lifetime, and < 1+ cigarette/day in the past year), past smokers (not currently smoking cigarettes), current smokers (no to previous 2 criteria). Financial strain was defined by response "somewhat hard" or "very hard" to the question of economic (financial) hardship: "how hard is it to pay for basics", the other possible response was not very hard. Perceived stress was defined by the sum of the responses to four variables about feelings and thoughts over the past two weeks: 1) "Felt unable to control important things in your life" 2) "Felt confident about your ability to handle your personal problems?" 3) "Felt that things were going your way?" and 4) "Felt difficulties were piling so high that you could not overcome them?" Possible responses were 1 = Never, 2 = Almost never, 3 = Sometimes, 4 = fairly often, and 5 = Very Often.

Spirituality and faith were measured by dichotomizing responses to five questions: 1) "How much is religion/spirituality a source of strength and comfort to you?" (*A great deal* vs. *none or a little*). 2) "How often do you pray or meditate?" (≥4 times a week vs. less frequently or never). The final three questions were prefaced by the language: "The next statements are about your general views of life. Please tell me whether you agree, feel neutral (have no opinion) or disagree with them"; for analysis responses were grouped as *agree* vs. *neutral or disagree*. 3) "I have a mission or purpose in life". 4) "My faith sustains me". 5) "I have something meaningful in my life that helps me to get through difficult times". Agreement with "My Faith Sustains Me" is referred to as high faith.

For time to event analyses, time was defined by number of study years after baseline through visit 7, with all non-events censored at follow-up 7. Participant characteristics were categorized as marital status (married vs. otherwise), education level (beyond high school vs. otherwise), menopausal status (premenopausal, early perimenopausal, late perimenopausal, and postmenopausal), baseline smoking (current vs. otherwise), and geographic region of study site (east, midwest, or west).

We compared rates by which we excluded women by Hispanic ethnicity based on baseline rates of MetS and diabetes among women not missing race or prevalence of either condition. In the analytical sample, demographic and clinical characteristics of Hispanic and non-Hispanic women were summarized and compared. Differences were tested with chi-square for categorical and two-sample *t*-tests for continuous measures. Skewed variables were analyzed on the log-scale and back-transformed with presentation as geometric mean and 95% confidence interval (CI). The individual associations between of stress and faith on incident MetS were estimated in a proportional hazards model with discrete ties (i.e. a discrete logistic model) separately for each predictor, with results reported as hazard ratio with 95% CI. To