



Socioeconomic Determinants of Diabetes and Hypertension: Mechanisms, Health Disparities, and Strategies for Equitable Prevention and Management

Saba Javed¹, Hadia Iqbal², Memoona Qureshi³, Maria Khan⁴, Salma Roman⁵, Zahrah khalid⁶, Monmina Iftikhar⁷, Hina Anwar⁸

¹Department of Pharmacy Practice, The University of Lahore, Sargodha Campus, Pakistan

²Department of Pharmacy Practice, Government College University Faisalabad, Pakistan

³Mirpur University of Science and Technology (MUST), Mirpur, Azad Jammu and Kashmir, Pakistan
children Hospital, Prayagraj

⁴Iqra University Karachi, Pakistan

⁵Department of Biotechnology, Islamic International university Islamabad

⁶Department of Physiology, Government college university Faisalabad (GCUF) Pakistan

⁷Department of Eastern Medicine, Government College University Faisalabad Pakistan

⁸Department of Eastern Medicine, Government College University Faisalabad Pakistan Email:
hinaanwar@gcuf.edu.pk

OPEN ACCESS

Corresponding Author:

Hina Anwar

Department of Eastern
Medicine, Government College
University Faisalabad Pakistan.
Email: hinaanwar@gcuf.edu.pk

Received: 13-02-2026

Accepted: 26-03-2026

Published: 11-04-2026

Copyright© International Journal of
Clinical, Medical and Health Sciences

ABSTRACT

Diabetes mellitus and hypertension are significant noncommunicable diseases, and are key causes of cardiovascular, renal, neurological, and other chronic complications. While the predisposition to these diseases is an important factor, their distribution and outcome are greatly influenced by socioeconomic factors. Exposure to risk factors, health behaviors, diagnosis, treatment, adherence, and long term outcomes are influenced by income, education, employment, housing, food security, neighborhood environments, social protection and access to affordable health services. This review summarizes the literature about the pathways between socioeconomic disadvantage and diabetes and hypertension and how these pathways relate to health disparities. Low SES can be associated with more exposure to unhealthy food environments, chronic psychosocial stress, environmental hazards, and less access to physical activity, as well as fewer access to preventive services, medicines, monitoring and continuity of care. These factors influence each other over the years, and can perpetuate patterns of disease and economic instability. Beyond individual behaviour change, interventions that promote access to healthy food, primary health care services, affordable medicines, community-level screening, culturally responsive health education, social protection and commercial and environmental determinants of health are necessary to achieve equitable prevention. To minimize preventable disparities in diabetes and hypertension, a multi-sectoral effort is needed, with health systems, communities, education, labor, agriculture, and urban planning playing a critical part.

Keywords: Health disparities/health equity, socioeconomic determinants of health, diabetes mellitus, hypertension, prevention, primary care, chronic disease management.

INTRODUCTION

Some of the most significant chronic diseases in the world include diabetes and hypertension. It is especially concerning that their co-existence is associated with a higher risk of cardiovascular disease, chronic kidney disease, stroke and early death due to high blood pressure and abnormal glucose metabolism. Increased population ageing, urbanization, dietary change, decreased physical activity, and growing exposure to social and commercial determinants of health (World Health Organization [WHO], 2023; International Diabetes Federation [IDF], 2025) have contributed to the increasing burden of these conditions around the world.

The burden is not equally shared. Higher exposure to risk factors and difficulty gaining timely diagnosis and continued treatment are common among persons living with low income, limited education, insecure employment, poor housing, and limited access to health services. Disease therefore can be affected by socioeconomic inequalities, even as to whether it is detected, controlled and prevented. There is a multi-dimensional relation: social conditions influence behaviours and environments, and a chronic disease can diminish income and employment opportunities, which in turn affects social conditions.

It is important to conceptualize socioeconomic position as an upstream determinant that works through material, psychosocial, behavioral, environmental and healthcare pathways. Educational programs can have an impact on health literacy and employment; income has an impact on the ability to access healthy food and medicine; neighborhood conditions have an impact on opportunities for physical activity; and healthcare access is an impact of opportunities for screening, treatment, and follow-up. These mechanisms can intersect and compound, and are further exacerbated by other social barriers, such as gender, geography, age, disability, and other forms of social disadvantage (Solar & Irwin, 2010; WHO, 2021).

This paper summarizes the key socio-economic risk factors for diabetes and hypertension, describes potential mechanisms by which disadvantage can contribute to disease and summarizes resultant health inequities, identifies strategies to prevent and manage inequity for these two conditions. The focus is on actions by the population and by the health system in addition to clinical care.

Socioeconomic Determinants of Diabetes and Hypertension

Income and Economic Security

Income in the household is closely related to the resources available for maintaining health. Economic uncertainty may constrain the ability to buy fresh foods, engage in recreational physical activity, access clinics, and obtain medicines and health monitoring supplies. Low income families could also have a higher exposure to low-cost foods that are rich in calories. These factors may make individuals more susceptible to obesity, insulin resistance, dyslipidaemia, and elevated blood pressure, which are risk factors for developing cardiovascular disease (WHO, 2023; Hill-Briggs et al, 2021).

Financial stress can also affect the treatment of a disease after it is diagnosed. Patients could be reluctant to attend verification appointments, be hesitant to take medications, delay laboratory monitoring visits, or delay preventive health care because of immediate family needs. Such restrictions are not solely matters of taste and preference, but are signs of what people are able to afford when it comes to health decisions. Policies which lower out-of-pocket payments and enhance social protection can thus have direct health effects.

Education and Health Literacy

Education has a number of impacts on health. Generally, higher education is correlated with higher health literacy, better employment prospects and better ability to interact with the health system. However, illiteracy may hinder the ability to read nutrition labels, comprehend drug instructions, recognize symptoms and engage in shared decision making. Diabetes and hypertension highlight the special significance of health literacy because both may have no symptoms for a long period of time, but lead to progressive organ damage. Effective education can take place when it is accessible, culturally relevant and literacy friendly. Patient education should be delivered in a way that is clear, through practical examples, visual aids, and teachback techniques. CHWs can be used to communicate and support self-management away from the clinical environment.

Mechanisms Linking Socioeconomic Conditions to Disease

Diet and Food Environment

Social conditions can have a significant effect on the cardiometabolic health through diet. Food choices are influenced by availability, affordability, marketing and cultural acceptability. Food environments full of processed foods and sugar-sweetened beverages can increase the risk of overeating and unhealthy metabolism. Also diet sodium is relevant to hypertension, especially if processed foods are a major source of sodium intake (WHO, 2023).

Personal responsibility-based interventions can be ineffective if more healthy options aren't available or feasible. In addition to counseling in clinical settings, structural measures like nutrition labeling, reformulation of processed foods, and restricting the marketing of unhealthy foods to children can be implemented. In addition to counseling in clinical settings, structural measures such as nutrition labelling, reformulation of processed foods, restrictions on unhealthy foods marketing to children, increasing availability of fruits and vegetables, and targeted subsidies can be implemented.

Physical Environment and Physical Activity

The opportunities for regular physical activity can be affected by neighborhood design. Low quality walks and recreation opportunities can be due to unsafe streets, traffic, no sidewalks, substandard public transportation, limited green space, and long commutes. The environment can be a barrier and this can be more prevalent in disadvantaged communities and increase exposure to sedentary lifestyles.

Urban planning and community development can then be used as chronic disease prevention tools. A safe walking environment, public parks, convenient recreational facilities and transportation can make health behaviors more achievable.

Such interventions can have a more widespread impact than those offered to the individual without changes in the environment.

Psychosocial Stress and Biological Pathways

Chronic stressors such as low income, precarious employment, discrimination, living in poor quality housing and other factors can help to create chronic psychological stress. The effects of chronic stress on neuroendocrine and autonomic activity can impact sleep, appetite, inflammation, insulin sensitivity and blood pressure regulation. Stress can also trigger coping mechanisms like smoking, drinking, eating and not exercising.

These pathways demonstrate the need to recognise socio-economic disadvantage not as a background factor. The impact of social adversity can be biologically imprinted, occurring over the life course. Therefore, interventions to reduce stress, social support, employment stability, and housing instability can be complementary to health care treatment.

Healthcare Access and Health-System Inequalities

Healthcare access, as a key factor, determines diagnosis and diabetes and hypertension control. Consultation costs, cost of medications, transportation, distance to services, lack of health care providers, hours of clinics, and lack of continuity of care are all barriers. These barriers might be especially difficult for rural and underserved populations.

Primary health care is ideally suited to manage these diseases since screening, risk assessment, counselling, initiation of treatment, re-stocking of medicines and follow-up of treatment are all part of routine services. Primary care, however, needs to be properly resourced and resourced. The other main elements of a good chronic disease program are reliable supply of essential medicines, basic lab testing, blood pressure monitoring, glucose monitoring and referral pathways (WHO, 2021).

Financial protection is also a priority. UHC can prevent catastrophic household spending due to chronic diseases. Local policies to limit excessive out-of-pocket costs such as essential-medicine lists, pooled procurement and generic medicines can enhance the continuity of treatment.

Health Disparities in Diabetes and Hypertension

Health disparities occur when the social patterning of exposure, care or outcomes is unnecessary and inequitable. Diabetes and hypertension related disparities can manifest as differences in the prevalence of these conditions, age at diagnosis, initiation of treatment, adherence to treatment, glycemic and blood-pressure control, rates of complications, and mortality. Lacks' socioeconomic disadvantage frequently overlaps with geography, gender, age and other social factors.

There are also variations along the disease spectrum. There are several stages, in which a person is exposed to a higher risk level due to neighborhood and/or economic conditions, followed by delayed diagnosis due to inadequate access to health care, and then by poorer control due to difficulty in maintaining treatment or the cost of treatment. Therefore, it is important to have interventions at multiple points and not just a single screening campaign to reduce disparities.

Health outcomes should be tracked by socioeconomic status and region in an EO health system. Data disaggregation can help target the populations that may be suffering the greatest disparities and can guide policy decisions to allocate resources not only on a population level, but on an as-needed basis.

Diabetes: Socioeconomic Pathways and Management

There are a number of major risk factors that are closely linked to type 2 diabetes: obesity, physical inactivity, unhealthy eating, and age, however these risk factors are modified by socioeconomic context in terms of exposure to these risk factors and capacity to manage them. Self-care for diabetes involves ongoing treatment and care—such as taking medicines, managing food, exercising, monitoring blood sugar level if needed, caring for your feet, and checking for diabetes-related complications every so often. Meeting these needs can be difficult, especially if patients have financial and social limitations.

Healthcare services need to be as simple as possible and provide services near the place people live to ensure diabetes treatment is fair. Community based screening may identify undiagnosed disease and structured education may be beneficial as a tool to offer support for self-management. In cases where digital health is adopted, programs should take into consideration the unequal access to smartphones, internet services, digital literacy and electricity.

Prevention should begin BEFORE diabetes occurs. Interventions that impact population levels are needed with regard to diet and physical activity, obesity prevention, and healthy environments. Clinically appropriate monitoring and targeted lifestyle interventions can support high risk individuals, but should not be a substitute for structural interventions.

Hypertension: Socioeconomic Pathways and Management

It is important to have regular blood pressure checks as hypertension frequently does not produce any symptoms. Hypertension can be caused by food intake of too much sodium, obesity, stress, disruption of sleep, environmental factors, and lack of preventive care, among other things, and these are all factors in socioeconomic disadvantaged communities. Control depends on the good access to medicines, adherence, regular medicines measurement and clinical escalation if needed, after diagnosis.

A pragmatic equity solution is the need to extend the scope of BP screening beyond the traditional clinic, maybe to the community setting as appropriate, and to link positive screening to further diagnosis and treatment. Continuity can be fostered through the use of standardized treatment protocols, team-based care, medication refill systems, and follow-up systems.

CHWs and nurses can assist in the education, measurement, referral, and follow-up of blood pressure, and, with appropriate training and supervision, this can be an important role. These models can reduce burden on physicians, and increase the availability of services to underserved populations.

Strategies for Equitable Prevention and Management

Strengthening Primary Healthcare

Primary health care should be the cornerstone of integrated diabetes and hypertension prevention and management. Training of staff, availability of essential medicines, availability of functional equipment, the existence of referral systems, and the availability of reliable information systems are needed in facilities. Chronic disease services can help to improve access to care and decrease fragmentation for people with multiple risk factors.

Improving Food Environments

Evidence-informed nutrition policies can be used to enhance population health. These can range from front-of-package labelling, to reducing sodium levels, to healthier school food standards, to bans on unhealthy product marketing to children, and to policies that make healthy foods more readily available and affordable. These should be considered with the consideration of cost-effectiveness and the impact of these on low-income households.

Community-Based Prevention

Culturally responsive education, screening, peer support, activity and referral to primary care can all be offered through community programs. CHWs can facilitate the linkage of health systems with hard-to-reach populations. Local stakeholders should participate in the planning and evaluation of a program.

Financial Protection and Social Policy

Health financing reforms are needed to lower direct expenses of essential medicines and services for chronic diseases. Upstream determinants can also be addressed through social protection, food-security policies, decent work, housing assistance, and transportation policies. These strategies acknowledge that chronic disease prevention, at least in part, is a social-policy problem, not just a medical problem.

Digital and Telehealth Approaches

When used appropriately, telehealth, electronic reminders, mobile apps, and remote monitoring are effective tools to enhance the continuity of care. However, the potential for digital interventions not to exacerbate inequalities and ensure that those without reliable connectivity or digital skills are not excluded. Hybrid approaches using digital tools in combination with community, face-to-face and telephone services can be more inclusive.

Policy and Research Priorities

Equity lens should be used in policy design. Programs need to determine who is included, who is excluded, and if the resources are being delivered to communities in greatest need. Since a number of the factors that contribute to the occurrence of diabetes and hypertension fall outside the purview of health, ministries can work together with the education, agriculture, labour, transport and housing ministries.

Interventions should be assessed in research using equity-sensitive outcomes, not just average population outcomes. When ethnically and methodologically appropriate, studies should provide results by income, education, and rural or urban living, and other socio-relevant factors. A great need is also the implementation research to identify models that will be viable in resource-poor environments.

Locally adapted strategies are especially significant in low and middle income countries. Informal work, mobility, access to medicines, food price, and health literacy are factors that should be taken into consideration in policies. Importantly, a strategy for equity must not condemn or stigmatize individuals with obesity or chronic disease, but rather focus on supportive environments, without blame.

Table 1. Socioeconomic determinants and pathways relevant to diabetes and hypertension

Socioeconomic determinant	Pathway described in the review	Potential impact on diabetes/hypertension
Income and economic security	Constrains affordability of healthy foods, healthcare, medicines and monitoring; financial stress may delay follow-up and preventive care.	Greater exposure to unhealthy diet, obesity-related risk and interruptions in treatment continuity.
Education and health literacy	Influences understanding of nutrition labels, medication instructions, symptoms and shared decision-making.	May contribute to delayed prevention, diagnosis and self-management.

Food environment	Food choices are shaped by availability, affordability, marketing and cultural acceptability; processed foods and sodium are highlighted.	Unhealthy dietary patterns and increased metabolic and blood-pressure risk.
Physical environment	Unsafe streets, limited sidewalks/green space, poor transport and long commutes can reduce opportunities for physical activity.	Greater sedentary behaviour and cardiometabolic risk.
Psychosocial stress	Economic insecurity, precarious employment, discrimination and poor housing may affect sleep, appetite, inflammation, insulin sensitivity and BP regulation.	Potential worsening of metabolic and blood-pressure regulation and unhealthy coping behaviours.
Healthcare access	Consultation and medication costs, transport, distance, provider availability and lack of continuity can limit care.	Delayed diagnosis, treatment interruption and poorer disease control.

Table 2. Equity-oriented strategies for prevention and management

Intervention level	Strategies described in the review	Equity rationale
Primary healthcare	Integrated screening, risk assessment, counselling, treatment, follow-up, essential medicines, monitoring and referral systems.	Improves access, continuity and reduces fragmentation of chronic disease care.
Community-based prevention	Community screening, culturally responsive education, peer support, physical activity promotion and referral to primary care.	Extends prevention and care to underserved and hard-to-reach populations.
Food-environment policies	Nutrition labelling, sodium reduction, healthier food standards, healthier food availability and targeted subsidies.	Makes healthier choices more accessible and feasible at population level.
Financial protection and social policy	Lower out-of-pocket costs; social protection; food-security, decent-work, housing and transport policies.	Addresses upstream socioeconomic barriers that affect prevention and treatment continuity.
Digital and telehealth approaches	Telehealth, electronic reminders, mobile applications and remote monitoring combined with community, face-to-face or telephone services.	Can strengthen continuity of care while reducing exclusion through hybrid delivery.
Cross-sector policy and research	Coordination across health, education, agriculture, labour, transport and housing; equity-sensitive outcomes and locally adapted implementation research.	Targets determinants outside the health sector and helps identify feasible equity-oriented models.

DISCUSSION

The data suggest that the socioeconomic environment has an interrelated association with diabetes and hypertension. Material deprivation, education, neighborhood conditions, psychosocial stress, and health-system barriers, all impact health, in addition to access to food and healthcare. These mechanisms may build over the life course, resulting in differential risks and outcomes.

The best answer is therefore multi-layered. Clinical care is still vital, but needs to be complemented by population level prevention and social policy. For instance, an antihypertensive will have to be prescribed for a person who has hypertension, but treatment will be less effective if they can't afford the medication, or if they don't have regular follow-up. Likewise, one cannot maintain dietary counseling without having access to healthy foods that are always more expensive or less available in the community.

Equity oriented prevention should involve universal prevention measures, plus extra targeted interventions for disadvantaged groups. This way, there's no need to choose between 'population based' policy and 'targeted services'. Overall distribution of the risk can be shifted by using universal measures and the steepest gaps can be reduced using targeted resources.

Culture should be given credit as well. Prevention and adherence can be influenced by dietary habits, family dynamics, beliefs about disease and beliefs about medicines. Building trust can be enhanced by culturally respectful communication and engagement of community leaders. Traditional health practices and other traditional medicine approaches could be part of culturally relevant health education, but are to be used with responsibility and cannot replace diagnostic and treatment procedures recommended by evidence-based medicine for diabetes and hypertension.

CONCLUSION

Diabetes and hypertension is not purely a biological condition. Social economic factors affect exposure to risk factors, ability to adopt healthy lifestyle, access to diagnosis and treatment and ability to sustain long-term disease control. Persistent and preventable disparities occur when poverty, lower educational opportunity, unstable employment, unhealthy food environments, unsafe neighborhoods, chronic stress and lack of access to health care services all work together.

The solutions to these inequalities will involve a multi-sector approach: primary health care, low-cost essential medicines, community-based screening and education, healthier foods and physical environments, social protection, and cross-sector public policies. To monitor inequalities and allocate resources in line with need, health systems should measure inequalities. Clinically, therefore, and more generally, in public-health and social-policy terms, the prevention and management of diabetes and hypertension must be equitable.

REFERENCES

1. International Diabetes Federation. (2025). IDF Diabetes Atlas (11th ed.). Brussels: International Diabetes Federation.
2. Hill-Briggs, F., Adler, N. E., Berkowitz, S. A., Chin, M. H., Gary-Webb, T. L., Navas-Acien, A., Thornton, P. L., & Haire-Joshu, D. (2021). Social determinants of health and diabetes: A scientific review. *Diabetes Care*, 44(1), 258–279.
3. Solar, O., & Irwin, A. (2010). A conceptual framework for action on the social determinants of health. World Health Organization, Geneva.
4. World Health Organization. (2021). Guideline for the pharmacological treatment of hypertension in adults. WHO, Geneva.
5. World Health Organization. (2023). Global report on hypertension: The race against a silent killer. WHO, Geneva.
6. World Health Organization. (2023). Diabetes. WHO Fact Sheet. Geneva: World Health Organization.
7. World Health Organization. (2024). Noncommunicable diseases. WHO Fact Sheet. Geneva: World Health Organization.
8. American Diabetes Association Professional Practice Committee. (2024). Standards of care in diabetes—2024. *Diabetes Care*, 47(Suppl. 1).
9. Mills, K. T., Stefanescu, A., & He, J. (2020). The global epidemiology of hypertension. *Nature Reviews Nephrology*, 16, 223–237.
10. Zhou, B., Perel, P., Mensah, G. A., & Ezzati, M. (2021). Global epidemiology, health burden and effective interventions for elevated blood pressure and hypertension. *Nature Reviews Cardiology*, 18, 785–802.
11. GBD 2021 Diabetes Collaborators. (2023). Global, regional, and national burden of diabetes from 1990 to 2021. *The Lancet*, 402.
12. GBD 2021 Hypertension Collaborators. (2024). Global burden of elevated blood pressure and hypertension. *The Lancet*.
13. United Nations. (2015). Transforming our world: The 2030 Agenda for Sustainable Development. United Nations, New York.
14. World Health Organization. (2019). HEARTS: Technical package for cardiovascular disease management in primary health care. WHO, Geneva.
15. World Health Organization. (2022). Package of essential noncommunicable disease interventions for primary health care (PEN). WHO, Geneva.