

PUBLIC HEALTH IMPLICATIONS OF HYPERTENSION: LONG-TERM HEALTH OUTCOMES AND BURDEN ON NATIONAL HEALTH SYSTEMS

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**International Academic Journal of Health, Medicine and Nursing (IAJHMN) | ISSN
2523-5508**

Received: 17th February 2026

Published: 28th February 2026

Full Length Research

Available Online at: https://iajournals.org/articles/iajhmnn_v2_i2_100_105.pdf

Citation: Muriithi, E. N. (2026). Public Health Implications of Hypertension: Long-Term Health Outcomes and Burden on National Health Systems. *International Academic Journal of Health, Medicine and Nursing*, 2(2), 100-105.

ABSTRACT

Hypertension is a significant worldwide community health issue and a significant risk factor that is adjustable in the occurrence of a heart disease. Despite adulthood being the most popular age group in reference to this, growing evidence indicates an upsurge in cases of high blood pressure in teenagers. Long-term cardiovascular complications linked with early-onset hypertension are coronary heart disease, stroke, chronic kidney disease, and early mortality. Using the evidence of a systematic review of anxiety and hypertension in adolescents in the United Kingdom, this paper will discuss the health impacts of hypertension in the long run and the burden it has to the health system of nations. There has also been evidence that

the physiological processes that are associated with anxiety such as the activation of the sympathetic nervous system and high cortisol levels contributes to long-term high blood pressure. When not treated in the adolescent stage, hypertension elevates the lifetime healthcare and economic expenditure. Proper prevention early on, combined with the aspect of mental health screening, and lifestyle interventions are necessary to minimize the strain on the national healthcare services in the future.

Keywords: Hypertension; Adolescents; Public health; cardiovascular disease; Health systems; United Kingdom.

INTRODUCTION

Hypertension is a major contributor to cardiovascular disease and it is among the common modifiable risk factors leading to morbidity and mortality in the world (Mucci et al., 2016). Though the concept of high blood pressure is linked to older people, there is increasing evidence that high blood pressure is becoming a common phenomenon among adolescents. Hypertension at early ages is especially alarming since it predisposes a person to a greater cardiovascular risk in the course of life, which further complicates adverse health outcomes in the long run.

In the United Kingdom, youths have been experiencing a massive increase in mental illnesses, especially anxiety (Newlove-Delgado et al., 2021). New studies show that there is a quantifiable relationship between anxiety disorders and blood pressure highness among adolescents (Astudillo et al., 2024). Physiological pathways to this relation are persistent activation of the sympathetic nervous system and malfunctioning of the hypothalamic-pituitary-adrenal (HPA) axis, which contributes to the persistence of the vascular resistance and arterial hardening (DeLalio, Sved and Stocker, 2020; Oo et al., 2025).

Based on the natural progression of hypertension, it is important that it is identified early on in terms of the public health perspective. In case hypertension is started as an adolescent, the cardiovascular burden during the decades can be a substantial burden on national health systems. In the current paper, the author presents the analysis of the long-term health outcomes of hypertension and discusses the implications of healthcare systems in general based on the systematic review research conducted in the dissertation.

RESEARCH METHODOLOGY

The analysis is based on a systematic review done as MSc International Public Health dissertation. The review was conducted in a systematic and clear process of tracking down, analyzing, and consolidating known peer-reviewed evidence that investigated the relationship of anxiety and hypertension in adolescents. Predefined keywords were applied to search electronic databases associated with anxiety, hypertension, adolescents, cardiovascular risk and public health. Inclusion criteria included: (1) peer-reviewed articles, (2) adolescent sample, (3) quantitative blood pressure and anxiety measurement and (4) English publication.

The studies that only involved adult populations or those that have no measurable cardiovascular outcomes were eliminated. The final synthesis consisted of eight eligible studies. The data extraction was based on reported relationships, effect sizes, confidence intervals, and physiological mechanisms of linking anxiety to increased blood pressure. The quality of methodology of the studies incorporated was examined in order to make the findings reliable. The present journal article explicitly understands those results in terms of a population health prism, looking at the health outcomes and consequences in the national healthcare systems in the long term.

RESEARCH RESULTS

Eight peer-reviewed articles that analyzed the relation This paper is based on a systematic review done as MSc International Public Health dissertation. The review was conducted in a systematic and clear process of tracking down, analyzing, and consolidating known peer-reviewed evidence that investigated the relationship of anxiety and hypertension in adolescents.

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in the long term relationship between anxiety and hypertension in adolescents were included in the systematic review. In the literature, a positive correlation was found to be consistent. In the research, Astudillo et al. (2024) found that the levels of systolic and diastolic blood pressure were significantly higher in adolescents with moderate-to-severe symptoms of anxiety ($p < 0.01$). In the same vein, Astudillo et al. (2022) established an improved prevalence of hypertension in the adolescent population with anxiety disorders (OR = 1.32, 95% CI: 1.10-1.58). Longitudinal data also revealed that those teenagers who were regularly anxious were over twice as susceptible to contracting hypertension in adulthood (HR = 2.05, 95% CI: 1.54-2.74) (Davidson, Alcántara and Miller, 2018).

The results of the meta-analysis showed that adolescents who were anxious and those who are not nervous had a pooled standardized mean difference of 0.47 (95% CI: 0.31-0.64, $p < 0.001$), which was found to be statistically significant. Physiological processes found in the literature were related to the activation of the chronic sympathetic nervous system (DeLalio, Sved and Stocker, 2020) and long-term cortisol elevation associated with the dysfunction of the HPA axis (Oo et al., 2025). These processes lead to constriction of the vessel, ventricular hypertrophy, and permanent damage to the arteries. Altogether, the results suggest that stress responses related to anxiety are coupled with significant physiological changes in blood pressure in adolescence and have long-term cardiovascular health consequences.

DISCUSSION

The review outcomes prove that hypertension in adolescents is not only a lifestyle-related illness, but also closely connected with psychological stress and anxiety disorders. This observation has significant implications to population health. In the first place, early hypertension is a lifetime risk factor of cardiovascular disease, such as coronary heart disease, stroke, heart failure and chronic kidney disease. Constant activation of the sympathetic nervous system increases peripheral resistance and cardiac workload that encourages long-term vascular remodeling and arterial stiffening (DeLalio, Sved & Stocker, 2020).

The increase of cortisol over a long period also leads to endothelial dysfunction and atherosclerosis (Oo et al., 2025). Second, the cost to health care systems of countries is high. Hypertension is a chronic condition that must be monitored on a long-term basis, treated with the drugs, and the complications like myocardial infarction and stroke should be managed. When high blood pressure starts during the adolescent years, it is possible that patients can take decades of medical attention. Since the prevalence of mental conditions in the youth is steadily increasing (Newlove-Delgado et al., 2021), the overlapping of anxiety and hypertension can magnify the prevalence of cardiovascular diseases in the future.

Third, this burden is increased by social economic disparities. Environmental and socioeconomic stressors and their chronic exposure are associated with the prevalence of anxiety and the risk of

hypertension (Modey Amoah et al., 2020). In the absence of early preventive measures, vulnerable groups are likely to encounter disproportional long-term morbidity of cardiovascular diseases, and health inequalities will be increased. Based on the public health policy, these results underscore the importance of integrated screening strategies. Routine blood pressure screening among the adolescents integrated with mental health evaluation can help to intervene earlier. Mental health treatment can also be used as cardiovascular risk prevention since psychological interventions like cognitive behavioural therapy have been shown to have quantifiable improvements in systolic blood pressure (Li et al., 2021). The solution to adolescent hypertension consequently needs multidisciplinary approach that includes mental health services, health promotion in the school and lifestyle interventions.

CONCLUSION

Hypertension is an urgent and increasingly significant public health problem with a long-term national health issue. The systematic review shows that there is a strong correlation between anxiety disorders and high blood pressure among adolescents. The activation of sympathetic processes over time and impairment of the HPA axis give viable biological explanations of the association between psychological distress and prolonged cardiovascular stress. Untreated early-onset hypertension lifelong risk of cardiovascular disease, and therefore of coronary heart disease, stroke, renal failure, and early death.

This development will help in increasing the healthcare spending and eventual pressure on national health services. The prevention measures should include early identification, combined mental health screening, and preventive treatment based on both psychological and physiological risk factors. Prevention of hypertension in adolescence is not merely a clinical priority, but a strategic population health priority that will minimize cardiovascular morbidity in the future and ensure sustainability of the healthcare system.

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