World Journal of Advanced Research and Reviews
eISSN: 2581-9615 CODEN (USA): WJARAI
Cross Ref DOI: 10.30574/wjarr
Journal homepage: https://wjarr.com/

(REVIEW ARTICLE)

Check for updates

Cumulative impact of substance use disorders, mental illness, and marginalization on health system utilization patterns

Deborah Chinenye Uzor *

Department of Public Health, University of Illinois Springfield, USA.

World Journal of Advanced Research and Reviews, 2025, 25(03), 1923-1941

Publication history: Received on 14 February 2025; revised on 23 March 2025; accepted on 26 March 2025

Article DOI: https://doi.org/10.30574/wjarr.2025.25.3.0962

Abstract

The increasing complexity of healthcare demands is shaped not only by medical conditions but also by the cumulative effects of behavioral health challenges and social marginalization. Individuals facing substance use disorders (SUD), mental illness, and socioeconomic marginalization often experience disproportionately high rates of health system utilization. These intersecting vulnerabilities result in a syndemic—a convergence of multiple health and social issues that exacerbate individual outcomes and stress healthcare systems. From emergency department visits to repeated hospital admissions, this population tends to access acute care services more frequently than the general population, often due to unmet needs in primary care, community-based mental health support, and housing stability. Marginalization—through homelessness, racial discrimination, poverty, or criminal justice involvement—further restricts access to preventative and consistent healthcare, reinforcing a cycle of crisis-based utilization. When combined with SUD and mental illness, these factors produce a synergistic burden, leading to fragmented care, higher costs, and poorer outcomes. Despite these systemic challenges, many healthcare models remain ill-equipped to address the layered and overlapping needs of these populations. This review examines the cumulative impact of SUD, mental illness, and marginalization on health system utilization patterns, integrating theoretical frameworks such as syndemic theory and intersectionality. It explores utilization trends, identifies structural barriers, and highlights integrated care solutions and policy responses aimed at improving health equity and reducing systemic strain. Ultimately, the article argues for a paradigm shift toward trauma-informed, inclusive, and coordinated care systems that address the full spectrum of biopsychosocial vulnerabilities in marginalized populations.

Keywords: Substance Use Disorders; Mental Illness; Marginalization; Health System Utilization; Syndemic Theory; Integrated Care

1. Introduction

1.1. Overview of Healthcare Utilization Trends and Disparities

Healthcare systems across the globe are experiencing mounting pressure from increasing patient demand, aging populations, and the rising burden of chronic and behavioral health conditions. Among the most pressing concerns is the disproportionate use of acute healthcare services by specific vulnerable populations. Emergency departments and inpatient hospitalizations, in particular, are frequently utilized by individuals experiencing complex health and social challenges. These include not only medical conditions but also underlying behavioral health disorders and socio-structural disadvantages [1].

Patterns of overutilization are strongly linked to fragmented service delivery, socioeconomic instability, and barriers to preventative care access [2]. High-cost, high-need individuals often cycle through multiple service points without

* Corresponding author: Deborah Chinenye Uzor*

receiving coordinated or effective interventions that address their root causes. For example, frequent emergency department visits are not necessarily indicative of misuse but may reflect systemic inadequacies in outpatient or community-based care options [3]. Behavioral health conditions, particularly when untreated, lead to higher rates of hospitalization, prolonged stays, and readmissions, further exacerbating system inefficiencies [4].

Disparities in healthcare utilization are evident across racial, economic, and geographic lines, with marginalized communities facing greater obstacles to equitable access [5]. These disparities are not only clinically significant but carry broader public health implications by reinforcing cycles of disadvantage and burdening already stretched health resources. Thus, understanding healthcare utilization through a lens that includes behavioral health and structural vulnerability is essential for crafting more inclusive and efficient health systems [6].

1.2. Defining Substance Use Disorders (SUD), Mental Illness, and Marginalization

Substance Use Disorders (SUD) are characterized by the recurrent use of alcohol or drugs that lead to clinically significant impairment, including health problems, disability, and failure to meet responsibilities at work, school, or home [7]. Individuals with SUDs often struggle with dependence, withdrawal symptoms, and risky behaviors that contribute to both acute and chronic health issues. Despite the availability of treatment, stigma and systemic barriers often impede access, particularly for marginalized individuals [8].

Mental illness encompasses a wide spectrum of psychological disorders that affect mood, thinking, and behavior. These range from common conditions such as depression and anxiety to more severe disorders like schizophrenia and bipolar disorder. Mental illness can significantly impair daily functioning and, when left untreated, often coexists with other conditions such as SUD, resulting in what is known as dual diagnosis or co-occurring disorders [9].

Marginalization refers to the systemic social disadvantage experienced by specific groups due to factors like poverty, homelessness, racial discrimination, or criminal justice involvement [10]. These structural barriers can inhibit access to healthcare, employment, education, and stable housing. Marginalized populations often experience cumulative disadvantage over time, leading to poorer health outcomes and lower life expectancy [11].

When these three elements—SUD, mental illness, and marginalization—intersect, they create a high-risk profile for frequent, and often preventable, healthcare utilization. These individuals may encounter fragmented systems of care, repeated acute health episodes, and limited engagement with long-term support services [12]. As such, it is imperative to view these issues as interconnected, rather than isolated, in healthcare planning and research [13].

1.3. Importance of Studying Their Cumulative Impact

The study of the cumulative impact of SUD, mental illness, and marginalization on healthcare utilization is essential for several reasons. Firstly, traditional approaches often analyze these conditions in isolation, failing to capture the synergistic effect they exert when combined [14]. This omission results in underdeveloped care models that do not meet the needs of complex populations.

Secondly, these intersections represent a syndemic—a set of linked health problems that interact synergistically under conditions of social inequality—leading to compounded health risks and systemic stress [15]. Understanding how these factors jointly influence healthcare demand enables providers and policymakers to implement more targeted interventions, such as integrated care and harm reduction strategies [16].

Moreover, as healthcare systems move toward value-based models, there is growing pressure to reduce avoidable utilization and improve outcomes for high-cost populations. Addressing the root causes behind frequent utilization requires a comprehensive understanding of the multiple burdens experienced by these groups [17].

1.4. Aim and Scope of the Article

This article explores the cumulative impact of substance use disorders, mental illness, and marginalization on health system utilization patterns. It aims to synthesize current evidence on how these factors intersect to influence care demands, particularly in emergency and inpatient settings. The article draws from public health, psychiatric, and sociological literature to contextualize utilization trends, identify systemic barriers, and evaluate effective response models. It also emphasizes the importance of trauma-informed and equity-focused frameworks to redesign health services that are both inclusive and efficient. Ultimately, it advocates for systemic reforms that address the full scope of psychosocial vulnerability within healthcare planning [18].

2. Conceptual and theoretical framework

2.1. Syndemics Theory and Social Determinants of Health

Syndemics theory offers a powerful lens through which to understand the cumulative impact of co-occurring health and social issues. Originating from medical anthropology, the term "syndemic" refers to the aggregation of two or more diseases or health conditions in a population that interact synergistically, exacerbated by social, environmental, and economic contexts [5]. Unlike traditional models that analyze diseases independently, syndemics theory emphasizes the interplay between pathology and structural conditions such as poverty, racism, and housing instability [6].

In the context of substance use disorders (SUD), mental illness, and marginalization, syndemics theory explains how these factors amplify each other's impact. For example, an individual with a mental health condition who experiences homelessness and substance dependence is more likely to face barriers to care, stigma in clinical settings, and repeated interactions with emergency services [7]. These interrelated factors create feedback loops that worsen health outcomes and increase health system dependency.

The social determinants of health (SDOH) framework complements syndemics theory by identifying the broad socioeconomic factors that shape health status and healthcare engagement. These include education, employment, neighborhood conditions, and social support systems [8]. When negative SDOH are compounded—such as unemployment combined with racial discrimination and unstable housing—the result is a deeply entrenched disadvantage that places individuals at high risk of chronic disease, mental health crises, and substance misuse [9].

Taken together, syndemics theory and SDOH provide a comprehensive understanding of why certain populations are overrepresented in high-cost healthcare environments and underrepresented in preventive care systems [10].

2.2. Intersectionality and Structural Vulnerability

Intersectionality, a concept rooted in critical race and feminist theory, offers additional insight into how overlapping social identities and systemic inequalities shape health experiences [11]. Coined by Kimberlé Crenshaw, the term highlights how individuals are impacted not just by single axes of identity—such as race, gender, or class—but by the intersections of these identities in a broader structure of oppression [12]. This framework is crucial for understanding how marginalized populations interact with healthcare systems.

In populations with SUD and mental illness, intersectionality helps illuminate why certain individuals experience disproportionate health burdens. A Black transgender person with bipolar disorder and a history of incarceration, for instance, will face layers of discrimination that influence both their health-seeking behavior and the responses they receive from providers [13]. These overlapping identities are not merely additive in impact—they multiply and compound, creating unique vulnerabilities that are often overlooked in traditional healthcare models [14].

Structural vulnerability extends intersectionality into practical assessment by identifying how economic, political, and institutional structures place individuals in positions of heightened risk. This includes exposure to violence, food insecurity, lack of legal protections, and systemic bias within healthcare delivery [15]. Individuals labeled as "frequent flyers" in emergency departments often reflect structural failures rather than individual pathology.

Health systems that fail to account for structural vulnerability risk perpetuating harm. For example, the absence of culturally competent services or trauma-informed care can deter engagement and worsen outcomes over time [16]. Integrating intersectionality and structural vulnerability into health planning fosters more responsive and equitable systems, particularly for complex populations facing overlapping disadvantages [17].

2.3. Relevance to Health System Interactions and Outcomes

The interaction between theoretical frameworks and real-world health system utilization is both direct and measurable. Individuals affected by the syndemic triad of SUD, mental illness, and marginalization tend to engage with health systems in crisis mode, using emergency departments as primary access points for care [18]. These patterns are not simply the result of personal choice but reflect systemic barriers to consistent, preventive, and culturally sensitive services.

When health systems overlook the social contexts of illness, they risk implementing interventions that are ill-suited to patient needs. For example, requiring strict appointment adherence or extensive paperwork may seem benign but can be exclusionary for individuals dealing with unstable housing or cognitive impairment from trauma or substance

withdrawal [19]. These individuals are more likely to miss appointments, disengage from services, or be labeled as "non-compliant," contributing to fragmented care cycles and poor outcomes.

Moreover, health systems often lack integration across services, resulting in disconnected care for people with co-occurring disorders. A person receiving mental health support from one agency, addiction treatment from another, and social services from a third may experience redundancy, gaps, or contradictory recommendations [20]. These inefficiencies can drive overutilization of acute care and reduce the overall effectiveness of treatment strategies.

Figure 1 presents a conceptual framework that integrates syndemics theory, intersectionality, and structural vulnerability to explain how SUD, mental illness, and marginalization converge to shape health system utilization. It highlights the interconnected pathways through which social disadvantage and behavioral health challenges produce recurrent and preventable engagement with high-cost care [21]. Recognizing these patterns is essential for designing targeted and equitable health interventions.

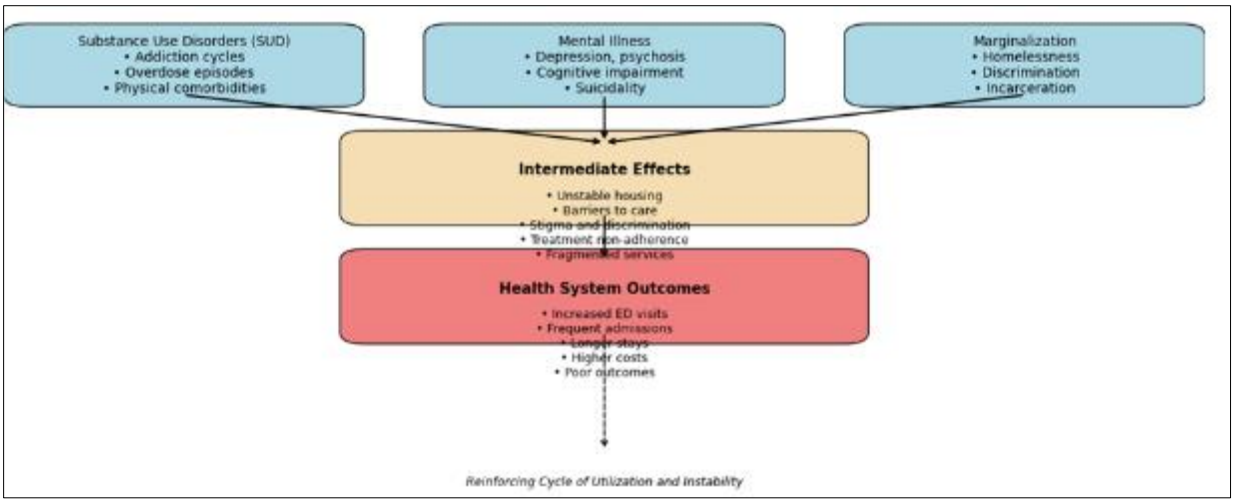

Figure 1 Conceptual framework linking SUD, mental illness, marginalization, and health system utilization

3. Patterns of health system utilization

3.1. Definition and Indicators of Utilization

Health system utilization refers to the frequency and manner in which individuals interact with healthcare services. It encompasses a range of activities including primary care visits, specialist consultations, emergency department (ED) use, inpatient admissions, diagnostic testing, and long-term care services [9]. Utilization is typically measured using metrics such as the number of ED visits per capita, hospital admission rates, length of hospital stays, and readmission within 30 days. These indicators help evaluate system efficiency, accessibility, and population health needs [10].

Emergency department visits are often seen as a proxy for unmet healthcare needs, especially when used for non-urgent conditions. Inpatient hospitalizations, on the other hand, may reflect either the severity of illness or failures in preventive care systems [11]. Frequent or high-cost utilizers—those who disproportionately consume healthcare resources—are of particular concern to policymakers and providers due to their impact on healthcare expenditures and system burden [12].

It is also critical to differentiate between necessary and avoidable utilization. The latter includes instances where proper outpatient care or early intervention could have prevented an acute health episode. Identifying the drivers of overutilization enables targeted policy interventions, particularly for populations affected by behavioral health disorders and social disadvantage [13].

3.2. Baseline Utilization Patterns in General Populations

In general populations, healthcare utilization tends to follow a relatively predictable pattern based on age, gender, socioeconomic status, and the presence of chronic conditions. Most individuals engage with primary care intermittently, with occasional visits to specialists or urgent care, depending on personal health needs and access [14]. Emergency

department usage in the general population is typically low to moderate, with the majority of visits related to injury, respiratory conditions, or acute infections [15].

Hospital admissions in the general population are most often driven by childbirth, surgical procedures, or chronic disease management, particularly for conditions like diabetes, cardiovascular disease, or cancer. The length of hospital stay tends to be shorter in high-income countries due to advances in treatment and discharge planning systems [16]. Readmission rates remain a concern for older adults and patients with complex needs, but these tend to be much lower than those observed in vulnerable populations [17].

Preventive care utilization—such as immunizations, screenings, and wellness checks—is more common in higher-income or insured populations, who benefit from consistent access to primary healthcare providers. In contrast, populations with limited insurance or geographic barriers often delay care, resulting in more acute and costly interventions later on [18].

Healthcare systems often use risk stratification tools to categorize patients by expected utilization, allowing resources to be allocated more effectively. These tools, while useful, can sometimes under-identify individuals from marginalized groups, who may not fit traditional risk models but are nonetheless at high risk for episodic and costly care [19].

3.3. Comparative Utilization in Populations with SUD or Mental Illness

Populations affected by substance use disorders (SUD) and mental illness consistently demonstrate higher levels of health system utilization compared to the general population. Individuals with SUD are more likely to use emergency departments for both substance-related crises and general health concerns, often due to the absence of regular primary care or perceived stigma in traditional health settings [20]. Studies show that people with opioid use disorder, for example, have significantly elevated rates of ED visits, largely driven by overdose, withdrawal, infections, and trauma [21].

Mental illness, particularly severe mental disorders such as schizophrenia or bipolar disorder, is also strongly associated with increased healthcare utilization. These individuals frequently require psychiatric care, crisis intervention, and inpatient hospitalization, especially when symptoms are unmanaged or complicated by social instability [22]. Comorbid physical illnesses—such as cardiovascular disease, diabetes, and infectious diseases—are also prevalent in this population, further increasing demand on health systems [23].

Co-occurring SUD and mental illness often lead to even more complex utilization patterns. Individuals with dual diagnoses are significantly more likely to be categorized as frequent utilizers of emergency and inpatient services, experiencing fragmented care and poor long-term outcomes [24]. This group also faces higher rates of medical complications, treatment non-adherence, and early discharge failures, all of which contribute to revolving-door care cycles [25].

Marginalization further amplifies these utilization trends. Individuals with SUD or mental illness who also face homelessness, incarceration histories, or racial discrimination are more likely to delay treatment, experience discrimination in healthcare, and receive suboptimal care plans [26]. These structural barriers not only reduce the effectiveness of treatment but push individuals toward reactive care-seeking behaviors.

Integrated care models have demonstrated promise in reducing these trends by offering coordinated, patient-centered services that address both behavioral health and social needs [27]. However, such models remain underutilized and underfunded, particularly in rural or underserved regions where gaps in the continuum of care persist. Expanding access to comprehensive case management, peer support, and harm reduction services may help mitigate reliance on acute services and promote more sustainable engagement with health systems [28].

Table 1 below summarizes recent data comparing utilization rates across populations with SUD, mental illness, and the general population. These figures highlight not only the scale of the disparity but also the urgency of addressing root causes through systemic reform.

Table 1 Comparative Health System Utilization Rates Across Populations

Utilization Indicator	General Population	SUD Population	Mental Illness Population
Average ED Visits/Year	1.2	4.7	3.5
Hospital Admissions/Year	0.3	1.1	0.9
Readmission Rate (30 days)	10%	25%	22%
Inpatient Length of Stay	4.2 days	7.9 days	6.8 days
Preventable Hospitalizations	12%	31%	28%

4. Substance use disorders and health system burden

4.1. Acute and Chronic Care Needs in Individuals with SUD

Substance Use Disorders (SUD) encompass a range of chronic, relapsing conditions that significantly impact both physical and mental health. Individuals with SUD often experience a dual burden of acute medical crises and long-term health complications stemming from substance misuse, unsafe behaviors, and coexisting social vulnerabilities [12]. These conditions demand both immediate and sustained intervention across multiple domains of care.

Acute care needs in this population frequently arise from overdose, intoxication, withdrawal symptoms, and injuries sustained during episodes of impaired judgment. Intravenous drug use is particularly associated with complications such as abscesses, endocarditis, and sepsis, often requiring urgent and intensive medical treatment [13]. Additionally, acute psychiatric symptoms—such as psychosis or suicidal ideation—are not uncommon, necessitating emergency psychiatric stabilization [14].

Chronic conditions are also highly prevalent among individuals with SUD. Hepatitis C, HIV/AIDS, chronic obstructive pulmonary disease, and liver cirrhosis are often co-occurring, particularly in those with long-term opioid or alcohol dependency [15]. The presence of chronic pain syndromes further complicates care, as patients may struggle to access appropriate pain management due to provider concerns around substance misuse [16].

The combination of acute and chronic needs leads to a pattern of episodic care-seeking, often disconnected from ongoing preventive services. Many individuals do not engage consistently with primary care, either due to stigma, lack of insurance, or competing life priorities such as homelessness or legal issues [17]. This results in missed opportunities for early intervention, disease management, and care continuity—critical elements for improving health outcomes in this population [18].

Without integrated, multidisciplinary models that address both addiction treatment and comorbid health issues, these care gaps are likely to persist and intensify over time [19].

4.2. Emergency Department and Inpatient Service Use Patterns

Emergency departments (EDs) serve as a primary entry point into the healthcare system for individuals with SUD, often acting as de facto safety nets for those without stable access to outpatient care [20]. This population exhibits disproportionately high ED visitation rates, with many presenting multiple times annually for substance-related or secondary health issues [21]. Common presenting complaints include overdose, acute intoxication, withdrawal, trauma, and infections—all requiring immediate clinical attention.

The cyclical nature of addiction, coupled with structural barriers to treatment continuity, leads to a pattern of repeat ED visits and avoidable admissions. Studies have shown that individuals with opioid use disorder are five to seven times more likely than the general population to use the ED within a six-month period [22]. Alcohol-related conditions also contribute significantly to the volume of ED presentations, particularly among older adults and those with liver disease or psychiatric comorbidities [23].

Inpatient utilization is similarly elevated among individuals with SUD. Hospitalizations often follow emergency presentations and are characterized by longer-than-average stays due to medical complexity, behavioral management needs, and discharge planning delays [24]. However, many discharges are premature or inadequately coordinated, leading to rapid readmissions and recurring health crises.

ED and inpatient settings are not equipped to provide long-term addiction care, yet they are frequently used to address issues rooted in chronic substance use. This misalignment between acute care services and addiction treatment creates inefficiencies and places unsustainable pressure on healthcare infrastructure [25].

4.3. System Cost Implications and Service Fragmentation

The economic impact of SUD-related healthcare utilization is substantial, placing a heavy financial burden on health systems worldwide. Individuals with SUD incur significantly higher per capita medical costs compared to those without, largely due to frequent hospitalizations, emergency visits, diagnostic testing, and treatment for complications such as infections or injuries [26]. These costs are magnified when care is reactive and fragmented, rather than preventive and integrated.

In the United States alone, it is estimated that over $35 billion annually is spent on direct healthcare services related to SUD, with the majority of this expenditure allocated to acute care settings [27]. Similar trends are observed in other high-income countries, where hospital-based treatment consumes a disproportionate share of public health budgets despite yielding limited long-term benefit for individuals with chronic addiction issues [28].

Fragmentation of services contributes to these inefficiencies. Addiction treatment is often siloed from general medical care, with limited coordination between emergency departments, primary care providers, mental health professionals, and social services. This disconnection results in duplicated services, medication mismanagement, and gaps in follow-up, all of which increase the likelihood of deterioration and repeat utilization [29].

Moreover, healthcare systems are frequently not designed to address the broader social determinants affecting individuals with SUD. Housing instability, unemployment, and legal involvement complicate care planning and continuity, often leading to disengagement and relapse. These socio-structural challenges necessitate cross-sector collaboration, including partnerships between healthcare, criminal justice, and community organizations, to reduce the revolving-door nature of service use and improve recovery outcomes [30].

A shift toward integrated, community-based models of care—incorporating harm reduction, case management, and trauma-informed practices—may help mitigate these cost burdens and improve overall system efficiency [31].

5. Mental illness and healthcare utilization

5.1. Common Mental Disorders Associated with High Utilization

Certain mental health disorders are consistently associated with elevated levels of health system utilization. Among the most impactful are schizophrenia, bipolar disorder, major depressive disorder, and generalized anxiety disorder, each of which contributes uniquely to the burden on emergency and inpatient services [17]. Schizophrenia, characterized by hallucinations, delusions, and cognitive impairments, often leads to repeated psychiatric admissions due to treatment nonadherence, symptom relapse, and the absence of stable social support [18].

Bipolar disorder, which involves alternating periods of mania and depression, also results in frequent acute care episodes, particularly when symptoms escalate rapidly or involve risky behavior requiring urgent intervention. Patients with bipolar disorder commonly experience comorbid substance use, further compounding the complexity of care and increasing reliance on crisis services [19].

Major depressive disorder (MDD), though more prevalent, exerts a widespread impact on both outpatient and emergency care use. Individuals with MDD are at heightened risk for suicidal ideation, somatic complaints, and reduced motivation to engage in routine care, all of which contribute to higher emergency department visitation and hospitalizations [20]. Anxiety disorders, while often managed in primary care, are also linked to overutilization due to physical symptom manifestation such as chest pain, dizziness, and gastrointestinal issues that prompt frequent diagnostic evaluations [21].

In all cases, comorbidity with chronic physical illnesses and SUD significantly amplifies healthcare needs. Without consistent mental health treatment and case management, these disorders continue to drive recurrent system use, largely through reactive and fragmented pathways of care [22].

5.2. Mental Illness as a Driver of Repeated and Prolonged System Use

Mental illness significantly contributes to repeated and prolonged interactions with healthcare systems, especially when individuals experience episodic exacerbations, poor treatment adherence, or coexisting psychosocial challenges. Recurrent psychiatric crises often lead to emergency department visits, which may or may not result in hospitalization, depending on the severity of symptoms and the availability of psychiatric beds [23]. In many cases, individuals with severe mental illness are discharged prematurely due to system constraints, only to return days or weeks later in acute distress [24].

Chronic psychiatric conditions such as schizophrenia and major depression are frequently marked by periods of functional decline, during which patients may disengage from outpatient care, leading to disease progression and crisis reentry. These episodes increase the burden on emergency services and lengthen hospital stays due to difficulties in stabilization, medication titration, and social reintegration planning [25]. Hospital length of stay is typically longer for psychiatric patients, averaging between 7 to 15 days depending on diagnosis, comorbidity, and support availability [26].

Additionally, mental illness often leads to complex discharge planning challenges. Patients may lack housing, family support, or insurance coverage, delaying safe discharge and resulting in extended hospital occupancy that contributes to bed shortages and system inefficiency [27]. Those with dual diagnoses—mental illness and SUD—experience even longer stays and higher rates of readmission due to the compounding effects of addiction and psychiatric instability [28].

Overall, mental illness acts as a critical driver of high-frequency healthcare utilization. Addressing this issue requires not only effective medical treatment but also structural interventions that support continuity of care and long-term stabilization [29].

5.3. Barriers to Continuity of Care

Continuity of care for individuals with mental illness remains a significant challenge across many healthcare systems. One of the primary barriers is fragmentation between physical health, mental health, and social services. Patients with serious mental illness often receive treatment from multiple providers working in isolation, leading to disjointed care plans, medication conflicts, and limited information sharing [30]. This siloed approach reduces treatment effectiveness and increases the risk of relapse, readmission, or medical emergencies.

Access barriers further disrupt continuity. Limited availability of outpatient psychiatric services, long wait times, and geographic disparities in mental health workforce distribution impede consistent care engagement. Rural and underserved urban areas are particularly affected, with fewer specialists and mental health clinics per capita [31]. Additionally, service eligibility restrictions and rigid intake procedures deter many individuals from seeking timely help, especially those with co-occurring conditions or unstable living situations [32].

Financial constraints are another significant hurdle. Even in systems with universal coverage, ancillary services such as counseling, community support, and crisis intervention may not be fully funded or accessible. For uninsured or underinsured individuals, the cost of psychiatric medications, transportation, and regular therapy visits often leads to treatment discontinuation [33]. This is particularly relevant for populations with overlapping vulnerabilities such as poverty, homelessness, and incarceration histories, who already face systemic disadvantages in navigating healthcare systems [34].

Stigma also plays a crucial role. Many patients report negative experiences in clinical settings, including being dismissed, misdiagnosed, or treated without dignity. These encounters diminish trust and deter future engagement, making it difficult to establish the therapeutic relationships essential for long-term care [35]. Providers, too, may lack adequate training in trauma-informed and culturally competent care, resulting in unintentional biases that alienate patients and erode adherence [36].

Moreover, transitions between levels of care—such as from hospital to community-based services—are poorly coordinated in many systems. Discharge planning often occurs without adequate follow-up, leaving patients vulnerable during critical recovery periods. Without consistent monitoring and early intervention, minor setbacks can escalate into full-blown crises requiring emergency or inpatient care once again [37].

Table 2 below presents comparative data illustrating how different mental health diagnoses correlate with healthcare access patterns, highlighting gaps in continuity and points of systemic strain.

Table 2 Frequency of Healthcare Access Types Among Patients with Various Mental Health Diagnoses

Mental Health Diagnosis	Avg. ED Visits/Year	Hospital Admissions/Year	Missed Outpatient Appointments (%)	30-Day Readmission Rate (%)
Schizophrenia	4.5	1.2	38%	28%
Bipolar Disorder	3.9	1.0	33%	25%
Major Depressive Disorder	2.7	0.8	29%	22%
Generalized Anxiety	1.8	0.4	24%	18%
Dual Diagnosis (SUD + MI)	5.2	1.5	46%	34%

6. Marginalization and structural barriers to care

6.1. Definitions and Forms of Marginalization

Marginalization refers to the systematic exclusion of certain groups from social, economic, and political participation, resulting in reduced access to resources, power, and opportunities. In healthcare contexts, marginalization often manifests as structural barriers that disproportionately impact specific populations, such as racial and ethnic minorities, people experiencing homelessness, immigrants, incarcerated individuals, and those living in poverty [20].

One prominent form of marginalization is homelessness, which severely limits an individual's ability to access stable healthcare services. Homeless individuals often lack insurance, permanent addresses, and identification—all of which complicate registration and continuity of care processes [21]. Without a consistent place to live, they may prioritize basic survival needs over medical follow-up or preventive services, leading to crisis-driven utilization patterns.

Racial and ethnic minorities face another dimension of marginalization, driven by a legacy of institutional racism, implicit provider bias, and disproportionate exposure to environmental and economic disadvantage [22]. These groups often receive lower quality care, experience more frequent misdiagnoses, and have less access to culturally competent providers, all of which contribute to poorer health outcomes over time [23].

Incarceration represents a state-imposed form of marginalization, where individuals are systematically removed from their communities and subjected to institutional controls that often lack adequate mental health or substance use support [24]. Upon reentry into society, formerly incarcerated individuals face stigma, unemployment, and restricted healthcare access, increasing their risk of relapse, recidivism, and chronic illness.

These intersecting identities and structural positions create compounded vulnerabilities, placing marginalized individuals at a significantly higher risk of unmet health needs and adverse system interactions [25].

6.2. Access Limitations Due to Social Exclusion, Stigma, and Poverty

Social exclusion is a key mechanism through which marginalization affects healthcare access. Individuals who are socially excluded are systematically denied participation in key aspects of society, including education, employment, and healthcare. This exclusion often results in reduced health literacy, fewer healthcare navigation skills, and a deep mistrust of institutional systems—including medical providers [26]. For example, those who have previously experienced discrimination in clinical settings may be reluctant to return for follow-up care, even when their symptoms worsen [27].

Stigma, particularly toward people with mental illness and substance use disorders, further exacerbates these challenges. Public stigma involves negative societal attitudes, while structural stigma refers to policies and practices that disadvantage certain populations. Many marginalized individuals report being treated with suspicion, disrespect, or outright denial of services due to their mental health history or perceived substance use, regardless of their current clinical status [28]. This leads to a cycle in which care is avoided until it becomes unavoidable, often resulting in emergency department visits or hospitalizations.

Poverty remains one of the most entrenched and powerful forms of marginalization. It limits access to nutritious food, stable housing, transportation, and preventive services—all of which are essential to maintaining health. Individuals

living in poverty often cannot afford medications, co-pays, or time off work to attend appointments, causing chronic conditions to go unmanaged until they escalate into acute emergencies [29].

Financial instability also contributes to insurance instability, particularly in countries where healthcare coverage is tied to employment. Intermittent coverage leads to disrupted care and reduced access to consistent providers. As a result, marginalized individuals frequently rely on overburdened public hospitals or free clinics that may lack resources to provide comprehensive, long-term care [30].

Without structural changes to address the roots of exclusion, stigma, and poverty, health disparities among marginalized populations will continue to widen, and overutilization of acute care services will remain a persistent challenge [31].

6.3. Compounding Effects on SUD and Mental Illness Management

Marginalization profoundly complicates the management of both substance use disorders (SUD) and mental illness. While each of these conditions presents unique challenges in clinical care, their interaction with social disadvantage creates a complex web of needs that are often unmet by standard service delivery models [32].

First, marginalized individuals with SUD or mental illness are more likely to encounter barriers at every point of the treatment continuum. These may include denial of entry into residential treatment programs due to lack of insurance, limited access to outpatient counseling, or difficulty adhering to medication regimens without stable housing or transportation [33]. Traditional treatment programs often rely on rigid attendance requirements, documentation, or abstinence-based models, which may not be feasible for individuals facing daily survival challenges [34].

Second, the stressors associated with marginalization—such as community violence, unemployment, food insecurity, and legal vulnerability—can exacerbate both SUD and psychiatric symptoms. This makes recovery not only more difficult to achieve but harder to sustain over time. Many marginalized individuals experience trauma and chronic stress, which have been linked to higher relapse rates and worsening psychiatric outcomes, particularly in the absence of trauma-informed care [35].

Third, comorbid conditions are frequently underdiagnosed or mismanaged in marginalized populations. For instance, a homeless person with co-occurring schizophrenia and alcohol use disorder may receive emergency detoxification services but never receive a comprehensive mental health evaluation or continuity planning [36].

These compounded challenges increase the likelihood of avoidable emergency visits, delayed recovery, and ongoing health system dependence, reinforcing a pattern of high-cost, low-outcome care [37].

6.4. Health Outcomes in Marginalized vs. Non-Marginalized Populations

The cumulative impact of marginalization on health outcomes is stark when compared to the general population. Marginalized individuals with SUD and/or mental illness experience significantly higher rates of morbidity, mortality, and disability than their non-marginalized counterparts [38]. Life expectancy is substantially lower, particularly among people experiencing homelessness, with some studies indicating reductions of over 20 years [39].

Rates of chronic illness—including cardiovascular disease, diabetes, liver disease, and respiratory conditions—are also elevated, driven by delayed care, poor access to preventive services, and limited management resources [40]. Mental health outcomes are similarly poor, with higher incidences of untreated depression, suicide attempts, and psychotic relapses among those facing systemic exclusion [41].

In addition, marginalized populations exhibit higher hospital readmission rates and more frequent emergency department use, often for conditions that could have been managed or prevented through earlier intervention. Preventable hospitalizations, including those for diabetes complications, hypertensive crises, and mental health exacerbations, are disproportionately concentrated in marginalized communities [42].

Figure 2 illustrates a causal pathway showing how marginalization amplifies the impact of SUD and mental illness on health system utilization. It visually represents how structural disadvantage, stigma, and exclusion converge to increase disease burden and care complexity.

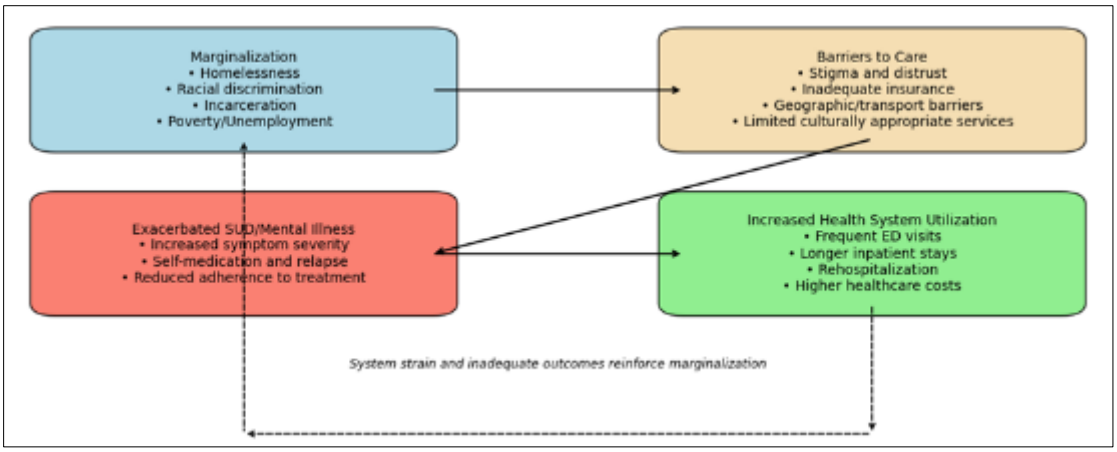

Figure 2 Causal Pathway Showing How Marginalization Amplifies SUD/Mental Illness Impacts on Utilization

7. The cumulative and synergistic impact

7.1. Interaction Effects Among SUD, Mental Illness, and Marginalization

The interaction between substance use disorders (SUD), mental illness, and marginalization creates a multidimensional burden that far exceeds the impact of any single condition alone. While each of these factors individually contributes to increased healthcare utilization, their intersection generates a syndemic effect—mutually reinforcing and escalating vulnerabilities that result in intensified system reliance and worse health outcomes [24].

For instance, individuals with both SUD and a psychiatric condition may struggle with medication adherence, cognitive disorganization, or emotional instability. When this is compounded by homelessness or unemployment, the likelihood of consistent treatment engagement drops dramatically [25]. These combined stressors lead to high-risk behaviors, delayed care, and increased emergency department presentations for crises that could have been prevented through early intervention.

The compounded nature of these interactions often traps individuals in a feedback loop. Psychiatric symptoms may lead to substance use as a form of self-medication, which in turn worsens mental health. Both can be further exacerbated by marginalizing conditions like incarceration or systemic racism, increasing the likelihood of relapse and disengagement from care [26].

Moreover, when these conditions co-occur, clinical presentations become more complex, and traditional care models may not be equipped to address overlapping needs. For example, treating opioid dependency in someone experiencing psychosis and living on the streets requires integrated, multi-sectoral support that goes beyond standard clinical protocols [27].

Understanding this interaction is critical for designing effective care systems. Without acknowledging the compounding impact of these conditions, interventions may fall short, perpetuating cycles of avoidable utilization and poor outcomes across entire populations [28].

7.2. Case Studies or Meta-Analysis Findings Demonstrating Compounded Burdens

Empirical research has increasingly validated the cumulative impact of SUD, mental illness, and marginalization on healthcare utilization. Numerous meta-analyses and longitudinal studies confirm that individuals with co-occurring disorders and structural disadvantage use health services more frequently and with less effective outcomes than those affected by only one of these factors [29].

A meta-analysis involving over 100,000 patients across North America found that individuals with both SUD and serious mental illness had hospitalization rates nearly three times higher than those with either condition alone [30]. When these individuals also experienced homelessness, their rates of emergency department use increased by 270%, with an average of over six visits per year compared to 1.5 in the general population [31].

Another study focusing on Medicaid enrollees revealed that those with co-occurring SUD and depression had total healthcare costs 130% higher than those with depression alone [32]. Much of this cost stemmed from inpatient and crisis services, suggesting a gap in preventative and community-based care.

A well-documented case study from Los Angeles examined a cohort of "super-utilizers"—individuals who frequently accessed emergency services. Nearly 70% had both mental health and substance use diagnoses, and over 80% were either homeless or housing insecure [33]. Interventions targeting only one condition were ineffective; successful engagement required wraparound services including housing, peer navigation, and co-located behavioral health treatment.

Table 3 Summary of Studies Showing Cumulative vs. Individual Impact on System Usage

Study / Source	Population Studied	Conditions Examined	Utilization Outcome	Key Finding
Meta-analysis (USA, 2020)	100,000 patients with SUD and/or mental illness	SUD + MI vs. SUD or MI only	Hospitalization rates	Co-occurrence led to 3× higher hospitalizations than isolated conditions
Medicaid Study (2019)	Low-income adults across multiple states	Depression + SUD vs. Depression alone	Total annual healthcare costs	Dual diagnosis group had 130% higher costs than those with depression only
LA Case Study (2018)	300 "super-utilizer" homeless individuals	SUD + MI + Homelessness	Annual ED visits	Co-occurring conditions led to 6+ ED visits/year, compared to 1.5 normally
Canadian Cohort (2021)	Formerly incarcerated adults	SUD + MI + Incarceration	30-day rehospitalization rates	Dual burden patients were 2.5× more likely to be readmitted within 30 days
Australian Study (2022)	Rural underserved populations	SUD + MI + Poverty	Emergency and inpatient service dependency	Cumulative burden associated with longer inpatient stays and frequent ED use

These findings reinforce the necessity of syndemic-informed healthcare planning. Ignoring the layered nature of patient needs leads to recurrent system failures, while integrated strategies can yield both cost savings and improved health outcomes [34].

7.3. System-Level Challenges in Treating Co-Occurring Disorders in Marginalized Groups

Despite increasing awareness, health systems continue to face substantial obstacles in addressing co-occurring SUD and mental illness among marginalized populations. Chief among these challenges is fragmentation. Services for addiction, psychiatry, and social support often operate in silos, with different funding streams, documentation protocols, and eligibility criteria. This makes coordinated care delivery complex and often inefficient [35].

Even when integrated care models are available, access remains limited. Many community health centers lack the specialized workforce necessary to treat dual diagnoses, particularly when compounded by housing instability or legal issues. Waiting lists for psychiatric evaluation or addiction treatment frequently stretch for weeks or months—an unmanageable delay for someone in crisis or living on the street [36].

Another major issue is policy misalignment. Funding for mental health and substance use services is frequently reactive rather than preventive, favoring crisis stabilization over long-term recovery planning. Moreover, Medicaid and other insurers often limit coverage for services like peer navigation or case management, despite their proven value in engaging high-need populations [37].

Stigma within the healthcare system itself is also a barrier. Clinicians may view patients with co-occurring disorders as "non-compliant" or "too complex," leading to suboptimal treatment plans or premature discharge. Marginalized patients may be denied care due to behavioral issues stemming from untreated mental illness or active substance use, perpetuating the cycle of instability and relapse [38].

Lastly, data-sharing limitations between institutions impede the continuity of care. Without interoperable health records, critical patient information is often unavailable across service providers, resulting in duplicated efforts or gaps in treatment history [39]. For patients who frequently move between shelters, jails, hospitals, and outpatient clinics, this lack of cohesion increases risk and reduces therapeutic efficacy.

Addressing these system-level issues requires policy reform, investment in integrated care infrastructure, and a paradigm shift toward trauma-informed, equity-driven service models [40].

8. Policy and system-level responses

8.1. Integrated Care Models and Trauma-Informed Approaches

Integrated care models have emerged as one of the most promising strategies to address the complex needs of individuals living with co-occurring substance use disorders (SUD), mental illness, and experiences of marginalization. These models emphasize coordinated, person-centered services that cut across primary care, behavioral health, and social support systems [28]. Rather than treating physical health, mental health, and addiction separately, integrated care brings providers together to offer comprehensive and continuous care within a single setting or care plan.

One key component of effective integration is the use of multidisciplinary teams. These typically include primary care physicians, psychiatrists, addiction specialists, case managers, and peer support workers. This team-based approach fosters better communication, shared decision-making, and reduced treatment duplication, ultimately improving health outcomes and patient satisfaction [29].

Another foundational element is trauma-informed care, which recognizes the pervasive role of trauma—especially among marginalized groups—and integrates this awareness into all aspects of service delivery. Trauma-informed models avoid retraumatization by prioritizing safety, choice, collaboration, and empowerment in clinical interactions [30]. For example, clinicians are trained to recognize behavioral responses as potential trauma adaptations rather than symptoms of non-compliance or resistance.

Trauma-informed integrated care models also emphasize trust-building and cultural humility, recognizing that many patients—particularly those with histories of homelessness, incarceration, or discrimination—may be reluctant to engage with traditional institutions. When implemented effectively, these models reduce emergency service dependency and increase the use of outpatient and preventive care [52].

Together, integrated and trauma-informed care models represent a critical framework for health systems aiming to serve high-utilizer populations more ethically, efficiently, and equitably [51]

8.2. Examples of Successful Interventions

Several real-world interventions have successfully applied integrated, equity-centered approaches to reduce system overutilization while improving outcomes for vulnerable populations. Among the most studied is the Housing First model, which prioritizes permanent housing for individuals experiencing homelessness without requiring sobriety or psychiatric stability as a precondition. Housing First has been shown to significantly reduce emergency department visits, psychiatric hospitalizations, and overall healthcare costs by providing the stability needed for individuals to engage in treatment and self-care [50].

Another impactful model is harm reduction, which emphasizes minimizing the negative consequences of substance use rather than requiring abstinence. Interventions such as supervised consumption sites, syringe exchange programs, and low-barrier opioid agonist therapy have reduced overdose deaths, emergency visits, and the transmission of infectious diseases like HIV and hepatitis C [48]. These models also serve as critical access points for engaging hard-to-reach populations in broader health and social services.

Programs like the Assertive Community Treatment (ACT) and Forensic Assertive Community Treatment (FACT) teams extend mental health and addiction care directly into the community. ACT teams provide wraparound services to individuals with serious mental illness, often in their homes or shelters, improving engagement and reducing hospital readmissions [47]. FACT programs adapt this model to justice-involved individuals, integrating legal support and behavioral health services to reduce recidivism and promote continuity of care.

Each of these models recognizes that health cannot be disentangled from housing, legal status, income, or trauma history. Their success underscores the need for cross-sectoral collaboration and investment in upstream interventions that address the root causes of high system utilization [49].

8.3. Recommendations for Policy Reform and Equitable Care Delivery

Addressing the cumulative burden of SUD, mental illness, and marginalization requires systemic change. Policy reforms must move beyond individual-level solutions and adopt structural strategies that reduce inequities, enhance service integration, and promote long-term engagement with care. One of the most urgent needs is the expansion of funding for integrated care infrastructure, particularly in under-resourced urban and rural areas. This includes incentivizing co-location of services, expanding community health centers, and supporting workforce development for behavioral health professionals [43].

Policymakers should also ensure that trauma-informed and culturally competent care becomes standard practice. This may involve mandating provider training, integrating trauma-screening protocols, and funding research into culturally specific care models. Recognizing the unique needs of Indigenous, Black, LGBTQ+, and immigrant communities is essential to reduce disparities in access and outcomes [44].

Insurance reform is another critical area. Restrictions on reimbursement for harm reduction, peer support, and community outreach limit the flexibility of care models that are proven to work. Expanding coverage for these services under public and private insurance plans will enable providers to implement evidence-based approaches without bureaucratic barriers [45].

In the legal sphere, decriminalization of non-violent drug offenses and diversion into treatment rather than incarceration are key reforms that reduce both health and justice system strain. Policies that support Housing First, remove barriers to employment, and ensure equitable access to identification and benefits are also essential for addressing the broader social determinants of health [46].

Figure 3 illustrates a model of an integrated, equity-centered healthcare approach, demonstrating how interdisciplinary, trauma-informed, and socially responsive practices can collectively reduce system utilization while improving quality of care.

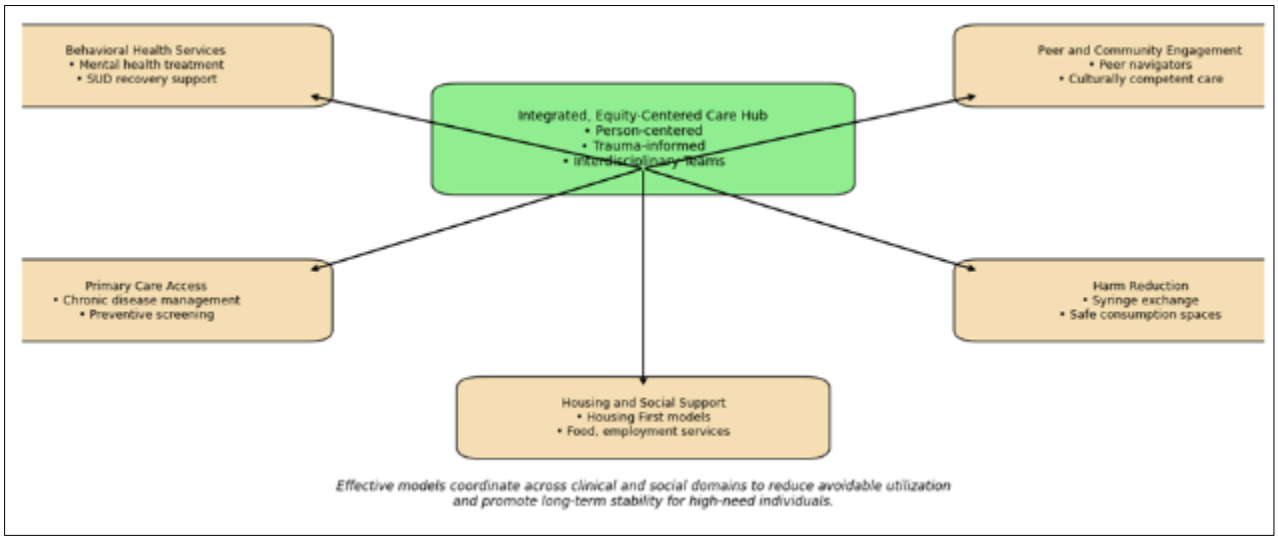

Figure 3 Model of an Integrated, Equity-Centered Healthcare Approach for High-Utilizer Populations

9. Future research directions and conclusion

9.1. Gaps in Current Literature and Data Limitations

Despite growing awareness of the compounded burden created by substance use disorders (SUD), mental illness, and marginalization, several critical gaps remain in the literature. Many existing studies tend to examine these conditions in isolation, without sufficiently exploring their intersectional and synergistic impacts on healthcare systems. This

fragmented approach limits our understanding of how these vulnerabilities interact to drive emergency department visits, hospital admissions, and long-term health outcomes.

Additionally, much of the current research focuses on short-term utilization outcomes, such as 30-day readmissions or annual emergency visits. There is a lack of studies evaluating long-term trajectories, including patterns of disengagement from care, cyclical instability, and mortality rates. This narrow scope hinders the development of sustainable, life-course-oriented interventions.

Another limitation lies in the underrepresentation of marginalized groups within datasets. Individuals experiencing homelessness, undocumented immigrants, formerly incarcerated persons, and those without consistent healthcare access are frequently excluded from traditional survey instruments and electronic health records. This leads to an incomplete picture of system usage and distorts population-level estimates.

Further, the definition and measurement of healthcare utilization vary widely across studies. Inconsistent metrics and terminology make it difficult to compare findings or synthesize evidence effectively. There is also a paucity of qualitative research capturing patient experiences, particularly among populations who may mistrust institutional systems or who communicate differently due to trauma or cultural factors.

Addressing these gaps requires more inclusive data collection methods, standardization of utilization metrics, and interdisciplinary research approaches that blend clinical, sociological, and public health perspectives. Only through a holistic and nuanced understanding can effective interventions be designed and evaluated.

9.2. Need for Longitudinal and Population-Specific Studies

To fully understand the cumulative and evolving impact of SUD, mental illness, and marginalization, there is an urgent need for longitudinal research that follows individuals over extended periods. These studies are essential for identifying how early life adversity, trauma exposure, and systemic inequality influence healthcare engagement, relapse patterns, and health outcomes across the lifespan. Cross-sectional snapshots offer limited insight into the cyclical nature of instability experienced by many high-utilizer populations.

Longitudinal designs allow researchers to observe how health trajectories are shaped not only by clinical interventions but by external factors such as housing status, employment opportunities, incarceration, and policy changes. They can also help identify protective factors that contribute to long-term recovery and resilience, such as community support, stable housing, and access to culturally appropriate care. These insights are critical for designing preventive strategies and improving chronic disease management in vulnerable populations.

Population-specific studies are equally important. Most existing research lacks granularity in addressing the unique experiences of racial and ethnic minorities, LGBTQ+ individuals, refugees, Indigenous populations, and others who face distinct forms of discrimination and exclusion. Without this specificity, interventions risk being overly generalized and ineffective at addressing group-specific barriers to care.

Moreover, tailored research can inform culturally competent models of care and guide the equitable allocation of resources. Understanding the nuanced needs of different communities will lead to more targeted outreach, more relevant health messaging, and more effective engagement strategies.

Investing in longitudinal and population-specific studies is not just a research imperative—it is a moral and policy necessity if health systems aim to reduce disparities and improve outcomes for their most vulnerable users.

10. Summary of Findings and Recommendations for Healthcare Providers and Policymakers

This review highlights the synergistic burden created by the co-occurrence of substance use disorders, mental illness, and marginalization on healthcare systems. Individuals facing these intersecting challenges are disproportionately represented in emergency departments, inpatient units, and high-cost utilization patterns, not because of misuse, but due to systemic gaps, inadequate community support, and reactive care models.

The evidence demonstrates that marginalized individuals with behavioral health conditions often encounter fragmented, stigmatizing, and culturally insensitive care. This perpetuates a cycle of disengagement, crisis-driven utilization, and poor outcomes. Integrated and trauma-informed care models have shown measurable success in

breaking this cycle, especially when combined with supportive housing, harm reduction, and assertive community treatment approaches.

For healthcare providers, the findings underscore the importance of delivering services that are person-centered, culturally responsive, and coordinated across disciplines. Providers must be equipped with tools to recognize trauma, address social determinants of health, and engage with patients who may present with distrust or communication barriers.

Policymakers, in turn, must prioritize funding for cross-sector collaboration, ensure equitable access to behavioral health services, and remove administrative barriers to harm reduction and community-based interventions. Structural reforms should address housing insecurity, criminal justice involvement, and economic inequality as core components of health strategy.

Workforce development is also essential. Training providers in trauma-informed practices, investing in peer-led models, and expanding the behavioral health workforce can improve both access and quality of care.

Ultimately, these recommendations call for a systemic realignment—one that moves beyond symptom management toward equity, prevention, and long-term stability for the highest-risk populations within the healthcare system.

10.1. Closing Remarks on the Urgency of System-Wide Responses

The convergence of SUD, mental illness, and marginalization presents one of the most urgent challenges for modern healthcare systems. Addressing it requires more than clinical expertise—it demands a coordinated, equity-driven response that spans housing, justice, employment, and community services. Without transformative change, the cycle of crisis, exclusion, and overutilization will persist, disproportionately harming those already pushed to society's margins. The evidence is clear, and the stakes are high. Now is the time to invest in compassionate, integrated, and systemic solutions that recognize the full humanity of every individual and strive for justice in both health and care.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

References

[1] Walkup J, Blank MB, Gonzalez JS, Safren S, Schwartz R, Brown L, Wilson I, Knowlton A, Lombard F, Grossman C, Lyda K. The impact of mental health and substance abuse factors on HIV prevention and treatment. JAIDS Journal of Acquired Immune Deficiency Syndromes. 2008 Mar 1;47:S15-9.

[2] Degenhardt L, Bharat C, Glantz MD, Sampson NA, Al-Hamzawi A, Alonso J, Andrade LH, Bunting B, Cia A, De Girolamo G, De Jonge P. Association of cohort and individual substance use with risk of transitioning to drug use, drug use disorder, and remission from disorder: findings from the world mental health surveys. JAMA psychiatry. 2019 Jul 1;76(7):708-20.

[3] Kendall CE, Boucher LM, Donelle J, Martin A, Marshall Z, Boyd R, Oickle P, Diliso N, Pineau D, Renaud B, LeBlanc S. Engagement in primary health care among marginalized people who use drugs in Ottawa, Canada. BMC Health Services Research. 2020 Dec;20:1-2.

[4] Azar MM, Springer SA, Meyer JP, Altice FL. A systematic review of the impact of alcohol use disorders on HIV treatment outcomes, adherence to antiretroviral therapy and health care utilization. Drug and alcohol dependence. 2010 Dec 1;112(3):178-93.

[5] Room R. Stigma, social inequality and alcohol and drug use. Drug and alcohol review. 2005 Mar;24(2):143-55.

[6] Vigo D, Jones L, Thornicroft G, Atun R. Burden of mental, neurological, substance use disorders and self-harm in North America: a comparative epidemiology of Canada, Mexico, and the United States. The Canadian Journal of Psychiatry. 2020 Feb;65(2):87-98.

[7] Volkow ND, Blanco C. Substance use disorders: a comprehensive update of classification, epidemiology, neurobiology, clinical aspects, treatment and prevention. World Psychiatry. 2023 Jun;22(2):203-29.

[8] Jones AL, Cochran SD, Rafferty J, Taylor RJ, Mays VM. Lifetime and twelve-month prevalence, persistence, and unmet treatment needs of mood, anxiety, and substance use disorders in African American and US versus foreign-born Caribbean women. International journal of environmental research and public health. 2020 Oct;17(19):7007.

[9] Jemberie WB, Stewart Williams J, Eriksson M, Grönlund AS, Ng N, Blom Nilsson M, Padyab M, Priest KC, Sandlund M, Snellman F, McCarty D. Substance use disorders and COVID-19: multi-faceted problems which require multi-pronged solutions. Frontiers in psychiatry. 2020 Jul 21;11:714.

[10] Babor TF, Stenius K, Romelsjo A. Alcohol and drug treatment systems in public health perspective: mediators and moderators of population effects. International Journal of Methods in Psychiatric Research. 2008 Jun;17(S1):S50-9.

[11] Mbah GO. Data privacy and the right to be forgotten. World Journal of Advanced Research and Reviews. 2022;16(2):1216–1232. https://doi.org/10.30574/wjarr.2022.16.2.1079

[12] Barnett ML, Meara E, Lewinson T, Hardy B, Chyn D, Onsando M, Huskamp HA, Mehrotra A, Morden NE. Racial inequality in receipt of medications for opioid use disorder. New England Journal of Medicine. 2023 May 11;388(19):1779-89.

[13] Fries L, Fedock G, Kubiak SP. Role of gender, substance use, and serious mental illness in anticipated postjail homelessness. Social Work Research. 2014 Jun 1;38(2):107-16.

[14] Joseph Nnaemeka Chukwunweike, Moshood Yussuf, Oluwatobiloba Okusi, Temitope Oluwatobi Bakare, Ayokunle J. Abisola. The role of deep learning in ensuring privacy integrity and security: Applications in AI-driven cybersecurity solutions [Internet]. Vol. 23, World Journal of Advanced Research and Reviews. GSC Online Press; 2024. p. 1778–90. Available from: https://dx.doi.org/10.30574/wjarr.2024.23.2.2550

[15] Berdahl TA, Hoyt DR, Whitbeck LB. Predictors of first mental health service utilization among homeless and runaway adolescents. Journal of Adolescent Health. 2005 Aug 1;37(2):145-54.

[16] Lawal Q. Leveraging artificial intelligence to enhance process control and improve efficiency in manufacturing industries. 2025 Jan. doi: 10.7753/IJCATR1402.1002.

[17] Joseph Chukwunweike, Andrew Nii Anang, Adewale Abayomi Adeniran and Jude Dike. Enhancing manufacturing efficiency and quality through automation and deep learning: addressing redundancy, defects, vibration analysis, and material strength optimization Vol. 23, World Journal of Advanced Research and Reviews. GSC Online Press; 2024. Available from: https://dx.doi.org/10.30574/wjarr.2024.23.3.2800

[18] Blosnich JR, Marsiglio MC, Dichter ME, Gao S, Gordon AJ, Shipherd JC, Kauth MR, Brown GR, Fine MJ. Impact of social determinants of health on medical conditions among transgender veterans. American journal of preventive medicine. 2017 Apr 1;52(4):491-8.

[19] Lawal Q. Advancing cybersecurity: Strategies for mitigating threats in evolving digital and IoT ecosystems. 2025 Jan. doi: 10.56726/IRJMETS66504.

[20] Umeaduma CMG. Behavioral biases influencing individual investment decisions within volatile financial markets and economic cycles. Int J Eng Technol Res Manag. 2024 Mar;8(03):191. Available from: https://doi.org/10.5281/zenodo.15091460

[21] Chukwunweike JN, Praise A, Bashirat BA, 2024. Harnessing Machine Learning for Cybersecurity: How Convolutional Neural Networks are Revolutionizing Threat Detection and Data Privacy. https://doi.org/10.55248/gengpi.5.0824.2402.

[22] Gaska KA, Kimerling R. Patterns of adverse experiences and health outcomes among women veterans. American Journal of Preventive Medicine. 2018 Dec 1;55(6):803-11.

[23] Mbah GO. Advancing data protection in Nigeria: the need for comprehensive legislation. Int J Eng Technol Res Manag. 2018;2(12):108. Available from: https://doi.org/10.5281/zenodo.15067826.

[24] Pumariega AJ, Jo Y, Beck B, Rahmani M. Trauma and US minority children and youth. Current psychiatry reports. 2022 Apr;24(4):285-95.

[25] Kumar A. Neuro Symbolic AI in personalized mental health therapy: Bridging cognitive science and computational psychiatry. World J Adv Res Rev. 2023;19(02):1663-79. doi: 10.30574/wjarr.2023.19.2.1516.

[26] Omiyefa S. Artificial intelligence and machine learning in precision mental health diagnostics and predictive treatment models. Int J Res Publ Rev. 2025 Mar;6(3):85–99. doi:10.55248/gengpi.6.0325.1107.

[27] Meulewaeter F, De Pauw SS, Vanderplasschen W. Mothering, substance use disorders and intergenerational trauma transmission: an attachment-based perspective. Frontiers in psychiatry. 2019 Oct 18;10:728.

[28] George MB, Ayiku EO. AI-driven fire risk indices integrating climate, fuel, and terrain for wildfire prediction and management. Int J Eng Technol Res Manag. 2024 Feb;8(02):67. doi: 10.5281/zenodo.15043141.

[29] Van Duin L, Bevaart F, Zijlmans J, Luijks MJ, Doreleijers TA, Wierdsma AI, Oldehinkel AJ, Marhe R, Popma A. The role of adverse childhood experiences and mental health care use in psychological dysfunction of male multi-problem young adults. European child & adolescent psychiatry. 2019 Aug 1;28:1065-78.

[30] Lawal Q. Cybersecurity governance: Strengthening policy frameworks to address global cybercrime and data privacy challenges. Int J Sci Res Arch. 2025 Jan;14(1):1146-63. doi: 10.30574/ijsra.2025.14.1.0225.

[31] DeCoux Hampton M, Chafetz L, White MC. Exploring the impact of race on mental health service utilization among African Americans and whites with severe mental illness. Journal of the American Psychiatric Nurses Association. 2010 Apr;16(2):78-88.

[32] Moschetti K, Zabrodina V, Stadelmann P, Wangmo T, Holly A, Wasserfallen JB, Elger BS, Gravier B. Exploring differences in healthcare utilization of prisoners in the Canton of Vaud, Switzerland. PLoS One. 2017 Oct 30;12(10):e0187255.

[33] Ajayi O. Data Privacy and Regulatory Compliance Policy Manual. January 2025. DOI: 10.2139/ssrn.5043087. Effective from November 23, 2022.

[34] Cochran SD, Björkenstam C, Mays VM. Sexual orientation differences in functional limitations, disability, and mental health services use: Results from the 2013–2014 National Health Interview Survey. Journal of consulting and clinical psychology. 2017 Dec;85(12):1111.

[35] Alegría M, Green JG, McLaughlin KA, Loder S. Disparities in child and adolescent mental health and mental health services in the US. New York, NY: William T. Grant Foundation. 2015 Mar:26.

[36] Olayinka OH. Leveraging Predictive Analytics and Machine Learning for Strategic Business Decision-Making and Competitive Advantage. International Journal of Computer Applications Technology and Research. 2019;8(12):473–486. Available from: https://doi.org/10.7753/IJCATR0812.1006

[37] Williams M, Yussuf M, Yussuf M, Olukoya A. Machine learning for proactive cybersecurity risk analysis and fraud prevention in digital finance ecosystems. Int J Eng Technol Manag Sci. 2021 Dec;5(12):160. doi: 10.5281/zenodo.14735561.

[38] Tarter R, Vanyukov M, Giancola P, Dawes M, Blackson T, Mezzich AD, Clark DB. Etiology of early age onset substance use disorder: A maturational perspective. Development and Psychopathology. 1999 Dec;11(4):657-83.

[39] Umeaduma CMG. Impact of monetary policy on small business lending, interest rates, and employment growth in developing economies. Int J Eng Technol Res Manag. 2024 Sep;08(09):[about 10 p.]. Available from: https://doi.org/10.5281/zenodo.15086758

[40] Omiyefa S. Evaluating the efficacy of harm reduction, psychosocial interventions and policy reforms in reducing drug-related suicide cases. World J Adv Res Rev. 2025;25(3):1130–47. doi: https://doi.org/10.30574/wjarr.2025.25.3.0854.

[41] Roy L, Crocker AG, Nicholls TL, Latimer EA, Ayllon AR. Criminal behavior and victimization among homeless individuals with severe mental illness: a systematic review. Psychiatric services. 2014 Jun;65(6):739-50.

[42] Osifo Emmanuella Osagioduwa, Omumu Ewere Stephanie, Alozie Modestus. Evolving contractual obligations in construction law: Implications of regulatory changes on project delivery. World Journal of Advanced Research and Reviews. 2025;25(03):1315–33. doi: https://doi.org/10.30574/wjarr.2025.25.3.0896

[43] Bassuk EL, Buckner JC, Perloff JN, Bassuk SS. Prevalence of mental health and substance use disorders among homeless and low-income housed mothers. American Journal of Psychiatry. 1998 Nov 1;155(11):1561-4.

[44] Simon R, Snow R, Wakeman S. Understanding why patients with substance use disorders leave the hospital against medical advice: a qualitative study. Substance abuse. 2020 Oct;41(4):519-25.

[45] Umeaduma CMG. Evaluating company performance: the role of EBITDA as a key financial metric. Int J Comput Appl Technol Res. 2020;9(12):336–49. doi:10.7753/IJCATR0912.10051.

[46] Ogunola A, Olaniyan J. Protecting small businesses from social engineering attacks in the digital era. World Journal of Advanced Research and Reviews. 2024 Dec;24(3). doi: 10.30574/wjarr.2024.24.3.3745.

[47] Zolopa C, Burack JA, O'Connor RM, Corran C, Lai J, Bomfim E, DeGrace S, Dumont J, Larney S, Wendt DC. Changes in youth mental health, psychological wellbeing, and substance use during the COVID-19 pandemic: a rapid review. Adolescent Research Review. 2022 Jun;7(2):161-77.

[48] Omiyefa S. Global mental health policy innovations: investigating trauma-informed care, housing-first models, and refugee interventions. Int Res J Mod Eng Technol Sci. 2025 Mar;7(3):2582–5208. doi:10.58257/IJPREMS38522.

[49] Magee LA, Fortenberry JD, Aalsma MC, Gharbi S, Wiehe SE. Healthcare utilization and mental health outcomes among nonfatal shooting assault victims. Preventive medicine reports. 2022 Jun 1;27:101824.

[50] Robinson AC, Knowlton AR, Gielen AC, Gallo JJ. Substance use, mental illness, and familial conflict non-negotiation among HIV-positive African-Americans: latent class regression and a new syndemic framework. Journal of behavioral medicine. 2016 Feb;39:1-2.

[51] Umeaduma CMG, Adedapo IA. AI-powered credit scoring models: ethical considerations, bias reduction, and financial inclusion strategies. Int J Res Publ Rev. 2025 Mar;6(3):6647-6661. Available from: https://ijrpr.com/uploads/V6ISSUE3/IJRPR40581.pdf

[52] Lawal Qudus. Advancing cybersecurity: strategies for mitigating threats in evolving digital and IoT ecosystems. Int Res J Mod Eng Technol Sci. 2025 Jan; DOI: 10.56726/IRJMETS66504.