

AN INTEGRATIVE REVIEW: SYSTEMIC, EDUCATIONAL, AND CLINICAL DETERMINANTS OF CARDIOVASCULAR HEALTH IN BIPOC WOMEN

Author:
Yashvi Verma

Faculty Sponsor:
Michelle Lambing
Department of Psychology

ABSTRACT

Racial disparities for cardiovascular care in BIPOC women. is a notable contributor to the mortality rate of women in the United States. Disparities can result from a combination of factors. Systemic barriers (such as insurance coverage barriers) result in people being hesitant to seek out care unless it becomes debilitating to their day-to-day life. Lack of a comprehensively inclusive curriculum may not equip providers to care for diverse populations with varying disease presentation. Clinical underrepresentation of BIPOC women in research leads is another major contributor to the lack of educational resources around properly treating these women. Thus, there is a decrease in overall effectiveness, classification and diagnosis. Promoting gender and racial inclusive representation in clinical research can help increase discoveries leading to better cardiovascular disease outcomes being discovered and implemented in routine care. This review will dive into these sectors of disparity, synthesize recent findings of health outcomes, and highlight present efforts to improve these issues within the healthcare system.

INTRODUCTION

The American healthcare system has made notable progress within recent years towards inclusivity, however more work remains to be done. Racial and gender disparities are still prevalent. Women are often excluded from important clinical studies, experience a lack of representation among available providers, and face systemic issues such as higher mortality rates resulting in worse health outcomes overall (Balla et al., 2020). Kimberlé Crenshaw termed the framework of Intersectionality to explain how intersecting identities such as race and gender create inequalities that shape the human experience (Bauer et al., 2021). In the last five years, there has been an increasing demand for more education about intersectionality, and its relation to access to resources and lived experiences (Sabik, 2021; Wenger et al., 2022).

Intersectionality can be applied to Black, Indigenous, and women of color (BIPOC) and their cardiovascular outcomes. For example, CVD rates for American Indian and Alaskan Native people are underreported by 21%, contributing to lack of data on typical sex-specific risk factors for different demographics of women (Sharma et al., 2023). Underdiagnosis and underreporting, despite growth in knowledge of risk factors, remains a prevalent issue as women are often overlooked for preventative cardiac care and optimal risk evaluation. Further, a survey done by the Women's Heart Alliance noted that primary care physicians (PCPs) did not determine cardiovascular disease to be the top priority in assessing women, and over 90% stated that women have differential presentation of heart disease compared to men (Henry et al., 2019). The combination of these factors is the beginning of what creates mistrust and within the patient provider relationship, further contributing to worse outcomes for these women.

Many BIPOC women often have hesitancy or mistrust with the healthcare system, unless there is patient-provider concordance (Brown et al., 2022). This is likely due to a higher probability that the provider will have a better understanding of cultural or gender-based factors that can sometimes lead to suboptimal risk assessment of women for cardiovascular diseases. There is evidence that male physicians

treating female patients often experience worse outcomes (Brown et al., 2022). This phenomenon is also likely due to a lack of representation in leadership of female providers in medical care teams. There is a lack of data on how sex concordance is related to health outcomes for female patients (Harik et al., 2024). Within cardiology, cardiovascular surgery, and vascular surgery, the number of women in these subspecialties is notably low (Lau et al., 2021). So, attention should be given to how the role gender plays in the interaction with cardiovascular disease (CVD) outcomes, progression, and manifestation (Connelly et al., 2021). Women often receive poorer outcomes for CVD as a result of provider-patient concordance, and lack of representation, but these issues are compounded further by systemic and educational factors within the healthcare system. This review will explore each aspect in depth and provide direction for the future.

CARDIOVASCULAR RISK DISPARITIES AMONG BIPOC WOMEN

It has been established that women are not as well represented in the field of cardiology, both on the provider end but also in clinical research used to educate providers (Farr, 2024). This stems from a lack of inclusion of women of different races in clinical practice, which can result in paucity of information about recognizing factors of diseases, prescriptions, and risk assessment (Brown et al., 2022). Data from the last 5 years have shown that BIPOC women have higher rates of CVD compared to white women (Brown et al., 2022).

Black and Hispanic Women

Heart disease is responsible for almost half of pregnancy related deaths among black women (Lister et al., 2020). Women of this subgroup have a 2.5 times higher risk for overall maternal death rate, which is typically 100% preventable (Reed et al., 2022). Other causes of death aside, cardiovascular disease plays a major role in maternal death rates with 48% of African American women and 32% of Hispanic women are known to have CVD (Gaskin et al., 2021). Further, 66% of Black women and 80% Hispanic women were less likely to be aware of the risk of CVD for women (Rojo et al., 2023). The danger of the prolonged duration between disease onset and manifestation of CVD contributes to the staggeringly different mortality rates for these women. Proper education and system wide changes are needed in the way that HCPs are taught to screen for and treat CVD in Black and Hispanic women, especially when they are pregnant. Evidence also suggests that the combination of varied heart disease presentation and lack of knowledge in identifying these symptoms creates suboptimal outcomes for these women (Gomez et al., 2022; Ali et al., 2024)

For Hispanic women, the same issue arises where higher rates of coronary heart disease are more likely to result in worse outcomes (Rojo et al., 2023). Part of this can be attributed to the unique CVD risk factors in hispanic individuals, with about 41% of Puerto Rican women specifically having hypercholesterolemia: excess cholesterol in the bloodstream which leads to issues like coronary artery disease (Daviglius et al., 2012). Aside from Coronary Heart Disease, Hispanic women often suffer from hypertension and hyperlipidemia that can cause radiating health effects. In the USA, 23% of the growing population is Hispanic, and CVD is the leading cause of death in this group. It affects 42.7% of Hispanic women, largely due to factors like health equity and socioeconomic challenges that can contribute to the underassessment or prolonged delay to seek treatment for risk factors that are overlooked (Gomez et al., 2022). Thus, it can be seen that CVD plays an unfortunate but notable role in mortality of Black and Hispanic Women.

Asian and Pacific Islander Women.

For the purposes of this review, Asian and Pacific Islander Women encompass Central Asia, East Asia, Hawai'i and Pacific Islands, South Asia, and West Asia (Luo, 2017). For Asian Indian Women, cardiovascular disease mortality rates have increased and have not improved for other Asian American subgroups (Đoàn et al., 2022). Asian and Pacific Islanders are 10% more likely to be diagnosed with coronary artery disease than individuals who are non-Hispanic and white. It is also established that the CAD also has an earlier onset than in other ethnic groups (Brown et al., 2022). There is a lack of literature for Asian and Pacific Islander Women overall and their cardiovascular outcomes, but from what is

available, the general consensus is that their outcomes also have room for improvement with further inclusion of Asian and Pacific Islander Women in clinical research studies being done.

American Indian and Alaskan Native Women

American Indian (AI) and Alaskan Native (AN) Women have a lot of research data on how cardiovascular disease leads to maternal morbidity, but there is a slight lack of data available on reporting of these diseases. Specifically, there is data that points to about 21% of underreported CVD rates for this group of women (Sharma et al., 2023). However, there is some data suggesting that the prevalence of CVD in AI and AN has been on the decline as a result of factors like primary prevention efforts. These efforts mainly involve targeting diseases like obesity and diabetes that lead to the worsening or development of CVD (Sharma et al., 2023). The majority of the literature found focused on the AI and AN population as a whole, with very little statistics or information available on how this data is reflected for women specifically. The danger with this however is that men and women often experience different health outcomes, so looking into women's cardiovascular health for AI and AN women outside of other factors like pregnancy is important (Brown et al., 2022).

CLINICAL RESEARCH GAPS IMPACT PROVIDER DIAGNOSES

Majority of healthcare provider (HCP) knowledge comes from research, data, and statistics. Based on years of findings, that sample has to be representative of populations in order to be extrapolated and applied to BIPOC women in clinical practice. Any gaps in representation in clinical research leads to paucity of information given to HCPs, potentially contributing to worse risk assessment, inconsistencies in communication diagnoses, and decreased recognition of non-traditional markers of CVD (Brown et al., 2022). Standardizing methods to measure gender and race have been a proposed solution to fix this (Connelly et al., 2021). Effective communication is a critical component to this, as strengthening communication can prevent mistrust in the patient provider relationship (Samra & Hankivsky, 2021). Lack of patient trust opens up issues for detection, diagnosis, and reporting of cardiovascular disease. It is imperative that the medical provider curriculum is expanded to better include disease presentation for more diverse women. Screening protocols used by HCPs should also seek this same expansion in tandem with better communication and outreach to groups of women who are known to be more predisposed to heart disease. It has been demonstrated that stronger communication has copious benefits in improving women's physiological status, and resolution of symptoms (Samra & Hankivsky, 2021).

There is an estimation that by 2050, about 50% of the US population is projected to be composed of "racial minorities" and thus, the current model of healthcare must grow with its ever-evolving population to be equipped with the knowledge and resources to prevent any racial or gender disparities in care, particularly for cardiovascular disease in women (Nair & Adetayo, 2019). In postgraduate medical training, about 70% of trainees indicated there was minimal education on gender-based medical concepts (Wenger, 2024; Wenger et al., 2022). Further, only 42% of cardiologists in a survey administered nationwide indicated they felt equipped to handle cardiovascular risk in women. This number drops lower to about 22% for primary care physicians feeling equipped to address these issues (Wenger, 2024). National advocacy campaigns have actually been shown to have a positive impact in decreasing the annual number of CVD deaths in the early 2000s, which shows that advocacy and education can have a prevalent impact on changing cardiovascular outcomes for women (Wenger, 2024)

It is imperative to increase the representation of BIPOC women in clinical research and in the development of medical education texts to help rectify issues such as suboptimal risk assessment and under recognition of non-traditional risk factors (Cho et al., 2021; Michos et al., 2021). This can go further to create disparities in risk factor awareness in patients if HCPs are not trained in how to recognize the presentation of cardiovascular diseases across different racial subgroups for women (Brown et al., 2022). It has been established that many prospective studies did not have a large representation of women, nor did it include anything to account for sex-specific factors that ultimately make a difference in cardiovascular outcomes as mentioned by statistics of HCPs feeling equipped to handle issues regarding women's cardiovascular risk (Gaffey & Spatz, 2024).

SYSTEMIC RACIAL DISPARITIES AND WOMEN'S CVD

Thinking more broadly, a contributing factor of why healthcare professionals (HCPs) may not feel equipped to identify and treat BIPOC women's CVD is a result of systemic factors. Systemic racism, and xenophobia are known contributions in structural barriers that result in health disparities for all women (Snitselaar & Carr, 2023). A 2018 National Healthcare Quality and Disparities Report found evidence that Black, American Indian, and Alaskan Native patients receive worse care for 40% of quality-of-care measurements in comparison to White patients. Hispanic patients specifically received about 35% worse outcomes (Javed et al., 2022). For quality care measures, Asian patients receive worse care for about 27% percent of quality-of-care measures, which can be defined as anything that helps quantify healthcare processes, outcomes or patient perceptions of healthcare (Quentin et al., 2019; Schneider et al., 2021). Social determinants and their interaction with the infrastructure of the healthcare system unfortunately will play a role in how diverse women receive care for cardiovascular diseases. Social conditions that fit within the Social Determinants of health are race and ethnicity, socioeconomic status, and psychosocial factors. It has been established that there is an association between a woman's socioeconomic status (SES) and risk factors for CVD such as hypertension, diabetes and obesity (Javed et al., 2022).

Another major systemic factor of disparities in outcomes for BIPOC women and their outcomes for cardiovascular diseases are insurance coverage barriers. Broadly, about 7.3 million adults with CVD are uninsured (Javed et al., 2022). Within that, there is data suggesting that the uninsured rate is about 2-4 times higher than for Hispanic individuals (28.7% uninsured), Black individuals (12.9% uninsured) in contrast to only 7.4 White individuals being uninsured (Javed et al., 2022). Further evidence from a Behavioral Risk Factor Surveillance System indicated that 31% of Hispanic and 28% of Black individuals avoid care strictly because of the cost, whereas that number is approximately 21% for white individuals (Javed et al., 2022). Specifically for women however, these statistics are greater due to gender related discrepancies in healthcare cost and insurance. Before the Affordable Care Act healthcare services cost anywhere from 50 to 80% more than for men on the market (Cardoso et al., 2021). Overall, it is apparent that there are many systemic barriers that interfere with better outcomes for BIPOC women in the healthcare system but leaves room for more work to be done to dismantle these systemic issues and provide better care.

FUTURE DIRECTIONS AND CONCLUSION

Undoubtedly, notable strides have been achieved in recent years to acknowledge and improve disparities in cardiovascular care for BIPOC women. Particularly in the last 5 years more attention has been given to advocacy for expansion of curricula, increased representation in clinical studies, representation of HCPs, and how systemic barriers have changed. By continuing this work, patient-provider relationships can be strengthened and improve the concerning statistics surrounding BIPOC women's cardiovascular care outcomes.

A greater emphasis on outreach, accessibility and inclusion of underrepresented women in clinical research will translate into better preparation of healthcare providers to diagnose cardiovascular diseases while it is manageable. Specifically, the inclusion of Asian and Pacific Islander Women, and American Indian and Alaskan Native Women should be a focus given the existing literature demonstrates a lack of representation of these women in clinical studies.

It is imperative to have a continued focus on expanding access and inclusion of BIPOC women in clinical research and medical education given the varying presentation of the disease in different populations. This, in tandem with the targeted development of more inclusive education materials will aid healthcare providers to better treat and diagnose cardiovascular disease in women.

REFERENCES

- Ali, M. R., Nacer, H., Lawson, C. A., & Khunti, K. (2024). Racial and ethnic disparities in primary prevention of cardiovascular disease. *Canadian Journal of Cardiology*.
<https://doi.org/10.1016/j.cjca.2024.01.028>
- Balla, S., Gomez, S. E., & Rodriguez, F. (2020). Disparities in cardiovascular care and outcomes for women from racial/ethnic minority backgrounds. *Current Treatment Options in Cardiovascular Medicine*, 22(12), 75. <https://doi.org/10.1007/s11936-020-00869-z>
- Bauer, G. R., Churchill, S. M., Mahendran, M., Walwyn, C., Lizotte, D., & Villa-Rueda, A. A. (2021). Intersectionality in quantitative research: A systematic review of its emergence and applications of theory and methods. *SSM - Population Health*, 14, 100798.
<https://doi.org/10.1016/j.ssmph.2021.100798>
- Brown, R.-M., Tamazi, S., Weinberg, C. R., Dwivedi, A., & Mieres, J. H. (2022). Racial disparities in cardiovascular risk and cardiovascular care in women. *Current Cardiology Reports*, 24(9), 1197–1208. <https://doi.org/10.1007/s11886-022-01738-w>
- Cardoso, L. J., Gassman-Pines, A., & Boucher, N. A. (2021). Insurance barriers, gendering, and access: Interviews with central north carolinian women about their health care experiences. *The Permanente Journal*, 25, 20.176. <https://doi.org/10.7812/TPP/20.176>
- Cho, L., Vest, A. R., O, 'Donoghue Michelle L., Ogunniyi, M. O., Sarma, A. A., Denby, K. J., Lau, E. S., Poole, J. E., Lindley, K. J., Mehran, R., & null, null. (2021). Increasing participation of women in cardiovascular trials. *Journal of the American College of Cardiology*, 78(7), 737–751.
<https://doi.org/10.1016/j.jacc.2021.06.022>
- Connelly, P. J., Azizi, Z., Alipour, P., Delles, C., Pilote, L., & Raparelli, V. (2021). The importance of gender to understand sex differences in cardiovascular disease. *Canadian Journal of Cardiology*, 37(5), 699–710. <https://doi.org/10.1016/j.cjca.2021.02.005>
- Daviglus, M. L., Talavera, G. A., Avilés-Santa, M. L., Allison, M., Cai, J., Criqui, M. H., Gellman, M., Giachello, A. L., Gouskova, N., Kaplan, R. C., LaVange, L., Penedo, F., Perreira, K., Pirzada, A., Schneiderman, N., Wassertheil-Smoller, S., Sorlie, P. D., & Stamler, J. (2012). Prevalence of major cardiovascular risk factors and cardiovascular diseases among Hispanic/Latino individuals of diverse backgrounds in the United States. *JAMA*, 308(17), 1775–1784.
<https://doi.org/10.1001/jama.2012.14517>
- Davis, S. K., Gebreab, S., Quarells, R., & Gibbons, G. H. (2014). Social Determinants of cardiovascular health among Black and White women residing in stroke belt and buckle regions of the south. *Ethnicity & Disease*, 24(2), 133–143.
- Đoàn, L. N., Takata, Y., Hooker, K., Mendez-Luck, C., & Irvin, V. L. (2021). Trends in cardiovascular disease by Asian American, Native Hawaiian, and Pacific Islander ethnicity, medicare health outcomes survey 2011–2015. *The Journals of Gerontology: Series A*, 77(2), 299–309.
<https://doi.org/10.1093/gerona/glab262>
- Farr, M. (2024). Defining the actionable items in women and heart disease: A conversation with Nanette K. Wenger, MD. *Circulation*, 149(7), 492–497.
<https://doi.org/10.1161/CIRCULATIONAHA.124.068658>
- Gaffey, A. E., & Spatz, E. S. (2024). Psychological health and ischemic heart disease in women: A review of current evidence and clinical considerations across the healthspan. *Current Atherosclerosis Reports*, 26(3), 45–58. <https://doi.org/10.1007/s11883-023-01185-0>
- Gaskin, D. J., Zare, H., Jackson, J. W., Ibe, C., & Slocum, J. (2021). Decomposing race and ethnic differences in CVD risk factors for mid-life women. *Journal of Racial and Ethnic Health Disparities*, 8(1), 174–185. <https://doi.org/10.1007/s40615-020-00769-9>
- Gomez, S., Blumer, V., & Rodriguez, F. (2022). Unique cardiovascular disease risk factors in Hispanic individuals. *Current Cardiovascular Risk Reports*, 16(7), 53–61. <https://doi.org/10.1007/s12170-022-00692-0>
- Harik, L., Yamamoto, K., Kimura, T., Rong, L. Q., Vogel, B., Mehran, R., Bairey-Merz, C. N., & Gaudino, M. (2024). Patient–physician sex concordance and outcomes in cardiovascular

- disease: A systematic review. *European Heart Journal*, ehae121.
<https://doi.org/10.1093/eurheartj/ehae121>
- Henry, S., Bond, R., Rosen, S. E., Grines, C., & Mieres, J. H. (2019). Challenges in Cardiovascular Risk Prediction and Stratification in Women. *Cardiovascular Innovations and Applications*, 3, 329.
<https://doi.org/10.15212/CVIA.2017.0068>
- Javed, Z., Haisum Maqsood, M., Yahya, T., Amin, Z., Acquah, I., Valero-Elizondo, J., Andrieni, J., Dubey, P., Jackson, R. K., Daffin, M. A., Cainzos-Achirica, M., Hyder, A. A., & Nasir, K. (2022). Race, Racism, and Cardiovascular Health: Applying a social determinants of health framework to racial/ethnic disparities in cardiovascular disease. *Circulation: Cardiovascular Quality and Outcomes*, 15(1), e007917. <https://doi.org/10.1161/CIRCOUTCOMES.121.007917>
- Lau, E. S., Hayes, S. N., Volgman, A. S., Lindley, K., Pepine, C. J., & Wood, M. J. (2021). Does patient-physician gender concordance influence patient perceptions or outcomes? *Journal of the American College of Cardiology*, 77(8), 1135–1138. <https://doi.org/10.1016/j.jacc.2020.12.031>
- Lister, R., Baldwin, S., & Graves, C. (2020). Black box warning: Cardiovascular complications make motherhood unsafe for African American women. *World Journal of Gynecology & Womens Health*, 4(1), 000578. <https://doi.org/10.33552/wjgwh.2020.04.000578>
- Luo, S. (2017, July 28). Census data & API identities. *Asian Pacific Institute on Gender Based Violence Website*. <https://www.api-gbv.org/resources/census-data-api-identities/>
- Michos, E. D., Reddy, T. K., Gulati, M., Brewer, L. C., Bond, R. M., Velarde, G. P., Bailey, A. L., Echols, M. R., Nasser, S. A., Bays, H. E., Navar, A. M., & Ferdinand, K. C. (2021). Improving the enrollment of women and racially/ethnically diverse populations in cardiovascular clinical trials: An ASPC practice statement. *American Journal of Preventive Cardiology*, 8, 100250.
<https://doi.org/10.1016/j.ajpc.2021.100250>
- Nair, L., & Adetayo, O. A. (2019). Cultural competence and ethnic diversity in healthcare. *Plastic and Reconstructive Surgery Global Open*, 7(5), e2219.
<https://doi.org/10.1097/GOX.0000000000002219>
- Quentin, W., Partanen, V.-M., Brownwood, I., & Klazinga, N. (2019). Measuring healthcare quality. In *Improving healthcare quality in Europe: Characteristics, effectiveness and implementation of different strategies [Internet]*. European Observatory on Health Systems and Policies.
<https://www.ncbi.nlm.nih.gov/books/NBK549260/>
- Reed, L., Bellflower, B., Anderson, J., Bowdre, T., Fouquier, K., Nellis, K., & Rhoads, S. (2022). *Rethinking Nursing Education and Curriculum Using a Racial Equity Lens | Journal of Nursing Education*. <https://journals.healio.com/doi/full/10.3928/01484834-20220602-02>
- Rojo, M. O., Prince, L. Y., Li, C., & McSweeney, J. C. (2023). Heart disease knowledge and awareness in African American and Hispanic women. *Southern Medical Journal*, 116(10), 783–789.
<https://doi.org/10.14423/SMJ.0000000000001610>
- Samra, R., & Hankivsky, O. (2021). Adopting an intersectionality framework to address power and equity in medicine. *The Lancet*, 397(10277), 857–859. [https://doi.org/10.1016/S0140-6736\(20\)32513-7](https://doi.org/10.1016/S0140-6736(20)32513-7)
- Schneider, E. C., Chin, M. H., Graham, G. N., Lopez, L., Obuobi, S., Sequist, T. D., & McGlynn, E. A. (2021). Increasing equity while improving the quality of care. *Journal of the American College of Cardiology*, 78(25), 2599–2611. <https://doi.org/10.1016/j.jacc.2021.06.057>
- Sharma, G., Kelliher, A., Deen, J., Parker, T., Hagerty, T., Choi, E. E., DeFilippis, E. M., Harn, K., Dempsey, R. J., Lloyd-Jones, D. M., on behalf of the American Heart Association Cardiovascular Disease and Stroke in Women and Underrepresented Populations Committee of the Council on Clinical Cardiology, Council on Hypertension, Council on Cardiovascular and Stroke Nursing, Council on Arteriosclerosis, Thrombosis and Vascular Biology, & Council on Quality of Care and Outcomes Research. (2023). Status of maternal cardiovascular health in American Indian and Alaska Native Individuals: A scientific statement from the American Heart Association. *Circulation: Cardiovascular Quality and Outcomes*, 16(6), e000117.
<https://doi.org/10.1161/HCO.0000000000000117>

Wenger, N. K. (2024). The feminine face of heart disease 2024. *Circulation*, 149(7), 489–491.
<https://doi.org/10.1161/CIRCULATIONAHA.123.064460>

Wenger, N. K., Lloyd-Jones, D. M., Elkind, M. S. V., Fonarow, G. C., Warner, J. J., Alger, H. M., Cheng, S., Kinzy, C., Hall, J. L., Roger, V. L., & null, null. (2022). Call to action for cardiovascular disease in women: Epidemiology, awareness, access, and delivery of equitable health care: A presidential advisory from the American Heart Association. *Circulation*, 145(23), e1059–e1071. <https://doi.org/10.1161/CIR.0000000000001071>