ORIGINAL ARTICLE

Factors influencing substance-use intentions among undergraduate students in northern Thailand: insights from the theory of reasoned action

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ABSTRACT

Substance use among undergraduate students is a growing concern, particularly in Northern Thailand. This study aimed to investigate the factors influencing students' intentions to use substances and to identify key predictors using the Theory of Reasoned Action framework. A cross-sectional survey was conducted among 400 undergraduate students at a university in Northern Thailand during August–September 2024. Data were collected via self-administered questionnaires, and analyses included Chi-square tests and multiple logistic regression. Participants had an average age of 21 years (SD=1.33); 66.0% were female, and 46.0% reported a history of substance use. Notably, 36.2% expressed an intention to use substances. Factors significantly associated with these intentions included gender (p=0.003), relationship status (p=0.005), history of substance use (p<0.001), attitudes (p<0.001), subjective norms (p<0.001), and knowledge (p=0.003). Logistic regression revealed that subjective norms (Adj. OR=3.39, 95% CI=2.002–5.753, p<0.001) and history of substance use (Adj. OR=3.06, 95% CI=1.865–5.028, p<0.001) were the strongest predictors, collectively explaining 32.0% of the variance in substance-use intentions. The findings underscore the critical role of social influences and prior behavioural patterns in shaping substance-use intentions. Efforts to reduce substance use among undergraduate students should prioritize addressing subjective norms. Targeted interventions that incorporate social dynamics and individual behavioural histories are critical for effective mitigation.

Keywords:
attitude; intentions; subjective norm; substance use; undergraduate students

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INTRODUCTION

Substance use, including alcohol, smoking, cannabis, and kratom, remains a global concern, significantly affecting health, society, and the economy.[1] According to the World Health Organization, substance abuse leads to over 3 million deaths annually, with 0.6 million linked to psychoactive drugs, predominantly among men. Chronic diseases and mental health disorders resulting from substance use contribute to preventable deaths.[2] The United Nations Office on Drugs and Crime (UNODC) reported that a rising prevalence of drug-related health issues, with over 35 million individuals suffering from drug use disorders globally, posing severe social and health burdens, particularly in low- and middle-income countries.[3]

Thailand has undergone several legal transitions regarding cannabis and kratom. Historically, both substances were widely used in traditional medicine and cultural practices. However, in the 1970s, Thailand implemented strict narcotics laws, classifying cannabis and kratom as illegal substances. Recent legal reforms have led to the partial relaxation of these restrictions. In 2018, the Thai government legalized cannabis and kratom for medical and research purposes, and in 2022, cannabis was removed from the narcotics list, allowing for broader accessibility.[4] These policy changes have raised concerns about increased use among adolescents and undergraduate students. In addition, the use of multiple substances, particularly alcohol, cigarettes, cannabis, and kratom, has also shown an increasing trend.[5-6] Such as the younger population aged 18–19 had an increase in cannabis smoking from 0.9% in 2019 to 2.0% and 2.2% in 2020 and 2021, respectively.[6] Meanwhile, the prevalence of hazardous alcohol consumption was high among university students (13.5%) and the prevalence of lifetime drinkers was 65.3%.[7] A 2022 survey revealed heightened commercial and recreational consumption, raising concerns about the physical and mental health consequences, including mental disorders, criminal behaviour, and poor academic performance.[8] These outcomes hinder the quality of life and long-term prospects for affected individuals.

Undergraduate students, transitioning from adolescence to adulthood, are particularly vulnerable to substance use due to physical, psychological, and social changes.[9] Adolescents who were bullied and who had no close friends exhibited a high prevalence of alcohol and drug use.[10] Research also highlights the influence of peer pressure, curiosity,[11-12] stress,[13] and unstable family environments,[14] in driving substance use. Family support and university-based mechanisms can help mitigate these risks.[15]

This study uses the Theory of Reasoned Action (TRA) to examine substance-use behaviours among university students. TRA connects attitudes and subjective norms with behavioural intentions, providing insights into decision-making factors.[16] Undergraduate students' attitudes, such as beliefs about stress relief or social enjoyment, and subjective norms like peer pressure, family dynamics, and university culture, shape their substance-use behaviors. The model has been widely used in health research and is well-suited for understanding substance use among university students, who face unique social environments and accessibility challenges.[17-18] For example, this study applied the TRA to predict drug and alcohol use among 2,074 high school and university students. The findings revealed that attitudes and social norms play a significant role in predicting substance use behaviour.[17] In Thailand, a study examined factors that could predict the intention to quit drug use among

individuals who had undergone rehabilitation. Although TRA was not directly applied, the findings indicated that attitudes toward quitting drugs and conformity to reference groups in drug cessation played a significant role in determining the intention to quit drug use.[18]

Previous studies have identified multiple factors influencing substance use intentions among university students. In a Missouri college, 33.4% reported past-year cannabis use; 9.9% of cannabis-naïve students intended to initiate use, and 22% of prior users planned to increase usage.[19] Among Egyptian students, 4.9% reported cannabinoid abuse and 41% smoked cigarettes. Key risk factors were male gender, family conflict, peer influence, child abuse history, urban living, stay-at-home mothers, and family substance use history.[20] In Ethiopia, 73.7% of students reported lifetime substance use, including alcohol (68.2%), khat (53.6%), cigarettes (46.1%), and illicit drugs (23.3%), with family loss and financial hardship as predictors.[14] In Southeast Ethiopia, khat chewing (21.5%), cigarette smoking (15.4%), and alcohol use (33.8%) were common.[13] Although some students had good knowledge about substances, this did not always reduce their intention to use them.[21] Demographic and socio-economic variables such as gender, age, study year, income, and residence have shown varying associations with substance use. Males tend to have higher substance use intentions due to social norms.[22,23] A Finnish study found no significant links between these variables and substance use.[24] Relationship status also plays a role; single students had higher use intentions due to stress and low support, while supportive relationships were protective.[25-27] Family dynamics, including sibling influence, also shaped substance use attitudes.[28]

Although studies on substance use in Thailand exist, few have applied TRA to analyse behavioural intentions, particularly among students in Northern Thailand. This region has distinct cultural and social characteristics that influence substance use. The lack of research in this area limits our understanding of beliefs, attitudes, and norms shaping students' behaviours. This study addresses this gap by analysing factors influencing students' intention to use substances, guided by TRA. The findings will contribute to new knowledge, providing a foundation for developing effective prevention strategies and policies tailored to the needs of university students in Northern Thailand.

METHODS

Study design and population

The study was a cross-sectional survey research, collecting data through self-administered questionnaires. The study population consisted of students from the University of Phayao enrolled in years 1 to 4 during the first semester of the 2024 academic year, totalling 20,453 students. Data were collected between August and September 2024. This study includes the following substances: alcohol consumed through drinking, cigarettes (both traditional rolled cigarettes and electronic cigarettes), cannabis (typically dried and mixed with tobacco for smoking), and kratom leaves (consumed by chewing fresh leaves or by grinding dried leaves into a powder to be mixed with water).

Sample size and sampling procedure

The study estimated the proportion of alcohol consumption among undergraduate students as ranging from 20.3%,[29] leading to a suitable sample size of 340 individuals. To improve the reliability of the data, the researcher increased the sample size by 20%, resulting in a total of 400 participants. The sample size was calculated using the formula for a finite population.[30] This study employed multi-stage sampling. First, the university was divided into 18 faculties, which were then categorised into three groups: Health

Sciences, Science and Technology, and Arts. One faculty was randomly selected from each group using simple random sampling, resulting in the selection of three faculties. Next, the sample size for each faculty was calculated based on the proportion of students in each academic year (1st to 4th year), and students were then randomly selected by drawing lots from each classroom to form the final sample group.

Inclusion criteria:

1. Undergraduate students enrolled in their 1st to 4th year during the academic year 2024 in the regular programme.
2. The samples were 18 years or older.
3. The samples could read and write.
4. The samples consented to and voluntarily participated in the research project by signing a written consent form.

Exclusion criteria:

1. The samples had visual impairments.
2. The samples were absent during the data collection period.
3. The samples did not complete the questionnaire.

Study instrument

The questionnaire for collecting personal information was developed, based on a review of relevant literature and previous research studies. To create the research instrument for this study, the research team designed a questionnaire grounded in the TRA. This questionnaire aimed to explore students' intentions toward substance use, attitudes toward substance use, and perceived subjective norms regarding substance use. The design process ensured that the questions were relevant to the target population and appropriately adapted to the specific context of the study area. The TRA is integrated into the study's conceptual framework, which is organised into six sections as follows:

(1) General characteristics: this collects information about participants' gender, age, study year, monthly income, income sufficiency, residence, relationship and family status, and history of substance use.

(2) Substance use behaviour questionnaire: this section assesses behaviours related to alcohol, cigarettes/e-cigarettes, cannabis, and kratom use, consisting of 8 items, both closed- and open-ended. For example: "have you ever used substances such as alcohol, cigarettes/e-cigarettes, cannabis, and kratom?", "how many days in the past 30 days have you used substances such as alcohol, cigarette/e-cigarette, cannabis, and kratom?".

(3) Substance use knowledge assessment: it includes 10 items with 4 response options, with the correct answer receiving one point, and the wrong answer receiving zero points. Examples of knowledge questions include "Which organ is primarily affected by alcohol?"; examples of risk of substance questions include "Which of the following is a health risk associated with e-cigarette use?"; and characteristics of substances include "How does cannabis affect the nervous system?". Knowledge score is categorised as high (6–10 points) or low (0–5 points), based on Bloom's taxonomy.[31]

(4) Attitude toward substance use scale: this section consists of 12 items measured on a 5-point Likert scale; strongly agree = 1 score, agree = 2 score, neutral = 3 score, disagree = 4 score, and strongly disagree = 5 score, with scores ranging from 12 to 60. For example: "substance use among adolescents is common", "substance use is a way for individuals to seek happiness for themselves".

(5) Subjective norms of reference groups scale is the perception of family and

friends' opinions on one's substance use: this scale has 13 items, also measured on a 5-point Likert scale like the attitude toward substance use scale, with scores ranging from 13 to 65. For example: “your friends agree with you using substances”, “your parents agree if you use substances to relieve stress”.

(6) Substance use intention assessment: with 6 items with 4 response options, this scale uses a 4-point Likert scale; strong intention = 1 score, intention = 2 score, no intention = 3 score, and strongly no intention = 4 score, scoring between 6 and 24 points. For example: “do you intend to use substances?”, “Do you intend to use substances in the next 3 months?”.

We classified the scores of sections (4) to (6) using the 75th percentile as a cut-off point, dividing participants into two groups: high scores (scores > 75th percentile), indicating positive attitudes, subjective norms, and intentions toward substance use; and low scorers (scores ≤ 75th percentile), indicating negative attitudes, norms, and intentions. This cut-off approach was adapted from the study by Abi Doumit et al.[32] and follows the use of percentiles in score classification.[33] A positive attitude refers to having a negative perception toward substance use, viewing it as harmful or undesirable. In contrast, a negative attitude reflects a more accepting or permissive view, such as believing that occasional substance use is acceptable. Positive subjective norms indicate that the individual perceives important people around them (e.g., family, peers) as disapproving of substance use and expecting them to avoid it, while negative subjective norms reflect the perception that others are accepting of or indifferent to substance use. According to the TRA, a positive intention refers to the likelihood or intention to use substances in the future, whereas a negative intention indicates the absence of such intention or a tendency to avoid substance use.

We checked the quality of the questionnaire protocol in this study. This questionnaire, which was administered to a 30-sample group with characteristics similar to those of eligible participants of the main study, has been tested for content validity by three experts in the field. The questionnaire language was assessed for appropriateness and revised based on their suggestions, achieving an index of objective congruence (IOC) of 1, and the reliability of the questionnaire was accepted with Cronbach’s alpha ranging from 0.735 to 0.810.

Data collection

Following IRB approval, participants were informed of the study's purpose, and data collection adhered to strict ethical standards. Class schedules were reviewed to identify suitable times for data collection, and permissions were obtained from instructors. Students were invited to participate voluntarily, signing informed consent forms. Questionnaires were distributed with an explanation of the study's purpose, emphasising confidentiality and ensuring responses would only be reported in aggregate form. Completed questionnaires were reviewed for completeness to ensure data quality. A total of 400 fully completed responses were analysed following the research protocol. The process prioritised transparency, confidentiality, and respect for participants’ rights.

Statistical analyses

The statistical software was used to analyse the data, employing descriptive statistics and inferential analyses, including Chi-square tests and multiple logistic regression at a significance level of 0.05. Before running the data analysis, the assumptions of multiple logistic regression were tested for independence of errors, linearity in the logit for continuous variables, no multicollinearity, and no strong influential outliers. All assumptions

were met. The multiple logistic regression analyses by stepwise intention levels allowed the researchers to identify factors statistically significantly related at the significance level of 0.05 and variables with p-values less than 0.05, as the researchers intended to perform a comprehensive selection of variables during the initial stage to ensure that potentially significant variables were not excluded prematurely. These variables included gender, relationship status, attitude toward substance use, subjective norm, knowledge of substance use, and history of substance use.

RESULTS

Table 1 shows that the study analysed the characteristics of 400 participants. Most participants were female (66.0%), aged 18–25 years (mean = 21.0, S.D. = 1.33), with 55.7% aged 21 or older. Nearly half (48.3%) were in their fourth year, and 52.0% earned 1,000–5,000 Baht monthly. Most (73.0%) found their income sufficient, and 82.0% lived in private dormitories. Regarding relationships, 60.2% were single, and 69.0% came from families with both parents still together. A history of substance use was reported by 46.0% of participants.

Table 1. Characteristics of participants (n=400)

Characteristics	**Number**	**%**
Gender		
Male	136	34.0
Female	264	66.0
Age (Mean = 20.41, S.D. = 1.331, Min. = 18 years, Max. = 25 years)		
18-20 years	177	44.3
≥ 21 years	223	55.7
Current year of study		
First year	60	15.0
Second year	65	21.2
Third year	62	15.5
Fourth year	193	48.3
Income per month (Mean=5924.50 ,S.D.=2440.418, Min.=1,000 Baht , Max.=20,000 Baht)		
1000 – 5000 Baht	208	52.0
≥ 5001 Baht	192	48.0
Income Sufficiency		
Insufficient	108	27.0
Sufficient	292	73.0
Place of residence		
Parents'/Relatives' house	22	5.5
Private dormitory	328	82.0
University dormitory	50	12.5
Relationship status		
Single	241	60.2
Has a boyfriend/girlfriend	159	39.8
Family status		

Characteristics	Number	%
Parents are together	276	69.0
Others	124	31.0
History of substance use		
No	216	54.0
Yes	184	46.0

S.D.= standard deviation, Min.= minimum, Max.= maximum

Table 2 shows that alcohol was the most commonly used substance (46.0%), followed by cigarettes/e-cigarettes (16.3%). Cannabis and kratom use were less prevalent, reported by 6.3% and 6.0% of participants, respectively.

Table 2. Substance use behaviour of participants (n=400)

Variables	Number	%
Alcohol		
No	216	54.0
Yes	184	46.0
Cigarettes/E-cigarettes		
No	335	83.7
Yes	65	16.3
Cannabis		
No	375	93.7
Yes	25	6.3
Kratom		
No	376	94.0
Yes	24	6.0

Figure 1 shows that 36.2% of undergraduate students expressed an intention to use substances. Nevertheless, the positive proportions of attitudes (51.0%) and subjective norms (52.0%) toward substance use, according to the TRA, slightly exceeded the midpoint.

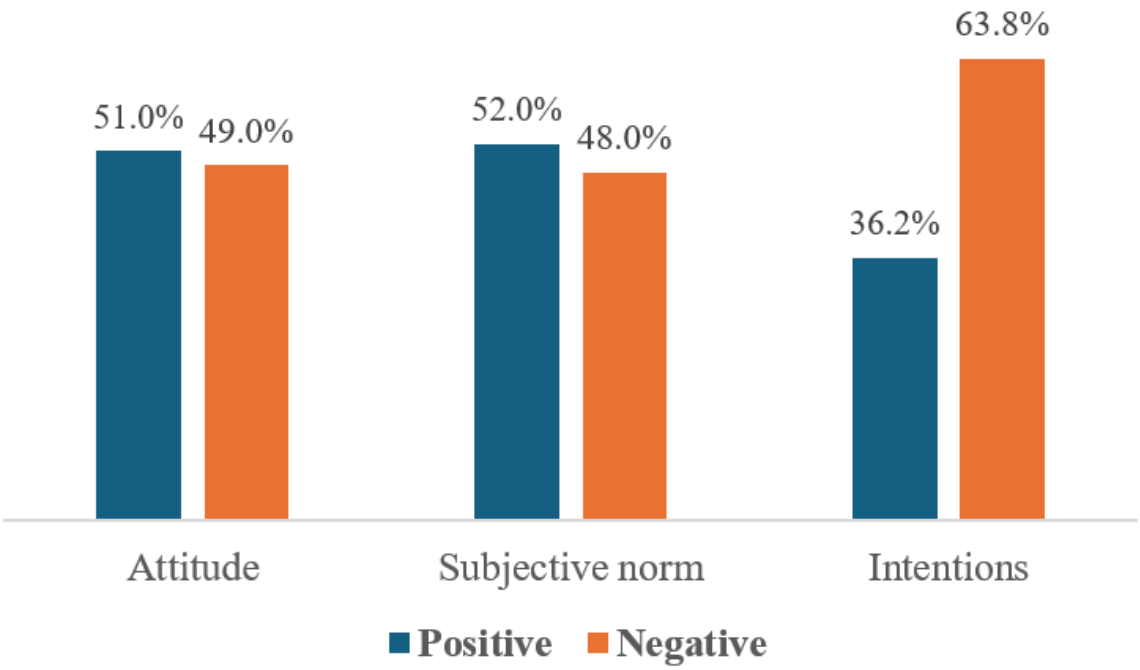

Figure 1. The proportions of substance use intentions to TRA

Table 3 shows that the Chi-square analysis revealed several significant factors associated with substance-use intentions among undergraduate students. Males (46.3%) were more likely than females (31.1%) to report substance-use intentions (p-value = 0.003). Students who were in a relationship (44.7%) were more likely to have intentions compared to those who were single (30.7%) (p=0.005). A strong association was found for history of substance use ($p < 0.001$); students with no prior substance use reported a higher rate of intention (55.4%) compared to those with a history of use (19.9%). Regarding psychosocial factors, students with negative attitudes (52.0%) were significantly more likely to express intentions than those with positive attitudes (21.1%) ($p < 0.001$). Similarly, those perceiving negative subjective norms (56.3%) were more likely to have intentions than those perceiving positive norms (17.8%) ($p < 0.001$). Additionally, students with lower knowledge about substance use (42.2%) were more likely to report intentions compared to those with higher knowledge (27.6%) ($p = 0.003$). On the other hand, variables such as age group, year of study, income level, income sufficiency, place of residence, and family status were not significantly associated with substance-use intentions.

Table 3. Chi-square test assesses the relationship between the independent variables and substance-use intentions

Variables	Substance use intentions (%)		χ^2 (df)	p-value
	Negative	Positive		
Gender			9.048	0.003*
Male	73 (53.7)	63 (46.3)	(1)	
Female	182 (68.9)	82 (31.1)		
Age Group			1.665	0.197
18–20 years	119 (67.2)	58 (32.8)	(1)	
≥ 21 years	136 (61.0)	87 (39.0)		
Current year of study			2.923	0.404
First year	43 (71.7)	17 (28.3)	(3)	
Second year	55 (64.7)	30 (35.3)		
Third year	41 (66.1)	21 (33.9)		
Fourth year	116 (60.1)	77 (39.9)		
Income per month			0.007	0.934
1000–5000 Baht	133 (63.9)	75 (36.1)	(1)	
≥ 5001 Baht	122 (63.5)	70 (36.5)		
Income Sufficiency			1.291	0.256
Insufficient	191 (65.4)	101 (34.6)	(1)	
Sufficient	64 (59.3)	44 (40.7)		
Place of residence			3.990	0.136
Parents'/Relatives' house	18 (81.8)	4 (18.2)	(2)	
Private dormitory	203 (61.9)	125 (38.1)		
University dormitory	34 (68.0)	16 (32.0)		
Relationship status			8.066	0.005*
Single	167 (69.3)	74 (30.7)	(1)	
Had a boyfriend/girlfriend	88 (55.3)	71 (44.7)		
Family status			0.000	0.991
Parents are together	176 (63.8)	100 (36.2)	(1)	
Others	79 (63.7)	45 (36.3)		
History of substance use			54.269	<0.001*
No	82 (44.6)	102 (55.4)	(1)	
Yes	173 (80.1)	43 (19.9)		
Attitude toward substance use			41.467	<0.001*
Positive	161 (78.9)	43 (21.1)	(1)	
Negative	94 (48.0)	102 (52.0)		
Subjective norm			63.910	<0.001*
Positive	171 (82.2)	37 (17.8)	(1)	
Negative	84 (43.8)	108 (56.3)		
Knowledge of substance use			8.892	0.003*
High	118 (72.4)	45 (27.6)	(1)	
Low	137 (57.8)	100 (42.2)		

* Significance level (p-value < 0.05), df=degrees of freedom

Table 4 shows that the multiple logistic regression analysis identified key predictors of substance-use intentions among university students. Significant

factors included subjective norms and a history of substance use. Students with negative subjective norms were more likely to have substance-use intentions (Adj. OR=3.394, p<0.001), as were those with a history of substance use (Adj. OR=3.062, p<0.001). Although gender, relationship status, and knowledge of substance use were not statistically significant, negative attitudes approached significance (Adj. OR=1.666, p=0.058). The model explained 32.0% of the variance in substance-use intentions.

Table 4. Logistic regression multivariate analysis of the most influential variables on substance-use intentions

Variables	B	S.E.	Adj. OR	95% CI	p-value
Gender					
Female	Ref				
Male	0.203	0.253	1.225	0.746–2.011	0.423
Relationship status					
Single	Ref				
Had a boyfriend/girlfriend	0.364	0.247	1.438	0.886–2.334	0.141
Attitude toward substance use					
Positive	Ref				
Negative	0.511	0.270	1.666	0.982–2.828	0.058
Subjective norm					
Positive	Ref				
Negative	1.222	0.269	3.394	2.002–5.753	<0.001*
Knowledge of substance use					
High	Ref				
Low	0.460	0.253	1.584	0.964–2.601	0.069
History of substance use					
No	Ref				
Yes	1.119	0.253	3.062	1.865–5.028	<0.001*
Constant=-2.582, -2 log likelihood=417.603, Nagelkerke R^2=0.320					

* Significance level (p-value < 0.05), Ref=reference, B=regression coefficient, S.E.=standard error, Adj. OR=adjusted odds ratio, 95% CI=95% Confidence Interval

DISCUSSION

This study found that one in three undergraduate students intends to use substances, influenced by personal and social factors. Social norms, peer relationships, and relaxed restrictions on substances like cannabis for medical use have increased accessibility,[34] raising the likelihood of experimentation. In Northern Thailand, these substances hold historical and cultural significance.[35] Similarly, research from Switzerland shows that university students often perceive substance use as socially acceptable.[36] Vaping is increasingly popular, especially among young females with high internet usage.[37]

The study also revealed that gender, relationship status, and attitudes toward substances were statistically associated with substance use, as indicated by the Chi-square test. This suggests a relationship between these variables. However, logistic regression analysis revealed that these factors were not significant predictors of substance use. When considering other variables, gender, relationship status, and

attitudes toward substances did not have a strong influence on substance use behaviour. This suggests that while these variables may be linked to substance use, they are not decisive factors in determining whether an individual will engage in substance use. Other factors are likely to play a more significant role. For instance, a study conducted among Egyptian university students identified significant risk factors for substance use, including a history of family conflict, peer pressure, childhood abuse, urban residency, and a family history of substance use.[20] Similarly, research among Finnish university students demonstrated that the use of one substance was significantly associated with the use of others. Multiple substance use was less prevalent among students who were single or supported campus-wide bans on smoking and alcohol, but more common among those not residing with their parents during the academic term. No significant associations were observed with age, mental health status, income level, or academic performance.[24]

The history of substance use was strongly linked to increased intention to use substances, influenced by biological and psychological factors.[38] Repeated use alters brain areas related to memory and decision-making, increasing sensitivity to drug-related stimuli.[39] Additionally, reduced self-control contributes to relapse risk.[40] These findings align with previous studies emphasizing the role of peer groups, emotional states, and social environments in substance use.[41] Similarly, negative social media addiction behaviours may impact substance use behaviours among students.[42] Students without adequate support and awareness of the consequences of drug use were more vulnerable, highlighting the need for improved education on health and financial risks.[43]

Subjective norms were found to be the most influential factor associated with substance use intentions among undergraduate students. Students who perceived that their family or peers were permissive or non-oppositional toward substance use (i.e., negative subjective norms) were more likely to intend to use substances than those with positive subjective norms. According to the TRA, behavioural intentions are shaped by two main components: attitudes toward the behaviour and subjective norms. Subjective norms refer to an individual's perception of whether significant others—such as family and peers—approve of or expect them to perform a particular behavior.[16] When these referent groups appeared accepting or failed to discourage substance use, students tend to perceive such behaviours as socially acceptable and consistent with group expectations. This finding aligns with prior studies, which have demonstrated that peer influence plays a critical role in adolescent smoking behavior.[44] Social norms within peer groups have also been shown to significantly influence the initiation and maintenance of substance use, especially when peers themselves engage in such behaviours. The perceived acceptance of substance use by peers may heighten an individual's intention to engage in similar behaviour.[45] In addition to peer influence, family context was also shown to play an important role in either promoting or preventing substance use. A study conducted in Florida found that adolescents living in shared households with non-parental adults—particularly in the absence of either biological parent—were more likely to engage in substance use compared to those residing in two-parent households.[46]

LIMITATIONS OF THE STUDY

This study has several limitations. The cross-sectional design prevents the establishment of causal relationships, and

the use of self-administered questionnaires may introduce response bias. The sample was limited to a single university in Northern Thailand, restricting generalisability. Additionally, factors such as media influence and stress were not considered. Future research should use longitudinal designs and a more diverse sample for broader applicability.

CONCLUSION

This study emphasizes targeting subjective norms and substance use history to reduce students' future substance use intentions. Interventions should focus on reshaping attitudes, enhancing risk education, and providing tailored support for students with a history of use. Future research should examine the influences of gender and relationship status to develop more effective, group-specific strategies.

RECOMMENDATIONS

To reduce substance-use intentions among undergraduate students, interventions should prioritize addressing subjective norms and providing targeted support for individuals with a history of substance use. Programs should focus on reshaping attitudes, enhancing risk education, and developing strategies sensitive to gender and relationship status. Universities are encouraged to implement comprehensive prevention initiatives and strengthen campus policies to create a supportive environment.

AUTHOR CONTRIBUTIONS

TL, PK, AK, AN and NP designed the study, analysed the data, served as the lead author an revised the manuscript. TL, SA and NP assisted in data analysis and primarily wrote the manuscript. KT, CK, CS and NP designed and supervised the study, contributed to the local implementation of the study, assisted in the analysis and interpretation of the data and revised the manuscript. All authors read and approved of the final manuscript.

ETHICAL CONSIDERATION

The study was conducted in accordance with the Declaration of Helsinki. Ethical approval was obtained from the Human Research Ethics Committee of the University of Phayao (Reference No. HREC-UP-HSST 1.3/037/67) on 16 August 2024.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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