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Impact of social determinants of health on medication access and adherence

Cyril Blavo [1]*, Rachel Amsellem [1], London Danchulis [1], Dakota Taylor [1], Mayur S Parmar [1]

[1] Dr. Kiran C. Patel College of Osteopathic Medicine, Nova Southeastern University, Davie, FL, USA
***Corresponding Author:** cblavo@nova.edu

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ABSTRACT

Effective management of chronic medical conditions relies heavily on medication access and adherence, both of which are significantly impacted by the social determinants of health (SDOH). This narrative review examines how the five pillars of SDOH impact medication access and adherence among individuals with chronic conditions such as hypertension, diabetes, and HIV/AIDS, primarily in the USA. Financial barriers, including high out-of-pocket costs and restrictive insurance policies, directly impact treatment continuity, exacerbate health disparities, and contribute to the health care burden. Social support networks, confidence in providers, and community-level engagement play pivotal roles in promoting adherence, while geographic and infrastructure limitations, such as pharmacy deserts and hospital closures, further restrict access. This narrative review also explores how systemic reforms, including cost transparency, multidisciplinary care models, and technology-driven solutions such as telemedicine and health applications, can improve patient engagement and autonomy. Addressing SDOH through targeted policy, education, and infrastructure initiatives is essential for equitable health outcomes. By identifying barriers to medication access within a public health context, this review highlights actionable strategies to reduce disparities and strengthen chronic disease management across communities, particularly in underserved populations.

Keywords: social determinants, medication access, medication adherence, chronic disease, health disparities, healthcare barriers

INTRODUCTION

Medication access and adherence are important factors that may determine good health outcomes. They are influenced under various circumstances by social determinants of health (SDOH). The World Health Organization (WHO) described SDOH as “the conditions in which people are born, grow, live, work, and age” [1]. The Centers for Disease Control and Prevention (CDC) organizes these components into five key domains: economic stability, education access and quality, healthcare and quality, social and community context, and neighborhood and built environment [2]. Each of these components has been identified by the CDC as non-medical factors that impact the health of individuals. Lower socio-economic status (SES), for example, can limit a patient’s ability to purchase the necessary medications or maintain the supply of such medicines, particularly in the care of chronic diseases such as hypertension, diabetes and HIV [3]. A lack of health literacy, particularly affected by lower educational attainment, may also adversely impact on the ability of a patient to understand the instructions for taking particular medications or to appreciate the relevance of medication compliance [4]. Lack of access to adequate medical insurance adversely impacts health, especially as it relates to effective and affordable medications [5]. Socio-demographic factors, such as educational level, employment status, living arrangement, and status in the community can impact the quality of healthcare received and the outcomes of health attained [6]. The neighborhood within which one lives and its amenities, such as distant access to pharmacies or healthcare services, have also been shown to impact health, and this includes medication access [6]. Medication access and adherence, which is considered an outcome influenced by SDOH rather than a determinant itself, remain a central challenge of chronic disease management.

METHODS

A narrative literature review approach was used to identify relevant studies on SDOH and their impact on medication access and adherence in chronic disease management. Literature searches were conducted across PubMed, Scopus, and Web of Science databases, primarily covering the period from January 2010 to August 2025. Search terms included combinations of general and domain-specific keywords such as “social determinants of health,” “medication access,” “medication adherence,” “chronic disease,” and domain-specific keywords (e.g., “economic stability” and “pharmacy desert”). Peer-reviewed studies were included that examined SDOH in relation to medication access or adherence in chronic

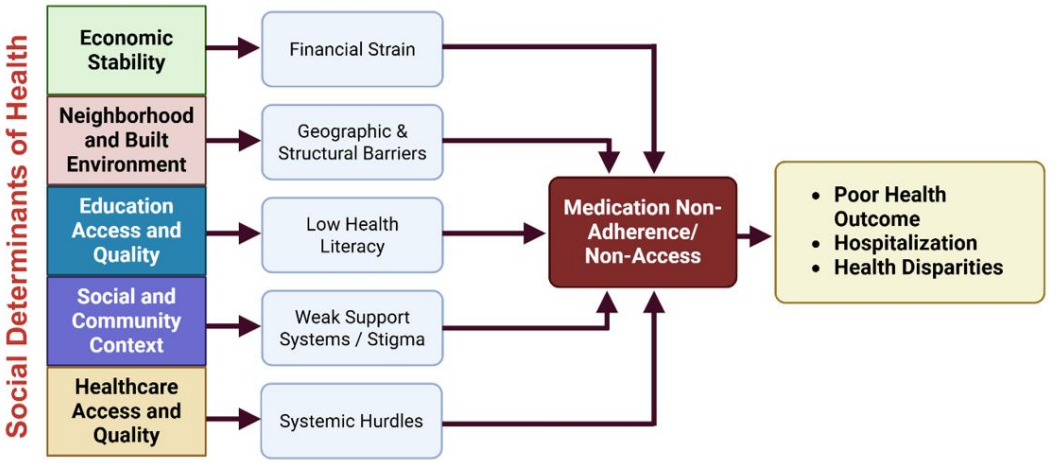

Figure 1. A conceptual model of SDOH pathways to medication non-adherence and poor health outcomes (https://BioRender.com/o5q240m)

conditions (e.g., hypertension, diabetes, and HIV/AIDS). To provide essential context, foundational reports from government health organizations (e.g., CDC and WHO) and key clinical practice guidelines were also included.

Exclusion criteria included non-English articles or articles not focused on chronic disease populations. To enhance comprehensiveness, reference lists of included studies were hand-searched for additional relevant sources. Findings were thematically synthesized according to the five CDC-defined SDOH domains: economic stability, education access and quality, healthcare access and quality, social and community context, and neighborhood and built environment. Each study was critically appraised based on design type, sample size, and reported limitations, with attention to generalizability and potential bias

SOCIAL DETERMINANTS OF HEALTH: RELATIONSHIP TO MEDICATION ACCESS AND ADHERENCE

Figure 1 shows a schematic flow diagram illustrating how the five CDC-defined SDOH generate domain-specific barriers that converge to drive barriers to medication access and non-adherence, ultimately contributing to health disparities.

Economic Stability

SES is a major determinant of health outcomes, particularly as it relates to access to essential medications. Individuals at lower income levels encounter obstacles that affect both the ability to purchase prescriptions and adherence to treatment over time [7]. The study in [7] showed that cost-related nonadherence is widespread among the US adults with multiple chronic conditions. According to a review in [8], these SES challenges for low-income families include complications with health insurance, a lack of education, and a distrust of healthcare providers. Financial strain can lead patients to ration or delay administration of medications, often skipping doses or extending prescriptions to reduce costs [7]. Even when prescriptions are available, these financial pressures can weaken the stability of a patient's care routine and create ongoing uncertainty in managing chronic conditions. Housing and employment may further disrupt continuity of care, as frequent relocation or job loss can interfere with prescription refills and follow up appointments [9-11]. Structural barriers within insurance systems, including coverage gaps and administrative complexity, can further limit affordability and consistent access to essential medications [12, 13]. Together, these patterns reveal how financial pressure, unstable living circumstances, and systemic insurance barriers converge to interrupt treatment continuity and jeopardize long-term disease management.

For patients under active management for chronic diseases such as diabetes, hypertension, and HIV, continuous pharmacologic treatment is critical to long-term health, improved quality of life, and reduced morbidity. Cost-related barriers reduce insulin adherence in diabetes, compromising glycemic control and care continuity. In a national cross-sectional analysis of medicare part D beneficiaries, higher out of pocket insulin spending was independently associated with lower adherence after adjustment for demographic, clinical, and plan level factors [14]. Similarly, in hypertension, a large meta-analysis found that poor medication adherence is dose-dependently associated with a greater risk of stroke, with a 20% increase in adherence lowering stroke risk by 9% [15]. The challenge is not limited to cardiometabolic disease, as in HIV, interruptions in therapy due to cost barriers have been linked to viral rebound and increased transmission with adherence barriers identified at the patient and system level [16].

The burden of financial strain becomes most visible in households where prescription costs compete with basic needs such as shelter and housing. Some patients even report spending less on food or transportation to buy medicines, directly linking financial tradeoffs to treatment interruptions [17]. Data from the national health interview survey show that patients frequently report delaying refills, skipping doses, or splitting pills to extend prescriptions and these behaviors remained prevalent among adults with multiple chronic conditions from 2019 to 2023, though they decreased significantly in 2021-2022 before trending upward again in 2023 [7]. This longitudinal trend analysis, though self-reported, captures real-world behavior shifts. These behaviors result in increased emergency department visits, hospitalizations, and reduced continuity of care [7, 17]. Cost-related nonadherence remains widespread, with particularly high prevalence among adults managing multiple chronic conditions such as diabetes and cardiovascular disease [7]. Even when insurance coverage

exists, high out-of-pocket costs (e.g., for insulin) leave patients unable to afford essential drugs included in their plans, demonstrating that underinsurance can be as detrimental as lack of coverage [7].

Lifestyle disruptions such as changes in housing and employment can also interrupt access to medications [9-11]. Individuals who must relocate due to job changes often face lapses in care, delays in scheduling appointments, or challenges in transferring medical records and prescriptions. These interruptions are particularly problematic for those who rely on regular or specific medication to manage chronic conditions. These barriers are compounded in rural and underserved regions. A systematic review in [18] identified significant availability barriers, including a shortage of clinics and providers, and accessibility barriers, such as long travel distances and high costs, which make obtaining medication treatment for conditions like opioid use disorder particularly challenging.

Although there are assistance programs designed to lower the cost of prescriptions, many who qualify never enroll [19]. Awareness is a major barrier. This may be due to inadequate information from healthcare providers, lack of access to patient navigators or advocates, or deficiencies in health literacy [19]. Fewer than fifteen percent of income-eligible adults are aware of relevant drug assistance programs, and even fewer successfully enroll [19]. Other barriers include complex application processes, limited internet access for online forms, and short visits that leave little time for counseling [19]. Financial strain also reverberates through families, as parents often reduce adherence to their own long-term therapies when a child begins a high-cost medication, demonstrating how pediatric drug expenses can disrupt overall household treatment continuity [20].

Beyond affordability, the terms associated with insurance coverage often pose additional obstacles [7]. Even when a patient has insurance, it may not cover the medications they need without additional steps or delays. These policies can create significant barriers. For instance, a study in an HIV clinic found that prior authorization requirements alone created significant uncompensated costs and burdens for providers [21]. These policies often delay treatment or cause patients to give up altogether. For patients living with HIV, restrictions on access to newer once-daily regimens can result in lower adherence and poorer viral suppression outcomes consistent with barriers prioritized by patients and clinicians [16]. In hypertension, delays in approval for specific antihypertensive therapies can worsen blood pressure control [22]. Furthermore, in pediatric cases, coverage barriers, such as insurance policies that prevent 90-day fills, have been shown to reduce adherence and contribute to poorer hypertension control [23]. These barriers are particularly concerning in HIV, where formulary restrictions and step therapy requirements have been identified as major drivers of nonadherence [16].

Broader policy decisions at both the state and national levels influence medication access. Medicaid expansion has been associated with a significant increase in antihyperglycemic prescription fills among adults with diabetes, while those residing in non-expansion states remain markedly less likely to obtain glucose-lowering therapies even after adjustment for demographic and clinical characteristics [24]. These state-level disparities reflect a broader national trend, where structural insurance limitations and social inequities continue to hinder consistent access to chronic disease treatment. Restrictive insurance coverage and adverse SDOH have also been linked to lower adherence to antihypertensive medications among medicaid beneficiaries, underscoring how policy-level and systemic factors jointly shape access to chronic disease treatments and contribute to widening health disparities [12].

Low SES contributes to overlapping and interdependent barriers that limit access to necessary medications. Financial constraints, unstable living situations, low uptake of support programs, restrictive insurance structures, and policy-level factors all intersect to create an environment in which access to essential treatment is far from equitable. Addressing these challenges would require action across clinical, institutional, and policy domains. A comprehensive strategy that prioritizes health equity must incorporate policy reform, increased institutional support for patients, and improved system design that enables consistent access to medications regardless of financial status.

Social and Community Context

Social and community context, one of the core domains of the SDOH, plays a crucial role in shaping how individuals with chronic diseases engage with the healthcare system. These contexts include social support networks and the attitudes of individuals and communities toward healthcare systems and providers. Social support networks stand out as a powerful influence on health behaviors and access to care, particularly for individuals managing chronic conditions. Evidence from the reasons for geographic and racial differences in stroke cohort, a large national study involving over 17,000 adults with hypertension, diabetes, or dyslipidemia, demonstrated that individuals who engaged regularly with family or close friends were more likely to experience favorable medication-related outcomes through functional help such as rides and reminders and structural support [25]. While this large, robust prospective cohort minimizes recall bias via objective refill data, its findings are limited by potential unmeasured confounding and may not be generalizable to all populations [25].

In a longitudinal cohort of HIV-positive women in the rural Southeastern USA, higher levels of social support and positive coping strategies were associated with sustained improvements in medication adherence and healthcare utilization over time highlighting the value of consistent interpersonal connection in settings with limited resources [26]. These findings illustrate how frequent social interaction, such as shared transportation, pharmacy reminders, or informal care coordination, can counteract the effects of weak social networks and limited provider availability, particularly in underserved regions.

Family-level dynamics and shared illness experiences play a meaningful role in shaping medication access. A retrospective cohort in [27] involving 254,000 patients with chronic cardiometabolic conditions (including diabetes, hypertension, and dyslipidemia) found that having family members with similar conditions was associated with better adherence through shared routines such as pharmacy trips and refill reminders. Despite administrative data limitations and potential selection bias, the large scale supports generalizability [27]. Structural and social support systems extend beyond emotional encouragement. They enable practical assistance such as managing refills, and navigating insurance, which improves access to needed medications [27]. This support is especially critical for individuals living with

chronic illness, where consistent medication is central to disease control and quality of life.

Greater trust in primary care physicians is associated with better medication knowledge among adults with type 2 diabetes, including clearer understanding of purpose, dose, and timing [28]. There was a significant positive association between physician trust and patients' understanding of their medications, which has downstream implications for adherence and clinical outcomes [28]. Patients who reported stronger trust in their physicians demonstrated better understanding of medication purpose, dosage, and timing, ultimately supporting improved health outcomes [28]. Attitudes of healthcare providers add another dimension to inequity in access. Patients seeking pain management for conditions like acute traumatic injuries, postpartum complications, or chronic pain from postherpetic neuralgia, often report being labeled as drug-seeking. This perception reflects stigmatization and assumptions that undermine patient trust and prevent the delivery of appropriate treatment [29, 30]. Such labeling results in the under-treatment of genuine medical needs and discourages patients from engaging with the healthcare system [31]. These unfortunate provider attitudes not only reinforce the barriers created by geography and healthcare systems, but also contribute to worsening outcomes of chronic diseases, delayed treatment and erosion of trust in care.

Data from the diabetes study of Northern California, a cohort study including over 9,000 patients with type 2 diabetes, demonstrated that poorer ratings of provider communication, particularly regarding listening, explanations, and shared decision-making, were significantly associated with lower medication refill adherence [32]. Even in settings where physical access to medications was relatively stable, perceptions of inadequate communication and weak provider relationships functioned as independent barriers to consistent medication use [32].

In summary, social and community context, including support networks, positive attitudes towards the healthcare system and its providers, and accessibility to healthcare infrastructure, strongly influence medication access and adherence.

Neighborhood and Built Environment

Individualized neighborhoods and environments vary widely, producing meaningful differences in exposure to health risks, access to resources, and consistency of medical care. These variations are shaped less by personal choice and more by structural and geographic factors that influence how chronic conditions such as diabetes, hypertension, and HIV are managed. The impact of these disparities becomes particularly clear when considering the uneven distribution of healthcare providers. Across many communities in the USA, shortages of both primary care and specialty providers limit opportunities for routine monitoring and continuity of care as documented in federal workforce reports [33]. These shortages extend beyond logistic concerns and reflect systemic inequities that carry direct consequences for patient outcomes. Limited provider density has been associated with a greater risk of uncontrolled blood pressure, poorer glycemic control, and interruptions in HIV treatment, underscoring how uneven workforce distribution directly contributes to observable differences in health outcomes [34-36]. This persistent pattern highlights how the built environment imposes barriers that cannot be fully overcome through individual efforts alone.

While interpersonal and household-level support systems help mitigate barriers to care, factors such as geographic location can significantly influence whether individuals can obtain necessary medications. The concept of pharmacy deserts - communities with limited access to pharmacies - has gained national attention [37]. Approximately 15.8 million people in the USA live in pharmacy deserts, with disproportionately high rates in predominantly Black, Latino, and American Indian or Alaskan native communities [37]. Access is severely limited, as 95% of pharmacy desert tracts have no pharmacies, making it extremely difficult for residents to fill prescriptions for chronic conditions such as hypertension, diabetes, and asthma [37]. Furthermore, the closure of pharmacies has exacerbated these challenges, with a recent analysis showing a net loss of pharmacies between 2018 and 2021. This trend disproportionately impacts independent pharmacies and those in predominantly Black and Latinx communities, which are at the highest risk for closure [38]. Rural areas have been particularly affected, not only by pharmacy closures but also by limited healthcare infrastructure. The lack of nearby hospitals, healthcare centers and pharmacies forces residents to travel long distances. Physical access to these essential services continues to shape medication access across the USA. A 2024 cohort study focused on the Delta Region (Tennessee, Mississippi, Arkansas, Kentucky, and Missouri) examined prescription adherence versus non-adherence rates among patients in medically underserved areas (MUAs). This study found that patients living in MUAs were significantly more likely to abandon new prescriptions compared to those in non-MUAs, revealing a key disparity in primary medication adherence. While this regional focus limits national generalizability, it highlights disparities in high-burden rural areas [39]. Even in neighborhoods where pharmacies remain open, barriers to affordability and availability consistently undermine access. Cost-sharing requirements, restrictive formularies, and limited stock can delay timely medication use despite physical proximity. Thus, physical proximity alone is insufficient to guarantee equitable access without addressing affordability and supply.

Hospital accessibility follows a similar trajectory, with location determining both the timeliness and quality of care in emergencies. Patients living farther from HIV care centers are less likely to be retained in care and achieve viral suppression, highlighting how geographic distance can delay timely access to essential services for chronic conditions [40]. These delays have significant consequences, since good outcomes often depend on prompt intervention. The situation is made worse by hospital closures through removing an essential point of contact for urgent and intensive care. Hospital closures, particularly in disadvantaged areas, have been linked with poorer outcomes in chronic disease management and prolonged emergency response times including longer emergency medical service transport after rural closures [41].

Transportation consistently emerges as another cross-cutting determinant of healthcare access, linking the neighborhood environment to daily patient decisions. Limited public transit systems, unsafe walking environments, or unaffordable private transportation make it difficult for patients to reach clinics, pharmacies, or hospitals [42]. The financial burden of transportation adds another layer to these challenges, particularly for those requiring frequent visits.

Transportation costs compete with other basic needs, and patients with diabetes who need regular monitoring, those with hypertension who require frequent follow-up, and individuals with HIV who must adhere strictly to treatment schedules are especially vulnerable with higher missed care reported among frequent users during the 2019 pandemic [43].

The built environment and neighborhood planning have consequences on healthcare outcomes, and certainly on medication access. Whether through provider shortages, pharmacy closures, hospital inaccessibility, or unreliable transportation, neighborhood conditions can undermine disease management [44]. Access to healthcare services is determined just as much by place as by personal health behaviors.

Health Care and Quality

Quality and delivery of healthcare are directly associated with medication access and inherently may improve adherence in patients with chronic disease [45]. Despite investments into developing and expanding healthcare in the USA, quality and delivery of care continue to be a concern. Poorly controlled chronic diseases can lead to exacerbated health problems, poorer quality of life, and increased medical expenses [46]. Over time, it may contribute to a heavier strain on the healthcare system, drive up treatment costs, and reduce access to essential services.

Quality of healthcare services is a predictor of a patient's future engagement in healthcare and depends significantly on whether the care is patient-centered, safe, equitable, affordable or efficient [45]. Cost transparency is an issue for many patients facing chronic illness. Even with access to health insurance, financial constraints continue to pose significant obstacles to the availability and distribution of medications. Efforts to improve transparency in healthcare face major hurdles, largely due to restrictive insurance frameworks and complex state and federal policy regulations [47]. Providers and insurers are often faced with the task of navigating vague parameters regarding price reporting and disclosure that ultimately impact cost to the patient. Restrictions imposed on insurers and providers, such as prior authorization requirements, off-label approval, and formulary limitations, may substantially hinder patients' access to and affordability of medications by limiting their ability to recommend or provide alternative treatments, services, or pharmaceutical options [48-50]. The Health Insurance Portability and Accountability Act (HIPAA) safeguards patient privacy by imposing strict regulations on the use and disclosure of medical information. These protections, while advantageous, can complicate efforts to share health data efficiently, particularly in initiatives aimed at promoting transparency or improving system-wide access. While not identified as a direct driver of increased patient cost, this inefficiency can lead to duplicated services, delayed care, and increased administrative costs– ultimately driving up the cost of care for patients.

Chronic diseases such as hypertension, diabetes, and HIV are typically needed but often lack long-term management through a multidisciplinary team (MDT) approach [51]. Evidence from a systematic review has shown that MDTs enhance patient outcomes, including reduced in-hospital mortality and better symptom control [52]. Clinicians, researchers, and health system leaders are tasked with designing, sustaining, and enhancing care delivery models capable of delivering complex care to patients facing chronic illness. Proper development and implementation of such strategies can drastically improve patient care, quality, and medical management [45]. In the clinical setting, successful integration of services among a multidisciplinary care team, particularly those that include pharmacists and medication management teams, has been associated with significant reductions in hemoglobin A1c levels among patients with diabetes [53-55]. Furthermore, the American Diabetes Association and the American Heart Association advocate for individualized plans, routine screening, and active engagement with social and community resources as critical components of managing chronic diseases [56, 57]. Effective medical management and compliance, including the appropriate and affordable use of medications, can enhance a patient's quality of life, reduce health care expenditures, and prevent the onset or progression of chronic disease [45, 46].

Discrepancies in health information system interfaces and the barriers in access to patient information can significantly delay or reduce the distribution of necessary medications [58, 59]. In coordinating long-term management and care in patients with diabetes, the Veterans Health Administration maintains a national electronic medical records system with decision support tools, such as clinical reminders and population management dashboards, to help providers order routine screening tests and prescribe medications based on clinical guidelines [45]. This integrated health system has been shown to promote more frequent primary care visits and higher quality of care among patients receiving primary care in the Veteran Administration (VA) primary care centers when compared to non-VA primary care centers [60, 61]. Strategies integrating patient registries and electronic health records to deliver targeted patient outreach, clinical decision support, and individualized feedback for patients with diabetes at elevated risk for complications have been shown to enhance clinical outcomes and reduce health disparities [62].

As artificial intelligence and other technology-driven resources continue to advance, it is increasingly important to develop tools that are both user-friendly and operationally effective across clinical and patient care environments. A study examining factors influencing patients' interest in support for uncontrolled diabetes found that individuals were more likely to engage with self-directed assistance through accessible, home-based websites than through traditional in-person follow-up visits [63]. Suggesting that, improved technology interfaces in combination with medication cost transparency and affordability could potentially increase patient autonomy, engagement, and medical compliance.

While many health care systems incorporate components that advocate access, equity, and quality, considerable opportunities remain to advance these efforts in ways that can benefit patients and the broader health care infrastructure. Policy reform that promotes medication cost transparency and improved accessibility has the potential to enhance patient engagement, promote autonomy, support shared decision-making among providers, and contribute to overall patient well-being [47]. At a systems level, routine collection, storage, and retrieval of patient information has the potential to strengthen individualized care planning, population health strategies, and medication access [64].

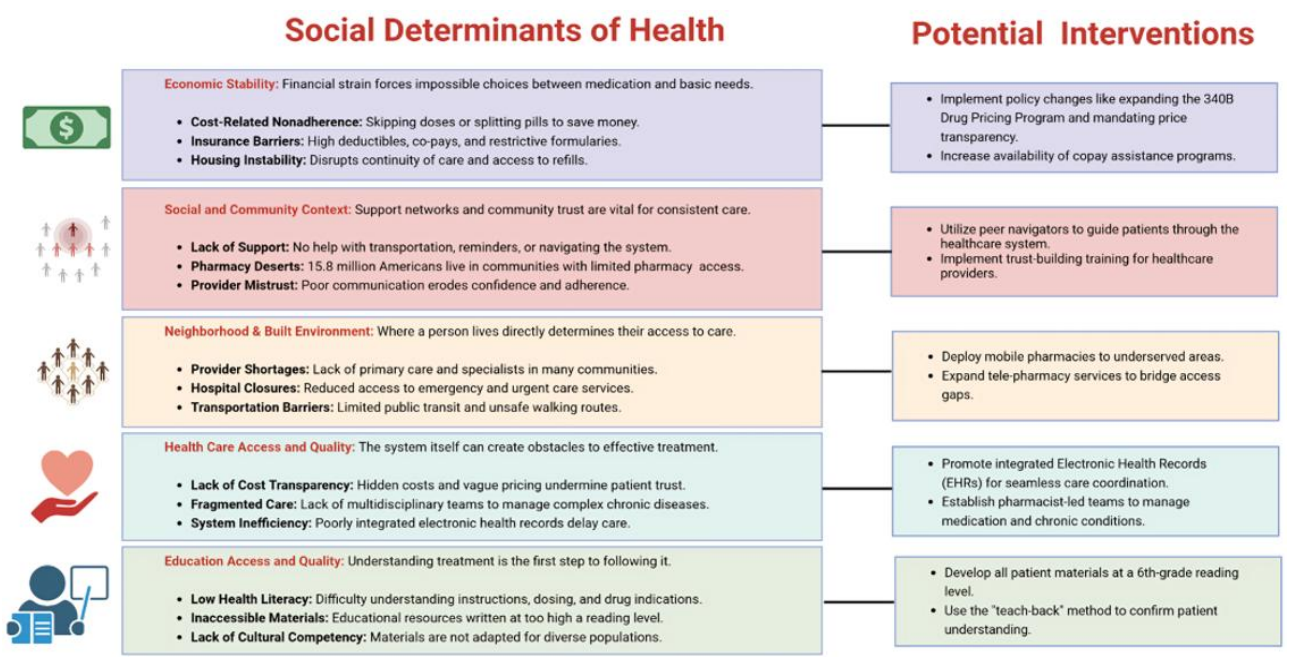

Figure 2. SDOH: Barriers and interventions for medication access and adherence (https://BioRender.com/ubhjb3o)

Education Access and Quality

Educational access and quality significantly influence health outcomes, particularly in individuals managing chronic diseases. Low health literacy is associated with poorer medication self-management and adherence, including difficulties in understanding drug indications, instructions, and dosing, leading to increased risk of medication errors and non-adherence [65]. A cross-sectional observational study in [66] involving patients with uncontrolled hypertension found that those with low health literacy were less likely to review and verify their medications, understand dosing instructions, and demonstrate adherence, highlighting the critical role of education in chronic disease management.

Challenges persist in ensuring that patient educational resources are accessible and of high quality for all patients. A cross-sectional study in [67] assessed online educational resources for heart failure and found that most patient education materials were written at a high school or college reading level, exceeding the recommended sixth-grade level for the average patient's comprehension. These resources often lacked multilingual support and accessibility features, limiting their usefulness for diverse patient populations [67]. The study also found that higher functional and communicative health literacy were associated with fewer difficulties adhering to medication regimens. These findings emphasize the necessity for effective health education resources that are linguistically and culturally appropriate and accessible to individuals with varying levels of literacy and abilities.

In a study of correct inhaler technique and daily adherence among asthma patients [68], it was identified that low health literacy was strongly linked to improper inhaler use, poor disease control, and heightened reliance on emergency services. Conversely, patients with higher numeracy skills experienced fewer hospitalizations. Educational interventions such as simplified action plans and structured "concordance" interviews were shown to improve medication adherence and reduce healthcare utilization [68]. Similarly, a study on stable angina in [69] found that patients residing in low health literacy communities were approximately 3.5 percentage points less likely to undergo coronary artery bypass grafting and 3.3 percentage points less likely to adhere to anti-anginal medications compared to those from higher literacy areas. The results suggest that community level literacy environments can quietly affect both the pursuit of advanced medical interventions and everyday health behaviors.

The study in [70] conducted a comprehensive review of medication nonadherence in patients with chronic kidney disease (CKD). In this study, older adults often struggled with medication adherence due to regimen complexity, cognitive decline, low health literacy, and systemic barriers. The study emphasized that of their participants, nearly a quarter of CKD patients had limited health literacy, which impaired their ability to understand asymptomatic therapies and manage polypharmacy effectively [70]. This collectively contributes to poor blood pressure control, more hospitalization, and higher mortality.

These studies illustrate how educational access and quality serve as key drivers in managing chronic health conditions. While higher educational attainment is broadly linked to lower disease burden and mortality, it is the quality of education, also referenced as health literacy, that most directly determines adherence, treatment engagement, and safe self-management.

Figure 2 shows a visual framework identifying key barriers to medication access and adherence within each SDOH domain, paired with corresponding evidence-based interventions to overcome these obstacles.

FUTURE DIRECTIONS

Improving medication access requires addressing the barriers patients face and recognizing the powerful role SDOH play in shaping health outcomes. SES directly influences an individual's ability to obtain and adhere to necessary medical treatments and medication regimens [11]. While policy reforms and accessible insurance may not directly increase a patient's

income, they can alleviate financial burdens by lowering health care-related costs. Initiatives to improve medication access must be multi-faceted. Success depends on systemic support, such as affordable and transparent health insurance [11, 47, 71] and policies sensitive to vulnerable populations [12]. It also requires high-quality clinical infrastructure, including accessible, multidisciplinary healthcare services [37, 38, 53-55] and awareness of medication assistance programs [19]. Finally, these efforts must be bolstered by a supportive social community [25]. Creating databases that allow price and quality transparency for medications and care could also enhance patient autonomy and support shared decision-making among patients and providers [71, 72].

The most impactful strategies in improving medication adherence depend on access to good education and health literacy programs, comprehensible and accessible health education resources, cultural sensitivity and compassionate communication of healthcare providers, and manageable continuity of care [73]. By highlighting the importance of medical treatment adherence, a patient can be empowered to play an active role in their health and gain confidence in navigating the healthcare system. Patient education and collaboration with providers directly address individual-level social determinants while potentially impacting broader aspects of community-level variables [45]. In addition, simplification of treatment regimens has the potential to mitigate financial burdens by reducing unnecessary costs and services, while enhancing patient confidence and potentially facilitating adherence.

Utilizing technological innovations such as health applications or electronic monitoring systems can improve patient engagement and indirectly, medication adherence [74]. When implemented correctly, affordable technology, such as medication reminders, medication tracking, and educational content can improve patient education and compliance. Additionally, digital health tools such as telemedicine offer scalable solutions by closing access gaps and extending care to patients in both urban and rural environments [75]. Collectively, responsible social media, innovative health applications, and adaptable telemedicine can reduce disparities, improve chronic disease management, and contribute to more equitable healthcare systems. Future research should evaluate AI/telemedicine equity in rural SDOH contexts and test bundled interventions.

CONCLUSION

The strategies outlined in this narrative review highlight opportunities to improve medication access, but their effectiveness will depend on addressing the broader influence of SDOH. Viewing medication access through a public health framework helps uncover actionable solutions at every tier of the SDOH, offering potential pathways for bridging gaps between patients, communities, and healthcare systems. To achieve sustainable change, strategies must target both individual actions and broader systemic frameworks. Medication access and adherence extend beyond clinical care and is shaped by economic stability, healthcare quality, education, social support, and neighborhood environments. Across conditions such as hypertension, diabetes, and HIV, these factors influence whether patients can reliably obtain and use essential therapies. Primary interventions should be aimed at patient education and provider collaboration in order to empower individuals to actively manage their health, while deepening their understanding and confidence in adhering to prescribed treatments. Policy and program initiatives that reduce financial burdens, such as affordable medication access and transparent pricing, help dismantle socioeconomic obstacles that often hinder care. Finally, technological innovations like health applications and telemedicine offer scalable, personalized solutions that enhance engagement and extend care to underserved populations. Together, these interventions form a cohesive, applicable strategy to promote equity, strengthen chronic disease management, and build a more responsive healthcare system.

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