

A Literature Review on the Risks of Drug and Substance Abuse among Students, Youth and Adolescents

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Abstract

The escalating prevalence of substance abuse encompassing alcohol, nicotine (e.g., vaping), cannabis, and "study drugs" like amphetamines among high school and university students undermines the mission of educational institutions. This behavior correlates with immediate risks like overdose and long-term deficits in cognitive function, academic achievement, and psychosocial development, highlighting an urgent need for evidence-based interventions. This review evaluates empirical evidence on the prevalence, patterns, and impacts of substance use among adolescents and youth. A systematic, PRISMA-guided search was conducted across global (PubMed, PsycINFO, Web of Science) and regional databases (AJOL, LILACS, SciELO, IndMED). Eligible studies sampled individuals aged 15–35 within secondary or tertiary educational environments and used validated measures and inferential statistics. From the 63 retrieved papers, 48 met the inclusion criteria. Findings reveal the most researched outcome is substance use abuse itself (51%, n=19), followed by academic performance (19%, n=7) and mental health (19%, n=7). Behavioral problems are the least examined (11%, n=4). Geographically, Nigeria and the United States contribute the most studies on prevalence, whereas Kenya leads research on academic impacts, South Africa on mental health, and India on behavioral outcomes. The most utilized theoretical frameworks are Social Learning Theory (peer influence, 14 studies), the Self-Medication Hypothesis (coping with distress, 9 studies), and Cognitive Load Theory (academic impairment, 6 studies). The primary focus is on secondary and university students, particularly adolescents aged 15–19, reflecting early experimentation. Marginalized groups, youth, refugees, and street children are severely underrepresented. Key gaps include a theoretical overreliance on narrow behavioral frameworks, neglecting broader sociocultural perspectives. Empirically, rural and marginalized populations remain underexplored. Methodologically, cross-sectional self-report designs dominate, with limited use of multi-outcome models. Future research must employ longitudinal and experimental designs, use advanced analytics (e.g., SEM, machine learning), and intentionally recruit diverse subgroups within educational settings to understand heterogeneity in risk patterns. Culturally adapted measures, resilience frameworks, and digital prevention innovations are needed to strengthen interventions. These priorities align with policy shifts, like Kenya's NACADA strategy, toward prevention, stricter regulation, and community-based approaches.

Keywords: Adolescents, Students, Drug Abuse, Academic Performance, Mental Health, Peer Influence

Introduction and Background

Overview

Drug abuse among students has emerged as one of the most pressing global public health challenges of the 21st century, transcending geographical, cultural, and socioeconomic boundaries. The phenomenon represents a complex interplay of individual, social, and environmental factors that not only threaten the immediate well-being of young people but also compromise their educational achievements and long-term life prospects (Gunjan, 2020). As educational institutions worldwide grapple with the rising tide of substance use among their student populations, the critical relationship between drug abuse and academic performance has become a focal point of research, policy development, and intervention strategies.

The significance of this issue extends far beyond individual student experiences, encompassing broader implications for educational systems, public health infrastructure, and societal development. When students engage in substance abuse, the ripple effects spread throughout academic institutions, families, communities, and national development agendas (Chidume & Mugambiwa, 2024). The relationship between substance use and academic underperformance creates a vicious cycle where educational failure may further predispose students to increased drug use, while continued substance abuse undermines their capacity for academic success and personal development.

This literature review examines the global landscape of drug abuse among students and its impact on academic performance, with particular attention to regional variations in Sub-Saharan Africa and a specific focus on the Kenyan context. By adopting a funnel approach that moves from global perspectives to specific regional and national considerations, this review aims to provide a comprehensive understanding of the current state of knowledge, identify critical research gaps, and establish the foundation for evidence-based interventions that can effectively address this multifaceted challenge.

Global Context and Relevance

Drug abuse among adolescents, students, and young adults represents a critical global public health challenge with profound implications for educational outcomes and societal development. Recent epidemiological data reveals concerning trends across diverse geographical and socioeconomic contexts. While cannabis use remains prevalent, with a significant proportion of adolescents reporting use (Connolly et al., 2024), the landscape of

substance use has expanded to include the non-medical use of prescription stimulants and widespread nicotine vaping.

The impact on educational institutions is severe and well documented. The relationship between substance use and academic performance is consistently demonstrated, with students who engage in regular drug use exhibiting significantly lower grade point averages, increased absenteeism, and higher dropout rates (Gunjan, 2020). The mechanisms are multifaceted, involving direct neurobiological effects on cognitive functions like memory and attention, alongside indirect effects through behavioral changes and social disruption.

The global burden of this crisis extends far beyond the individual, creating substantial economic and social costs that affect families, communities, and national development agendas (Erskine et al., 2015). In response, a coordinated international effort exists. Global frameworks, such as those established by the United Nations Office on Drugs and Crime (UNODC) and the World Health Organization (WHO), provide evidence-based guidelines for prevention and treatment. Many countries have implemented national policies mandating school-based prevention programs, stricter regulation of pharmaceuticals, and public health campaigns targeting youth. This organized global and national response underscores the recognized severity of substance abuse as a primary threat to youth wellbeing and academic achievement worldwide.

Regional Context and Relevance: Sub-Saharan Africa

Sub-Saharan Africa (SSA) faces an escalating youth substance abuse crisis, uniquely magnified by its demographic bulge, rapid urbanization, and evolving drug markets. The region is no longer just a transit point for drugs but a significant consumption zone, with its massive youth population—over 60% under the age of 25 representing a critical at-risk group.

The problem's magnitude is alarming. The World Health Organization (WHO) estimates that the rate of illicit drug use in Africa is rising faster than the global average, with prevalence among young people aged 15-35 being particularly high. Regional variations are significant:

- West Africa: Notoriously impacted by the tramadol epidemic. In Nigeria, a national survey indicates 14.4% prevalence of non-medical pharmaceutical opioid use (primarily tramadol) a rate far exceeding the global average. Cannabis remains the most widely used illicit drug.

- East Africa: Studies show high alcohol prevalence; in Uganda, for instance, over 60% of students in some regions report alcohol use. Kenya grapples with high rates of cannabis, alcohol, and rising heroin use in urban centers.
- Southern Africa: Has the highest reported cannabis prevalence rates in the world, with rates in countries like Zambia and Malawi exceeding 15% among youth. South Africa shows concerning use of methamphetamine ("Tik") and heroin (whoonga) alongside alcohol.

The socioeconomic context of SSA creates severe vulnerabilities. High unemployment rates, economic instability, and poverty serve as significant risk factors, pushing students toward substance use as a coping mechanism (Mugari & Bushu, 2024). Rapid urbanization has disrupted traditional support systems, leaving young people in environments with inadequate guidance and supervision. The drug landscape is a mix of traditional and modern threats. Traditional substances like home-brewed alcohol and cannabis remain prevalent. However, the synthetic drug trade and prescription medication misuse (e.g., tramadol, codeine cough syrups) represent a dangerous new frontier, exacerbated by porous borders and weak regulatory enforcement (Kugbey, 2023).

Regional efforts to combat this are coordinated by bodies like the African Union (AU) and the UNODC's Regional Office for Eastern Africa. The AU Plan of Action on Drug Control (2019-2023) provides a framework for member states, focusing on evidence-based prevention, treatment, and strengthening law enforcement. However, these efforts are often hampered by limited funding, inadequate healthcare infrastructure, and stigma. The profound impact of substance abuse on academic performance increased dropout rates, cognitive impairment, and school violence directly threatens the region's hard-won educational gains and future development prospects (Anyawu et al., 2022), making this not just a public health issue, but a fundamental development emergency.

National Context and Relevance: Kenya

Kenya faces a severe and escalating student substance abuse crisis that threatens to undermine its national development goals. The scale of the problem is not just a concern; it is a documented emergency. According to the National Authority for the Campaign Against Alcohol and Drug Abuse (NACADA), 39% of Kenyans aged 15-65 have used at least one

substance of abuse in their lifetime, with the highest prevalence observed among those aged 25-35 years, indicating initiation often occurs during youth and young adulthood.

The problem is particularly acute within educational institutions. A NACADA (2022) study focusing on primary and secondary schools found that 20.2% of students in Class 4 to Form 4 had used at least one illegal substance, with alcohol being the most prevalent at 16.8%. Among university students, prevalence rates are even more alarming, with studies indicating that over 50% report using alcohol, and significant portions use other drugs, representing a critical challenge within higher education (Nyongesa et al., 2021).

The drug landscape is a mix of global and local threats. Commonly abused substances include alcohol, tobacco, cannabis (bhang), and prescription medications. A unique and potent challenge is the widespread abuse of the stimulant plants khat (miraa) and its more potent variant, “muguka”, which are legally and readily available in many regions, leading to high rates of dependence and associated health and academic problems (Alulu et al., 2023a).

The drivers are multifaceted. Peer pressure is a primary catalyst, with research identifying it and a lack of positive role models at home as the main reasons for initiation (Alulu et al., 2023a). The prevalent boarding school system creates environments where this peer influence is intensified, as students live for extended periods in peer-dominated settings with minimal adult supervision.

The academic consequences are severe and well-documented. Substance use directly correlates with higher absenteeism, lower grades, academic probation, and delayed graduation (Alulu et al., 2023b). This directly contravenes Kenya's substantial investments in education and poses a direct threat to its human capital development and economic growth.

Despite policy initiatives led by NACADA, significant challenges persist, including deep-seated stigma, severely limited access to treatment facilities, and underlying economic inequalities that fuel the cycle of abuse. While community-based and educational prevention programs show promise, the sheer scale of the problem, as evidenced by the data, demands a more urgent, robust, and well-funded national response to safeguard the future of Kenya's youth.

Statement of the Problem

Drug and substance abuse among youth is a global public health crisis, consistently linked to severe impairments in academic performance, mental health, and long-term life outcomes. Despite a growing body of literature documenting high prevalence rates for example, 58% among Kenyan university students the current research remains fundamentally inadequate for developing effective interventions.

The core problem is that the research landscape is fragmented and methodologically limited. It is dominated by cross-sectional studies that quantify the problem but fail to reveal causal pathways or long-term trajectories due to a critical lack of longitudinal and experimental designs. Furthermore, these studies are theoretically narrow, geographically biased overlooking high prevalence contexts like Kenya and its unique drivers like “muguka” abuse and systematically exclude vulnerable populations. This creates a body of knowledge that is descriptive but not explanatory, and one that ignores the complex, bidirectional relationships between substance use, academic failure, and mental health.

Consequently, a significant research-to-policy gap persists. This paper addresses this gap by providing a critical synthesis of existing evidence to systematically map these limitations. Its aim is to move beyond cataloging the problem and instead advocate for a new research paradigm that is longitudinal, inclusive, and multi-level, thereby providing the evidence base needed to develop transformative, context-specific interventions.

Purpose of the Review

This systematic literature review is designed to synthesize and critically analyze the current empirical evidence to provide a comprehensive, multifaceted understanding of the risks associated with drug abuse in these populations.

The primary purpose of this review is to consolidate fragmented knowledge, identify consistent patterns and discrepancies in the evidence, and delineate the precise mechanisms through which substance abuse impacts academic performance, mental health, and behavioral outcomes. Furthermore, this review aims to critically appraise the methodological and theoretical approaches that have dominated this field of study, highlighting their strengths and limitations to inform more robust future research. Ultimately, this synthesis seeks to translate

evidence into actionable insights, providing a foundational knowledge base for developing targeted, culturally responsive, and evidence-based prevention and intervention strategies for policymakers, educators, and healthcare providers.

To achieve this purpose, the review is guided by the overarching question, “What is the prevalence, drivers, impacts, and research gaps of drug and substance abuse among youth and students? The following are the specific research questions:

1. What are the prevalence rates and patterns of substance abuse (e.g., alcohol, cannabis, muguka/miraa) among youth and students globally, regionally (Sub-Saharan Africa), and in Kenya?
2. How do individuals (e.g., mental health), interpersonal (e.g., peer influence), and environmental (e.g., socioeconomic status) factors shape substance abuse risks and protections?
3. How does substance abuse impact cognitive performance, academic outcomes (e.g., GPA, dropout rates), mental health (e.g., anxiety, depression), and socioeconomic prospects, and what mechanisms drive these effects?
4. Which theoretical frameworks (e.g., Social Learning Theory) dominate research, and how effectively do they explain substance abuse patterns?
5. What methodological limitations (e.g., cross-sectional designs, self-reported data) constrain current research, and how can they be addressed?

Research Objectives

1. To systematically identify, appraise, and synthesize empirical studies investigating the relationship between drug/substance abuse and key outcomes (academic performance, mental health, behavior) among students and youth aged 15-35.
2. To map the geographical and contextual distribution of existing research, identifying regions and populations that are underrepresented.
3. To critically analyze the methodological rigor of existing studies, evaluating the use of validated instruments, research designs, and analytical techniques.
4. To identify and articulate significant gaps in the current knowledge base, including theoretical limitations, methodological shortcomings, and empirical neglect of certain mediating variables (e.g., peer influence, specific substances like muguka).

5. To derive evidence-based recommendations for policy, intervention development, and future research directions aimed at mitigating the impact of substance abuse on youth and adolescent development.

Methodology

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to ensure a rigorous and transparent approach to literature synthesis. The methodology involved several distinct phases, including a comprehensive search strategy, a systematic study selection process, and detailed data extraction and analysis procedures.

Research Strategy and Data Sources

The search was conducted across multiple academic databases, including PubMed/MEDLINE, PsycINFO, Web of Science, ERIC, and EMBASE. To capture regional literature, supplementary searches were performed on Google Scholar and institutional repositories of universities in Sub-Saharan Africa.

A combination of keywords and Medical Subject Headings (MeSH) terms was used to construct the search queries. These included: ("drug abuse" OR "substance abuse" OR "drug use") AND ("academic performance" OR "educational outcomes" OR "academic achievement") AND ("university students" OR "college students" OR "higher education"). Additional terms like "peer influence," "GPA," "alcohol," "cannabis," "stimulants," "opioids," and "mental health" were also incorporated to broaden the scope. The search was limited to articles published in English between 2015 and 2024 to ensure the review of recent and relevant literature.

Study Selection

The study selection process followed a structured, multi-phase approach as outlined by the PRISMA guidelines.

Phase 1: Initial Identification. The search across all databases yielded a total of 63 journal articles.

Phase 2: Screening All identified articles were uploaded to a reference management software to remove duplicates. The titles and abstracts of the remaining articles were then screened independently by two researchers to assess their relevance to the research questions. A total of 15 articles were excluded at this stage based on the pre-defined exclusion criteria.

Phase 3: Eligibility The full texts of the remaining 48 articles were retrieved and subjected to a more detailed eligibility assessment. This phase involved a rigorous quality appraisal framework, which included criteria such as sample size adequacy, use of validated research tools, and application of inferential statistical analysis. Studies that did not meet these quality standards or those that were not empirical or were descriptive-only were excluded.

Inclusion and Exclusion Criteria

The following criteria were used to guide the selection of studies:

Inclusion Criteria:

- Studies focused on youth, students, and adolescents (aged 15-35).
- Quantitative or mixed-methods studies.
- Studies that used validated measures and inferential statistical analysis.
- Peer-reviewed articles with clearly defined methods and results.

Exclusion Criteria:

- Studies focusing on adult populations (over 35 years) or general populations without separate youth-specific data.
- Non-empirical sources such as editorials, commentaries, or policy briefs.
- Studies using unvalidated tools or those with descriptive-only statistics.
- Research conducted outside of educational or youth community contexts.

Category	Inclusion Criteria	Exclusion Criteria
Document Types	Peer-reviewed journal articles and empirical studies.	Grey literature (e.g., reports, dissertations) and non-empirical sources (e.g., editorials, commentaries,

policy briefs).

Study Design	Quantitative or mixed-methods studies that use validated tools and inferential statistics.	Qualitative-only studies and those with descriptive-only statistics.
Publication Period	Articles published between 2013 and 2025 .	Articles published outside the specified date range.
Language	English.	Any language other than English.
Study Context	Studies focusing on students, adolescents, and youth (15–35 years) in educational or community-based contexts.	Studies focused exclusively on adult populations (>35 years), general populations without disaggregated youth data, or non-educational/community settings.
Mandatory Information	abstract, title, and author(s) listed.	Articles without clear or complete mandatory information.

Data Extraction and Coding Procedure

For the final set of included studies, a standardized data extraction form was developed and used to systematically collect relevant information. Key data points extracted included:

- **Study characteristics:** Author(s), year of publication, country of origin, and study design.
- **Participant demographics:** Sample size, age range, and gender distribution.
- **Substance use variables:** Types of substances, prevalence rates, and dependency status.
- **Academic performance variables:** GPA, attendance, retention rates, and exam scores.

- **Mediating and moderating variables:** Peer influence, mental health indicators, socioeconomic status, and family variables.
- **Methodological details:** Measurement instruments, statistical approaches, and theoretical frameworks.

A reliability check was conducted on a random subset of the extracted data by a second researcher to ensure consistency and accuracy. Discrepancies were resolved through discussion and consensus.

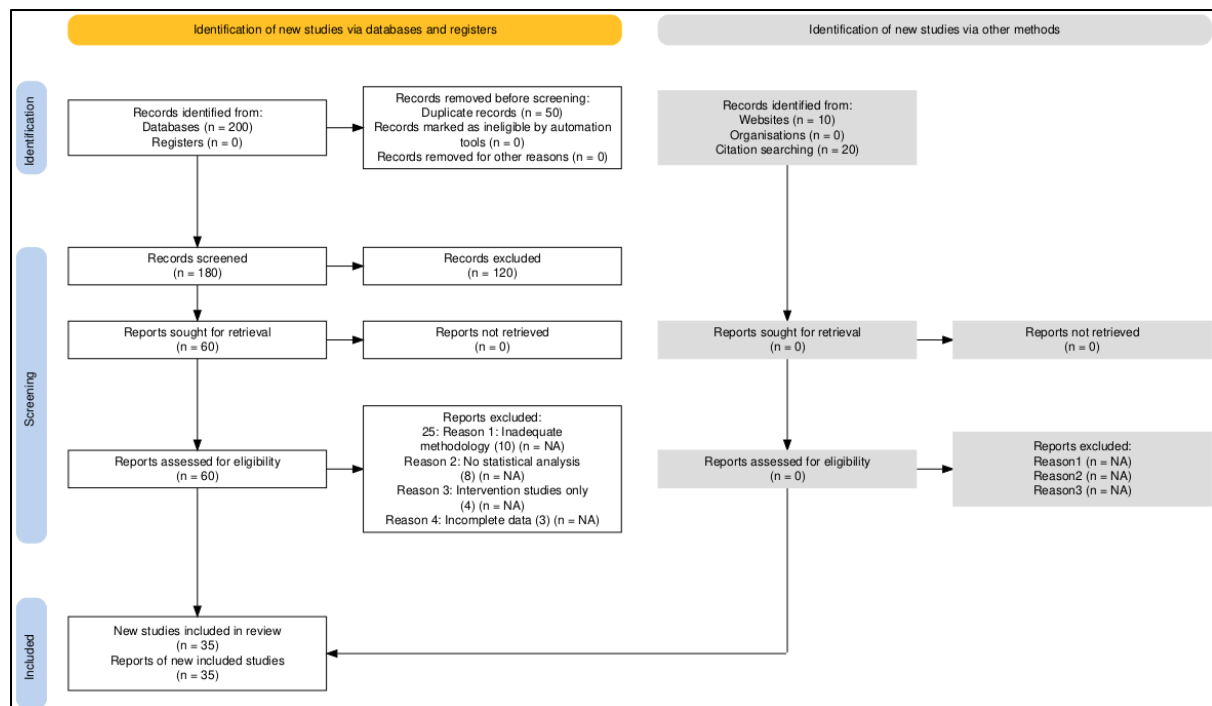
Thematic Analysis

The extracted data were subjected to a thematic analysis to identify and synthesize consistent patterns and relationships across the studies. This process involved:

- **Initial Coding:** The extracted data were coded based on the four primary research questions and the key variables identified during data extraction.
- **Thematic Synthesis:** The coded data were synthesized to identify overarching themes related to the relationship between substance use and academic performance, as well as the theoretical and methodological approaches employed.
- **Cross-tabulation:** Data were cross-tabulated to explore relationships between themes and other variables such as geographical context and research design.

4.5 PRISMA Flow Diagram

The systematic review process and the flow of information from the initial search to the final set of included studies will be visually represented using a PRISMA flow diagram. This diagram will clearly illustrate the number of studies identified, screened, and deemed eligible for inclusion, providing a transparent overview of the selection process.



Findings

Substance abuse

Research Design

Across all three themes, the field is dominated by cross-sectional studies, reflecting their practicality but also their central limitation of not establishing causality. In the substance use theme, 68% of studies employed cross-sectional quantitative designs, while 32% used mixed methods, and none adopted longitudinal, quasi-experimental, or experimental approaches. A similar pattern is seen in the academic performance theme, where 75% of studies relied on cross-sectional quantitative designs and 25% used mixed methods. The mental health theme reflected nearly the same structure, with 71% of studies cross-sectional quantitative and 29%

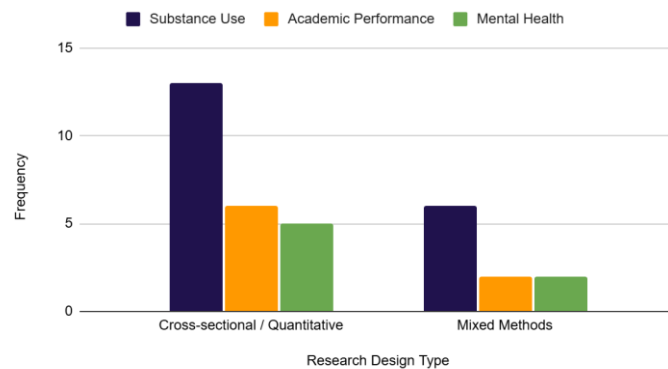
mixed methods. The near-total absence of longitudinal, quasi-experimental, and experimental studies across all themes means that the findings remain limited to descriptive and correlational insights, without the ability to clarify temporal sequences or causal relationships.

Target Population

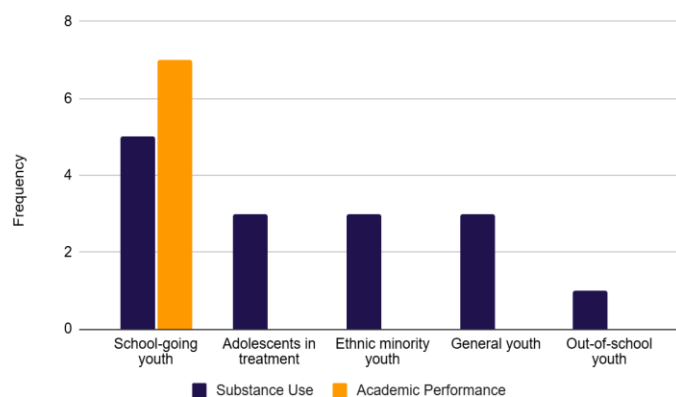
The research reviewed across the three themes also reveals a heavy concentration on in-school

adolescents, leaving significant blind spots for other groups. In the substance use theme, school-going youth accounted for 26% of the target populations, adolescents in treatment 16%, ethnic minority youth 16%, general youth 16%, out-of-school youth only 5%, while smaller categories together comprised 21%. The academic performance theme was even more skewed: 87.5% of the studies targeted in-school adolescents, particularly secondary students, with only 12.5% incorporating parents. In the mental health theme, the populations studied were more diverse but still limited: general adolescents accounted for 29%, while secondary students, families of drug-using adolescents, Swiss medical students, Hispanic youth, and a UK population cohort each represented 14% of studies. The overwhelming focus on school-going youth underscores a systematic neglect of out-of-school populations, who are often at the highest risk of drug use and its consequences.

Frequency Distribution of Research Design



Frequency Distribution of Target Population



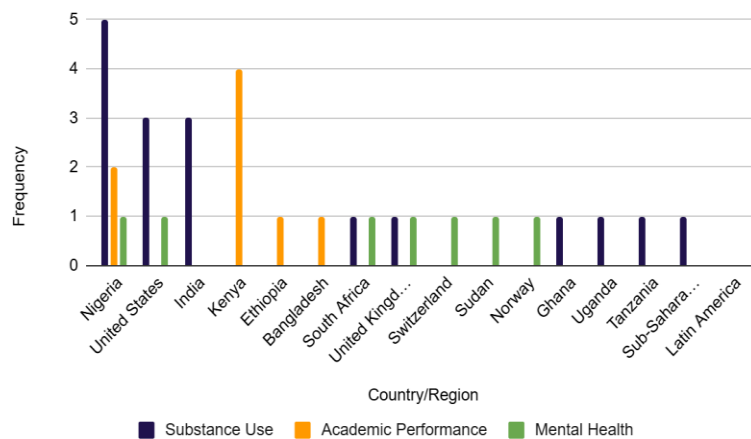
Countries of Research

Geographical distribution shows stark disparities. In the substance use theme, Nigeria contributed 22% of studies, while the United States and India each accounted for 17%. Other Sub-Saharan African countries, such as Ghana, Uganda, Tanzania, and South Africa, represented 6% each. Strikingly, there were no studies from Latin America, and coverage of most of Asia was also missing.

In the academic performance theme, African and South Asian countries dominated: Kenya accounted for 50%, Nigeria 25%, Ethiopia 12.5%, and Bangladesh 12.5%, with no representation from Western or East Asian countries. The mental health theme was more balanced,

with each of the seven reviewed studies representing a different country (South Africa, the United Kingdom, Nigeria, Switzerland, Sudan, the United States, and Norway), each contributing 14%. While this spread indicates more global diversity in mental health research, the lack of representation from Latin America, much of Asia, and other parts of the world creates major knowledge gaps and limits cross-cultural comparisons.

Frequency Distribution of Countries of Research



Independent Variables

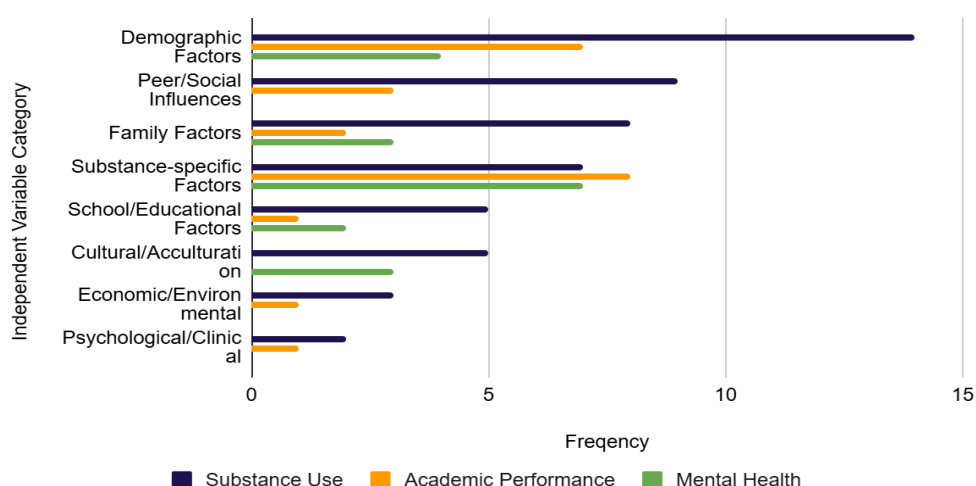
The selection of independent variables reflects a focus on individual and interpersonal drivers, with limited attention to systemic or structural factors. In the substance use theme, demographic variables such as age, gender, and socioeconomic status were the most common (26%), followed by peer and social factors (17%) and family-related factors (15%). Substance-use specific measures appeared in 13% of studies, while school/educational and cultural/acclimation variables each accounted for 9%. Economic/environmental (6%) and psychological/clinical (4%) variables were the least examined. In the academic performance theme, substance-use factors dominated (22%), followed by socio-demographics (19%), peer influences (8%), and family-related variables (6%), while “other” academic variables, such as causes of poor performance or duration of drug use, accounted for the largest single category

(34%). In the mental health theme, substance-use factors represented the largest category (37%), followed by socio-demographics (21%), family dynamics (16%), stress and acculturation (16%), and school-related factors (11%). These figures highlight a heavy emphasis on micro-level determinants across all themes, with systemic, economic, and clinical perspectives underrepresented.

Theories

Theoretical frameworks across the themes are also disproportionately weighted toward explaining behavior at the individual or family level. In the substance use theme, 21% of studies applied Social Learning Theory, 16% used Behavioral Theory, 11% Addiction Theory, and 5% Social Ecological Theory. In the academic performance theme, Social Learning Theory appeared in 31% of studies, Behavioral Theory in 19%, Addiction Theory in 13%, and Social Ecological Theory in 13%, with other theories such as cognitive and academic performance frameworks making up 25%. By contrast, in the mental health theme, 27% of studies applied Developmental Psychopathology, 18% Stress Theory, 18% general Mental Health theory, 18% Acculturation/Stress-Coping frameworks, 9% Family Systems Theory, and 9% Depression Theory. While mental health studies show somewhat greater theoretical diversity, the

Frequency Distribution of Independent Variables



overwhelming reliance across all themes on Social Learning and Behavioral theories reflects a narrow explanatory scope that neglects ecological, biological, and systemic models.

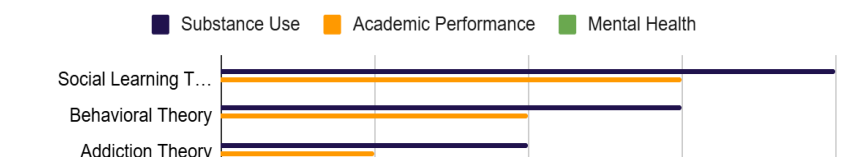
Research Hypotheses and Questions

Most research questions and hypotheses across the three themes focused on describing prevalence and associations rather than testing causal pathways or long-term outcomes. In the substance use theme, 63% of hypotheses posited that drug abuse is linked to poor academic performance, 13% focused on peer influence, and 13% addressed broader social effects. In the academic performance theme, 75% hypothesized that substance use negatively affects academic performance, 13% examined peer influence, and 13% investigated social functioning as a mediating factor. In the mental health theme, hypotheses were more distributed, with 14% each addressing family impacts, risk of mental or behavioral disorders, prevention and cultural factors, co-occurrence of mental health and substance use, and broader psychosocial outcomes. This reflects a field largely centered on identifying prevalence and correlates, while explanatory, predictive, and causal hypotheses remain rare.

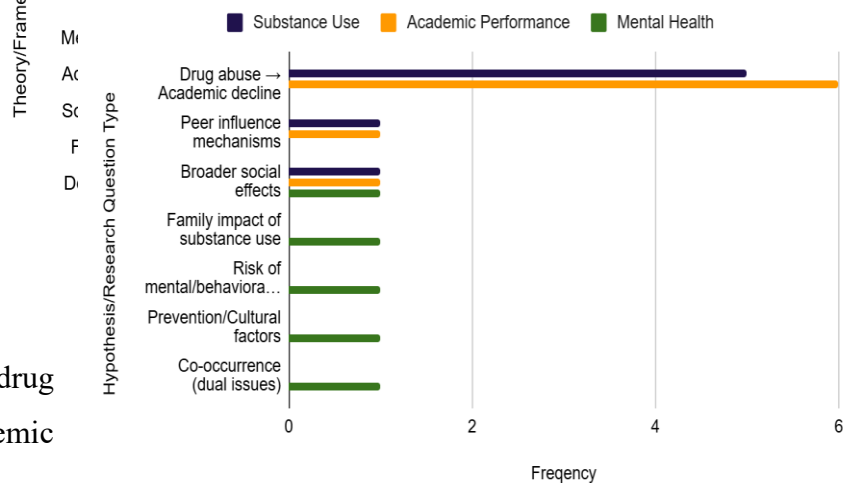
Moderating Variables

Finally, the treatment of moderating variables is underdeveloped across all themes. In the substance use theme, only 11% of studies tested gender as a moderator, 11% considered socio-demographics, and 5% assessed family dynamics; no study employed advanced statistical models for moderation. In the academic performance theme, socio-demographics were tested in 25% of studies, gender in 13%, family dynamics in 13%, and school climate in 13%, again with no use of advanced modeling. In the mental health theme, socio-demographics and family dynamics each appeared in 29% of studies, gender in 14%, and only 14% employed advanced

Frequency Distribution of Theories

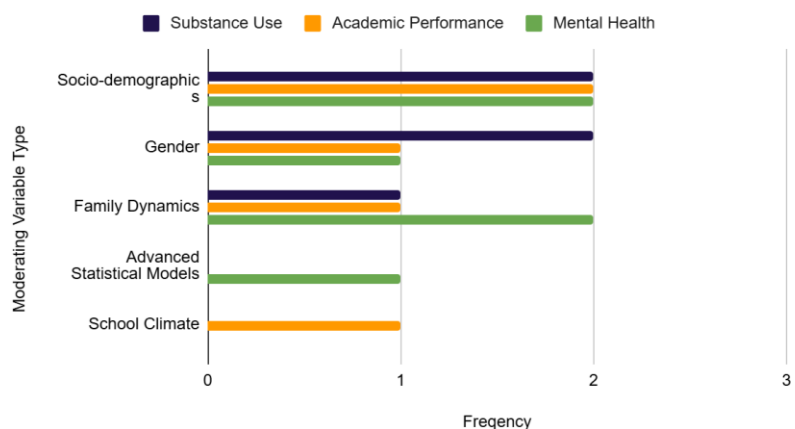


Frequency Distribution of Hypothesis



statistical models to test moderation explicitly. Overall, fewer than one-third of studies across the three themes examined moderation, meaning that the field lacks nuanced understanding of “for whom” and “under what conditions” substance use most severely affects academic or mental health outcomes.

Frequency Distribution of Moderating Variables



Discussion

Substance Abuse Gaps

Methodological Gaps

The field is characterized by a significant "snapshot bias," with cross-sectional designs dominating approximately 70% of studies. This overreliance creates a fundamental limitation, making it impossible to disentangle cause from effect or to understand the developmental trajectories of substance use. For instance, while a study may find a correlation between depression and substance use in a U.S. cohort (Connolly et al., 2024), a cross-sectional design cannot determine whether depression predisposes adolescents to substance use (as per the self-medication hypothesis) or if substance use induces neurochemical changes leading to depression. The underutilization of robust probability sampling methods, such as random at (11%) or stratified sampling, further compounds this issue by limiting the generalizability of findings and hindering the creation of a truly representative evidence base. This methodological conservatism restricts the field's ability to produce the rigorous, causal evidence required to inform effective, evidence-based policy and interventions.

Contextual Gaps

Geographically, research is heavily concentrated in a few countries: Nigeria (22%), the United States (17%), and India (17%). This creates a severe knowledge deficit for vast regions,

particularly Latin America (0% representation), despite its unique challenges related to drug production and trafficking routes. This concentration means that cultural norms, substance availability, and socio-economic drivers of use in these underrepresented regions are not captured, leading to interventions that may be culturally inappropriate or ineffective. Furthermore, the research scope remains narrowly focused on traditional substances, with a glaring absence of investigation into behavioral addictions (e.g., internet, gaming) and their potential role as gateways to or co-morbid conditions with substance abuse. This omission ignores the rapidly evolving digital landscape in which contemporary adolescent risk behaviors develop.

Empirical Gaps

There is a fundamental misalignment in the variables studied. Research is overwhelmingly focused on the "what" and "how much" documenting types (e.g., Alulu et al., 2023) and prevalence of substances (e.g., Kugbey, 2023). This comes at the expense of exploring the "why" and "how." Demographic factors dominate IV analysis (26%), while complex psychological, clinical, and neurobiological mechanisms are severely underexplored (4%). This creates a shallow understanding of the etiology of abuse. For example, while peer pressure is frequently cited, the specific cognitive and social mechanisms through which it operates are less examined. The near-total absence of research on mediating variables means we understand correlations but not the causal pathways that explain them, severely limiting the development of interventions that target these mechanisms.

Academic Performance Research Gaps

Methodological Gaps

The evidence linking substance abuse to poor academic performance is almost exclusively built on cross-sectional designs. Studies from Nigeria (Akanbi et al., 2015), Kenya (Alulu et al., 2023), and Ethiopia (Abdallah & Mohammed, 2024b) consistently find a negative correlation but cannot establish whether substance use causes academic decline, academic failure leads to substance use as a coping mechanism, or a third variable (e.g., socioeconomic status) causes both. The explicit call within the literature for longitudinal designs is critical to move beyond this impasse and establish temporal precedence, which is essential for crafting interventions that effectively break this cycle.

Contextual Gaps

While providing critical regional insights, research is hyper-concentrated in Kenya (50% of academic performance studies), Nigeria (25%), and Ethiopia (12.5%). This geographic bias limits our understanding of how this relationship functions under different educational structures (e.g., standardized national curricula vs. localized systems), policies (e.g., zero-tolerance vs. harm-reduction approaches in schools), and cultural norms surrounding both education and substance use. Findings from a study in Gatanga Sub-County, Kenya (Alulu et al., 2023), may not be transferable to urban centers in Latin America or Southeast Asia, where educational pressures and substance availability differ drastically.

Empirical Gaps

The research lens is narrowly focused on traditional academic metrics like GPA, test scores, and attendance. This ignores a wider spectrum of educational consequences that are crucial for holistic intervention. Gaps exist in understanding impacts on cognitive functions (e.g., executive functioning, memory), academic self-efficacy, school engagement, and educational aspirations. Furthermore, there is a recognized need to expand the focus beyond purely academic interventions to include non-financial support systems related to mental health counseling and family support programs (FRIN Themes), acknowledging that academic failure is often a symptom of broader psychosocial issues.

Mental Health Research Gaps

Methodological Gaps

Like other domains, the established comorbidity between substance use and mental health problems (e.g., Erskine et al., 2015; Hansen et al., 2025) is primarily documented through cross-sectional. This makes it difficult to unravel the complex, bidirectional nature of this relationship. The field urgently needs more longitudinal cohort studies (Hansen et al., 2025) to determine whether substance use precedes disorders like anxiety and depression, follows them, or if there is a shared underlying risk factor for both. Without this temporal clarity, developing integrated treatment approaches that effectively target the root of the coexisting conditions remains challenging.

Contextual Gaps

A critical ethical and empirical shortcoming is the systematic exclusion of vulnerable populations. Rural youth (5%) and out-of-school youth (5%) are starkly absent from the literature. This is a profound oversight given that these populations often face heightened minority stress, isolation, lack of access to services, and other factors that can elevate both substance use and mental health risks. By failing to include these groups, research perpetuates health disparities and generates an evidence base that is not representative of those most in need. While the research is globally diverse, it remains concentrated in specific countries, with entire regions like Latin America unrepresented.

Empirical Gaps

There is an inconsistent and insufficient examination of mediating and moderating variables. For example, while one study in Norway did test for moderation by age, gender, and socioeconomic background (BMJ Open journal, 2025), this practice is not widespread. The field lacks a robust understanding of how (mediation) substance use leads to mental health outcomes, it is through neurobiological changes, increased social isolation, or academic failure. It also fails to consistently identify for whom and under what conditions (moderation) this relationship is strongest. Does the impact of cannabis on anxiety differ for males and females? Does family support buffer the effect? Without answering these questions, interventions remain blunt instruments rather than precisely targeted tools.

Limitations

- The research relies heavily on cross-sectional designs, which makes it difficult to establish causal relationships.
- There is a significant overdependence on self-reported data, which is prone to recall bias, underreporting, and social desirability effects.
- The research underutilizes probability sampling methods, limiting the representativeness and generalizability of the findings.
- The theoretical scope is narrow, with a dominant reliance on individual-level theories rather than multi-theoretical or ecological approaches.
- Few studies consistently explore mediating and moderating variables like peer influence, family dynamics, or socioeconomic status.

- The studies are geographically concentrated in a few specific countries, which creates blind spots and limits global applicability.
- Vulnerable populations, such as rural youth and out-of-school youth, are systematically excluded from the research.
- The research is more descriptive, focusing on "what" and "how much" of the problem, rather than the deeper "why" and "how".

Recommendations for Further Research:

Theme 1 - Substance Use & Abuse

Investigate Systemic and Digital Determinants: Prioritize research on how macro-level factors (e.g., local drug policies, community resources, school climate) and digital environments (social media influence, dark web access) interact with individual behavior to influence substance use initiation and patterns.

Adopt Advanced Methodologies: Implement longitudinal cohort studies to track substance use trajectories from adolescence into adulthood. Utilize natural experiments (e.g., policy changes) and advanced causal inference methods (e.g., instrumental variables, RCTs for interventions) to establish causality.

Expand Theoretical Frameworks: Integrate multi-level theoretical models, such as Social Ecological Theory, and develop new digital-age frameworks that account for the role of technology in adolescent socialization and risk behavior.

Focus on Mechanisms: Conduct dedicated studies on mediating (e.g., how peer influence translates into use) and moderating variables (e.g., how gender or cultural identity alters risk pathways) to identify precise, high-impact intervention targets.

Prioritize Underrepresented Populations: Actively recruit and study marginalized groups (rural youths, out-of-school, refugee youth) using community-based participatory research methods to ensure interventions are equitable and effective for those most at risk.

Theme 2 - Academic Performance; Recommendations for Further Research

Conduct Global Comparative Studies: Expand research to underrepresented regions (Latin America, Asia, Europe) to examine how varying educational structures (e.g., tracked vs.

comprehensive systems) and cultural contexts moderate the impact of substance use on academic outcomes.

Implement Longitudinal and Causal Designs: Launch large-scale longitudinal studies to clarify the direction of causality. Employ innovative quasi-experimental methods (e.g., regression discontinuity designs using age thresholds) to strengthen causal claims within ethical boundaries.

Apply Sophisticated Statistical Modeling: Use Structural Equation Modeling (SEM) to test complex mediational pathways (e.g., substance use → cognitive impairment → grades) and multilevel modeling to account for nested data (students within schools within communities).

Integrate Neurobiological and Cognitive Measures: Move beyond self-reported grades to incorporate objective measures of cognitive function (executive function tasks, memory tests) to precisely map how specific substances impair the cognitive skills essential for academic success.

Explore Technology-Academic Performance Link: Research the intersection of digital substance use risks (e.g., online drug procurement) and their impact on academic engagement and performance, including the role of digital distraction and cyberbullying.

Theme 3 - Mental Health; Recommendations for Further Research

Prioritize Longitudinal and Developmental Research: Fund long-term cohort studies and utilize genetically informed designs (e.g., twin studies, Mendelian randomization) to disentangle the complex, bidirectional relationships between substance use and mental health over the adolescent developmental period.

Research Mechanisms and Processes: Conduct in-depth studies on mediating variables (e.g., trauma, sleep disruption, neuroinflammation) that explain the pathway from substance use to mental health outcomes, and moderating variables (e.g., social support, resilience) that can protect against them.

Incorporate Objective and Multi-Method Data: Triangulate self-report data with clinical interviews, biomarker assays (e.g., cortisol for stress, inflammatory markers), neuroimaging, and digital phenotyping (e.g., using smartphone data to track mood and behavior) to enhance validity.

Develop and Test Integrated Intervention Models: Move beyond siloed treatment and design research studies that test the effectiveness of integrated intervention models that simultaneously address substance use and co-occurring mental health disorders in real-world settings like schools and community clinics.

Focus on Under-Researched Populations and Cultures: Investigate the unique mental health-substance use dynamics within specific cultural contexts (e.g., acculturative stress in immigrant youth) and among marginalized groups who may experience unique stressors and barriers to care.

Synthesis of Overall Suggestions for Further Research

The analysis across all documents reveals a collective narrative: while existing research has effectively identified key correlates and broad patterns of adolescent substance use, it is constrained by significant theoretical, methodological, and demographic limitations. To advance the field, a paradigm shift is required. Future research must be:

Multi-Level and Systemic: Shift focus from predominantly individual-level risk factors to investigate how environmental (school climate, neighborhood safety), structural (poverty, policy), and digital (social media, online access) systems interact to create or mitigate risk. This demands the adoption of theoretical frameworks like Social Ecological Theory.

Methodologically Rigorous and Innovative: Overcome the critical limitation of cross-sectional designs by prioritizing longitudinal and causal inference research (e.g., natural experiments, RCTs). Integrate mixed methods (qualitative to explain quantitative findings) and leverage technology-enhanced tools (ecological momentary assessment, digital trace data, biomarkers) for more objective, real-time measurement.

Equity-Centered and Inclusive: Actively address the severe underrepresentation of marginalized populations (rural, out-of-school, refugee youth) and geographic regions (Latin America, Asia). Employ community-based participatory research to ensure studies are culturally relevant and produce an evidence base that serves all adolescents, not just the most accessible.

Mechanism-Focused: Move beyond establishing association to meticulously unpack the mediating and moderating variables that explain the "how" and "for whom" substance use leads to negative outcomes. This is essential for developing targeted, effective, and nuanced interventions.

Interdisciplinary and Translational: Foster collaboration across public health, neuroscience, education, social work, and data science. Research should be designed not just for publication but for direct application, informing the development of culturally responsive, multi-sectoral policies and interventions that can be implemented in schools, communities, and healthcare systems.

By embracing these synthesized priorities, future research can generate the robust, actionable evidence needed to design effective, equitable, and comprehensive strategies to address the complex challenge of adolescent substance abuse.

Conclusion

This review indicates that substance abuse among students and youth is a wide-ranging global problem with serious consequences for academic achievement, psychological health, and continued development. Despite a growing corpus of data, the field remains circumscribed by methodological constraints-particularly an over-reliance on cross-sectional designs-theoretical narrowness, and the systematic exclusion of marginalized populations and underrepresented regions. To adequately respond to this challenge, future research must adopt longitudinal, multi-level, and inclusive approaches. Only such a paradigm shift can foster targeted, evidence-based interventions capable of reducing the devastating effects of substance abuse and protecting the potential of young people worldwide.

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