Substance Use Initiation and Accessibility in Students of the College of Medicine, Ambrose Alli University, Ekpoma.

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Abstract

Background: Secondary school represents the dominant context for substance use initiation across most drug categories in Nigeria, yet the specific patterns of onset age and educational setting at first use among medical students — a high-risk group whose training trajectory extends risk exposure beyond this period — remain poorly characterized. Understanding initiation trajectories is critical for designing appropriately timed prevention interventions. Objectives: To describe the age of first use and educational level at which substances were first used for tobacco, alcohol, cannabis, amphetamine, tranquilizers, and sedatives among medical students at Ambrose Alli University (AAU), Ekpoma, Edo State, Nigeria, and to determine the overall prevalence of substance use across lifetime, past-year, and current timeframes. Methods: A cross-sectional descriptive study was conducted between September and October 2010 among 370 pre-clinical and clinical medical students of AAU and the Irrua Specialist Teaching Hospital. Data was collected using a self-administered modified WHO Student Drug Use Survey Questionnaire. Frequency distributions and percentages were used to describe patterns of initiation by age band and educational level. Results: Alcohol was the most reported substance with a lifetime prevalence of 62.2% (n = 230), followed by tobacco (15.9%), tranquilizers (6.8%), cannabis (5.7%), and amphetamine (5.7%). Sedative and opiate use were rare. Alcohol onset peaked at 15 to 18 years, with secondary school as the most common educational setting for first tobacco (40.6%) and alcohol (42.6%) use. Cannabis initiation was concentrated at 15 to 18 years, while amphetamine and tranquilizer onset more frequently began between 19 and 22 years, corresponding to the pre-clinical university period. Sedative use was more likely to begin at the clinical level. Conclusion: Substance use initiation among medical students in Edo State predominantly occurs during secondary school, with alcohol and tobacco representing the earliest and most commonly initiated substances. These findings support the need for school-based prevention programmes beginning at the secondary level, and continued vigilance during the pre-clinical university transition period.

Keywords: *Substance use initiation, age of onset, medical students, Edo State, Nigeria*

Introduction

A central but underexplored dimension of substance use epidemiology is not simply whether people use substances, but when and in what context they begin. Age at first use is consistently identified as one of the strongest predictors of long-term substance use disorder, with earlier onset associated with heavier use, greater dependence, and poorer treatment outcomes.[1,2] In Nigeria, the available evidence points to secondary school as the dominant period of substance initiation. Soremekun et al.[3] in Lagos documented substantial alcohol and tobacco use among secondary school students, and Azi and Maduka[4] in Rivers State found that peer pressure, curiosity, and boredom were the most cited reasons for first use among junior secondary school students, typically aged 12 to 16 years. That use should begin early, before individuals have entered higher education, has important implications for where prevention resources should be directed.

The gateway model of substance progression holds that early use of licit substances, particularly alcohol and tobacco, lowers the psychological and social barriers to subsequent use of illicit drugs.[5,6] This model has found support in multiple settings, with alcohol appearing to function as an entry point after which other substances

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become accessible through the same peer networks.[7] However, the developmental specificity of this pathway — which substances are first accessible at which educational levels — remains poorly characterized in Nigerian medical student populations specifically. This gap is important to address because, although the dominant period of initiation may precede medical school, the medical student cohort represents a uniquely high-risk group: individuals who have already passed through the secondary school initiation window with established use patterns enter a training environment that extends both the duration and the intensity of risk exposure. Understanding when and under what circumstances was first established in this group therefore informs not only retrospective prevention strategy but also the design of targeted support during their current training trajectory. The general university literature suggests that while secondary school represents the dominant initiation context for alcohol and tobacco, illicit drugs and prescription stimulants tend to be introduced later, during the university years, reflecting the distinct social networks and access structures of higher education.[8,9]

Medical students occupy a specific position within this developmental framework. Unlike general university students, they follow a structured and elongated training trajectory that itself creates distinct vulnerability windows. The medical training programme, characterized by intense academic pressure and social adjustment, has been associated with stimulant use for cognitive enhancement. This association operates through several intersecting mechanisms. First, the demanding volume of preclinical coursework — spanning anatomy, physiology, biochemistry, pharmacology, and pathology within compressed timelines — creates a performance environment in which students perceive pharmacological aids as necessary rather than optional. Second, sleep deprivation arising from extended study hours reduces cognitive performance, and stimulants such as amphetamines and caffeine-based compounds are used to counteract this impairment. Third, examination-driven academic cultures in Nigerian medical schools generate episodic peaks of extreme pressure around professional examinations, during which stimulant use is most likely to be initiated or escalated. Unlike recreational drug use, stimulant initiation in this context is instrumental: it is framed by users as a response to an academic demand rather than a social behaviour, which may lower the perceived risk threshold and reduce the effectiveness of general substance use messaging that does not address performance pressure specifically.[10] The clinical phase, in which students gain direct access to hospital environments and prescription medications, introduces an entirely new route of substance accessibility, particularly for prescription anxiolytics and sedatives, that is not available to students in other faculties.[11]

Understanding which substances are first used at which stage of the educational trajectory, and what mechanisms of access are involved, is essential for prevention and monitoring efforts appropriately. This study was therefore conducted to describe the age of onset and educational context of first use for tobacco, alcohol, cannabis, amphetamines, tranquilizers, and sedatives, alongside the overall lifetime, past-year, and current prevalence of use.

Materials and Method

This was a cross-sectional descriptive study examining patterns of substance use initiation and overall prevalence of psychoactive substance use among medical students of Ambrose Alli University (AAU), Ekpoma, Edo State, Nigeria.

The study was conducted at the College of Medicine, Ambrose Alli University, Ekpoma, and the Irrua Specialist Teaching Hospital (ISTH), Irrua, both in Edo State, Nigeria. Ekpoma is situated in the South-South geopolitical zone, approximately 100 kilometres from Benin City. Pre-clinical medical training (years 1 to 3) is carried out on the main university campus in Ekpoma, while clinical training (years 4 to 6) takes place at ISTH, Irrua. At the time of the study, the total medical student population was approximately 430.

All consenting medical students enrolled in the pre-clinical and clinical programmes (200 to 600 level) were eligible to participate. A minimum sample size of 196 was calculated based on a previously reported lifetime substance use prevalence of 85% among Nigerian medical students (95% confidence interval, precision level 0.05), though the decision was taken to include all available students.

Data were collected using a modified version of the World Health Organization (WHO) Student Drug Use Survey Questionnaire, validated for use across diverse sociocultural settings, with high reliability and validity demonstrated in Nigerian pilot studies.[11,12] The instrument captured age at first use and educational level at which substances were first used for each drug category.

A pilot study was first conducted with 38 students drawn from the target population. Questionnaires were administered to students in each class during free periods, without peer discussion. All questionnaires were collected immediately upon completion. No names or matriculation numbers were recorded to preserve confidentiality.

Data were entered and analyzed using SPSS version 25.0. Descriptive statistics, specifically frequency distributions and percentages, were used to summarize prevalence rates across lifetime, past-year, and current timeframes, as well as patterns of initiation by age band and educational level. Results are presented as proportions of those who reported ever using each substance.

Ethical written approval was obtained from the Health Research and Ethics Committee before commencement of the study. Written informed consent was obtained from each participant. Participation was entirely voluntary, and all data was handled in strict confidence.

Results

Overall Prevalence of Substance Use (Table 1)

Alcohol was the most reported substance, with a lifetime prevalence of 230 (62.2%), followed by tobacco at 59 (15.9%), tranquilizers at 25 (6.8%), cannabis at 21 (5.7%), and amphetamines at 21 (5.7%). Sedative and opiate use were rare, each reported by fewer than 3% of respondents. Past-year prevalence was highest for alcohol at 167 (45.1%), and current use followed the same hierarchy.

Table 1: Prevalence of Substance Use by Timeframe (N = 370)

Substance	Lifetime n (%)	Past Year n (%)	Current/Past Month n (%)
Tobacco	59 (15.9)	20 (5.4)	11 (3.0)
Alcohol	230 (62.2)	167 (45.1)	78 (21.1)
Cannabis	21 (5.7)	8 (2.2)	5 (1.4)
Amphetamine	21 (5.7)	4 (1.1)	2 (0.5)
Tranquilizers	25 (6.8)	12 (3.2)	0 (0.0)
Sedatives	6 (1.6)	6 (1.6)	4 (1.1)
Other Opiates	10 (2.7)	6 (1.6)	4 (1.1)

Cells shown (%).

Table 2: Age and Educational Level at First Drug Use in Relation to Lifetime Drug Use (N = 370)

ariable	Tobacco n(%)	Alcohol n(%)	Cannabis n(%)	Tranq. n(%)	Amphet. n(%)	Sedatives n(%)
Age at First Use (years)						
<10	11 (18.6)	37 (16.1)	1 (4.8)	0 (0.0)	0 (0.0)	0 (0.0)
11–14	12 (20.3)	36 (15.7)	1 (4.8)	0 (0.0)	1 (4.8)	2 (33.3)
15–18	13 (22.0)	92 (40.0)	12 (57.1)	5 (20.0)	5 (23.8)	1 (16.7)
19–22	19 (32.2)	56 (24.4)	7 (33.3)	12 (48.0)	16 (76.2)	2 (33.3)
>22	4 (6.8)	9 (3.9)	0 (0.0)	8 (32.2)	0 (0.0)	1 (16.7)
Educational Level at First Use						
Primary school	12 (20.3)	38 (16.5)	1 (4.8)	0 (0.0)	1 (4.8)	0 (0.0)
Secondary school	24 (40.6)	98 (42.6)	7 (33.3)	8 (32.0)	9 (42.9)	2 (33.3)
Pre-Clinical	14 (23.7)	56 (24.4)	9 (43.0)	8 (32.0)	8 (38.1)	0 (0.0)
Clinical	3 (5.1)	12 (5.2)	0 (0.0)	5 (20.0)	5 (23.8)	3 (50.0)
Others †	6 (10.2)	26 (11.3)	2 (9.5)	4 (16.0)	2 (9.5)	1 (16.7)

†Others = Pre-degree, Advanced Level Certificate, First Degree undergraduate. Cells show n (%).

Age and Educational Level at First Drug Use (Table 2)

Most substances were first used between 15 and 18 years. Alcohol onset peaked at 15 to 18 years, reported by 92 (40.0%) of lifetime alcohol users, while tobacco initiation most occurred between 19 and 22 years, reported by 19 (32.2%) of lifetime tobacco users. Cannabis initiation was concentrated at 15 to 18 years, reported by 12 (57.1%) of lifetime cannabis users. Amphetamine use more frequently began between 19 and 22 years, reported by 16 (76.2%), corresponding to the university pre-clinical period. Tranquilizer initiation showed a bimodal pattern, with peaks at 15 to 18 years (20.0%) and 19 to 22 years (48.0%), with an additional 32.2% initiating after 22 years, suggesting a distinctly later onset than other substances. Sedative use was most initiated between 11 and 14 years (33.3%) and between 19 and 22 years (33.3%)

Regarding educational level at first use, secondary school was the most common setting for first tobacco use in 24 (40.6%) of ever-users, and first alcohol use in 98 (42.6%) of ever-users. Cannabis initiation was most common at the pre-clinical university stage, reported by 9 (43.0%) of cannabis users, followed by secondary school at 7 (33.3%). Amphetamine use also predominantly began

during secondary school in 9 (42.9%), with a notable proportion (38.1%) initiating during pre-clinical years. Tranquilizer use was distributed across secondary school (32.0%), pre-clinical (32.0%), and clinical (20.0%) years. Sedative initiation was most common at the clinical level, in 3 (50.0%) of sedative users, suggesting that access within the clinical hospital environment may facilitate sedative exposure.

Substance Use by Hostel Residence (Table 3)

For the purposes of this analysis, hostel residents were defined as students residing in university-owned or university-affiliated on-campus accommodation at either the Ekpoma main campus or the ISTH Irrua campus, while non-residents comprised students living in off-campus private accommodation or family homes. Hostel residents consistently reported higher substance use than non-residents across all substances and timeframes. Lifetime alcohol use was 154 (41.6%) among hostel residents compared to 76 (20.5%) among non-residents. Tobacco followed a similar pattern, with 35 (9.5%) of hostel residents reporting lifetime use versus 24 (6.5%) of non-residents. For cannabis, 12 (3.3%) of hostel residents and 9 (2.5%) of non-residents reported lifetime use, while tranquilizer lifetime prevalence was 16 (4.3%) versus 9 (2.4%) respectively. The hostel-non-hostel gradient was present for all substances including amphetamines, sedatives, and other opiates, though differences did not reach statistical significance for any individual substance.

Table 3: Substance Use by Hostel Residence (N = 370)

Substance	Hostel Lifetime (%)	Non-Hostel Lifetime (%)	Hostel Past Year (%)	Non-Hostel Past Year (%)	Hostel Current (%)	Non-Hostel Current (%)
Tobacco	35 (9.5)	24 (6.5)	13 (3.5)	7 (1.9)	6 (1.6)	5 (1.4)
Alcohol	154 (41.6)	76 (20.5)	113 (30.5)	54 (14.6)	44 (11.9)	34 (9.2)
Cannabis	12 (3.3)	9 (2.5)	5 (1.4)	3 (0.8)	3 (0.8)	2 (0.5)
Amphetamine	12 (3.3)	9 (2.5)	3 (0.8)	1 (0.3)	2 (0.5)	0 (0.0)
Tranquilizers	16 (4.3)	9 (2.4)	7 (1.9)	5 (1.4)	0 (0.0)	0 (0.0)
Sedatives	4 (1.1)	2 (0.5)	4 (1.1)	2 (0.5)	3 (0.8)	1 (0.3)
Other Opiates	6 (1.6)	4 (1.1)	4 (1.1)	2 (0.5)	3 (0.8)	1 (0.3)

Cells show n (%). No association reached statistical significance (p > 0.05) for any individual substance.

Alcohol Use by Monthly Allowance (Table 4)

Monthly allowance was significantly associated with current alcohol use ($\chi^2 = 17.695$, p = 0.002). Students in the lowest allowance band (<₦11,000) reported the highest lifetime alcohol prevalence at 125 (33.7%) and the highest current use at 43 (11.6%), exceeding all higher allowance groups. Students receiving ₦11,000–15,000 per month reported lifetime and past-year use of 50 (13.5%) and 34 (9.2%) respectively. Past-year and current use were lowest in the ₦16,000–20,000 band, with lifetime use of 22 (6.0%) and current use of only 1 (0.3%).

Table 4: Alcohol Use by Monthly Allowance (N = 370)

Monthly Allowance (₦)	Lifetime n (%)	Past Year n (%)	Current n (%)
<11,000	125 (33.7)	92 (24.9)	43 (11.6)*
11,000–15,000	50 (13.5)	34 (9.2)	21 (5.7)
16,000–20,000	22 (6.0)	19 (5.1)	1 (0.3)
>20,000	33 (8.9)	22 (5.9)	13 (3.5)

**** Statistically significant (p = 0.002 for current use, χ^2 = 17.695). Cells show n (%).***

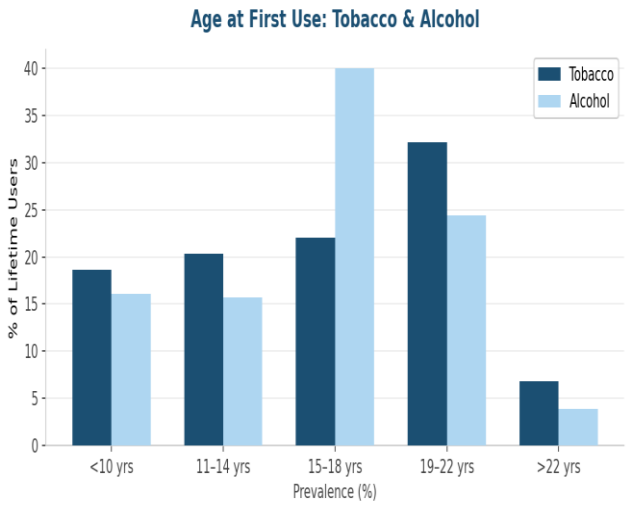

Figure 1: Proportion of lifetime tobacco and alcohol users reporting first use within each age band (N = 370).

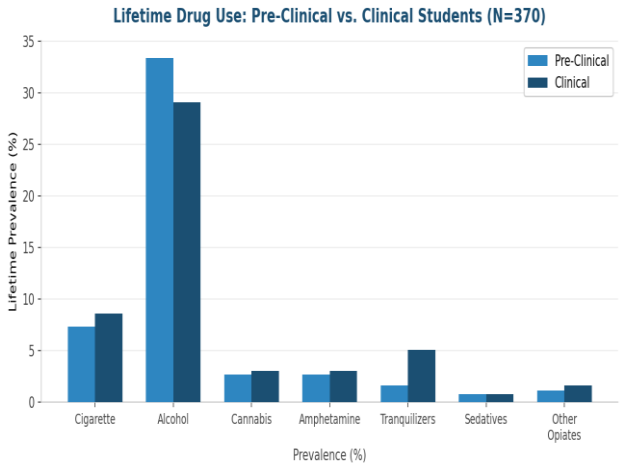

Figure 2: Lifetime drug use prevalence comparing pre-clinical and clinical medical students (N = 370).

Discussion

This study mapped the age of onset and educational context of first substance use among 370 medical students at Ambrose Alli University, Ekpoma, providing the first systematic characterization of initiation trajectories in this population. The most notable finding is that secondary school is the dominant entry point for both tobacco and alcohol, the two most widely used substances, with approximately four in ten ever-users of each substance reporting first use during secondary school. This is consistent with Nigerian population data from Lagos and Rivers State, where Soremekun et al.[3] and Azi and Maduka[4] both documented that secondary school students are actively being initiated into substance use, and that the average age of onset falls within the 15 to 18 year band, precisely the period that corresponds to senior secondary school attendance.

The particularly early initiation of alcohol is worth emphasizing more than one in three lifetime alcohol users in this study reported first use before the age of 15, and 16.5% reported first use during primary school. Early initiation of alcohol before age 15 is associated with a substantially elevated lifetime risk of alcohol use disorder and with faster progression to other substances, consistent with the gateway hypothesis as articulated by Nkansah-Amankra and Minelli.[6] That so many medical students in this study had already been introduced to alcohol during their primary school years speaks to a public health environment in which alcohol is normalized and accessible far earlier than formal regulations permit. Coomber et al.[13] have argued that the social supply of alcohol, mediated through family and community rather than commercial channels, largely drives early initiation in contexts like Nigeria, where monitoring of alcohol sales to minors is inconsistent.

Cannabis initiation diverged markedly from alcohol and tobacco, with the pre-clinical university period rather than secondary school being the most common context for first use. This pattern aligns with the general West African literature: Bollom et al.[14] in Guinea-Bissau found that cannabis use was more strongly concentrated in older adolescents and young adults than alcohol, and Nawaz and Akhter[15] similarly noted that illicit substance use in university students tended to follow a distinct peer network dynamic that differs from the family and community transmission pathways more relevant to alcohol. The pre-clinical medical school environment, characterized by close peer cohorts, social stress, and greater autonomy from parental oversight, appears to provide a similar social context. The finding that over 43% of cannabis users first used the substance during pre-clinical years points to this transitional period as a specific intervention window.

Amphetamine initiation was concentrated almost entirely between 19 and 22 years, with 76.2% of lifetime amphetamine users reporting first use in this band, which maps closely to the pre-clinical medical student age range. The leading explanation is cognitive enhancement: the demanding pre-clinical curriculum creates strong incentives for students to seek pharmacological aid for concentration and wakefulness, and amphetamine-type stimulants are commonly perceived among university students as performance-enhancing agents. Idoko et al.[16] in Enugu, among medical students specifically identified academic pressure and the desire to improve examination performance as drivers of stimulant use in this population, and Agbo et al.[17] in Anambra found that psychostimulant use increased significantly as students progressed through university. These findings suggest that pre-clinical medical training itself creates demand for stimulants independent of prior use history. The transition from caffeine-based stimulants to amphetamine-type agents likely follows an escalation pathway driven by perceived tolerance and inadequacy of milder stimulants. Caffeine, available cheaply and legally in energy drinks, coffee, and over-the-counter caffeine tablets, is typically the first substance students employ to manage fatigue and extend study hours; this represents the socially normalised entry point. As the demands of pre-clinical coursework intensify, particularly around major examinations, students who find caffeine insufficient may seek more potent pharmacological alternatives. Amphetamine-type stimulants, which produce more pronounced and

prolonged wakefulness and concentration effects, are the next step in this progression. The peer networks of pre-clinical medical schools, where knowledge of pharmacological agents is greater than in other student populations, may facilitate awareness of and access to these alternatives. The data in this study, showing that 76.2% of amphetamine initiators first used between 19 and 22 years, are consistent with this escalation timeline, as this age range corresponds precisely to the maximum pre-clinical academic pressure.

The initiation profile for tranquilizers and sedatives is perhaps the most clinically significant finding of this study. Tranquilizers showed a distinctly late and distributed onset, with 48% first using between 19 and 22 years and a further 32% after age 22, and 20% of ever-users first using during the clinical years specifically. Sedative initiation was most reported at the clinical level. This pattern cannot be explained by peer network transmission or recreational demand in the way that secondary school alcohol or pre-clinical amphetamine use can be. Rather, it points to institutional accessibility as the operative mechanism: clinical students gain physical proximity to these medications through hospital rotations, familiarity through pharmacology training, and in some cases direct access through dispensing contexts. Babalola et al.[18] and Aguocha and Nwefoh[19] both flagged elevated tranquilizer and sedative use among clinical students but did not map when initiation occurred; the present data suggest the clinical environment itself is the initiating context for a substantial proportion of users of these drugs. An additional interpretive possibility deserves consideration: the late initiation of tranquilizers and sedatives among clinical students may represent a pattern of substance escalation rather than de novo initiation.

Having previously used stimulants for wakefulness and performance during pre-clinical training, some students may subsequently seek sedating agents to manage the rebound effects of stimulant use, including insomnia, anxiety, and hyperarousal. This step-up from stimulants to depressants mirrors patterns described in the general substance escalation literature and suggests that tranquilizer and sedative use in clinical students may not be simply an opportunistic response to institutional access but may also reflect a progressive pharmacological adaptation driven by prior stimulant exposure.

Taken together, these findings outline a developmental staging of substance initiation that is specific to the Nigerian medical training context. Alcohol and tobacco are pre-medical school problems, established largely in secondary education. Cannabis and amphetamines are early university problems, concentrated in the transitional pre-clinical years. Prescription drug misuse is a clinical training problem, facilitated by institutional access. Each stage requires a distinct response: broad community and school-based interventions for alcohol and tobacco before students reach university; orientation and peer-support programmes targeting stimulant and cannabis use at medical school entry; and pharmacy access controls and mental health support during clinical rotations.

Two structural accessibility findings merit specific attention. Hostel residents reported consistently higher substance use than non-residents across all seven substances, with the gradient most pronounced for alcohol, where lifetime prevalence among hostel residents was double that of non-residents (41.6% versus 20.5%). Campus residential environments concentrate peer networks, reduce parental oversight, and increase social exposure to substance use norms in ways that are not replicated in off-campus living. Henneberger et al.[20] identified peer social networks as a primary structural driver of narcotics susceptibility in adolescents, and the hostel finding in the present data is consistent with that framework applied to the university residential context. Although none of the individual hostel-substance associations reached statistical significance, likely reflecting limited power with small cell counts for less common substances, the consistent direction of the gradient across all substances strengthens the case for a genuine environmental effect.

The monthly allowance finding for alcohol presented an unexpected pattern: current alcohol use was highest among students in the lowest allowance band (<₦11,000), not among the most economically privileged. This likely reflects differential access to cheap or informally produced alcohol, including local brews and sachet spirits, which are widely available in Edo State at prices accessible even to financially constrained students. This is consistent with the normalization of drug supply argument advanced by Coomber et al.[13], who noted that social and community supply channels, rather than formal commercial channels, often determine access for lower-income users. The implication is that economic deprivation does not protect against alcohol use where informal supply structures fill the gap; rather, it may shape the form and pattern of consumption toward cheaper, less regulated products with greater associated health risks. Among

medical students specifically, the additional factor of prescription drug accessibility introduces a peculiarity absent from the general student population. Beyond the informal supply channels relevant to all low-income students, clinical medical students possess institutional proximity to pharmacies, dispensing units, and prescription pads that creates a parallel route of access not available in other faculties. This asymmetry means that while economic constraint may shape the type of substance accessed by medical students in common with other low-income peers, their occupational environment provides a distinct and largely unmonitored supplementary supply pathway for prescription substances.

Limitations

The primary limitation of this study is the reliance on retrospective self-reports for age at first use. Recall of the specific age and educational context of initiation, particularly for substances first used ten or more years before data collection, is subject to telescoping and memory distortion. Social desirability bias is particularly likely to affect reporting of illicit substance use and may disproportionately affect female respondents and those with high religiosity, potentially underestimating initiation rates in these groups.

Conclusions

Substance use initiation among medical students in Edo State follows a discernible developmental sequence: alcohol and tobacco are predominantly established during secondary school, cannabis and amphetamines during the pre-clinical university period, and prescription tranquilizers and sedatives during clinical training, where institutional access is the most plausible driver. This staging has direct implications for intervention design. Efforts targeting alcohol and tobacco must reach students before they enter higher education. Programmes addressing cannabis and stimulant use must be integrated into the medical school entry experience. Monitoring prescription drug misuse must be embedded within the clinical training environment itself. This is a non-trivial challenge: clinical students are uniquely positioned to obscure prescription drug acquisition by presenting as proxy purchasers for patients, a plausible cover that is difficult to distinguish from legitimate patient-assistance behaviour. Effective monitoring therefore requires systems-level rather than individual-level approaches, including prescription tracking software that flags unusual dispensing patterns associated with student-linked transactions, random pharmacy audit protocols, and the integration of substance use screening into routine clinical supervision rather than standalone screening events.

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