Beyond the Numbers: Exploring the Landscape of Adolescent Hypertension in Contemporary Literature

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Abstract

This literature review delves into the escalating global health concern regarding hypertension among adolescents, with a particular focus on the unique challenges faced by African youth. Initially associated with aging, hypertension is now prevalent among teenagers, necessitating a shift in focus and understanding of the global health landscape. This manuscript highlights the prevalence of hypertension among adolescents in Africa, the risk factors for hypertension among adolescents in Africa, the consequences of hypertension in adolescence, and interventional strategies.

Keywords: Hypertension, Adolescence, Africa, Youth, Ghana

Introduction

Once thought to be exclusively linked to aging, hypertension has become a major global health concern among teenagers. Even though the non-communicable disease burden is increasing globally, teenagers in Africa face particular difficulties that lead to an increase in the prevalence of hypertension in this age group (Liu et al., 2017). The increasing prevalence of hypertension in African teenagers is contextually summarized in this introduction, which also explores the various elements that contribute to this problem and emphasizes the pressing need for study, education, and focused treatments (Del Pinto et al., 2020). The global landscape of health is transforming, with non-communicable diseases taking center stage. Traditionally perceived as adult-onset conditions, diseases such as hypertension now infiltrate younger demographics, demanding a shift in focus and understanding (Norboo et al., 2015). Hypertension, a leading risk factor for cardiac ailments, is a concern among adolescents, reflecting shifts in lifestyle, diet, and environmental factors that extend beyond the borders of developed nations.

African adolescents experience unique health concerns that are formed by a complex interplay of cultural customs, socioeconomic conditions, and scarce healthcare resources. Africa's teenage disease burden is changing as a result of demographic and epidemiological shifts. Alongside an increasing number of lifestyle-related health problems, such as the silent danger of hypertension, there

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is malnourishment, infectious infections, and a weak healthcare system(Oguoma et al., 2015). Understanding the factors that contribute to the increase in hypertension in African adolescents is crucial. Lifestyle changes, including shifts towards diets high in salt and processed foods, sedentary behaviors, and exposure to urbanization-related stressors, play a pivotal role. Additionally, genetic predispositions, lack of awareness, and limited access to healthcare exacerbate the challenges faced by adolescents in managing and preventing hypertension(Satoh et al., 2017).

Adolescent African Americans with hypertension face consequences beyond simple medical issues. Adolescent hypertension is a precursor to a wide range of cardiovascular disorders and can persist into adulthood. This significantly adds to the load on healthcare systems(Leng et al., 2015). It is critical to investigate preventive measures and interventions due to the pressing need to address the social and economic ramifications of the unchecked hypertension epidemic among African adolescents. This review aimed to synthesize the existing knowledge on hypertension among adolescents in Africa(Sharma et al., 2018)the prevalence of high blood pressure (BP. By examining prevalence rates, risk factors, consequences, and intervention strategies, this review seeks to offer a thorough understanding of the present landscape. Furthermore, it identifies research gaps and emphasizes the necessity of context-specific approaches that consider the unique challenges faced by African adolescents in combating hypertension (Leng et al., 2015).

This investigation into the particulars of hypertension among African adolescents is crucial to addressing the underlying causes, developing successful interventions, and promoting a healthier future for the youth on the continent as the global health community grapples with the changing landscape of adolescent health.

Prevalence of Hypertension among Adolescents in Africa

The prevalence of hypertension among African adolescents is a growing concern, as lifestyle changes, urbanization, and economic transitions contribute to shifting health patterns. Although hypertension has traditionally been associated with older age groups, recent studies have highlighted an increasing incidence among adolescents in various African regions (Schutte et al., 2017). Understanding the prevalence rates is crucial for public health planning, intervention strategies, and resource allocation. In a qualitative study, researchers reported that the prevalence of hypertension ranged from 0.2 to 24.8%. The pooled prevalence of raised blood pressure (systolic or diastolic blood pressure ≥ 95th percentile) was 5·5% (95% CI 4·2-6·9), whereas that of mildly increased blood pressure (systolic or diastolic blood pressure ≥90th percentile and <95th percentile) was 12·7% (2·1-30·4%) (Noubiap et al., 2017). Sharma et al. (2018) published the findings that 905 out of 15,584 children (5.8%) had

newly diagnosed hypertension (n=381) or worsened clinical stage (n=524), resulting in a significant increase in disease burden for the healthcare system. Children who had their blood pressure reclassified upward were more likely to be overweight or obese, with higher z-scores for weight, waist circumference, and body mass index. Wang et al. (2019) conducted a qualitative synthesis of fifty-nine (59) research in China, and the prevalence of hypertension ranged from 2.2 to 26.4%. The meta-analysis comprised 25 trials (341,281 participants), and the pooled prevalence of hypertension was 9.8% (95% confidence interval 7.9, 11.9). The prevalence of raised blood pressure in obese children (34.1%, 95% CI 26.9, 41.7) and overweight children (15.5%, 95% CI 10.1, 21.7) was significantly greater than that in normal or underweight children (5.0%, 95% CI 2.4, 8.4). Kar and Khandelw (2015) reported that the prevalence of obesity, overweight, and hypertension was 2.04%, 14.5%, and 5.62%, respectively, in a study on the effects of fast foods on the health of adolescents in India.

The prevalence of hypertension among African adolescents is a multifaceted issue that is influenced by a range of factors (Ewald & Haldeman, 2016). Ongoing research, coupled with targeted public health interventions, is crucial for addressing this emerging health challenge and promoting cardiovascular health among the youth in Africa. Studies have revealed variations in the prevalence of hypertension among adolescents in different African regions. Urban areas often show a higher prevalence than rural settings, reflecting the impact of urbanization on lifestyle and dietary habits. Research by Akinlua et al. (2015) suggests sex-based differences in the prevalence of hypertension among African adolescents. While some studies report higher rates in males, others find a more equal distribution between genders. Understanding these variations is essential for developing targeted interventions.

Urbanization is linked to an increased prevalence of hypertension among African adolescents. Urban environments often bring about changes in dietary patterns, reduced physical activity, and increased stress levels, which contribute to hypertension (Song et al., 2019)the prevalence of childhood hypertension has rarely been synthesized at the global level.To conduct a systematic review and meta-analysis to assess the prevalence of hypertension in the general pediatric population.PubMed, MEDLINE, Embase, Global Health, and Global Health Library were searched from inception until June 2018, using search terms related to hypertension (hypertension OR high blood pressure OR elevated blood pressure. Socioeconomic factors play a significant role in hypertension prevalence. Adolescents from lower socioeconomic backgrounds may face challenges in accessing healthcare and are often exposed to environments that promote unhealthy behaviors, thereby increasing the risk of hypertension. Dietary patterns characterized by high salt intake and consumption of processed foods contribute to the rising prevalence

of hypertension (Psaltopoulou et al., 2017). Poor nutrition during adolescence can have long-term consequences on cardiovascular health. The association between obesity and hypertension has been well established. Studies on African adolescents highlight the increasing prevalence of obesity, particularly in urban areas, which correlates with higher blood pressure levels (Bird et al., 2015).

Genetic factors can contribute to hypertension, and certain populations may have higher genetic susceptibility. Understanding the interplay between genetic and environmental factors is essential for the development of effective prevention and intervention strategies(Sharma et al., 2018)the prevalence of high blood pressure (BP. Limited awareness of hypertension and its risk factors among adolescents and their caregivers can contribute to delayed diagnoses and interventions. Hypertension in adolescence is not just a concern for the present but also serves as a predictor of future cardiovascular diseases. Early detection and management are essential to mitigate long-term health risks (Azizi et al., 2023).

Risk Factors of Hypertension among Adolescents in Africa

The risk factors contributing to hypertension (hypertension) among adolescents in Africa are complex and multifaceted, encompassing a range of genetic, environmental, lifestyle, and socioeconomic factors (Wilson & Renzaho, 2015). A study reported that 21% of adults residing in the Federal District and state capitals of Brazil had self-reported hypertension. Self-reported elevated blood pressure was linked to the following factors: age group, using 18 to 24 as the reference (the entire group showed greater risk: low education level (OR = 0.8; 95% CI 0.7–0.9, and 12 years or more [OR = 0.6; 95% CI 0.6–0.7]); black race or skin color (OR = 1.3; 95% CI 1.1–1.5); smoking in the past (OR = 1.2; 95% CI 1.1–1.3), obesity (OR = 2.7; 95% CI 2.5–3.5%), diabetes (OR = 2.9; 95% CI 2.5–3.5%), and high cholesterol (OR = 1.9; 95% CI 1.8–2.2) (Amponsem-Boateng & Bosu, 2022). In another study, the frequency of hypertension in teenagers outweighed the number of cases diagnosed, according to experts, with studies showing that at least 75% of cases go untreated. (Ewald & Haldeman, 2016). Genetic factors play a significant role in the development of hypertension (Patel et al., 2017). Adolescents with a family history of hypertension are at increased risk. Research indicates that certain African populations may have a genetic predisposition to hypertension, emphasizing the importance of familial risk assessment (Patel et al., 2017). The increase in obesity rates among African adolescents is a major contributor to hypertension.

Poor dietary habits, increased consumption of high-calorie processed foods, and a sedentary lifestyle contribute to excess weight gain, leading to an increased risk of hypertension (Tappia & Defries, 2020). A study by Choukem et al. (2020a) in Sub-Saharan Africa (SSA) reported that the proportion of overweight

and obese children and teenagers in SSA is increasing. Its main associations are gender, high maternal body mass index, bad diets, high socioeconomic position, and inactivity. Among overweight/obese children and adolescents with SSA, glucose intolerance, metabolic syndrome, hypertension, dyslipidemia, and diabetes are the main CVRFs identified(Quan et al., 2018). Diets high in salt and saturated fats and low in fruits and vegetables contribute to hypertension. In many African settings, traditional diets are shifting towards processed and high-sodium foods, further exacerbating the risk of increased blood pressure in adolescents. Lack of physical activity is a substantial risk factor for hypertension. With urbanization and lifestyle changes, adolescents in Africa may engage in less physical activity, contributing to obesity and other cardiovascular risk factors (Choukem et al., 2020b). Urbanization is often associated with lifestyle changes that increase the risk of developing hypertension. Adolescents in urban areas may have limited access to green spaces, engage in less physical activity, and be exposed to a more stressful environment, all of which contribute to higher blood pressure levels. Tobacco use and excessive alcohol consumption are the risk factors for hypertension (Rahman et al., 2015). Adolescents experimenting with these substances may have an increased risk of developing hypertension.

Psychosocial stressors including academic pressure, family issues, and societal expectations can contribute to hypertension among adolescents. The impact of stress on blood pressure should be considered in holistic preventive strategies (Wilson & Renzaho, 2015). Limited awareness of healthy lifestyle choices and the consequences of hypertension may contribute to risky behaviors among adolescents. Comprehensive health education programs are essential for improving awareness and empowering adolescents to make informed decisions regarding their health (Noubiap et al., 2017). Irregular sleep patterns, including insufficient or poor sleep quality, are associated with an increased risk of hypertension in adolescents. Addressing sleep hygiene is an important aspect of comprehensive health intervention (Akinlua et al., 2015). Cultural factors including dietary habits and traditional practices can influence the risk of hypertension. Understanding cultural context is crucial for tailoring interventions that resonate with the local population. Limited access to healthcare services can result in delayed diagnosis and management of hypertension. Improving healthcare infrastructure and accessibility is vital for early detection and intervention(Choukem et al., 2020b).

Understanding the interplay between these risk factors is essential for developing culturally sensitive and effective interventions to prevent and manage hypertension among adolescents in Africa. A comprehensive approach that addresses lifestyle factors, promotes health education, and ensures equitable access to healthcare is critical for mitigating the rising burden of hypertension in this vulnerable population.

Consequences of Hypertension in Adolescence

The consequences of hypertension (hypertension) during adolescence extend beyond immediate health concerns, impacting both short-term and long-term cardiovascular health. Recognizing and addressing these consequences are essential for developing effective preventive measures and interventions(Agyemang et al., 2015). Adolescents with untreated hypertension are at increased risk of developing cardiovascular complications. Over time, persistent hypertension can cause injury to blood vessels, increasing the risk of atherosclerosis, coronary artery disease, and other cardiovascular disorders(Norboo et al., 2015). Hypertension exerts strain on the heart, arteries, and other vital organs. Increased pressure can lead to target organ damage, affecting organs such as the heart, kidneys, and brain(Soubeiga et al., 2017). This damage may be irreversible and contribute to long-term health issues. Persistent hypertension can result in kidney damage, leading to reduced kidney function or chronic kidney disease(Wilson & Renzaho, 2015). Adolescents with hypertension may be at increased risk of developing kidney-related complications later in life.

Evidence suggests a link between hypertension during adolescence and cognitive impairment. Elevated blood pressure may affect cognitive function and is associated with a greater risk of developing conditions, such as dementia, in later adulthood. Uncontrolled hypertension is a major risk factor for stroke(Fisher & Curfman, 2018). Adolescents with hypertension may face an increased risk of stroke later in life, particularly if the condition is left untreated or poorly managed (Ruiz et al., 2019). Hypertension during adolescence is a sign of early onset of cardiac ailments in adulthood. Young individuals with an antiquity for hypertension are more prone to developing heart-related issues earlier than those without such a history(Zhou et al., 2021). Adolescents with hypertension may experience a reduced quality of life due to the impact of the condition on daily activities, energy levels, and overall well-being. Physical and emotional consequences can affect social interaction and academic performance. The consequences of hypertension during adolescence contribute to the long-term health burden on individuals and healthcare systems. Early intervention and management are critical for preventing the progression of hypertension-related complications(Schutte et al., 2017). Severe and uncontrolled hypertension in adolescence may lead to hypertensive crises characterized by extreme hypertension levels. These emergencies can result in organ damage, stroke, or other life-threatening complications(Flynn et al., 2017). Adolescents with hypertension are more likely to carry this condition into adulthood, perpetuating a cycle of cardiovascular risk.

Addressing hypertension during adolescence has implications for not only individual health but also the health of future generations(Sharma et al., 2018) the prevalence of high blood pressure

(BP. The chronic nature of hypertension can contribute to psychosocial stress and anxiety among adolescents. Managing a chronic condition may affect self-esteem, relationships, and overall mental well-being. The economic burden associated with the treatment of hypertension-related complications is substantial. Costs related to hospitalization, medications, and long-term care contribute to the overall economic impact of uncontrolled hypertension in adolescence(Fisher & Curfman, 2018).

Intervention Strategies

Hypertension during adolescence has far-reaching consequences that extend into adulthood. Early detection, lifestyle modifications, and effective management strategies are crucial to mitigate the immediate and long-term health risks associated with hypertension in this vulnerable population. Public health initiatives, awareness campaigns, and comprehensive healthcare approaches are essential components for addressing the growing impact of hypertension among adolescents. Developing extensive health education programs in schools to increase knowledge of the risks associated with hypertension is a good way forward. These programs should include modules for stress management, healthy lifestyle choices, nutrition, and regular physical activities. The establishment of routine blood pressure screenings in healthcare settings and schools to detect hypertension early is another way to intervene in the spread of hypertension among adolescents. Ensuring that regular check-ups occur during routine healthcare visits to monitor blood pressure trends in communities is a way to uncover variables/predisposing factors that influence adolescent hypertension within various communities. Nutritional Initiatives include encouraging healthy eating habits by educating people about balanced diets, lowering salt intake, increasing the consumption of fruits and vegetables, and working with schools to enhance the nutritional value of cafeteria meals. Encouraging frequent exercise by implementing physical education initiatives in schools encourages an active lifestyle and creates community areas for sports and leisure activities.

A Policy that promotes laws that restrict the supply of unhealthy food in public areas, such as schools, and back laws that encourage physical exercise, such as those that create secure routes for bicyclists and pedestrians, are needed in African communities. Improved access to healthcare services by implementing telehealth projects, particularly in underserved or remote locations, will offer teens and their families virtual consultation and online resources. Family-friendly activities that encourage exercise and a healthy diet should be encouraged. Again, by employing peer education initiatives in which adolescent mentors provide guidance on good behavior to younger peers and create a peer-supportive atmosphere that promotes healthy living decisions, teenagers are likely to become ambassadors of their own health. These suggested interventions should be adjusted to the population's cultural background while considering customs and beliefs for effective outcomes.

Conclusion

Literature on adolescents with hypertension in Africa reveals a growing public health concern marked by shifting demographics, lifestyle changes, and an increasing prevalence of hypertension in this age group. This review explored the prevalence, risk factors, consequences, and intervention strategies related to hypertension among African adolescents.

The prevalence of hypertension varies across countries, with higher rates being observed in urban areas. Genetic predisposition, poor dietary habits, physical inactivity, and socioeconomic factors increase the incidence. The consequences of hypertension in adolescence are far-reaching and affect cardiovascular health, cognitive function, and quality of life. Long-term implications include early onset of cardiovascular diseases, renal impairment, and an increased risk of stroke.

Numerous risk factors, including genetic predisposition, obesity, unhealthy dietary patterns, and a lack of awareness, contribute to the development of hypertension. Urbanization and cultural practices further influence the risk landscape. The consequences of uncontrolled hypertension extend to psychosocial well-being, economic burden, and potential impacts on future generations.

Addressing hypertension among African adolescents requires multifaceted intervention. Health education programs, routine screening, and nutritional initiatives are essential for raising awareness and promoting healthy lifestyles. Policy development, community engagement, and integration of preventive measures into school curricula are crucial. Telehealth initiatives and family involvement enhance accessibility to healthcare services, whereas research and surveillance guide evidence-based interventions.

In summary, the literature underscores the urgency of addressing hypertension among African adolescents using holistic strategies. Early detection, education, lifestyle modifications, and collaborative efforts involving communities, healthcare providers, and policymakers are paramount for mitigating the impact of hypertension and fostering a healthier future for this vulnerable population in Africa.

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