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INTEGRATED STUDY MASTER'S THESIS

Attitudes Towards Drug Use and Psychoses Among University Students:

Cross-Cultural Comparisons

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ABSTRACT

EN:

In emerging adulthood, a period characterized by exposure to psychoactive substances, is also the time when psychotic disorders tend to first appear. This dissertation aims to synthesize empirical evidence related to four key areas of study (a) drug usage patterns among university students; (b) psychological/cultural variables affecting students' attitudes toward psychoactive substance usage; (c) familiarity of university students with signs/symptoms of psychosis and the degree of stigma associated with it; and (d) the relationships between psychoactive substance use (specifically cannabis/stimulant use), and psychosis.

Given the large amount of variability in social law, moral code, and stigmatizing systems around the globe, emphasis was placed on creating an international model for research. The primary substance of choice for illicit substance use among college students across Europe and the rest of the world was determined to be cannabis. However, both polydrug use and party-drug, inhalant and prescription misuse was recognized as substantial risks for various groups.

Additionally, there was strong evidence supporting that heavy/frequent cannabis use had the greatest association with psychosis risk; especially dose-response associations. It appears that substance-induced psychosis represents a type of bridge-state for individuals who develop schizophrenia-spectrum disorders with a considerable likelihood of transitioning to these diagnoses.

Overall, this dissertation supports the idea that universities/colleges should regard psychoactive substance use and psychosis prevention as a single health issue facing campuses using strategies that include harm-reduction, identification of early indicators of psychotic symptoms, and reducing stigma through culturally-competent approaches.

LT:

Besiformuojančios suaugystės laikotarpis, kuriam būdingas didesnis psichoaktyviųjų medžiagų vartojimo paplitimas, taip pat yra tas gyvenimo etapas, kai dažniausiai pirmą kartą pasireiškia psichoziniai sutrikimai. Šios disertacijos tikslas – apibendrinti empirinius duomenis, susijusius su keturiomis pagrindinėmis tyrimų sritimis: (a) psichoaktyviųjų medžiagų vartojimo tendencijomis tarp universitetų studentų; (b) psichologiniais ir kultūriniais veiksniais, darančiais įtaką studentų požiūriui į psichoaktyviųjų medžiagų vartojimą; (c) universitetų studentų žiniomis apie psichozės požymius ir

simptomus bei su tuo susijusios stigos lygiu; ir (d) ryšiu tarp psichoaktyviųjų medžiagų vartojimo (ypač kanapių ir stimuliantų vartojimo) ir psichozės.

Atsižvelgiant į didelę socialinių normų, teisinių sistemų, moralinių vertybių ir stigmatizacijos skirtumų įvairovę pasaulyje, tyrime ypatingas dėmesys buvo skirtas tarpkultūrinės analizės modeliui. Nustatyta, kad dažniausiai tarp universitetų studentų Europoje ir kitose pasaulio šalyse vartojama nelegali psichoaktyvioji medžiaga yra kanapės. Tačiau taip pat buvo nustatyta, kad polinarkotinių medžiagų vartojimas, vakarėlių narkotikų, inhaliantų bei receptinių vaistų netinkamas vartojimas kelia reikšmingą riziką tam tikroms studentų grupėms.

Be to, buvo rasta stiprių įrodymų, kad intensyvus ir dažnas kanapių vartojimas yra labiausiai susijęs su padidėjusia psichozės rizika, ypač nustatant dozės ir atsako ryšį. Taip pat nustatyta, kad medžiagų sukeltos psichozės gali veikti kaip tarpinė būseną asmenims, kurie vėliau išsivysto į šizofrenijos spektro sutrikimus, kadangi egzistuoja reikšminga tikimybė pereiti į šias diagnozes.

Apibendrinant galima teigti, kad ši disertacija pagrindžia požiūrį, jog universitetai ir kolegijos turėtų psichoaktyviųjų medžiagų vartojimą ir psichozės prevenciją vertinti kaip vieningą sveikatos problemą universitetų aplinkoje. Tam būtina taikyti žalos mažinimo strategijas, ankstyvųjų požymių atpažinimą bei laiku prieinamas psichikos sveikatos intervencijas.

1 INTRODUCTION

Substance abuse by college students has been an ongoing problem for many years and continues to evolve. For many students the transition from high school to college is accompanied by "emerging adulthood," which is defined as a time in development characterized by greater independence, novelty-seeking behavior and peer influence than previously experienced. All these elements contribute to the potential for experimentation with psychoactive substances. Additionally, in college settings social drinking and marijuana are often accepted or encouraged and "party drugs" may be accessible.

While there is no specific correlation between substance abuse and developing Schizophrenia Spectrum Disorders (SSD), the majority of SSDs have their onset in late adolescence and/or young adulthood. According to the World Health Organization, the majority of individuals diagnosed with a SSD have their first episode during late adolescence and/or young adulthood. The vast majority of individuals who develop a SSD will incur substantial impairment throughout their lives. This includes educational and other areas of functioning. There are several reasons why substance abuse is relevant to the study of SSD. First, both substance use and neurodevelopmental vulnerabilities can create conditions under which stress is exacerbated. Second, even occasional substance use can lead to transient psychotic episodes after acute intoxication, and in some instances, substance-induced psychosis may occur prior to the development of a primary psychotic disorder.

The purpose of this dissertation is not simply to identify whether students use drugs, but to examine how students conceptualize, assess, and describe drug use and psychosis. Students' attitudes about drugs determine their intentions/behaviors regarding drugs. However, they also affect help-seeking, risk assessment, and stigma. When viewed as low-risk and socially acceptable in permissive environments, students may perceive cannabis as such. Conversely, when seen as unacceptable by others in restrictive environments, students may deny using drugs in public yet face social pressures and curiosity regarding drugs. Therefore, cross-cultural comparisons are critical as legal consequences, social desirability bias and moral norms can impact both the frequency of use of psychoactive substances and the degree to which students provide truthful answers on surveys or through interviews.

This dissertation provides a synthesis of published studies and governmental documents to investigate three research questions:

- (1) What patterns of psychoactive substance use exist among university students in various cultural settings?

(2) What variables psychologically, sociologically and culturally determine students' perspectives regarding the risks involved with drug use?

(3) What empirical research exists to support that substance exposures particularly those related to cannabis and amphetamines used by college students contribute to psychotic outcomes?

2 LITERATURE REVIEW

2.1 DRUG USE AMONG UNIVERSITY STUDENTS

Many studies have shown that college students are one of the highest-risk populations when it comes to using drugs. College surveys from many different countries show that the most commonly used psychoactive substance among young adults is alcohol. Cannabis is second.

The "types" of "student drug use", or what substances students consume, can depend upon several factors including availability; price; legality; campus norms; and local nightlife.

For example, in Germany, researchers conducted an online survey of over 3,991 students at the University of Mainz and reported that 14.9% smoked cigarettes; 38.6% engaged in risky drinking (using AUDIT-C criteria); and 10.9% smoked marijuana. (Hoff et al., 2023).

Most importantly, they noted that health-behavior related variables, and use of other substances, were powerful predictors of each outcome, indicating a clustering of risk behaviors versus individualized use patterns.

A "bundle" model is consistent with these findings. Students who participate in substance use behaviors (i.e., smoking, heavy drinking, etc.) will statistically be more likely to partake in other substance-use behaviors (e.g. marijuana, prescription pills). These findings also provide important information for designing effective prevention strategies.

Kunst & Gebhardt's (2018) study assessed party-drug use among a sample of n=446 Dutch university students. The results showed that 22.9% of the participants had experienced some form of party-drug use at least once during their lives. Notably, there was a large sex difference. Men (39.2%) reported greater rates of party-drug use compared to women (16.2%).

Although serious adverse effects were rare, mild problems were prevalent and multi-substance use occurred in significant proportions, highlighting how student use may be integrated into social

recreational "partying" settings where multiple substances being consumed together may be considered acceptable.

2.2 TYPES OF PSYCHOACTIVE SUBSTANCES USED BY STUDENTS

Although cannabis and alcohol are the two main substances represented for most students there are various other substances present on an ad-hoc basis. In Dutch student populations, ecstasy/MDMA is another major club/party drug which can also include amphetamine/cocaine and "new psychoactive substances" (NPS), and NPS appears to be as prevalent as some of the more established stimulants. (Kunst & Gebhardt, 2018).

In addition to the Netherlands, other European cohorts have identified inhalants (nitrous oxide/popper) as being more prominent in their students' lifetime exposure patterns than those in North America. Prescription drug misuse has been reported more frequently in North American cohorts. It would be helpful to differentiate at least four different types of functional categories of student substance use:

- (1) Social/recreational substances (alcohol, cannabis; often used in parties or informal gatherings),
- (2) Party stimulants (MDMA, cocaine, amphetamines; often linked to clubs/festivals),
- (3) "Study drugs" or performance-oriented misuse (nonmedical stimulant use),
- (4) Regionally salient substances shaped by local availability and norms (e.g., inhalants in some student scenes).

The above categorizations illustrate how "the prevalence of drug use" cannot be viewed as one issue. Each class of substance carries its own risk for physical harm, risk for developing dependency and relationship with psychotic episodes based upon the characteristics of each individual's use (i.e. frequency, potency, etc.); additionally, it should be noted that age of first time usage will impact all of these issues.

2.3 PSYCHOLOGICAL AND SOCIAL FACTORS INFLUENCING DRUG USE

Student drug use is influenced by an array of influences at different levels. On an individual basis, characteristics like impulsivity and sensation seeking have been consistently associated with

experimentation on party drugs, especially. In addition, the Dutch Party Drug Study identified differences in personality traits and impulsivity between lifetime users of party drugs and those who had never used them. (Kunst & Gebhardt, 2018). However, while personality may be predisposed toward certain behaviors, it does not determine behavior; social environment typically has the greatest impact in determining whether an opportunity to act upon a predisposition exists.

Peer norms and social networks also significantly affect behavior at the interpersonal level. A large-scale European multi-country study conducted as part of the SNIPE project (with n = 4,131) demonstrated significant normative misperception among students concerning cannabis use:

Only approximately 8 percent of students surveyed indicated they had used cannabis within the last 2 months, whereas many other students thought that the majority of students surveyed had used cannabis and that many others were approving of its use. Descriptive norms were positively correlated with personal cannabis use (OR 1.42) and injunctive norms were positively correlated with positive attitudes toward cannabis use (OR 1.46). (Dempsey et al., 2016).

These findings suggest that attitudes toward substance use are formed based on both actual experience and what one perceives to be the attitudes of one's peers toward substance use.

Campus environments — including university policies concerning substance use and the availability of health-related services — can either increase or decrease the risks associated with drug use. For example, universities which have developed robust programs of health promotion can mitigate potential harm related to the use of substances even if some students choose to engage in the use of substances. By contrast, universities which lack sufficient mental health services may suffer greater negative consequences related to the same levels of substance exposure because students may wait until problems become severe before seeking assistance — partly because of concerns about stigma or costs.

Borgogna et al. (2023) identify obstacles faced by college students who report having a history of psychotic disorders, including difficulties accessing appointments and financial burdens, highlighting the critical role that service provision structures have in influencing outcomes.

2.4 CANNABIS USE AND MENTAL HEALTH

Cannabis is unique within student drug culture primarily as a result of its widespread availability; changing legality; and socially acceptable usage. However, there exists a significant disconnect

regarding how society views the risks related to cannabis versus what science has shown us.

Approximately 9% of regular cannabis smokers develop cannabis use disorder, and the risk can be even higher (up to 17%) when an individual begins using prior to their eighteenth birthday (reviewed for cannabis legalization and college health). (Hall, W., & Degenhardt, L. (2009).

The same review also discussed that an increased amount of THC along with decreased perception of risk will lead to an increased likelihood of dependence and negative consequences for younger users.

While the discussion concerning mental health and cannabis is centered around dependency; however, research suggests that cannabis use can have both a positive and negative impact on individuals.

Research indicates that, depending upon the dosage used, age of onset, inherent vulnerabilities of an individual, and where an individual uses cannabis (socially) will dictate whether or not a particular outcome is associated with such. Therefore, it is essential to critically interpret data in order to distinguish between casual/low-dose usage and heavy/daily usage as well as between initiation during adolescence and later life initiation. Risk gradients, therefore, are non-linear for all potential outcomes.

Specifically regarding the relationship between psychosis and cannabis; although cannabis is the most extensively researched substance to date which relates to psychosis; this should not lead one to believe that each and every cannabis user is at risk of developing psychosis. A clinically relevant way to conceptualize the relationship between psychosis and cannabis is conditionally; thus, cannabis appears to elevate the risk of psychotic outcomes particularly for those who smoke heavily, begin smoking earlier than others, consume high-potency products, and have additional vulnerability factors.

2.5 DRUG USE AND PSYCHOSIS

Psychotic symptoms consist of two primary factors: perceptual disturbances (such as hallucinations), and thought disturbances (delusions). Psychoses may be an element of Schizophrenia spectrum disorder(s) and/or substance-induced psychotic syndrome(s).

Campuses are a logical place to identify early signs of psychosis due to the age group that typically starts using substances. (WHO, 2025).

There is considerable variability regarding whether there is evidence linking the use of psychoactive substances to psychosis depending upon the type of substance used and the manner in which they have

been used. There is also considerably stronger epidemiologic evidence linking cannabis to psychosis than other psychoactive substances. Stimulant use can result in psychotic symptoms when high doses are used. Hallucinogen users can experience acute psychotic episodes.

Determining if the relationship is causal or due to selection effect is particularly difficult in research. Those experiencing developing symptoms may either attempt to self-medicate or select social environments where substance use is prevalent. Surveys completed on cross-section do not provide sufficient data to determine the direction of association.

Two important aspects of clinical relevance apply to students in particular. Firstly, while transitory psychotic-like episodes that develop as a result of intoxication are typically reversible, they do indicate an individual's predisposition to such episodes; therefore, these incidents warrant serious attention. Secondly, Substance-Induced Psychosis does not necessarily represent a benign experience. Murrie et al. (2020), conducted a meta-analysis on fifty studies (the total number of participants was approximately 40,783) which indicated that approximately 25 percent of individuals who experienced substance-induced psychosis will ultimately develop schizophrenia. The rate of development for those whose psychosis was induced by cannabis use was higher (approximately 34%), and the likelihood of developing schizophrenia as a result of amphetamine use psychosis also represented a significant risk factor (approximately 22%). Therefore, this represents an opportunity for high priority early interventions regarding the onset of psychosis due to drug or alcohol use; it cannot be simply viewed as some form of temporary intoxication related phenomena.

2.6 ATTITUDES TOWARD DRUG USE

Individuals' views on the drug use experience determine not just what an individual will do in relation to drug use but also whether he or she will disclose drug involvement, how much influence peers have over his/her drug use, and whether he/she seeks help for drug problems. The attitudes of individuals tend to be clustered into four categories: harm, acceptability, addictiveness/control and normative beliefs.

In areas where "cannabis is normal," there is likely to be less perceived harm from using cannabis, leading to more experimentation. Similarly, in environments where substance use is heavily restricted, though moral condemnation of the behavior is strong, youth still face risks related to curiosity and peer pressure.

The Saudi students surveyed exemplify the complexity of these factors. A 2025 survey (n = 745) showed that most participants (85.6 %) strongly disagreed with the statement that substance abuse is enjoyable. However, 41.5% agreed that curiosity drives young people to try drugs; similarly, 40.4% agreed that peer influence is one of the main reasons young people experiment with drugs (Saudi Student Survey, 2025). This pattern of response illustrates that negative attitudes towards drug use can exist simultaneously with an understanding of the role of social risk factors in drug experimentation. Furthermore, this pattern of responses increases the likelihood that actual prevalence rates are lower than reported due to fear of sanctions and stigma.

2.7 PREVALENCE OF SUBSTANCE USE IN STUDENT POPULATIONS

There are many reasons why student drug use prevalence rates have varied greatly throughout history. First, studies have been conducted at different time periods – some looking at lifetime use while others look at the last year or month. Second, researchers used different sampling strategies as well as different environments where students live which influence how likely they will report their substance use behaviors.

Despite these differences, there are multiple sources of data with large enough samples that allow for an understanding of what is typically happening among college students.

According to Hoff et al. (2023), a very large study of German university students showed that 10.9% of the students smoked marijuana and 38.6% of them engaged in "problematic" drinking. Kunst & Gebhardt (2018) looked at university students in The Netherlands and found that 22.9% of those surveyed said they had ever used a party drug in their life. These two studies show that across Europe, "using drugs as a student," includes using common drugs like marijuana but also includes using party drugs that can cause immediate danger and potentially damage one's mental health.

The cross cultural synthesis project (the writer of this paper has drafted a document on this topic) also identified other anchors for interpreting prevalence: A European-wide study of college students indicated that in terms of a strict past two months definition, recent use of cannabis was relatively low, but there were also high levels of normative misperception about the extent of such use. This is important because people's perceptions of whether most of their peers are doing something can lead to

positive attitudes toward doing it -- regardless of whether it is actually true -- and set the stage for later increases in behavior.

It is important for thesis writing authors to understand that prevalence statistics are not just behavioral statistics -- they are social statistics that depend upon students' willingness to self-report. Therefore, comparisons between countries with relaxed laws versus those with very restrictive laws must be done carefully and include discussions of social desirability bias and the effect of fear of legal sanctions.

2.8 THE UNIVERSITY ENVIRONMENT AS A RISK CONTEXT

While universities offer many different forms of support to help students manage risks associated with drug use and other issues, there are a number of ways that the university system provides additional forms of protection. These include: student mental health and wellness resources such as counseling services; educational programs regarding healthy behaviors including substance use prevention and awareness; and peer-based support systems.

Whether the risk or protective factors present at a particular university weigh in favor of either risk or protection will depend on what exists in terms of the campus system. In general, this would include: how accessible students perceive that available services are (such as confidential counseling); whether or not the campus policy environment is clear; and whether students believe that the institution is supportive versus punitive.

Borgogna et al. (2023) while students experiencing psychosis report that they do utilize available services when they exist, the barriers to service utilization continue to exist. For example, scheduling appointments with providers continues to be a barrier as well as financial constraints, illustrating that "availability" alone does not guarantee usage and/or trust.

2.9 POLYDRUG USE AND RISK BEHAVIOR

In many college settings, there is a tendency for students to use multiple types of drugs and this type of behavior will enhance their risk as the potential interactions between various drugs could increase the level of intoxication, impaired judgement, or increased physiological burden.

According to the results from the Dutch Party-Drug Study, 31.4% of participants who used party drugs also indicated they engaged in polydrug use; while 6.9% admitted to using party drugs prior to operating a vehicle. Although, severe outcomes were relatively rare, these two behaviors are examples of high-risk behaviors that need to be addressed by university-based prevention programs.

Single-substance interventions are further undermined by the fact that polydrug use exists among students. For example, if a program focused on addressing only the use of cannabis, it would likely fail to identify those students who are most likely to consume stimulants, alcohol and/or other illicit drugs at parties.

Additionally, in the German study, it was found that cigarette smoking, risky alcohol consumption, and marijuana smoking all predicted each other; thereby providing additional support for an association between drug-related behaviors. (Hoff et al., 2023).

2.10 ACADEMIC CONSEQUENCES OF SUBSTANCE USE

Academic functioning can be affected by substance use in ways such as cognitive impairment, disrupted sleep patterns, decreased class attendance, and changes in motivation.

Academic outcomes from the effects of substance use are quite variable depending on the frequency of the use. In addition to individual differences among users, there are varying levels of educational disruption caused by both light/frequent use and heavy/infrequent use.

One of the most relevant mechanisms for institutions when it comes to academic performance may be indirect; the academic performance of students is directly related to their overall stress level. Stress is one factor used in determining how well a student uses time effectively. Student's who exhibit poor academic performance experience increased stress, which often leads to increased usage of drugs/cigarettes as a means to cope.

Institutionally, academic consequences result in loss of student retention and subsequently create an increase in demand for counseling services. Furthermore, academic consequences set precedent for what students believe regarding acceptable behaviors at school. If students see their peers performing academically while using drugs/cigarette, this will lead students to perceive less risk associated with the behavior. This perception can contribute to the creation of permissive norms regarding drug/alcohol use among peers.

Therefore, it would be wise for prevention programs to avoid making exaggerated statements about the harmfulness of substance abuse. Making unsubstantiated claims can damage the credibility of a program, thus reducing its effectiveness. Instead, messages focused on the situations under which a person is at a higher risk of experiencing problems due to drug/alcohol abuse (i.e. high frequency/mixing substances/driving after use/using as a means to cope) would provide a more realistic approach to preventing substance abuse.

2.11 GENDER DIFFERENCES IN STUDENT DRUG USE

Men have a greater likelihood of using illegal drugs when compared to women. The difference in drug use among men and women varies with each type of drug and each culture. For example, men used parties drugs significantly more often during their lives than did women; 39.2 percent versus 16.2 percent. (Kunst & Gebhardt, 2018).

Men and women had different rates of illegal drug use based on race, age and educational status in Germany. (Hoff et al., 2023).

Gender differences in drug use cannot be assumed as always being due to "men being more at risk." Men may be exposed to greater opportunity for nighttime activity. Men may also be less likely to report drug use. Women may have greater restrictions placed upon them, as well as a greater fear of consequences associated with drug use. There is evidence that women may progress faster from initial drug use to becoming dependent. This suggests that simply having data about the number of people who have tried an illegal drug does not provide a complete picture of a community's level of illegal drug problems.

2.12 CULTURAL DIFFERENCES IN DRUG ATTITUDES

Cross-cultural attitudes toward drugs exist because of differences in legal systems, social morality, religion, and media reporting. Students in countries where marijuana is allowed (either through legalization or decriminalization) tend to view the use of the drug as part of an individual's way of life. In contrast, students from countries with high levels of punishment for illicit substances will likely consider the same behavior as either immorally wrong or dangerous. As such, students from countries with very low tolerance of drug abuse may be less likely to report on their own drug use -- even when anonymous.

Student responses from the SNIPE study demonstrate there is a considerable range of attitudes and beliefs about drug use among European countries. The majority of students in each country overestimated how many peers were using substances, and thus did not accurately perceive peer behaviors. (Dempsey et al., 2016).

Student responses from Saudi Arabia also showed that although there was a strong level of disapproval towards drug use, there were still indications that curiosity, and peer influence were factors driving some students' decisions to try drugs. (Saudi student survey, 2025).

These results provide evidence for one of the three interpretive principles for research comparing cultures: Attitude measures are culturally "loaded" and therefore when researchers compare attitudinal data across cultures they should focus on issues related to translations, response styles, and the assessment of measurement equivalence.

In practice, cultural differences affect not only what students believe regarding substance use, but which type of intervention would be appropriate. For example, social norms campaigns may be effective in countries where students freely talk about substance use. However, in countries where talking about substance use could lead to sanctions against students, then confidential and stigma-free approaches may need to be taken.

2.13 MENTAL HEALTH AND SUBSTANCE USE

Mental health problems are prevalent in university students and have been associated with both substance use and psychosis risk. Stress anxiety and depressive symptoms may increase the likelihood

that students will use substances as coping tools; similarly, substance use can interfere with treatment for mental health issues or worsen existing symptoms.

Bidirectionality is a key challenge to addressing this issue. For example, cannabis may increase the risk of psychotic symptoms in some individuals; however, emergent psychotic symptoms also may lead to increased use of cannabis by students as a way of self-soothing and social adaptation.

Similar dynamics are evident with regard to stimulant misuse. For example, accelerating demands created by pressure from schoolwork may motivate students to misuse stimulants. However, once they have exposed themselves to these types of drugs, their exposure may enhance their vulnerability to developing more severe mental health issues through the enhancement of anxiety and sleep disturbance.

Thus, it is clear that campuses should not view substance use as a disciplinary issue alone when providing prevention services but instead must be incorporated into student mental health systems. These systems should offer low-threshold access for screening students for patterned risks (both substance related and psychotic) and clear referral pathways for early psychosis service.

3 METHODOLOGY

3.1 RESEARCH DESIGN

In this thesis, a qualitative literature review was chosen to explore the relationship between psychoactive substance abuse and psychosis amongst university students. In addition to assessing patterns of substance abuse; psychosocial variables (e.g., social support), cultural influences, and various aspects of mental health status resulting from or related to drug use in college students were evaluated.

Literature reviews are preferred when an investigation of numerous studies from many different countries and/or fields of inquiry is required. Literature reviews are especially beneficial for evaluating large-scale public health problems like substance abuse and psychosis. Public health problems often have interactions between biologic, psychological and sociologic variables that may be difficult to investigate through other types of studies.

This thesis was conducted using a cross-cultural comparison of results to evaluate differences due to legal systems, culture and education. Studies from Europe, North America, and the Middle East were primarily reviewed.

3.2 DATA SOURCES

The study relied on secondary information taken from a variety of publically available and peer reviewed literature. The primary sources included:

- Journal articles retrieved from databases such as PubMed, Google Scholar, ScienceDirect, and SpringerLink
- Reports from the World Health Organization (WHO)
- Publications from the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA)
- Government policy documents related to cannabis legalization and drug regulation

In addition to this, a number of articles that had been uploaded as part of the study were also used as core references, including articles focused on:

- Drug use prevalence among university students
- Cannabis use and psychosis
- Cross-cultural attitudes toward substance use
- Mental health and psychotic disorders in student populations

3.3 SEARCH STRATEGY

Relevant literature was identified using combinations of the following keywords:

- “university students”

- “drug use”
- “substance abuse”
- “cannabis”
- “psychosis”
- “psychotic disorders”
- “mental health”
- “cross-cultural attitudes”
- “student drug use”
- “cannabis legalization”

Boolean operators such as AND and OR were used to refine searches. For example:

- “cannabis AND psychosis”
- “university students AND substance use”
- “drug attitudes OR cannabis perceptions”

The literature search focused primarily on studies published between 2005 and 2025 in order to ensure the inclusion of recent findings and contemporary policy developments.

3.4 LIMITATIONS OF METHODOLOGY

Some methodological shortcomings exist when considering this study.

Firstly, this study relied exclusively on secondary data for its analysis; therefore, all conclusions drawn from the data are directly related to the quality and methodology used by previous researchers.

Additionally, many of the studies reviewed were cross-sectional designs which limit the establishment of causality within those studies.

Secondly, there exists a possibility that the results of this study are skewed due to Social Desirability Bias as participants have reported their own substance use via self-reporting surveys. The likelihood of underreporting/overreporting could vary depending on how much each country (the country where the participant resides) has prohibited or de-stigmatized drug use.

Lastly, terms for drugs, laws surrounding substances, and reporting requirements may vary between countries making it difficult to make direct comparisons across studies in multiple countries. Despite some limitations, this study's Literature Review Methodology allowed for an expansive and comprehensive view of current research into substance use and psychosis among university students.

4 THEORETICAL FRAMEWORK

4.1 THEORY OF PLANNED BEHAVIOR AND SOCIAL NORMS

The theory of planned behavior (TPB) posits that an individual's behavior will be determined by their intentions to perform a particular action. These intentions are primarily based on three factors; 1) attitude toward the behavior, 2) social normative beliefs regarding the behavior (i.e., what others believe about the behavior) and, 3) perceived behavioral control over performing the behavior. In the case of drug use among college students these two factors may have the most influence. College students frequently say "everybody is doing it" when asked why they drink alcohol or smoke marijuana. Also, most students who start using drugs on a regular basis significantly underestimate how difficult it is going to be to stop after they begin to regularly use them.

The study also provides evidence supporting a mechanism consistent with the theory of planned behavior. Perceptions of peer usage and acceptance (social norms) were found to be significantly related to both self reported use and attitudes toward use. (Dempsey et al., 2016).

Thus, interventions designed to correct misperceived social norms may be effective at reducing intentions and behaviors concerning drug use without having to include moralistic messages.

However, there are several limitations to the TPB. It fails to explain rapid increases in substance use during specific periods (such as during festivals). Additionally, it appears to give less weight to

structural influences including legal risks and institutional policies that affect whether an individual chooses to engage in substance use behaviors. Thus while TPB has some utility as a part of a comprehensive theoretical approach, it is insufficient as a complete model.

4.2 DIATHESIS–STRESS AND SUBSTANCE EXPOSURE

The idea of psychosis risk is usually viewed through the lens of a diathesis-stress model. In other words, people possess various degrees of risk for developing psychosis based on their genetic susceptibility, their neurodevelopment, and psychological make-up. Then there are stressors in an individual's environment that will lead to the development of symptoms. In this light, substance use has the potential to be both a stressor and/or a trigger for the onset of psychosis, especially if it impacts dopamine transmission, sleep, or one's reactivity to stress. This provides an explanation for how the vast majority of college students who consume cannabis do not develop psychosis; because the distribution of vulnerability is wide ranging, and therefore the amount of exposure to cannabis varies among those individuals. It also allows for targeted prevention; instead of having a "no tolerance" policy for all cannabis consumers at colleges and universities, they could achieve more success in preventing the progression to psychosis by identifying and providing support to those students with high-risk consumption patterns (e.g., daily cannabis consumers, heavy potency cannabis consumers, co-consumers of stimulants, previous psychotic-like experiences, etc. — and/ or those students with a significant family history of psychosis).

4.3 CROSS-CULTURAL MODELS: LEGALITY, MORAL NORMS, AND STIGMA

Cultural differences in terms of cross cultural can be viewed as interconnected layers; (1) Socio-legal environment (punitive or liberal); (2) Moral and Religious beliefs; and (3) Stigma systems for drug use and psychotic disorders. These layers affect not only how people behave, but they also influence how people will report and understand their behavior. For example, in a punitive environment, it is possible that the fear of being labeled "a user" may cause individuals to underreport drug use. In addition, there is stigma against psychosis that delays seeking medical attention.

Borgogna et al. (2023) found systemic and financial barriers to accessing mental health services among college students with psychosis. This supports the idea that "stigma" needs to be viewed as something

that affects not just attitudes about mental illness, but rather as a structure within the way we provide access to services.

5 EVIDENCE LINKING SPECIFIC SUBSTANCES TO PSYCHOSIS

5.1 CANNABIS: DOSE-RESPONSE AND POTENCY

The most compelling proof of a link between substances and psychotic states is cannabis. A meta-analysis of ten studies (total $n = 66,816$), identified a clear dose-response relationship among heavy cannabis users (odds ratio = 3.90) compared with individuals who have never used cannabis; (Marconi et al., 2016).

This provides support for a "harm reduction" approach to education: depending upon how much you are using, your risk for developing a psychosis is based on frequency and quantity of use as opposed to simply "using/not using".

Research has indicated that the amount of THC present in the marijuana being consumed, and frequency of consumption can be linked to increased psychosis related risks and symptom severity in individuals experiencing their first episode of psychosis. Therefore, when providing guidance to students regarding the use of cannabis, it would be more logical to provide information regarding frequency and potency rather than general statements against the use of cannabis. As well, this type of message is likely more relevant in situations where cannabis is available for purchase and commonly accepted by peers. (Di Forti et al., 2019; EU-GEI summaries).

It should be noted that there are many confounders which may cause an individual to engage in excessive cannabis use and increase his or her risk for psychosis. Examples include child abuse/adversity, genetic predisposition to develop psychosis. However, the fact that the data collected show a strong dose response relationship (i.e. increasing levels of use increases rates of psychosis) makes it reasonable to infer that one possible contributor to the development of psychosis in some individuals is cannabis.

5.2 STIMULANTS, MDMA, AND AMPHETAMINES

Stimulant use has been shown to induce psychosis. The degree to which this occurs will depend on dose levels and how long without sleep. It is possible that either of these conditions could be experienced by college students during a party weekend or while cramming for an exam.

This is clinically relevant because research has found that there is a correlation between being diagnosed with schizophrenia and having had psychotic episodes as a result of amphetamine use (Murrie et al. 2020).

There are two types of stimulants that college students may have experience with. These include amphetamines that are prescribed illegally by people who are also selling them. Additionally, some students may take prescription amphetamines that were given to them legally but taken for reasons other than what was intended. While it is true that taking prescription amphetamines for a medical condition called Attention Deficit Hyperactivity Disorder (ADHD) is different from using them to get high, the evidence does show that the greater the amount of time one has spent under the influence of amphetamines, the higher their chances of developing a form of psychosis/mania. This should be especially concerning for clinicians since they provide supervised medical treatment. In order to protect college students, universities would do well to adopt prevention strategies that educate students about the dangers of escalating use of prescription stimulants outside of the supervision of a clinician.

5.3 SUBSTANCE-INDUCED PSYCHOSIS AS A CAMPUS EARLY-WARNING EVENT

Transient in nature, substance induced psychosis was found to be commonly an "overpass" to future Schizophrenia Spectrum Disorders by meta-analysis. Murree et al., (2020), provided an average of 25 percent across studies for those transitioning into a schizophrenia spectrum disorder based on pooled data. The percentage increased when looking at Cannabis-Induced Psychosis which had a 34 percent transition rate.

The campus implications are significant; since the incidence of psychosis may be very low, the students who have acute psychotic symptoms following substance use should be identified as a high-risk group for immediate evaluation and subsequent follow up to reduce the long-term psychological damage.

Campus-based policies that are only disciplinary in nature can discourage students from reporting their symptoms after experiencing alarming psychotic episodes. As Borgogna et al., (2023), noted, practical impediments to students diagnosed with psychosis include accessing appointments, and cost; therefore, campus-based policies that create a clear and accessible pathway to speciality treatment will only enhance the positive impact of providing early warning systems.

5.4 NEUROBIOLOGICAL MECHANISMS LINKING DRUG USE AND PSYCHOSIS

Neurobiological mechanisms, including dopaminergic dysregulation, help explain how psychoactive substance use is related to psychosis. Dopamine plays an important role in the development of positive symptoms like hallucination and delusion in individuals with schizophrenia; it does this by increasing dopamine activity in the mesolimbic pathway.

High potency cannabis and Tetrahydrocannabinol (THC) have been found to affect dopamine. Cannabis works on the Endocannabinoid System by acting primarily on CB1 receptors located throughout the brain's cognitive, emotional and reward processing areas. Acting on these receptors increases dopamine release in the striatum -- a primary area associated with psychotic disorders (Di Forti et al., 2019).

Additionally, neuroimaging research demonstrates that there is a correlation between cannabis use and changes in structure and function in several critical brain areas including; the prefrontal cortex and the hippocampus. Areas of the brain impacted by cannabis include structures critical to the functioning of many aspects of our cognitive abilities, including executive functioning and memory, both of which are commonly impaired in individuals diagnosed with psychosis. (Volkow et al., 2014).

It appears that the effects of substance use are most pronounced at the ages of adolescence and young adulthood when the majority of brain development is occurring. At these stages of brain development, synaptic elimination or "pruning," and maturation of neural circuitry is taking place. As a result, the adolescent/young adult brain is highly susceptible to the influences of psychoactive substances. It has also been demonstrated that early cannabis exposure increases the risk of long term cognitive impairments as well as various forms of psychiatric disorder (Moore et al., 2007).

Overall, the neurobiological evidence supports the hypothesis that psychoactive substances, particularly cannabis, may contribute to the development of psychosis by altering neurotransmitter systems and disrupting normal brain development.

5.5 RISK FACTORS FOR SUBSTANCE-INDUCED PSYCHOSIS

Substance use (such as with drugs) is associated with psychosis; however, it does not appear as though the vast majority of people will experience a psychotic disorder following substance use. As such, there must be other contributing variables that determine an individual's degree of vulnerability.

Genetic Predisposition One of the greatest risk factors for developing psychosis after using a substance is genetic predisposition. If you have a family history of psychotic disorders, your likelihood of experiencing psychosis after using a substance is much greater than if you did not have this type of family history. This data provides support for the Diathesis-Stress Model (DSM).

In the DSM, there is interaction between genetic predisposition (vulnerability) and environmental factors that serve as triggers. **Age of Initiation** Another major risk factor is the age at which you first begin to use cannabis. There is evidence suggesting that early onset cannabis users (particularly before the age of 18) have a significantly greater chance of developing both short- and long-term psychiatric disorders. (Hall & Degenhardt, 2009). Early use may interfere with brain development and increase susceptibility to neurobiological changes.

Frequency and intensity of use also play a key role. Heavy and frequent cannabis use has been consistently associated with higher risk of psychosis compared to occasional use. Additionally, the potency of cannabis products, particularly those with high THC concentrations, further increases risk (Marconi et al., 2016).

This could be due to interference with normal brain development during adolescence and increasing the susceptibility to neurobiological changes. **Frequency/Intensity of Use** In addition to age of initiation, frequency/intensity of cannabis use also plays a critical role. The literature demonstrates a consistent relationship between heavy/frequent cannabis use and a greater risk of psychosis when compared to occasional use. Furthermore, the concentration levels of THC within cannabis products also appears to increase the potential risk of psychosis.

6 POLICY AND LEGAL CONTEXT IN CROSS-CULTURAL COMPARISON

6.1 CANNABIS LIBERALIZATION AND RISK PERCEPTION

Legalization of marijuana is associated with changes in students' views on marijuana use due to increased perceptions of risk, increased perceptions of normalization and/or increased availability.

Canada implemented its first legalized marijuana law under The Cannabis Act (Bill C-45) which took effect in late October 2018. This act created a federally regulated legal system for recreational cannabis. (Government of Canada, 2018).

Germany has partially legalized recreational cannabis since 2024; allowing adults to legally possess small quantities of marijuana as well as grow their own marijuana at home within specific quantity limitations (German Federal Ministry of Health, 2024).

Policy changes may or may not lead to an increased rate of drug usage by students; however, policy changes may decrease perceived risk of drug use and increase the likelihood of discussing drug use among students. The two factors can influence both the actual rates of drug use and what is reported as drug usage in surveys.

When viewed from a cross-cultural perspective, "higher reported prevalence" for drug usage in liberalized environments may be due to either real differences in usage patterns or because less under-reporting occurs.

Therefore, an adequate, graduate-level explanation of how policy affects drug use will need to include at least three distinct paths through which policy changes have an effect on drug use: (1) availability and marketplace changes (i.e., price, potency, product variety), (2) changes in perceived risk and social acceptance, and (3) increases in the willingness to report drug use in surveys and clinical interviews.

6.2 PUNITIVE CONTEXTS, STIGMA, AND UNDERREPORTING

It's likely that in environments with a high level of stigma and legal danger associated with illicit drug use, people will report lower levels of illegal drug use than they actually do. The responses of the Saudi students demonstrated an overwhelming dislike for using substances, but this could be due to their own cultural beliefs regarding substance use; however, at the same time, there is evidence to suggest that these attitudes may create an environment that discourages openness about illegal drug use. Therefore, it is possible that while there are risks present when using drugs illegally, people are going to hide how much they have used them. This means that people who are experiencing problems from their illegal

drug use may not get information about the different types of resources available to help mitigate some of those harms, nor would they seek out help until after they are experiencing severe problems. (Saudi student survey, 2025).

Similarly, in many countries around the world, there is significant stigma surrounding having psychotic symptoms. As such, many individuals may experience delays in seeking treatment for their illness. According to WHO, stigma and discrimination against individuals diagnosed with schizophrenia are among the most common experiences for individuals who suffer from the disorder. (WHO, 2025). These experiences result in barriers to accessing educational opportunities, obtaining employment, and receiving medical care. In campus settings, students who begin to experience psychotic symptoms often describe their symptoms as being either "a sign of personal weakness" or "spiritual punishment," based on their individual cultural explanatory model for why they are experiencing the symptoms. Therefore, cross-cultural comparisons must consider both the impact of stigma as a methodological issue (i.e., an influence on what people report), and as a clinical issue (i.e., an influence on the outcome of interventions).

6.3 CROSS-CULTURAL DIFFERENCES IN PREVALENCE AND REPORTING

The differences that exist between how substance use is viewed by law, socially and what people report about their own behavior in different cultures need to be considered very carefully when comparing substance use at universities from one country to another.

For example, in many European countries (for example Germany, and The Netherlands) there has been a history of somewhat liberal views towards drugs, including marijuana; therefore it's likely that more students will report using drugs because they have no fear of judgment for doing so.

On the other hand, in many countries where the laws and social rules are much stricter (such as Saudi Arabia), fewer students are likely to report having used drugs. It's also possible that the students who do report having used drugs in those countries are actually telling the truth. However, more often than not, in countries with strict laws and social sanctions, there is simply too great a fear of punishment or social isolation to allow them to tell the truth.

There is an equally significant difference in how society views mental health problems. For example, in some parts of the world, certain psychotic symptoms may be seen as "the devil" or "a sign from God",

etc., whereas in Western culture, these same symptoms would likely lead to immediate medical treatment.

Therefore, it is essential to take all of these cultural variations into consideration when making comparisons based on research studies from around the world.

7 IMPLICATIONS FOR UNIVERSITIES: PREVENTION AND EARLY INTERVENTION

7.1 INTEGRATED SUBSTANCE AND MENTAL HEALTH STRATEGIES

The data supports that Universities need to address both drug use and psychosis risk in an integrated way. Substance use is linked to other health behaviors (Hoff et al. , 2023) and while substance induced psychosis will be an infrequent event it can serve as a "sentinel" (Murrie et al. , 2020). Prevention should include:

- universal prevention (education, social norms correction),
- selective prevention (targeting high-risk patterns such as polydrug use, daily cannabis use, or stimulant misuse),
- indicated prevention (rapid assessment and referral after acute psychotic symptoms).

Social norm interventions for two reasons; first they have shown promise because they address a well established factor: misperceived peer behavior and approval (Dempsey et al. , 2016); secondly their effectiveness depends upon the cultural context.

7.2 HARM REDUCTION FOR PARTY-DRUG CONTEXT

The likelihood of drug use by students is often connected with nighttime events (parties) which contribute to increased levels of risk due to their context, for example; a large number of people in a confined space, loss of hydration from dancing and drinking, heat, lack of rest/sleep prior to attending the event or mixing drugs/alcohol.

Although few participants experienced serious negative effects related to substance use, many reported experiencing less severe negative effects. In addition, at least one risky behavior was observed (i.e., operating an automobile after using alcohol). (Kunst & Gebhardt, 2018).

Harm reduction in student populations should therefore include:

- education on mixing risks (e.g., alcohol + stimulants),

- guidance on hydration and sleep,
- encouraging buddy systems and safe transport,
- and clear guidance on seeking medical help without fear of disciplinary punishment.

These strategies align well with research evidence and offer practicality: They are based on the premise that it is unlikely that all illicit substance use will cease, however they have the potential to decrease harm and provide access to treatment/care options.

7.3 EARLY PSYCHOSIS LITERACY AND STIGMA REDUCTION

Psychosis literacy for most students may be low and/or limited by the stigma of seeking mental health assistance. The World Health Organization has also noted that there is a high level of stigma toward people experiencing psychosis and this has resulted in many being socially excluded from educational opportunities as well as receiving adequate healthcare. (WHO, 2025).

However, Borgogna et al. (2023), found that even students who had received some type of service reported that they still experienced barriers to accessing these services and had negative experiences. This suggests that "psycho-education" (psychosis literacy) alone will not improve outcomes if the services are not improved at the same time.

Universities can implement low-threshold education that focuses on:

- early warning signs (changes in sleep, paranoia, auditory hallucinations),
- the difference between transient intoxication effects and persistent symptoms,
- and how to access help confidentially.

Additionally, when working on campus within culturally diverse communities, it would be important to tailor the psycho-education to fit the local explanatory models of their illness; however, where possible, it would be helpful to work in conjunction with trusted community or religious leaders.

7.4 CLINICAL IMPLICATIONS FOR PSYCHIATRY AND UNIVERSITY HEALTH SERVICES

The results from this study are relevant to a number of areas including clinical practice and university health service settings. It is critical that psychotic symptomatology be identified as soon as possible in students. Screening programs, providing readily available mental health services and facilitating early

intervention through the implementation of these types of programs by universities can result in improved outcomes for individuals suffering from psychotic disorders. Substance use history should also be considered by healthcare professionals when evaluating students who present with psychiatric complaints. Substance induced psychosis may appear similar to primary psychotic disorder in its presentation; therefore it will likely be difficult for clinicians to make an accurate differential diagnosis. Harm reduction based prevention efforts should replace or at least be combined with sole reliance upon abstinence based models. Students should receive education that includes accurate risk related information regarding substance use, especially high potency cannabis and polydrug use. A collaborative effort between universities, healthcare providers and public health agencies is necessary to effectively address the relationship between substance abuse and mental illness within student populations.

7.5 Drug Policy, Legalization and Student Behavior

Drug policy plays a significant role in shaping both substance use patterns and attitudes among university students. Changes in legislation, particularly regarding cannabis, have altered perceptions of risk and social acceptability in many countries.

In recent years, several countries have moved toward the decriminalization or legalization of cannabis. For example, Canada legalized cannabis in 2018, and Germany introduced partial legalization measures in 2024. These policy changes have increased accessibility and reduced the perceived risks associated with cannabis use.

Research suggests that legalization is often associated with changes in attitudes rather than dramatic increases in use. As cannabis becomes more socially accepted, students may perceive it as less harmful compared to other substances. This shift in perception can lead to increased experimentation, particularly among young adults.

However, the relationship between legalization and substance use is complex. Some studies indicate that while overall prevalence may not significantly increase, patterns of use may change. For instance, there may be an increase in the use of high-potency cannabis products or more frequent consumption among existing users.

Additionally, legalization may influence reporting behavior. In countries where cannabis is legal, students may feel more comfortable disclosing use in surveys, leading to higher reported prevalence rates. In contrast, in countries with strict legal penalties, underreporting is likely.

From a public health perspective, legalization presents both opportunities and challenges. On one hand, it allows for regulation, quality control, and harm reduction strategies. On the other hand, it may contribute to normalization and reduced risk perception.

Understanding the impact of drug policy on student behavior is essential for developing effective prevention strategies. Universities must adapt to changing legal environments by providing evidence-based education and support services.

7.6 Prevention Strategies and University-Based Interventions

University students are at risk for developing a substance use disorder due to the widespread prevalence of substance use within this population. Furthermore, the development of a substance use disorder can have significant negative effects on an individual's mental health. Therefore, it is crucial to develop evidence-based prevention methods to prevent substance use disorders from occurring.

There are three main categories of prevention strategies: primary, secondary, and tertiary prevention. Primary prevention seeks to decrease the likelihood of substance use occurrence through education and awareness programs. Secondary prevention identifies and intervenes early among those who exhibit behaviors indicative of being at-risk of developing a substance use disorder. Lastly, tertiary prevention provides treatment and support to those who already have developed a substance use disorder as well as other psychiatric conditions.

Social norming interventions appear to be one of the most effective forms of prevention. Social norming interventions seek to alter a student's perception of how prevalent substance use is among his/her peer group. A great deal of research indicates that college students tend to grossly overestimate the number of their classmates who engage in substance use. The effect of such misinformation influences a student's decision whether or not to engage in substance use.

Additionally, educational programs focused solely on abstaining from all forms of substance use are ineffective. Educational programs should incorporate a harm-reduction model as opposed to simply focusing on abstinence. Harm-reduction models provide students with factual information regarding the

risk of various substances, (i.e., high potency cannabis) and combinations thereof (i.e., polydrug use), thus providing students with accurate knowledge to base their decisions upon.

Finally, university health services are a vital component of preventing substance abuse. In addition to accessible mental health services, counseling, and screening programs, universities have numerous resources available to them for identifying substance related problems and psychotic symptomology early.

Peer based interventions may also be an effective means of preventing substance abuse. Students are generally much more likely to listen to information provided by their peers than they would to receive information from someone outside of their academic community; especially in informal settings.

Although peer based interventions may be effective, there are limitations. Prevention strategies need to be culturally sensitive. Methods that are effective in one culture may not be effective in another. For instance, if there is a high level of stigma associated with drug use in certain cultures, then confidential/anonymous methods will probably be more successful than public methods.

In summary, effective prevention of substance abuse among university students requires a multi-faceted approach incorporating education, harm reduction models, and mental health support.

8 DISCUSSION

8.1 SYNTHESIS OF MAIN FINDINGS

The key findings from this body of literature support four major conclusions.

Firstly, psychoactive substance use appears widespread within the University population, however, there is considerable variability regarding patterns across countries and campus culture. While alcohol and cannabis use have been found to be prevalent among many University populations, other substances such as party drugs, inhalants and prescription medication misuse have been identified at

varying rates depending upon specific campus environments (Hoff et al., 2023; Kunst & Gebhardt, 2018).

Secondly, perception of attitude and social norms play an important role. Students often overestimate the rate of cannabis use on their campuses and incorrectly believe that others approve of such behaviors. These beliefs are also predictive of both individual behaviors and attitudes toward substance use. (Dempsey et al., 2016).

Thirdly, the relationship between substance induced psychotic disorders and cannabis use has been demonstrated to be non-uniform. Psychotic disorder risk is most clearly linked to high frequency/quantity cannabis use and clinicians should be aware that for approximately one-half to three-quarters of individuals who experience substance induced psychosis, this will eventually evolve into schizophrenia (Marconi et al., 2016; Murrie et al., 2020).

Finally, the cultural background of each country influences what aspects of a problem are most likely to be reported to authorities or healthcare professionals by a population. For example, in Saudi Arabia, a large number of students admitted they would not report marijuana use due to fear of the law. However, they did indicate that they were influenced by friends and peers when considering whether to experiment with marijuana. Thus, the degree of disclosure and subsequent feasibility of interventions may vary significantly based upon the culture in which they occur. (Saudi student survey, 2025)

8.2 CRITICAL LIMITATIONS IN THE EVIDENCE BASE

Limitations to strong conclusions limitations of student survey literature avoid overstating prevalence comparability and focus on consistency in patterns and mechanisms between study designs gaps between evidence and implementation gaps for social norms interventions and early psychosis services in many non-Western contexts. Many of the student survey literature rely heavily upon self-report survey data, which have a high propensity for social-desirability-bias as well as other types of measurement error particularly when use is either illegal or has stigma associated with it. Most of the studies reviewed were cross-sectionally designed, thereby making it difficult to establish cause-and-effect relationships. For example, studies that found an association between cannabis use and psychosis may do so due to one of several factors including uncontrolled confounders, reverse-causality, or common underlying risk factor(s). Since most of the literature cited was comprised of observational studies, even those studies identified through meta-analysis were similarly limited by their lack of control over the potential sources of measurement error listed above.

When conducting cross-cultural comparisons there are also unique challenges; for example language barriers make instrument equivalence unlikely. Additionally, cultural differences in how participants respond to questions on surveys (for example acquiescence) will create biased attitude scores.

Furthermore, the way "use" is defined is also inconsistent throughout the literature; for example lifetime exposure does not equal heavy daily use.

Therefore, thesis conclusions should avoid over-stating prevalence comparability and focus on identifying patterns and mechanisms that are consistent across different study designs.

There are also significant gaps between evidence-based practice and implementation of social norms interventions. There are few rigorously conducted randomized controlled trials in many non-Western contexts.

Additionally, availability of early psychosis services at universities vary significantly. These gaps provide opportunities for future research and policy development.

8.3 FUTURE DIRECTIONS

Future studies should focus on:

- (1) Longitudinal design, tracking students over a period of time to allow for separation of selection factors vs. causal paths;
- (2) Cross-culturally consistent measures using measurement-invariant methodologies to enhance comparability across cultures;
- (3) Mixed methodology designs capturing "risk" and "psychosis" as defined by students within their native culture's language.

and (4) Implementation Science: What types of Campus based Interventions work well and can be scaled up in different environments?

Additionally, Universities and Public Health Systems need to collaborate and monitor Trends in Student Attitudes toward Cannabis Use and Product Potency, Assess Harms and Adapt Prevention Strategies Accordingly.

8.4 LIMITATIONS OF THIS THESIS

The study has several key limitations to consider when evaluating its results.

- 1) The study is based almost exclusively on secondary data from existing studies. The study's conclusions will therefore depend heavily on the quality and methods employed in those studies.
- 2) Many of the studies that were analyzed used a cross-sectional design, which makes it difficult to identify whether there is an actual cause-and-effect relationship between the substance use and psychosis reported in the studies.
- 3) Self-reporting of substance use can also potentially be biased due to cultural attitudes toward drugs (i.e., stigma associated with using illegal substances), leading to lower reporting rates than would occur if all subjects had been honest about their drug usage.
- 4) Due to significant variations in how substance use is defined and measured across countries, along with social context differences among cultures, making valid cross-cultural comparisons is a complex task.

9 CONCLUSION

To conclude, college-aged individuals are an important demographic for studying how psychoactive drug use intersects with attitudes about substances, and how this intersects with psychosis-related risks since the ages at which individuals typically experience substance use (i.e. the "peak experimentation" age) coincide with the time frame when psychotic disorders commonly emerge (WHO, 2025).

Research has demonstrated that among many student populations, cannabis continues to be the most widely used illicit drug, although other substances such as party drugs, inhalants, and overuse/misuse of prescribed medications also contribute to levels of risk (Hoff et al., 2023; Kunst & Gebhardt, 2018). Studies have shown that there is strong empirical support that links substance use to increased psychosis risk in particular through heavy or regular use of cannabis. These studies found a dose-response relationship in their meta-analysis supporting these findings (Marconi et al., 2016). Substance induced psychosis is clinically significant because it appears that a considerable percentage of cases of substance-induced psychosis go on to develop schizophrenia spectrum disorder -- particularly those related to cannabis and stimulants (Murrie et al., 2020).

Thus, the emphasis in substance use prevention should shift from punishment to campus-wide health services that provide integrated harm-reduction, norm-correction, psychosis-literacy, and access to rapidly referring individuals experiencing psychosis-related problems to appropriate treatment. Culturally, attitudes towards drugs and psychosis are influenced by legal status, moral values, and stigma. Therefore, effective campus drug policies will need to be both culturally responsive (to the needs of students in different cultural backgrounds) but evidence based in addition to being confidentially delivered with credibility and accessibility.

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