

**EDITOR'S NOTE**

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# JAHA Spotlight on Psychosocial Factors and Cardiovascular Disease

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**P** psychosocial factors, such as stress, adversity, socioeconomic status, depression, and anxiety, are associated with overall health and with cardiovascular health in particular. In this issue of the *Journal of the American Heart Association (JAHA)*, we have featured a group of articles that explore different aspects of the complex relationships between psychosocial factors and cardiovascular health. Importantly, psychosocial factors have different prevalence among different demographic groups, and as such, may be key for addressing disparities in the development of cardiovascular disease (CVD) and its morbidity and mortality.

Disparities in cardiovascular health between blacks and whites have existed for some time. In this Spotlight, Tabb and colleagues used novel methods to explore spatial heterogeneity in racial differences in cardiovascular health in the United States.<sup>1</sup> They found that blacks consistently have worse cardiovascular health compared with whites and that these racial differences exist across the nation, even after considering residency in the Stroke Belt. These findings highlight the need for geographically based interventions and policies to address disparities.

Stress can come in many forms. Heikkilä and colleagues evaluated job strain in nearly 140 000 patients with no previous hospitalization for peripheral artery disease and found that job strain was associated with an increase in the risk of hospitalization for the disease.<sup>2</sup> Although stress has been associated with the development of myocardial infarction and stroke, this

study is novel because it demonstrates stress is also associated with adverse peripheral artery disease outcomes. In another study, Glover and colleagues evaluated the association between goal-striving stress, the stress from striving for goals, and CVD.<sup>3</sup> Goal-striving stress is a psychological phenomenon related to striving for upward mobility and awareness of having little success and may have affected blacks for decades. Using the JHS (Jackson Heart Study), they found that a quarter of the study population had high levels of goal-striving stress and that among women, this was associated with a lower risk of stroke but a higher risk of CVD.

Pierce and colleagues used the CARDIA (Coronary Artery Risk Development in Young Adults) study to perform a large longitudinal cohort study to evaluate the association between childhood adversity and the long-term development of CVD and the risk of death among geographically and racially diverse participants (47% black).<sup>4</sup> With over 30 years of follow-up, they found that self-reported childhood adversity was associated with an increased risk of death and CVD events. The study highlights that childhood is a critical developmental period for the development of CVD and risk of death over the lifespan. Of note, following adjustment for demographic, socioeconomic, clinical, and psychological factors, the risk of CVD events was no longer significant, suggesting that these factors are mediators of this relationship. The accompanying editorial by Barr discusses education as perhaps the strongest mediator.<sup>5</sup> Low education levels are associated with higher

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rates of smoking, a present-fatalistic perspective, and social networks that affirm such behaviors and perspectives.

Stress and psychological factors may act through many different complex mechanisms. One premise is that stress and adverse experiences predispose to behavioral risk factors, such as smoking, substance use, poor diet, and sedentary lifestyle. Those with poor psychosocial health may also have limited access to care and insurance. Physiologic mechanisms are also at play and include abnormal inflammatory and neurohormonal processes. Stress may also induce elevated blood pressure and glucose dysregulation. In this issue, Greaney and colleagues add to the literature on the physiologic response to stress.<sup>6</sup> They found that among healthy young adults, psychosocial stress adversely influenced microvascular vasoconstrictor function. Interestingly, this was regardless of the severity or the emotional consequences of the stress. In addition, Yano and colleagues found that sleep-disordered breathing was associated with higher blood glucose levels among blacks.<sup>7</sup>

Although stress may lead to increased morbidity and mortality from CVD, psychosocial well-being may be protective. Goldmann and colleagues found that among patients who survived a stroke, the perception that they can protect themselves from having a stroke was associated with greater blood pressure reduction at 1 year.<sup>8</sup> Positive health beliefs may reflect optimism and self-efficacy. To the contrary, Miller and colleagues evaluated youth who achieved upward socioeconomic mobility and found that improving financial conditions was associated with improved psychological well-being but worse cardiometabolic health.<sup>9</sup> This study highlights that psychological well-being and cardiovascular health are not always aligned.

Poor cardiovascular health and, in particular, experiencing a traumatic medical event may lead to psychosocial distress. Pasadyn and colleagues found that, among patients who survived an acute type A aortic dissection, nearly a quarter screened positive for posttraumatic stress disorder, with 44% reporting feeling on guard, watchful, or easily startled.<sup>10</sup> Similarly, Johnson and colleagues evaluated mental health among patients who experienced spontaneous coronary artery dissection and found significant rates of depression, anxiety, and posttraumatic stress disorder.<sup>11</sup> They also found that emotional and social quality of life was better among those with higher resiliency. These studies highlight the importance of screening patients with these conditions to refer them for further treatment of mental health and suggest that resiliency may be protective. Although less traumatic, patients with adult congenital heart disease experience ongoing health issues, interactions with the healthcare system, and perhaps short-term medical events. Carazo and colleagues found that the prevalence of depression

was nearly 20% among patients with adult congenital heart disease and that depression was associated with increased all-cause mortality, hospitalization, and systemic inflammation.<sup>12</sup> Those who were depressed had lower education, lower physical activity, and higher substance use, again raising the possibility that behaviors and education may play an important mediating role in outcomes.

Additional research is needed to better understand the complex associations between psychosocial factors and cardiovascular health and whether these factors can be modified to improve outcomes and reduce disparities. In this Spotlight, Shabatun and colleagues report the rationale for the Morehouse-Emory Center for Health Equity, a study designed to identify factors that predispose blacks to either increased risk or resilience from CVD.<sup>13</sup> In addition to exploring neighborhood and environmental factors, they plan to focus on personal factors, including psychosocial, socioeconomic, health behaviors and beliefs, and stress and risk profiles, and their association with prevalent and subclinical CVD. Their goal is to elucidate new strategies and key points for effective interventions to improve CVD outcomes in black communities. As part of this work, they plan to randomize participants to a behavioral mobile health plus health coach or mobile health only intervention and follow up for improvement.

Psychosocial factors and cardiovascular health are closely tied. As such, it is important to recognize psychosocial factors and these associations as we work to prevent CVD, treat patients with known disease, and improve both psychosocial well-being and cardiovascular health for all. This group of articles adds to our understanding of the epidemiology and underlying mechanisms between psychosocial health and cardiovascular health. Finally, it is important to understand the extent to which psychosocial factors contribute to disparities in cardiovascular health and evaluate interventions addressing psychosocial factors with the goal of eliminating these disparities.

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## ARTICLE INFORMATION

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