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EDITORIAL COMMENT

Ignoring Mental Well-Being Is Costing Lives

Is it Time for Life's Necessary 9?*

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With rare exceptions, life expectancy in the United States has been on the rise, from approximately 47 years in 1900 to 79 years in 2019.[1,2] However, there were consecutive declines in the following 2 years, dropping to 76.4 years in 2021—its lowest level since 1996.[3] Notably, cardiovascular disease (CVD) has remained the leading cause of death.[3] Likewise, depression has emerged as a major contributor to mortality, morbidity, and disability in the United States, with the age-standardized national prevalence among adults being 18.5%.[4] There is a high comorbidity of CVD and depression, suggesting a bidirectional relationship between the 2 conditions.[5]

Patients with depression often struggle with changing suboptimal lifestyle habits such as smoking, lack of regular moderate-intensity exercise, and unhealthy diet, while also experiencing social withdrawal, which is a strong determinant of poor quality of life and survival. Depression may also negatively impact medication adherence and increase the likelihood of substance abuse.[6] Interestingly, depression and CVD share dysregulated biological mechanisms such as autonomic nervous system dysfunction, elevated cortisol levels, and chronic inflammation. Conversely, cardiac events can trigger depressive symptoms due to the stress and lifestyle changes they entail, potentially leading to a cycle of declining mental and physical health.[6] Consequently, multiple international cardiovascular societies have recognized depression as a modifiable prognostic factor for CVD, emphasizing the importance of enhancing its identification and management.[7,8]

In a broader sense, the American Heart Association (AHA) laid the foundation for cardiovascular health (CVH) with delineation of key metrics for monitoring progress in 2010. Initially, these metrics were encapsulated in the "Life's Simple 7," encompassing 4 modifiable behaviors (body mass index, physical activity, smoking status, and diet) and 3 biometric measures (blood pressure, total cholesterol, and fasting blood glucose).[9] This construct was expanded to "Life's Essential 8" (LE8) in 2022, with the addition of sleep as the eighth metric and provision of a scoring algorithm for each of the metrics to generate a new composite CVH score.[10] The AHA Presidential Advisory's writing group acknowledged psychological well-being as a crucial factor underlying all the other CVH metrics. However, due to uncertainty about which indicators of psychological health would most significantly impact CVH, it could not be included as an independent metric.[10]

In this issue of *JACC: Advances*, Dinh et al[11] evaluated the associations of a CVH construct enhanced with a ninth metric for psychological health based on depression screening using the Patient Health Questionnaires (PHQ-2 and PHQ-9) with mortality risk in U.S. adults. They utilized data from 21,183 adults aged 20 to 79 in the 2011 to 2018 National Health and Nutrition Examination Survey. Participants received a score from 0 to 100 for each of the LE8 CVH metrics. Additional 100-point scales were utilized to denote the severity of depression based on the PHQ-2 and

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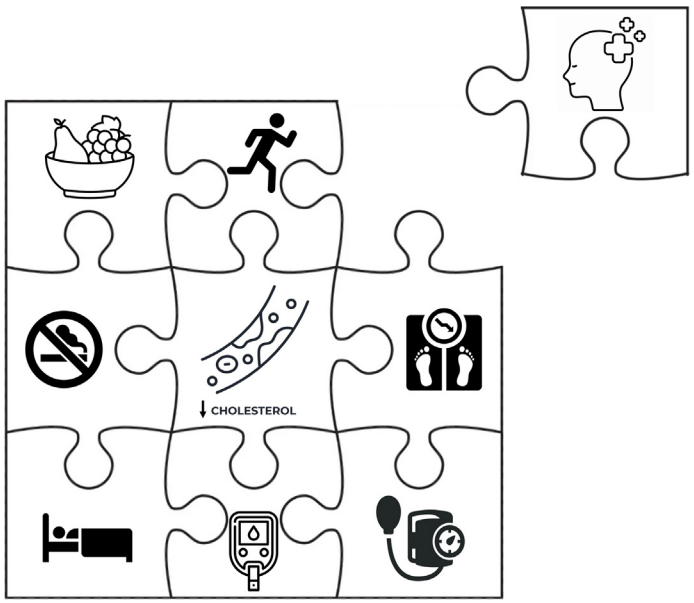
FIGURE 1 Incorporating Psychological Well-Being Into the Framework of Cardiovascular Health



PHQ-9 scores, respectively. Averages of these 8 and 9 individual component scores were then used to compute the overall LE8 scores and 2 distinct enhanced CVH scores. The National Death Index was used to determine the mortality status of the participants in the study.

The study population was predominantly female (51%) with a mean age of 48 years; 6% were Asian, 11% were Black, 15% were Hispanic, and 65% were White. Initial assessments categorized 21% as high, 63% as moderate, and 16% as low CVH, but re-evaluation with enhanced CVH scores altered proportions to 24%, 65%, and 11%, respectively. Over a median 5-year follow-up, 1,397 deaths occurred. While a high vs low LE8 score correlated with a 65% lower all-cause mortality risk, incorporating scores with PHQ-2 and PHQ-9 depression screening were associated with 69% and 70% reductions, respectively. All 3 CVH scores demonstrated comparably strong predictive abilities for mortality. Disparities by sex, race, and ethnicity were notable, with stronger associations in females and Black adults and weaker or null associations in Hispanics.

The investigators should be congratulated for their impactful study, which adds to the evidence supporting the utilization of an independent metric for psychological assessment when assessing overall CVH (Figure 1). The gradient in risk across all associations underscores the potential for substantial gains in longevity through improvements in overall and individual CVH metrics, especially psychological health. The study's findings align with previous studies indicating a strong inverse dose-response association between ideal CVH and mortality outcomes. In particular, the study highlights the significant association between depression, suboptimal CVH, and cardiovascular mortality.

The findings also underscore the need for integrated approaches to address psychological health in conjunction with cardiovascular risk management, especially among populations susceptible to psychological distress. While the authors reference the "Hispanic mortality paradox" as a possible contributor to the unexpected observation of a nonsignificant association between CVH and mortality among Hispanic adults, we advise prudence in interpreting these findings as optimization of psychological health is beneficial for all individuals, regardless of ethnicity. Rather, a lower statistical power to detect associations may be an important factor to consider.

The results of the study should be interpreted with caution, considering its limitations. The duration of follow-up for the cohort was limited, potentially affecting the ability to observe long-term effects or outcomes. Furthermore, the study relied on a single measurement for CVH and depression status, which precluded the consideration of changes in these factors over time, as well as the impact of depression duration or the timing of depression diagnosis on mortality. Additionally, the study's exclusive focus on depression symptoms as an indicator of psychological well-being, while overlooking factors such as anxiety and chronic stress that have been known to influence CVH, did not adequately capture the complexity of mental health.[12,13]

Taken together, this manuscript serves as a poignant reminder for cardiologists and other clinicians to recognize the significance of semi-annual or at least annual office visits. These encounters present a unique opportunity to delve into the psychological well-being of patients and its potential impact on CVH. By incorporating brief mental health screening tools into routine assessments, clinicians can initiate vital conversations about the presence and implications of psychological symptoms for overall health. This proactive approach facilitates the identification of issues necessitating further evaluation and management. Moreover, by guiding patients toward integrating exercise, meditation, and enhanced stress-management techniques into their lifestyles, clinicians can foster a symbiotic relationship between mental and cardiac well-being. Despite the time constraints in clinical settings, addressing identified

psychological concerns upfront can lead to tangible benefits such as reduced frequency of subsequent visits, improved medication adherence, and overall patient outcomes.[13]

Given the close connection between psychological distress and CVD, we anticipate that the AHA will eventually create "Life's Necessary 9" to further emphasize the importance of psychological health. In conjunction with the cardiovascular-kidney-metabolic syndrome paradigm, this could be a crowning achievement in CVD risk assessment and management.[14,15]

Finally, the health and success of sports teams are closely connected to the number of championship appearances. A total of 9 Super Bowl appearances were made by the winningest coach and player duo in National Football League history, Bill Belichick and Tom Brady. Incorporating psychological health as the ninth CVH metric may serve as the championship formula for the clinician-patient team to maximize the number of wins while lowering CVD risk.

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REFERENCES

1. Bastian B, Tejada Vera B, Arias E, et al. *Mortality Trends in the United States, 1900-2018*. National Center for Health Statistics; 2020.

2. Kochanek KD, Xu JQ, Arias E. *Mortality in the United States, 2019. NCHS Data Brief, no 395*. National Center for Health Statistics; 2020.

3. Xu JQ, Murphy SL, Kochanek KD, Arias E. *Mortality in the United States, 2021. NCHS Data Brief, no 456*. National Center for Health Statistics; 2022.

4. Lee B, Wang Y, Carlson SA, et al. National, state-level, and county-level prevalence estimates of adults aged ≥18 years self-reporting a lifetime diagnosis of depression — United States, 2020. *MMWR Morb Mortal Wkly Rep*. 2023;72:644-650.

5. Harshfield EL, Pennells L, Schwartz JE, et al. Association between depressive symptoms and incident cardiovascular diseases. *JAMA*. 2020;324(23):2396-2405.

6. Pivato CA, Chandiramani R, Petrovic M, et al. Depression and ischemic heart disease. *Int J Cardiol*. 2022;364:9-15.

7. Lichtman JH, Froelicher ES, Blumenthal JA, et al. Depression as a risk factor for poor prognosis among patients with acute coronary syndrome: systematic review and recommendations: a scientific statement from the American Heart Association. *Circulation*. 2014;129(12):1350-1369.

8. Vaccarino V, Badimon L, Bremner JD, et al. Depression and coronary heart disease: 2018 position paper of the ESC Working Group on Coronary Pathophysiology and Microcirculation. *Eur Heart J*. 2020;41(17):1687-1696.

9. Lloyd-Jones DM, Hong Y, Labarthe D, et al. Defining and setting national goals for cardiovascular health promotion and disease reduction: the American Heart Association's strategic impact goal through 2020 and beyond. *Circulation*. 2010;121(4):586-613.

10. Lloyd-Jones DM, Allen NB, Anderson CAM, et al. Life's Essential 8: updating and enhancing the American Heart Association's construct of cardiovascular health: a presidential advisory from the American Heart Association. *Circulation*. 2022;146(5):e18-e43.

11. Dinh VT, Hosalli R, Mullachery PH, Aggarwal B, German CA, Makarem N. Enhancing the cardiovascular health construct with a psychological health metric for predicting mortality risk. *JACC: Adv*. 2024;3:101112.

12. Emdin CA, Odutayo A, Wong CX, et al. Meta--analysis of anxiety as a risk factor for cardiovascular disease. *Am J Cardiol*. 2016;118(4):511-519.

13. Levine GN, Cohen BE, Commodore-Mensah Y, et al. Psychological health, well-being, and the mind-heart-body connection: a scientific statement from the American Heart Association. *Circulation*. 2021;143(10):e763-e783.

14. Ndumele CE, Rangaswami J, Chow SL, et al. Cardiovascular-kidney-metabolic health: a presidential advisory from the American Heart Association. *Circulation*. 2023;148(20):1606-1635.

15. Khan SS, Coresh J, Pencina MJ, et al. Novel prediction equations for absolute risk assessment of total cardiovascular disease incorporating cardiovascular-kidney-metabolic health: a scientific statement from the American Heart Association. *Circulation*. 2023;148(24):1982-2004.

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