



Understanding the Support Needs of Minority Women with Heart Disease

## Journal of Health Disparities Research and Practice

Volume 10 | Issue 1

Article 6

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2017

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#### Recommended Citation

Macario, Everly Sc.D., M.S., Ed.M.; Montague, Heather Z. Ph.D.; Campbell, Susan M. M.P.H.; Schneider, Yukari T. Ph.D., M.P.H.; and Mieres, Jennifer H. M.D. (2017) "Understanding the Support Needs of Minority Women with Heart Disease," *Journal of Health Disparities Research and Practice*: Vol. 10: Iss. 1, Article 6. Available at: <https://digitalscholarship.unlv.edu/jhdrp/vol10/iss1/6>

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# Understanding the Support Needs of Minority Women with Heart Disease

## Abstract

*Background.* Cardiovascular disease (CVD) affects minority women disproportionately. WomenHeart: The National Coalition for Women with Heart Disease sought to determine effective ways to support non-Caucasian women with CVD. We surveyed women of color living with CVD to understand their unique CVD-related support needs.

*Methods.* 514 non-white women (100 Hispanic, 180 African American, 104 Asian, 107 Indigenous, 23 multiracial) with CVD from 46 states responded to a 55-question survey (online/telephone, English/Spanish) 8/28/15 through 9/11/15.

*Results.* Among respondents not currently attending support groups, 80% were interested in attending support groups. Of WomenHeart services, respondents were most interested in online message boards. Among new services, respondents were most interested in a support group with a medical expert facilitator. Women with tachycardia wanted a support group with others with the same condition. Those with cardiomyopathy preferred to meet most frequently. Respondents most preferred a monthly support group with flexible membership. Community venues were the most popular location for support groups. Indigenous populations had the lowest CVD knowledge and self-efficacy levels, were most likely to prefer a support group with women of their own race, and wished to meet with their groups most frequently. Multiracial women were most likely to have never been told about clinical trials and were least interested in support groups. Hispanics had the least social support.

*Conclusions.* Minority women with CVD indicated interest in support groups. They may benefit from referrals to tailored support group types, including online platforms facilitated by medical experts, and to cardiac rehabilitation and clinical trials.

## Keywords

Heart Disease; Women; Minority; Support Group; Social Support; Self-Efficacy; Activities of Daily Living; Knowledge; Hispanic/Latina; African American; Asian; Indigenous

## Cover Page Footnote

ACKNOWLEDGMENTS The authors would like to thank Stephanie Adams for her guidance and survey promotion support, Kenia Alonzo for administering the survey via telephone in English and Spanish to interested respondents, and all of the women who completed the survey. This study was made possible by funding from Edwards Lifesciences.

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**Journal of Health Disparities Research and Practice**  
**Volume 10, Issue 1, Spring 2017, pp. 97-110**

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**ABSTRACT**

***Background.*** Cardiovascular disease (CVD) affects minority women disproportionately. WomenHeart: The National Coalition for Women with Heart Disease sought to determine effective ways to support non-Caucasian women with CVD. We surveyed women of color living with CVD to understand their unique CVD-related support needs.

***Methods.*** 514 non-white women (100 Hispanic, 180 African American, 104 Asian, 107 Indigenous, 23 multiracial) with CVD from 46 states responded to a 55-question survey (online/telephone, English/Spanish) 8/28/15 through 9/11/15.

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***Conclusions.*** Minority women with CVD indicated interest in support groups. They may benefit from referrals to tailored support group types, including online platforms facilitated by medical experts, and to cardiac rehabilitation and clinical trials.

**Keywords:** Heart Disease; Women; Minority; Support Group; Social Support; Self-Efficacy; Activities of Daily Living; Knowledge; Hispanic/Latina; African American; Asian; Indigenous.

## INTRODUCTION

Although mortality from cardiovascular disease (CVD) in the United States has declined since the 1970s, the burden remains high. Despite reductions in CVD mortality, racial/ethnic differences have remained constant (Havranek et al., 2015) and disparities between women and men persist. CVD prevalence among African American women is higher than among Caucasian women (48% vs. 32%) (Mozaffarian et al., 2015; American Heart Association, 2016), and women over 44 years are less likely than age-matched men to survive a year after a first heart attack (74% vs. 81%) (Mozaffarian et al., 2015). For American Indian, Alaska Native, Asian, and Pacific Islander women, CVD is the second leading cause of death (Heron, 2012). Minority women, furthermore, have a worse prognosis following hospitalization for CVD (Mochari-Greenberger, Mills, Simpson, & Mosca, 2010).

A cross-country survey showed just under half of women were able to name smoking as a risk factor of CVD, and less than one-quarter named hypertension or high cholesterol. Fewer than half of women knew the major symptoms of CVD (McDonnell et al., 2014). Lack of knowledge of CVD risk factors and symptoms is worse among minority women. Hispanic women are more likely than Caucasian women to report that there is nothing they can do to prevent CVD (Christian, Rosamond, White, & Mosca, 2007) and less likely than Caucasian women to correctly identify the leading cause of death among women (i.e., CVD) (Giardina et al., 2012).

Although evidence shows women with CVD benefit from cardiac rehabilitation (CR) as much as men, they are referred less (Mochari-Greenberger, Mills, Simpson, & Mosca, 2010). Caucasians are more likely than African Americans and Hispanics to receive a CR referral, and minorities are more likely than Caucasians to report financial barriers to CR (Mochari-Greenberger, Mills, Simpson, & Mosca, 2010). In a large cohort of women with CVD, African American women received appropriate preventive therapy and adequate risk factor control less often than Caucasian women despite greater CVD risk (Jha et al., 2003). Among Hispanics with CVD receiving care within a single large academic care network, patients treated at primary care practices that concentrate on linguistically and culturally appropriate services for Hispanics had higher rates of cardiologist consultation and performance on CVD measures compared with patients not treated at such clinics (López, Cook, & Hicks, 2015).

Many prevention intervention programs have successfully addressed the burden of CVD. For example, the Health Awareness and Primary Prevention in Your neighborhood (HAPPY) Heart Program in an eastern suburb of Boston resulted in participants' metabolic syndrome rate (a strong CVD predictor) falling from 64.7% to 34.9% at year 1 and 28.2% at year 2 (Gilstrap et al., 2013). Another CVD intervention built around community engagement, advocacy, self-efficacy, resource knowledge, and health promotion in faith- and community-based sites succeeded at improving CVD knowledge and awareness outcomes in high-risk women (Villablanca, Arline, Lewis, Raju, Sanders, & Carrow, 2009). Self-help interventions have been associated with significantly higher levels of self-efficacy and physical activities 5 days and 4 weeks post-surgery, as well as improvements in depressive symptoms (Parent & Fortin, 2000).

It is unclear what types of support are most associated with clinical outcomes in healthy persons and CVD patients. However, low levels of social support are associated with greater CVD risk (Lett, Blumenthal, Babyak, Strauman, Robins, & Sherwood, 2005). Participants in one peer self-help support group exercised more, smoked less, and had a denser network and more nonfamily social support (Hildingh & Fridlund, 2004). A 3-month randomized control trial that tested the effectiveness of training persons with heart failure to mentor others with heart failure

showed that intervention participants had significantly higher rates of heart failure self-care (Riegel & Carlson, 2004). Use of self-help programs and peer support is highest for diseases viewed as stigmatizing (e.g., AIDS, alcoholism, breast/prostate cancer) and lowest for less embarrassing but equally devastating disorders including CVD (Davison, Pennebaker, & Dickerson, 2000).

WomenHeart: The National Coalition for Women with Heart Disease, a patient-centered organization that focuses on supporting women with CVD, has recruited research participants for several surveys using its membership database. These surveys resulted in high response rates from Caucasian women (Macario, Schneider, Campbell, & Volgman, 2016; Macario, Campbell, Schneider, & Hayes, 2016; Beckie, Schneider, Campbell, & Macario, 2016). While we learned valuable lessons from these studies, we know little about the effective provision of support to non-Caucasian women with CVD. A landmark 2010 Institute of Medicine report called for greater research that focuses on the elimination of CVD disparities (Committee on Women's Health Research, 2010). The study we report in this paper sought to (a) explore issues among women of color who live with CVD to understand their unique CVD-related support needs and (b) inform efforts to reach minority women with the types of support services they need and want.

## METHODS

Using Qualtrics®, we programmed an online survey with 54 closed-ended questions and one open-ended question. The project team reached out to groups that serve minority populations and invited them to promote the survey (available August 28, 2015 through September 11, 2015) among their networks. We engaged in proactive follow-up to reach a minimum of 90 respondents per four racial/ethnic categories (Table 1) to include the necessary sample sizes for rigorous cross-race/ethnicity analyses. We offered the online survey in English and Spanish, with the option of taking the survey as an interview administered on the telephone by a bilingual researcher. Inclusion criteria were: female; CVD diagnosis by healthcare professional; 18+ years; English or Spanish speaker; and any race/ethnicity other than only Caucasian.

Ethical & Independent Review Services, an independent Institutional Review Board, approved all aspects of this study. We kept data confidential, in a password-protected computer, and did not collect personally identifiable information.

### Composite Scales

We created four CVD composite scales: CVD self-efficacy, CVD knowledge, CVD activities of daily living, and CVD social support (Appendix), confirming for scale reliability. Although CVD knowledge had a lower Cronbach's alpha than the other scores, we included these analyses because they provide interesting insights into minority women's knowledge of their CVD conditions.

*CVD Self-efficacy.* We used seven survey items to create the composite CVD self-efficacy score. Endpoints of the 4-point scale were "Strongly disagree" and "Strongly agree" (Cronbach's alpha for these items, .819; inter-item correlations range,  $r=.168-.619$ ).

*CVD Knowledge.* We used four survey items to create the composite CVD knowledge score. Endpoints of the 4-point scale were "Strongly disagree" and "Strongly agree" (Cronbach's alpha for these items, .605; inter-item correlations range,  $r=.174-.433$ ).

*CVD Activities of daily living.* We used three survey items to create the composite CVD activities of daily living score. Endpoints of the 3-point scale included "Yes, limited a lot" (1

point), and “No, not limited at all” (3 points) (Cronbach’s alpha for these items, .755; inter-item correlations range,  $r=.483-.533$ ).

*CVD Social support.* We used six survey items to create the composite CVD social support score. Endpoints of the 4-point scale included “None of the time” (1 point) and “All of the time” (4 points) (Cronbach’s alpha for these items, .835; inter-item correlations range,  $r=.310-.650$ ).

We added all the points to calculate the composite scores and means.

### Statistics

We conducted analyses of variance (ANOVA) and chi-square analyses to assess significant differences in composite scores and other variables by race/ethnicity.

The open-ended survey question invited respondents to, “Share how WomenHeart can help support you, as a minority woman, with heart disease.” Two data analysts segmented 307 comments by respondent race/ethnicity and labeled recurring themes within and across each racial/ethnic category.

## **RESULTS**

### Sample

We received 514 surveys, 491 completed in English (2 telephone) and 23 in Spanish (4 telephone) (Table 1) from women with CVD in 46 states. Over half (54.9%) lived in urban areas, 38.7% in suburban areas, 5.3% in rural areas, and 1.2% on Indian reservations. Respondents’ average age was 59.2 years (20-86 years, range; 11.8 SD). Almost three-quarters (70.7%) lived in households with total annual pre-tax incomes of \$40,000-129,999 (Table 2). Over half (56.1%) were now married (followed by 18.1% never married) and employed full-time (55.8%) (followed by 13.9% employed part-time), and one-third (33.6%) had a bachelor’s degree (followed by 20.7% with an associate’s degree).

We created a fifth category, “Multiracial,” based on the number of surveys submitted by multiracial women. The five racial/ethnic categories in our study included: (1) Hispanic/Latina; (2) African American/Black; (3) Asian/Asian American; (4) Indigenous; and (5) Multiracial (Table 1).

Table 1. Number of Surveys Completed by Racial/Ethnic Category (N=514)

<b>Racial/Ethnic Category of Women with Heart Disease</b>	<b>Number</b>
Hispanic/Latina (Includes Hispanic/Latina Caucasian)	100
African American/Black (Includes non-Hispanic and Hispanic)	180
Asian/Asian American (Includes non-Hispanic and Hispanic)	104
Indigenous (Includes non-Hispanic and Hispanic Native Americans/American Indians/Alaska Natives/Hawaiians/Other Pacific Islanders)	107
Multiracial (Includes non-Hispanic and Hispanic and at least two racial categories selected)	23



**Table 2.** Number/Percent of Respondents by Total Household Income Category

<b>Total Household Income Category</b>	<b>Number</b>	<b>Percent</b>
Less than \$20,000	36	7.1%
\$20,000 to \$39,999	62	12.2%
\$40,000 to \$69,999	126	24.8%
\$70,000 to \$89,999	117	23.0%
\$90,000 to \$129,999	116	22.8%
\$130,000 to \$149,999	34	6.7%
\$150,000 or more	17	3.4%
Total	508	100.0%

### CVD Conditions

Respondents reported suffering for an average of 7.0 years (8.70 SD) from a variety of CVD conditions, of which arrhythmia was the most common one reported (Table 3).

**Table 3.** Percent of Sample Experiencing Specific Cardiovascular Disease Conditions

<b>Cardiovascular Disease Condition*</b>	<b>Percent</b>
Arrhythmia	25.7%
Coronary artery disease	16.8%
Cardiomyopathy	15.4%
Heart attack	15.4%
Heart failure	12.1%
Atherosclerosis	10.1%
Atrial fibrillation	9.2%
Valve disease	8.6%
Congenital heart disease	6.6%
Tachycardia	5.1%
Coronary artery spasm	3.7%
Peripheral arterial disease	2.3%

\*Respondents could select more than one.

In addition to CVD, the respondent sample most commonly managed hypertension and high cholesterol (Table 4).

**Table 4.** Percent of Sample Experiencing Other Health Conditions

<b>Health Condition*</b>	<b>Percent</b>
Hypertension	34.2%
High cholesterol	32.5%
Anxiety	20.1%
Diabetes	16.8%
Obesity	16.5%
Arthritis	13.9%
Asthma	12.2%
Depression	12.0%
Sleep apnea	8.4%
Chronic fatigue	7.2%
Thyroid disorder	6.2%
Stroke	5.0%
Chronic obstructive pulmonary disease	3.4%
Cancer (acute myeloid leukemia, basal cell, breast, colorectal, Hodgkin's lymphoma, kidney, Non-Hodgkin's lymphoma, ovarian)	3.1%
Osteoporosis	3.1%
Rheumatic fever	3.1%
Metabolic syndrome	2.2%
Lung disease	1.2%
Cognitive dysfunction	1.0%
Hypokalemia (low potassium)	1.0%
Kidney disease	0.7%
Lupus	0.5%
Cystic fibrosis	0.2%

\*Respondents could select more than one.

### Health Behaviors

Of all of the respondents, 8.8% had an implantable device and 7.6% currently smoked cigarettes. Respondents consumed an average daily 4.5 (1.5 SD) servings of fruits/vegetables and engaged in moderate physical activity 4.4 (1.6 SD) average days per week. Indigenous populations reported highest fruit/vegetable consumption compared with multiracial women who reported least consumption ( $F(4,509)=3.083$ ,  $p=.016$ ). Multiracial women reported highest levels of weekly physical activity compared with Indigenous populations who reported least activity ( $F(4, 509)=2.567$ ,  $p=.037$ ).

Among the 72.0% respondents who currently took prescription medication for CVD, 81% reported taking medications as prescribed all of the time, 14.9% most of the time, 4.3% some of the time, and 0.3% rarely. "Forgetting to take medications" was by far the most common reason for non-adherence. A very small subset of respondents reported not taking medications all of the time because of medication side effects and costs.

### Cardiac Rehabilitation (CR) Participation

While less than half of all respondents (41.9%) reported a doctor had recommended they attend CR, only 12.1% completed a full program (21.2% attended part of a program and 66.7% had never attended a program). Among participants who completed CR, three-quarters (74.2%)



were either somewhat satisfied or very satisfied. Only 4 respondents were somewhat dissatisfied and none were very dissatisfied.

Indigenous populations were most likely to have been referred to CR (70.1%) compared with multiracial women who were least likely to have been referred (17.4%) (Chi-square 65.1,  $p<.001$ ). Indigenous populations were most likely to have completed CR (21.5%) compared with multiracial participants, who were least likely to report program completion (8.7%). Asians were most likely to have completed part of a program (31.7%) compared with multiracial participants who were least likely to report partial program completion (4.3%) (Chi-square 44.6,  $p<.001$ ).

#### Clinical Trial (CT) Participation

Of all of the respondents, 15% had participated in a CVD CT. Multiracial respondents were least likely to have participated in a CT (0%) compared with Asians (21.2%) and Hispanics (20.0%).

Among respondents who had not participated in a CVD CT, almost half (46.8%) said they had never been asked or told about CT opportunities. Multiracial women were most likely to say they had never been told (69.6%), followed by African American (49.4%), Hispanic (45.5%), Asian (32.7%), and Indigenous (18.7%) women (Chi-square 65.14,  $p=.000$ ). Of the respondents who never participated in a CVD CT, one-third (31.9%) were concerned about treatment effects, followed by one-quarter (24.1%) concerned about logistical issues. A minority had not qualified for a CT (8.3%).

#### Support Group Participation

Of the 19.7% (101) respondents who had participated in a CVD support group, over half said realizing that they are not alone and the emotional encouragement received were the most helpful aspects of attendance (Table 5). Respondents currently participating in a CVD support group mostly learned about their groups from their doctors (35) or an online platform (31).

**Table 5.** Percent of Support Group-Attending Respondents Finding Support Group Aspects Most Helpful

<b>Support Group Aspect*</b>	<b>Percent</b>
Realizing I am not alone.	54.5%
The emotional encouragement I received from other support group participants.	50.5%
The information on my heart disease condition that I received from other support group participants.	30.7%
My outlook on my heart disease condition improved.	27.7%
My ability to advocate for myself improved.	20.8%
My eating habits improved.	18.8%
My physical activity improved.	18.8%
Feeling less isolated.	17.8%
I generally feel better.	15.8%
Feeling less depressed.	15.8%
Feeling less stressed.	12.9%
Taking my medications as prescribed by the doctor improved.	4.0%

\*Respondents could select up to three.

Among respondents who had not participated in a CVD support group (80.3%), most (80.0%) were interested. Indigenous populations were most interested (90.7%) in support group participation. Multiracial women were least interested (38.1%) (Chi-square 31.6,  $p<.001$ ). The 84 disinterested respondents felt that they did not need this kind of support—some also stated wanting to preserve their privacy or not feeling comfortable speaking in a group setting. Lack of

time was another major constraint. A very small subset of all respondents reported not having transportation or knowing where to find a group.

#### Interest in Current WomenHeart Support Services

Of the support services WomenHeart currently offers, respondents were most interested in an online message board to engage in conversations with other women with CVD (45.5%) and an in-person support group of women with any type of CVD facilitated by a community member (33.5%). Over one-quarter were interested in a virtual support network that combines educational presentation and conversation via teleconference (28.3%) and an in-person support group with a trained patient (peer) facilitator (28.3%). Approximately one-quarter was interested in a hospital visit by a woman with CVD (24.6%) and a connection with another woman with CVD to communicate one-on-one via telephone/email (22.4%).

#### Interest in Other Support Services

Among other types of support, respondents were most interested in support groups with medical expert facilitators (40.7%), women of similar age with any CVD type (38.3%), women of similar race/ethnicity with any CVD type (34.0%), and women with similar CVD conditions (33.1%). Respondents in their 60s were most interested in attending support groups with age-matched women (48.7%) compared with those in their 20s (0.0%) ( $F(6, 505)=4.729, p=.000$ ). Indigenous populations were the most likely to want to attend a support group with women of their own race (43.9%), followed by Asian (38.5%), African American (29.4%), Hispanic (29.0%), and multiracial women (8.7%) ( $F(4, 509)=3.825, p=.005$ ). Women with tachycardia were the most likely to want a support group with others with the same condition. Also popular but to a lesser degree was interest in an informal get-together to socialize over snacks and network with other women with any type of CVD (27.4%).

Of four possible support options, respondents most preferred an open membership support group that meets regularly (43.8%), followed by supportive/reminder text messages and the ability to track heart health measures via smartphones (26.3%), support groups that meet for a predetermined length with the same members (19.3%), and being paired with one woman with CVD to connect as needed (10.6%).

The most popular location for a support group was at a local community venue (36.0%). Other options included: online (21.1%), hospital (13.8%), member's home (12.6%), telephone with local members (6.5%), and telephone with national members (6.1%). Most respondents (33.2%) wanted to meet with their support groups monthly.

#### Differences in Preferred Support Group Meeting Frequency

An ANOVA revealed significant differences between respondent race ( $F(4, 507)=9.035, p=.000$ ), age ( $F(6, 505)=4.729, p=.000$ ), and CVD condition ( $F(13, 497)=3.346, p=.000$ ) and frequency with which respondents wished to meet with their support groups. Indigenous populations wished to meet with their support groups most frequently and multiracial respondents wished to meet least frequently. Desire to meet with greater frequency increased from age 20 to 60 years, peaking in the 60s decade, and subsequently decreasing from 60 to 86 years. Respondents in their 60s did not differ significantly in their desired frequency to meet based on race. Those with cardiomyopathy preferred to meet most frequently, and respondents with peripheral arterial disease and atherosclerosis wished to meet least frequently, compared with respondents with other types of CVD.

#### Differences Across Race/Ethnicity By Composite Scores

Multiracial respondents had the highest levels of social support, followed by African Americans, compared with Hispanics who had the lowest levels social support ( $F(4,$

509)=2.453,  $p=.045$ ). Multiracial and African American respondents also had the highest reported levels of self-efficacy, compared with Indigenous populations who had the lowest self-efficacy levels ( $F(4, 508)=8.744$ ,  $p=.000$ ). Multiracial and African American respondents reported the highest levels of knowledge, compared with Indigenous populations who reported the lowest knowledge levels ( $F(4, 508)=4.773$ ,  $p=.001$ ). Indigenous populations reported greatest ability to perform activities of daily living compared with Hispanic and multiracial respondents who reported the least ability to perform these activities ( $F(4, 509)=2.746$ ,  $p=.028$ ).

An ANOVA comparing race and ability to climb several flights of stairs ( $F(4, 509)=2.696$ ,  $p=.03$ ) and walking several blocks ( $F(4, 509)=3.558$ ,  $p=.007$ ) showed some significant findings by race/ethnicity. Multiracial and Hispanic respondents (in that order) had the greatest difficulty climbing stairs and walking several blocks, compared with African Americans who had the least difficulty climbing several flights of stairs and Indigenous populations who had the least difficulty walking several blocks. Race and ability to lift or carry heavy groceries showed no significant differences across race/ethnicity.

#### Respondent Comments

Regardless of race/ethnicity, respondents most frequently requested more online support, such as text alerts, apps, wearable devices, live chats, webinars, blogs, and mobile counseling. Other common themes across all racial/ethnic groups was a strong need for medical expertise (including a medical hotline) particularly on genetic-specific risk factors and treatments available for specific CVD conditions, a preference for meeting with peers/experts of the same race/ethnicity, and meeting with others with the same CVD condition. Although African Americans were most vocal about needing culturally sensitive self-care information and support, Asian, Indigenous, and Hispanic women also commented on the importance of cultural humility (including developing Spanish resources). African Americans and Asians were interested in alternative medicine for CVD. African Americans and Hispanics wished for financial support.

## **DISCUSSION**

This study explored the health behaviors of 514 non-Caucasian women with CVD. These minority women were most commonly managing arrhythmia along with hypertension and high cholesterol. Although a small subset of the respondent sample used an implantable device or currently smoked cigarettes, our sample of minority women reported consuming less than the recommended daily 5 servings of fruits/vegetables and is limited in walking several blocks, on average. Moreover, although 81% of the minority women in the sample took their medications all of the time, 19% did not take their medications *all of the time*.

Two-thirds of all of the minority women with CVD in the sample never attended cardiac rehabilitation (CR). Of those who completed CR, the overwhelming majority was satisfied with their programs. Given how beneficial CR can be, awareness must be raised among clinicians regarding the importance of CR as a therapeutic resource for minority women with CVD (Heron, 2012).

Half of the respondents currently participating in support groups said the most beneficial aspect is not feeling alone. Most respondents learned about their groups from their doctors or from online searches. Of those currently not attending support groups, 80% were interested in doing so. Many respondents were interested in WomenHeart's online message boards to engage in conversations with other women with CVD and a notable number was interested in a virtual support network combining presentation and conversation. This finding reflects comments from several respondents regarding their discomfort in groups because they are shy or want to

maintain their privacy. Anonymous virtual platforms for support may be a way to engage these women.

Among service options that WomenHeart did not provide at the time of this study, respondents were most interested in a support group for any type of CVD where a medical expert, such as a cardiologist, facilitates the discussion. Respondents on the whole preferred a monthly support group with open membership. The most popular location for a support group was at a local community venue (e.g., church, community center, school, office building). Women with tachycardia were most likely to want a support group for those with the same condition. Women with cardiomyopathy preferred to meet with their support groups most frequently. Dedicated efforts to increasing awareness among cardiologists and electrophysiologists of existing support groups for women with CVD, encouraging referrals to in-person and virtual support groups, and facilitating the creation of support groups in local venues will likely address some of the current gaps experienced by minority women with CVD.

Indigenous women with CVD in the respondent sample reported wanting to meet with their support groups more frequently than their other non-Caucasian counterparts. A possible explanation for this finding may be related to Indigenous women's having the lowest levels of CVD knowledge and CVD self-efficacy among all of this study's five segmented groups. Indigenous women also reported the lowest amounts of weekly moderate-level physical activity. That said, Indigenous women in this study enjoyed the highest fruit/consumption levels, greatest ability to perform activities of daily living, and least difficulty walking several blocks compared with their other non-Caucasian counterparts. Our findings show that Indigenous women with CVD are eager to join support groups with other Indigenous women and are very likely to sustain their participation if given the opportunity.

It is also not surprising that multiracial women with CVD were least interested in support groups given that they had very high levels of CVD self-efficacy (Table A1), CVD knowledge (Table A2), and CVD social support (Table A3). It appears that these multiracial women are currently receiving the support they need from sources other than support groups. Still, multiracial women were most likely to have never been referred to CR or clinical trials (CTs). Indeed, none of the multiracial women who participated in this study had participated in a CT, and of those who began CR, few completed the program. Multiracial women also consumed the least fruits/vegetables and reported limited ability to perform activities of daily living with particular difficulty climbing stairs and walking several blocks. Among a variety of support structure options, most multiracial women said they would prefer using smartphones for social support *or* joining an open membership support group that meets regularly (as did Asian women), while the majority of African American women reported preferring a regular open membership support group.

Hispanic women with CVD had the lowest levels of social support. Of respondents who did not currently belong to a support group but reported being interested in one, 18% were Hispanic translating into 60% of the total Hispanic respondent sample. These results suggest a need for some type of support group structure among Hispanic women with CVD. Most Hispanics reported preferring a regular open membership support group, followed by one that meets for a predetermined length and smartphones to text reminders and track health measures.

Eighty-five percent of the study sample never participated in a CVD CT. Although Indigenous women were least likely to have been told about CTs, they were most likely to have been recommended and have completed CR. CT referral by healthcare personnel who reflect the

racial/ethnic culture of their patients may be another opportunity in which to influence the CVD care of women of color.

#### Strengths and Limitations

One of the strengths of this study of multicultural women with CVD is that we offered the survey in two languages and administered the survey according to respondent preference (online or telephone). Sample sizes from each of five minority populations also allowed statistically robust analyses. Expanding language and research administration mode options is critical in continuing efforts to reach minority women with CVD who have not been asked how best to serve them. Minority women will grow in their knowledge and awareness of heart healthy support options if efforts to reach them are successful.

This study's findings may not be generalizable to all minority women with CVD because we did not randomly select respondents and the sample was skewed toward higher than the national level of education average. That said, the shape of the income distribution of the sample is a bell curve, similar to that represented in the United States population as a whole—this study includes information reported by minority women with CVD in all annual income categories ranging from <\$20,000 through \$150,000+ (Table 2). A future study with randomly selected minority women with CVD stratified by demographic characteristics proportionate to those of the United States will build on this study's findings. Subsequent analyses should compare results from non-Caucasian women who participated in this survey with those of Caucasian women who participated in other similar surveys. In addition, comparing this study's results specific to each of the five racial/ethnic groups with their corresponding larger racial/ethnic group's population will illuminate how this study's sub-samples may differ and the likely effect those differences may have on the results. Moreover, because of the growing multiracial population, future research must consider ways of defining multicultural communities outside racial/ethnic categories.

Respondent recruitment efforts included placing announcements on social media, making it impossible to know the eligible viewing audience and thus the survey response rate.

#### **CONCLUSIONS**

Most of this study's women of color living with CVD are interested in participating in monthly open membership support groups—including online message boards for those women who expressed discomfort with in-person groups. Support group participants do not have to have the CVD condition that mirrors one's own but minority women with CVD expressed a preference for a medical expert, rather than a community member, to facilitate support groups. Indigenous and Hispanic women showed greatest interest in support groups. Multiracial and Hispanic women also reported interest in using smartphones as a platform for CVD-related information and support. Although 85% of the study's sample never participated in a CVD clinical trial (CT), respondents reported enthusiasm in exploring CTs.

This study provides practical guidance to program developers and evaluators and clinicians on how to design customized and meaningful interventions per the expressed preferences of their own target minority populations. Specifically, this study's findings will be useful to WomenHeart and any other group trying to develop CVD support services that will meet the needs of non-Caucasian women in varying racial/ethnic groups. For example, the finding that many women of color prefer participating in online support groups could influence stakeholders to earmark resources for online groups instead of only in-person groups. The



interest expressed in participating in CTs and the benefits of cardiac rehabilitation enrollment, also, should encourage stakeholders to extend this type of outreach in their local communities.

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## APPENDIX

### A1. Survey Items Comprising the Cardiovascular Disease Self-Efficacy Scale and Respective Means

Survey Item	Mean
1. When all is said and done, I am the person who is responsible for managing my heart disease condition(s).	3.29
2. Taking an active role in my own healthcare is the most important factor in determining my health and ability to function.	3.24
3. I am confident that I can take actions that will help prevent or minimize some symptoms or problems associated with my heart disease condition(s).	3.14
4. I am confident that I can tell a doctor concerns I have even when he or she does not ask.	3.11
5. I am confident that I can maintain lifestyle changes, like diet and exercise, even during times of stress.	3.11
6. I am confident that I can tell when I need to go get medical care and when I can handle a health problem myself.	3.09
7. I have been able to maintain the lifestyle changes that I have made for my heart disease condition(s).	3.07

1=Strongly Disagree; 2=Disagree; 3=Agree; 4=Strongly Agree  
(The higher the score, the greater the CVD self-efficacy.)

### A2. Survey Items Comprising the Cardiovascular Disease Knowledge Scale and Respective Means

Survey Item	Mean
1. I know what each of my prescribed medications does.	3.10
2. I understand the nature and causes of my heart disease condition(s).	3.02
3. I know the different medical treatment options available for my heart disease condition(s).	3.02
4. I know how to prevent further problems with my heart disease condition(s) when new situations or problems arise.	2.95

1=Strongly Disagree; 2=Disagree; 3=Agree; 4=Strongly Agree  
(The higher the score, the greater the CVD knowledge.)

### A3. Survey Items Comprising the Cardiovascular Disease Social Support Scale and Respective Means

Survey Item	Mean
1. Is there someone available to you who shows you love and affection?	3.84
2. Can you count on anyone to provide you with emotional support (talking over problems or helping you make a difficult decision)?	3.79
3. Do you have as much contact as you would like with someone you feel close to, someone in whom you can trust and confide?	3.71
4. Is there someone available to you whom you can count on to listen to you when you need to talk?	3.66
5. Is there someone available to help you with daily chores?	3.58
6. Is there someone available to give you good advice about a problem?	3.42

1=None of the time; 2=A little of the time; 3=Most of the time; 4=All of the time  
(The higher the score, the greater the CVD social support.)

### A4. Survey Items Comprising the Cardiovascular Disease Activities of Daily Living Scale and Respective Means

Survey Item	Mean
1. Walking several blocks	1.99
2. Climbing several flights of stairs	2.18
3. Lifting or carrying groceries	2.29

1=Limited a lot; 2=Limited a little; 3=Not limited at all  
(The higher the score, the fewer limitations in activities of daily living.)