

**Health Literacy and Frequency of Myocardial Infarctions and Hypertension in US
Minorities
Rupsa Mitra
Arlington Heights, Illinois**

ABSTRACT:

Myocardial infarction (MI), also known as a heart attack, and hypertension (HTN) are two types of cardiovascular disease (CVD) and are the leading causes of death in US minorities. While previous studies have found that genetics and other socioeconomic (SES) factors can explain the differences between the heart disease rates in Spanish-speaking Americans, African-Americans and their white counterparts, this research paper aims to explain how, specifically, health literacy can better explain the higher numbers of minorities suffering from MI and HTN in the United States. This literature review uses seven peer-reviewed papers that were published post 2000. These papers were found through PubMed and Google Scholar with the keywords being cardiovascular disease, health literacy, myocardial infarction, hypertension, minorities, and US. The results imply that health literacy plays a bigger role than others in determining one's health levels, and that targeted interventions, like CVD health camps, should be held to instruct minorities of the risks, treatments, signs, and symptoms of CVD. This literature review underscores the urgent need of such targeted health literacy interventions to address the rising incidence of MI and HTN among US minorities, highlighting disparities in risk factors and outcomes.

INTRODUCTION:

According to the CDC, one person dies every 33 seconds in the United States from cardiovascular disease (CVD) [1]. Based on a study, despite just being approximately 28% of the population sample, Black participants had the highest incident rate of heart failure, with Hispanic patients following closely second [2].

A myocardial infarction (MI), also known as a heart attack, occurs when the blood flow to the myocardium is reduced or ceased. This can happen for a lot of reasons– from blood clots to an underlying coronary disease [3]. A person can experience chest discomfort, shortness of breath (SOB), nausea, and/or light-headedness during the onset of a MI [4]. A heart attack can also lead to permanent heart damage, increasing the risk of arrhythmia and thrombosis [5].

Hypertension (HTN), a type of CVD, is caused when the pressure builds up in the arteries, pushing on the arterial walls. This results in severe headaches, fatigue, dizziness, and nosebleeds. In the United States, more than 35 million adults have uncontrolled blood pressure (BP), representing one-half of the adult population with hypertension [6]. Moreover, minority groups have a higher risk of negative effects due to hypertension than their white

counterparts. Black adults have higher hypertension prevalence than White adults. Hispanic adults have lower awareness and treatment rates than White adults [6].

Socioeconomic status (SES) is a complex phenomenon predicted by a combination of financial, occupational, and educational influences [7]. These factors influence one's successful recovery from MI and HTN. Health literacy, influenced by SES, is the ability of an individual to gain knowledge and use that information to improve health appropriately [8]. Inadequate health literacy can be responsible for the difficulties in comprehension of health information, limited knowledge of diseases and lower medication adherence, which contribute to poor health, high risk of mortality, insufficient and ineffective use of healthcare, increased costs, and health disparities [8]. Approximately 24% of African Americans and 41% of Hispanic adults exhibit "below basic" health literacy compared to 9% of White adults, as measured by the National Assessment of Adult Literacy [9].

While previous studies have researched how genetics and other socioeconomic factors can explain the differences between the heart disease rates in Spanish-speaking Americans, African-Americans and their white counterparts, this research paper aims to explain how health literacy can better explain the higher numbers of minorities suffering from MI and HTN in the United States.

METHODS:

A scoping literature review was conducted to identify articles published, after the year 2000, that investigate the higher frequency of MI HTN in minorities living in the US. The search strategy involved using databases such as PubMed and Google Scholar with keywords related to heart attacks, hypertension, risk factors, minorities, USA, health literacy, genetics, socioeconomic status, Hispanic-Americans, and African-Americans. Additionally, using the process of backsearching from those sources, more relevant articles were found. Articles were included if they focused on comparing the minority population and the white population, studying the higher risk factors and symptoms in each minority, or providing general information, including statistics, on CVD, and statements regarding sSES, including specific definitions.

After checking abstracts and reading the full research report, a total of seven relevant articles were selected for extracting data.

RESULTS:

In a trial that determined the effect of MI risk-associated genotypes among different racial groups, those who were African Americans (AA) had significantly higher frequencies of two out of three risk-associated genotypes compared to European Americans (EA). The frequencies of GJA4, MMP3, and PAI-1 were observed to be 20%, 78%, and 55% in AA, respectively, whereas in EA, they were 7%, 24%, and 16%, respectively [10]. Additionally, disparities in HTN control have also been proven to exist among racial groups by Aggarwal, R [6]. His team and he found Black adults have higher hypertension prevalence (45.3% versus 31.4%) but similar awareness and treatment rates as White adults [6]. Hispanic adults

have similar hypertension prevalence, but lower awareness (71.1% versus 79.1%) and treatment rates (60.5% versus 67.3%) than White adults [6]. After interviewing several hypertensive African-Americans, Ogedegbe, G., et al. concluded knowledge about high blood pressure and the nature of hypertension is one of the key facilitators of the health outcome of hypertensive African-Americans [11]. Lor et al. argues that health literacy has a larger impact on health outcomes than other factors. They found 88.4% of their sample to have low adherence levels and 84.9% to have inadequate health literacy [13]. Moreover, Chaudhry et al. used external surveys to conclude that even after adjusting for factors such as education, black patients still exhibited significantly worse health literacy [12]. Furthermore, Lor et al. held a survey, which outlined the importance of health literacy levels in developing effective adherence interventions [12]. Finally, Macabasco-O'Connell et al. discovered that out of 97 hispanic adults, 68 were found to have low health literacy regarding heart failure, while 29 had adequate literacy [14].

Table 1: Article Summaries

Sources	Claims
1. Lanfear et al. [10]	9.1% of African Americans had all three high-risk genotypes for CVD
2. Aggarwal et al. [6]	Black adults have higher hypertension prevalence Hispanic adults have lower awareness and treatment rates
3. Ogedegbe et al. [11]	Knowledge about high blood pressure and the nature of hypertension facilitates health outcome of hypertensive African-Americans
4. Chaudhry et al.[12]	Black heart-failure patients were significantly more likely than white patients to have poor health literacy: 24.4% of black patients had poor health literacy and 9.7% of whites
5. Lor et al. [13]	Overall, the majority of participants had low adherence levels to antihypertensive medications and inadequate health literacy.
6. Macabasco-O'Connell et al. [14]	68 (out of 97 hispanics) were found to have low health literacy regarding heart failure

DISCUSSION:

After reviewing the data, a consistent trend becomes apparent, and health literacy can be identified as an important risk factor among minorities in the United States experiencing MIs and HTNs. The study highlights significant health literacy disparities among African Americans and Hispanic Americans in the United States experiencing MIs and HTNs. This implies the urgent need to prioritize health literacy interventions for minorities. White Americans are less likely to face these challenges compared to minorities, but disparities persist overall. These findings emphasize the importance of targeted health literacy initiatives. Comparisons between SES and genetic factors suggest that SES alone may not be the sole determinant of MI and HTN outcomes. Genetics, as demonstrated by Lanfear et al.,

can also be a factor in the outcomes, highlighting the need to address genetics and SES to determine MI and HTN outcomes in Black Americans and Hispanics [10]. Even if African-Americans and Hispanic-Americans are genetically more prone to CVD, health literacy can increase the awareness of these fatal diseases, and, in turn, decrease the probability of a worse health outcome.

Overall, the results underscore the urgency of addressing the health literacy gap. Preventive strategies should target improving health literacy, especially among the respective minorities. A comprehensive plan of action with tailored interventions for race-specific risk profiles and a focus on enhancing health literacy can significantly contribute to reducing the burden of MI and HTN in the minority population. Schools and employers, in areas with high Hispanic/African populations, can hold health-literacy camps to spread awareness on the signs, symptoms, risk factors, and precautions for MI and HTN. These camps should be a part of the students' curriculum or the employees' training. Additionally, community outreach departments can hold such programs in libraries, playgrounds, or other community centers. Addressing potential barriers to resources is important, so that the minorities are able to participate. If transportation is an issue for some people, online camps should be held. These camps should not only cover CVD topics, but also basic health instruction, such as CPR procedure, better sleep habits, balanced food diets, and basic English instruction [15]. Additional efforts can involve partnerships with hospitals, government agencies, faith-based organizations, social service agencies, and medical schools. Schools and hospitals can incentivize the med-students and doctors, who go to hospitals in neighborhoods with a high marginalized population, to offer heart screenings and checkups.

By addressing these problems, coming up with more creative solutions, and enforcing the above solutions, public health efforts can effectively improve outcomes for African Americans and Hispanic-Americans suffering from MI and HTN.

REFERENCES:

1. Heart disease facts. CDC. (2023). Available at: <https://www.cdc.gov/heartdisease/facts.htm> ; Accessed December 31st, 2023
2. Bahrami, H., Kronmal, R., Bluemke, D. A., Olson, J., Shea, S., Liu, K., Burke, G. L., & Lima, J. A. (2008). Differences in the incidence of congestive heart failure by ethnicity: the multi-ethnic study of atherosclerosis. *Archives of internal medicine*, 168(19), 2138–2145.
3. Ojha N, Dhamoon AS. Myocardial Infarction. [Updated 2023 Aug 8]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK537076/>
4. Warning Signs of a Heart Attack. American Heart Association. (2023). Retrieved from <https://www.heart.org/en/health-topics/heart-attack/warning-signs-of-a-heart-attack>. Accessed December 31st, 2023

5. Mechanic O.J., Gavin M., Grossman S.A. Acute Myocardial Infarction. [Updated 2023 Sep 3]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK459269/>
6. Aggarwal, R., Chiu, N., Wadhwa, R. K., Moran, A. E., Raber, I., Shen, C., Yeh, R. W., & Kazi, D. S. (2021). Racial/Ethnic Disparities in Hypertension Prevalence, Awareness, Treatment, and Control in the United States, 2013 to 2018. *Hypertension* (Dallas, Tex. : 1979), 78(6), 1719–1726.
7. Winkleby, M. A., Jatulis, D. E., Frank, E., & Fortmann, S. P. (1992). Socioeconomic status and health: how education, income, and occupation contribute to risk factors for cardiovascular disease. *American journal of public health*, 82(6), 816–820.
8. Liu, C., Wang, D., Liu, C., Jiang, J., Wang, X., Chen, H., Ju, X., & Zhang, X. (2020). What is the meaning of health literacy? A systematic review and qualitative synthesis. *Family medicine and community health*, 8(2), e000351.
9. Shah, A., Macauley, C., Ni, L., Bay, A. A., & Hackney, M. E. (2022). The Relationship Between Attitudes about Research and Health Literacy among African American and White (Non-Hispanic) Community Dwelling Older Adults. *Journal of racial and ethnic health disparities*, 9(1), 93–102.
10. Lanfear, D. E., Marsh, S., Cresci, S., Shannon, W. D., Spertus, J. A., & McLeod, H. L. (2004). Genotypes associated with myocardial infarction risk are more common in African Americans than in European Americans. *Journal of the American College of Cardiology*, 44(1), 165–167.
11. Ogedegbe, G., Harrison, M., Robbins, L., Mancuso, C. A., & Allegrante, J. P. (2004). Barriers and Facilitators of Medication Adherence in Hypertensive African Americans: A Qualitative Study. *Ethnicity & Disease*, 14(1), 3–12.
12. Chaudhry, S. I., Herrin, J., Phillips, C., Butler, J., Mukerjee, S., Murillo, J., Onwuanyi, A., Seto, T. B., Spertus, J., & Krumholz, H. M. (2011). Racial disparities in health literacy and access to care among patients with heart failure. *Journal of cardiac failure*, 17(2), 122–127.
13. Lor, M., Koleck, T. A., Bakken, S., Yoon, S., & Dunn Navarra, A. M. (2019). Association Between Health Literacy and Medication Adherence Among Hispanics with Hypertension. *Journal of racial and ethnic health disparities*, 6(3), 517–524.
14. Macabasco-O'Connell, A., DeWalt, D. A., Broucksou, K. A., Hawk, V., Baker, D. W., Schillinger, D., Ruo, B., Bibbins-Domingo, K., Holmes, G. M., Erman, B., Weinberger, M., & Pignone, M. (2011). Relationship between literacy, knowledge, self-care behaviors, and heart failure-related quality of life among patients with heart failure. *Journal of general internal medicine*, 26(9), 979–986.
15. U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. (2010). National Action Plan to Improve Health Literacy. https://health.gov/sites/default/files/2019-09/Health_Literacy_Action_Plan.pdf