Review of the Influence of Socioeconomic Status on Cardiovascular Health Among Healthcare Workers

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Abstract
Cardiovascular diseases (CVDs) continue to be the leading cause of death and disability worldwide, placing a growing strain on healthcare systems. Surprisingly, healthcare workers—who are expected to model healthy behaviour—are increasingly at risk of developing these conditions. This review explores how socioeconomic factors such as income, education, job stress, workplace conditions, and access to care shape the cardiovascular health of healthcare professionals.
Despite having access to medical knowledge, many healthcare workers, especially those in lower socioeconomic roles, face significant challenges maintaining their own health. Long working hours, emotional demands, and shift work often lead to poor sleep, stress, unhealthy eating habits, and physical inactivity. These stressors, combined with limited institutional support—like a lack of preventive screening and wellness programs—contribute to rising rates of hypertension, obesity, and other CVD risk factors among healthcare staff.
Evidence shows that lower-paid healthcare workers are disproportionately affected, creating health inequalities within the very system designed to reduce them. This highlights a clear gap between professional knowledge and real-world circumstances, where structural and economic barriers hinder the ability to make healthy choices.
The review calls for stronger workplace health policies that go beyond education to address systemic issues. Regular cardiovascular screenings, stress management support, accessible preventive care, and inclusive wellness initiatives are critical steps. Supporting the health of healthcare workers isn't just ethical—it's essential for a strong, resilient health system that can meet future public health challenges. Addressing these gaps is key to protecting both workers and the populations they serve.

Keywords: *Cardiovascular diseases, socioeconomic status, healthcare workers, occupational health, lifestyle factors, health disparities*

Cardiovascular diseases (CVDs) including hypertension, ischemic heart disease, stroke, and heart failure continue to dominate global mortality statistics, accounting for approximately 17.9 million deaths annually, or nearly one-third of all deaths worldwide (World Health Organization [WHO], 2023). While prevention efforts largely target the general population, healthcare workers, despite their vital role in health promotion, also face significant cardiovascular risks. This is a paradox underscored by numerous studies demonstrating elevated CVD risk factors among healthcare workers, often attributable to socioeconomic inequalities and occupational stressors (Meyer et al., 2019; Shanafelt et al., 2015).

Healthcare professionals frequently endure prolonged work hours, emotionally taxing patient interactions, and irregular shift patterns disrupting circadian biology, all of which predispose them to hypertension, obesity, and metabolic dysregulation (Muller et al., 2020; Zhang et al., 2019). Importantly, socioeconomic factors such as income disparities, educational differences, and unequal access to healthcare exacerbate these occupational hazards (Kessler et al., 2017). These social determinants modulate lifestyle behaviors—diet, physical activity, smoking—and access to preventive services, underpinning differential cardiovascular risk profiles across healthcare worker cadres.

This article comprehensively reviews the current literature on the socioeconomic influences on cardiovascular health among healthcare workers, highlighting epidemiological trends, risk factors, institutional barriers, and best practice interventions to promote cardiovascular wellness in this critical workforce.

Socioeconomic Determinants of Cardiovascular Health: Conceptual Framework

Socioeconomic status (SES)—encompassing income, education, occupation, and social capital—is a foundational determinant of health with robust associations to cardiovascular outcomes (Braveman et al., 2011; Stringhini et al., 2017). Lower SES is consistently linked with higher incidence of hypertension, obesity, diabetes, and cardiovascular events, due to material deprivation, psychosocial stress, reduced health literacy, and limited healthcare access (Adler & Stewart, 2010; Havranek et al., 2015).

Within healthcare settings, SES stratification is stark: physicians typically hold high-income, high-autonomy roles, while nurses, allied health professionals, and support staff often experience lower income, less job control, and higher job strain (Salyers et al., 2017; Arnetz et al., 2015). These inequalities lead to divergent exposures to stress and lifestyle risk factors, explaining the observed gradients in cardiovascular health outcomes (Roberts et al., 2021).

Moreover, organizational culture and occupational conditions can either mitigate or amplify SES-related health disparities. Lower autonomy and high work demands—hallmarks of lower-status healthcare roles—predict elevated cardiovascular morbidity through chronic stress mechanisms (Hämmig, 2017; Jokela et al., 2014). Institutional failure to provide equitable wellness resources perpetuates these disparities (Aiken et al., 2012).

Global Burden of Cardiovascular Risk Among Healthcare Workers

Cardiovascular risk factors among healthcare workers not only reflect the broader social inequities prevalent in general populations but are further intensified by the unique demands and stressors inherent in healthcare professions. Research conducted in sub-Saharan African countries such as Nigeria, Ghana, and South Africa reveals a concerning prevalence of hypertension among healthcare workers, ranging between 25% and over 40%. Notably, nursing and support staff experience a disproportionately higher burden compared to physicians, which has been attributed to income disparities, greater occupational stress, irregular shift schedules, and limited access to wellness resources (Kengne et al., 2022; Owolabi et al., 2017; Okello et al., 2019). These disparities underscore the intersection of socioeconomic status (SES) with occupational roles, where lower-paid workers face more adverse psychosocial and physical working conditions, negatively impacting their cardiovascular health (Amoah et al., 2021; Boadu et al., 2021).

Similar patterns have been observed in Southeast Asian healthcare settings. Studies highlight that nurses and paramedics report significantly higher rates of smoking, sedentary lifestyles, and unhealthy dietary habits relative to physicians (Chaudhary et al., 2020; Thuy et al., 2018). These lifestyle factors, compounded by the high demands and stress of healthcare work, contribute to elevated cardiovascular risk profiles among lower-status healthcare workers. The disparities persist even in high-income countries such as the United States and various European nations, where lower-status healthcare professionals—such as nursing assistants, aides, and administrative staff—exhibit disproportionately high rates of obesity, hypertension, and diabetes (Miranda et al., 2017; Trinkoff et al., 2011). This widespread phenomenon highlights the universality of SES as a fundamental determinant of cardiovascular risk within healthcare professions, transcending regional economic differences (Väänänen et al., 2016; Clarke et al., 2019).

Key Socioeconomic Factors Impacting Cardiovascular Health

Income Level and Financial Stress

Income disparities profoundly impact cardiovascular health via direct material deprivation and psychosocial stress. Healthcare workers in lower-paid roles experience limited ability to purchase healthy foods, engage in physical activity, and afford preventive healthcare (Schultz et al., 2014; Gifford et al., 2020). Financial strain triggers stress pathways, including hyperactivation of the hypothalamic-pituitary-adrenal axis, resulting in hypertension and metabolic syndrome (Steptoe & Kivimäki, 2013; Cohen et al., 2015).

Extended working hours driven by financial necessity further reduce time for health maintenance activities, leading to cumulative physiological wear and tear (“allostatic load”) (McEwen, 2006). This chronic stress paradigm contributes to the clustering of cardiovascular risk factors among lower-income healthcare workers (Peters et al., 2016).

Educational Attainment and Health Literacy

Educational disparities within healthcare affect both knowledge and practical health behaviors.

Clinical staff generally have superior cardiovascular health literacy, while ancillary and administrative workers often lack comprehensive understanding of risk factors and prevention (Lazcano-Ponce et al., 2019; Wilkins et al., 2021). This gap influences dietary choices, tobacco use, and healthcare utilization.

However, structural factors limit the translation of knowledge into action. For example, time constraints, workplace culture, and limited autonomy impede healthy lifestyle adoption even among knowledgeable staff (Morris et al., 2019). Effective interventions therefore require addressing both literacy and enabling environments (Heijmans et al., 2015).

Occupational Stress and Work Environment

Occupational stress is a major contributor to cardiovascular morbidity among healthcare workers. The demands of high patient acuity, emotional labor, and shift work induce chronic stress responses linked to hypertension and coronary artery disease (Prajapati et al., 2020; Foti et al., 2021). Shift work, in particular, disrupts circadian rhythms, increasing insulin resistance and blood pressure (Vetter et al., 2016).

Lower-status healthcare workers report greater job strain due to less schedule control, inadequate breaks, and workplace hierarchies (Elfering et al., 2018; Andel et al., 2018). These conditions elevate cardiovascular risk via physiological stress pathways and behavioral coping such as smoking and poor diet (Siegrist & Li, 2016).

Access to Preventive Healthcare

Healthcare workers paradoxically underuse preventive services due to occupational demands, stigma, and institutional neglect (Nabavi et al., 2020; O'Brien et al., 2019). Lower-income workers face additional barriers such as lack of health insurance, paid sick leave, and flexible scheduling (Schneider et al., 2017).

Workplace wellness programs that integrate cardiovascular screening and health promotion can improve early detection and management (Goetzel et al., 2014). However, equitable access remains a challenge, with senior staff disproportionately benefiting (Wells et al., 2019).

Modifiable Cardiovascular Risk Factors Among Healthcare Workers

Healthcare workers demonstrate a notably high prevalence of modifiable cardiovascular risk factors, driven by a combination of socioeconomic, occupational, and behavioral influences. These risk factors critically contribute to the overall burden of cardiovascular morbidity and mortality within this population.

- **Hypertension:** Elevated blood pressure is one of the most common and potent risk factors for cardiovascular disease. Studies have consistently shown hypertension prevalence among healthcare workers ranging from 25% to over 40%, particularly in low- and middle-income countries (Kengne et al., 2022; Owolabi et al., 2017). Notably, nurses and support staff tend to exhibit higher rates compared to physicians, likely reflecting disparities in stress exposure, income, and access to care (Sharma et al., 2021). Poor hypertension control is also

common, often due to late diagnosis, lack of treatment adherence, and limited institutional health monitoring (Okello et al., 2019). Workplace stress, shift work, and unhealthy coping behaviors such as smoking exacerbate these risks (Lee et al., 2020).

- **Obesity and Physical Inactivity:** Obesity prevalence among healthcare workers often exceeds 30%, with physical inactivity identified as a major contributing factor (Lee et al., 2020; Sharma et al., 2021). Sedentary work hours combined with irregular eating patterns and limited time for exercise underpin this trend. Lower-income workers may additionally lack access to fitness facilities or safe spaces for physical activity (Morris et al., 2019). Obesity heightens the risk of insulin resistance, hypertension, and dyslipidemia, synergistically increasing cardiovascular risk (Havranek et al., 2015).
- **Tobacco and Alcohol Use:** Tobacco use remains a prevalent cardiovascular risk behavior among healthcare workers, with rates reaching 20% or higher in some populations (Ogunleye et al., 2023; Chaudhary et al., 2020). Smoking is often used as a stress-coping mechanism despite healthcare professionals' awareness of its harms. Alcohol consumption, particularly binge drinking, is similarly associated with occupational stress and socioeconomic hardship (Shanafelt et al., 2015). These behaviors compound vascular damage and raise blood pressure, accelerating cardiovascular disease progression.
- **Poor Dietary Habits:** Time constraints, workplace food environments, and socioeconomic constraints often force healthcare workers to rely on processed, energy-dense, and nutrient-poor foods (Wilkins et al., 2021). Frequent consumption of fast foods and sugary beverages contributes to obesity, dyslipidemia, and glucose intolerance. Lack of institutional support for healthy eating, such as absence of subsidized nutritious meals or nutritional counseling, exacerbates poor dietary patterns (Sharma et al., 2021).
- **Stress and Sleep Disruption**: Chronic occupational stress and shift work disrupt sleep quality and quantity, independently increasing cardiovascular risk through hormonal and metabolic dysregulation (Vetter et al., 2016; Prajapati et al., 2020). Sleep deprivation elevates sympathetic nervous system activity and systemic inflammation, which potentiate hypertension and atherosclerosis (Muller et al., 2020).

Institutional and Policy Challenges

Institutional gaps pose significant challenges to addressing cardiovascular risks among healthcare workers. Many healthcare facilities lack structured wellness programs accessible to all staff cadres, often focusing only on senior clinical staff (Ogunleye et al., 2023). Workplace stigma against admitting vulnerability or seeking help for stress or health problems deters early intervention. Additionally, inadequate staffing and resource constraints in many low- and middle-income country settings limit implementation of comprehensive health promotion initiatives.

Successful models such as the UK's NHS Staff Health and Wellbeing Framework illustrate that institutional commitment to employee health can reduce cardiovascular risks and improve morale (Dorsey & Topol, 2020; Wells et al., 2019). However, adapting such frameworks requires contextualization to resource availability and socioeconomic realities (Aiken et al., 2012).

Recommendations for Policy and Practice

To reduce cardiovascular health disparities among healthcare workers, multi-layered interventions are imperative:

- **Routine Cardiovascular Screening:** Establish regular, accessible health assessments for all healthcare workers, regardless of professional rank (Goetzel et al., 2014).
- **Comprehensive Wellness Programs:** Promote physical activity, stress management, healthy nutrition, and tobacco cessation tailored to the needs of diverse healthcare worker groups (Sharma et al., 2021).
- **Equitable Health Benefits:** Expand health insurance coverage, paid leave, and wellness incentives to include lower-status healthcare workers (Schneider et al., 2017).
- **Shift Work Reforms:** Implement scheduling policies that limit extended and night shifts, ensuring adequate rest and recovery (Vetter et al., 2016).
- **Targeted Health Literacy Interventions:** Provide culturally and occupationally tailored education focusing on cardiovascular risk reduction (Heijmans et al., 2015).
- **Workplace Culture Change:** Address stigma, promote mental health resources, and foster supportive environments encouraging health-seeking behavior (Shanafelt et al., 2015).

Conclusion

This comprehensive analysis demonstrates the profound influence of socioeconomic determinants on cardiovascular health outcomes among healthcare workers. The interweaving of income disparities, educational gaps, occupational stress, and limited access to preventive healthcare culminates in a heightened risk of modifiable cardiovascular disease factors within this population. Addressing these inequities requires multi-dimensional interventions, incorporating workplace wellness programs, policy reforms to enhance healthcare access, and targeted education to empower all cadres of healthcare workers.

Protecting the cardiovascular health of healthcare workers not only safeguards their well-being but also sustains the operational integrity and effectiveness of health systems globally. It is imperative for policymakers, healthcare administrators, and public health professionals to collaborate in crafting and implementing equitable, evidence-based strategies to reduce cardiovascular risk and promote health equity within the healthcare workforce.

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