

Original Article



Alcohol Craving and its Associated Factors Among Adolescent Hazardous Drinkers in Thailand

Suneerat Yangyuen^{1*}, Thidarat Somdee¹, Meihua Yin¹, Atchara Chaichan²

¹Faculty of Public Health, Mahasarakham University, Thailand

²Faculty of Nursing, Mahasarakham University, Thailand

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*Corresponding author:

Suneerat Yangyuen,
Email: suneerat.y@msu.ac.th

Abstract

Background: Alcohol craving is one factor contributing to subsequent increased drinking and relapse in adults and adolescents with alcohol use disorders (AUDs). However, little is known about alcohol craving and its associated factors in non-treatment-seeking Thai adolescent drinkers. Hence, this study aimed to explore factors related to alcohol craving among Thai adolescent hazardous drinkers.

Methods: A cross-sectional design was performed on 617 adolescent drinkers from three universities in northeastern Thailand who were selected by the multi-stage random sampling method. A self-reported questionnaire was used for data collection. Multiple logistic regression was applied to investigate factors influencing alcohol craving.

Results: Most adolescents were male (51.1%), and approximately 55.4% of them reported craving for alcohol. The greater cravings were found in the presence of alcohol-related cues, such as being at a party or in a pub or bar, showing alcohol-related stimuli (sights, sounds, and smells), drinking with peers or others, and drinking on weekends. Psychological factors such as positive alcohol expectancies, perceived stress, and negative affect were related to a higher level of alcohol craving and were inversely related to negative alcohol expectancies and positive affect.

Conclusion: Understanding the effects of alcohol-related cues and psychological factors on alcohol cravings may be useful for health professionals to identify which adolescent drinkers are at risk of renewed drinking and design potential target interventions to reduce cravings.

Keywords: Alcohol craving, Adolescent, Hazardous drinking, Trigger



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Introduction

Alcohol craving is defined as a strong desire or urge to consume alcohol (1) and has been considered one of the determinants of subsequent increased drinking, relapse, and alcoholism. (1,2) Craving is a criterion for the detection of alcohol use disorder (AUD) and a strong indicator of AUD among non-treatment seekers (1,3). In addition, alcohol craving is common among adolescents, particularly among those with more alcohol-related problems, AUD, and heavier drinking histories, and it predicts their drinking levels (3,4). Importantly, alcohol craving can be triggered by exposure to alcohol-related stimuli (e.g., sights or smells of an alcoholic beverage, and sounds of opening a beer can/bottle), environmental factors (e.g., being in a party, pub, or bar, or being under peer pressure), and psychological factors (e.g., negative emotions, stress, or outcome expectancies) (5,6). Other factors that may contribute to alcohol cravings are the time of day and the day of the week (6,7). Thus, adolescents

crave alcohol in the presence of alcohol-related cues that may lead them to a higher use of alcohol (5-7).

Alcohol cravings were widely observed in many countries. For example, studies of non-treatment seekers in the US showed that the prevalence of alcohol craving was 16.2% (3). It was 36.0% in AUD patients in the Netherlands (8), 64.3% in AUD patients in Spain (9), and 54% in outpatient addiction clinics in China (10). In Thailand, since 2020, the prevalence of current youth drinkers has been 34.8%, and hazardous and harmful youth drinkers have been 18.2%. The first rank with the highest prevalence of current youth drinkers found in the northeastern region was 39.8% (11). Moreover, some evidence demonstrated that the online alcohol market has become popular among Thai adolescents because of easy access to alcohol, delivery services, alcohol promotion (e.g., special discounts, a voucher, or free delivery), and exciting alcohol advertising on social media (e.g., pictures or video-auto play of alcoholic beverages). This online



alcohol marketing can increase positive emotions and thoughts about alcohol, trigger alcohol cravings, and make adolescents use more alcohol (12). Additionally, previous research revealed that exposure to alcohol advertising, alcohol promotion, and alcohol packaging increased cravings among adolescents (13). Thus, maybe Thai adolescents are vulnerable to alcohol cravings. However, there is less research focusing on psychological factors in alcohol craving, and the evidence of its associated factors among Thai non-treatment-seeking adolescents remains limited (12). Hence, this study aimed to assess the association between alcohol craving and its potential factors, which may help identify individuals who are at risk for renewed drinking or vulnerable to relapse.

Materials and Methods

Study Population

This cross-sectional study was conducted from August 2020 to January 2022. Eligible participants were undergraduate students who enrolled in three universities in northeastern Thailand, aged 18–22 years old, were assessed as hazardous drinkers by the Alcohol Use Disorders Identification Test (Thai version) and scored 8 or above, which is considered hazardous drinking (14), and had no communication problems. In addition, they were excluded because of treatment seekers, a lack of interest in participating, and an incomplete questionnaire. The sample size was calculated using Cochran's formula (15), with an estimator of the percentage of individuals who experienced stressful events reporting higher alcohol cravings in the study (85.7%), reported by Teeravisutkul et al (16), considering 3% precision and a 95% confidence interval. This accounted for 524 participants, plus 15% compensation for non-response. The final sample size was 617. The students who met the eligible criteria were enrolled using the multistage sampling method. First, the researcher used the lottery method to select three universities located in the upper, middle, and lower parts of northeastern Thailand from the university's geographically marked spot listing (one university per part). Second, the five faculties of each university were chosen using the lottery method from the list of faculties. Third, in each university, the students were chosen through systematic random sampling. Every third student on the hazardous alcohol drinkers list was selected as a participant, and if a student was absent or unwilling to participate, the student next on the list was taken in.

Measurements

This self-reported questionnaire was composed of four parts as follows:

Predictors

Part 1: Socio-demographic factors include gender, age, use of other substances, and duration of substance use. All variables were categorized as dichotomous variables, except for the age variable, which was a continuous variable.

Part 2: Alcohol-related factors encompassed alcohol-related contexts, alcohol-related behaviors, time of day, and day of the week. Most variables were identified as polychotomous variables, except for the days of the week, which were identified as dichotomous variables. Further, alcohol-related stimuli, including alcohol-related sights, sounds, and smells, were measured by three (yes/no) items in which respondents were asked, "Are these alcohol-related stimuli making you crave alcohol? (e.g., seeing alcoholic beverages in the house, smelling an alcoholic beverage, and hearing the sound of the opening of an alcoholic beverage can/bottle) (5,6). A dichotomous variable was computed to indicate whether or not participants endorsed any of these items.

Part 3: Psychological factors comprised perceived stress, alcohol expectancies (AEs), and positive and negative affect.

Perceived stress was assessed using the Thai version of the Perceived Stress Scale-10, which was translated by Wongpakaran and Wongpakaran (17), reflecting an individual's level of perceived stress in the past month. This is a 10-item scale rated on a 5-point Likert-type scale, ranging from 0 (never) to 4 (very often). Higher scores indicate higher perceived stress. The scale showed good internal consistency (Cronbach's alpha was 0.87).

AEs were measured by a self-reported questionnaire adapted by Ham et al (18), reflecting expectations of the positive and negative effects of alcohol use. The scale consists of 15 items [positive AEs (PAEs)=8 items and negative AEs (NAEs)=7 items] that are rated on a 4-point scale from 1 (disagree) to 4 (agree). The total score was computed by summing across all items of each dimension; PAEs and NAEs range from 8 to 32 and from 7 to 28, respectively. AEs are dichotomized by the median. This scale demonstrated good internal consistency for both PAEs and NAEs (Cronbach's alpha was 0.88 and 0.89, respectively).

Positive affect (PA) and negative affect (NA) were measured by the Positive and Negative Affect Schedule, which was developed by Watson et al (19), measuring PA (e.g., enthusiastic, alert, or inspired) and NA (e.g., upset, distressed, or guilty) to identify the emotions that cause individuals to be more likely to drink. This scale comprised 20 items (PA = 10 items and NA = 10 items). Each item is rated on a 5-point scale, ranging from 1 (very slightly or not at all) to 5 (extremely). Items are summed to provide the total, ranging from 10 to 50 for both PA and NA. The PANAS score was divided into two high and low groups based on the median method. The scale had good internal consistency for both PA and NA (Cronbach's alpha was 0.88 and 0.86, respectively).

Outcome Variables

Part 4: The primary outcome of interest in this study was alcohol craving assessed through the Penn Alcohol Craving Scale, which was developed by Flannery et al (20). This is a 5-item self-reported scale that evaluates the frequency, intensity, duration, and difficulty resisting cravings over

the previous week. This scale is rated on a Likert-type scale, ranging from 0 to 6. The total score was determined by summing the scores of all items (in the range of 0–30), with higher scores indicating more frequency and more intense cravings. The recommended cutoff for the indicator of alcohol craving in the community samples of non-treatment seekers was 15, and scores below 15 were considered non-cravers (21). The scale showed good internal consistency (Cronbach's alpha was 0.89).

Statistical Analysis

Descriptive statistics were applied to analyze the characteristics of all variables. For the comparison of socio-demographic, alcohol-related, and psychological factors between participants who were craving and non-craving, a chi-square test and an independent sample t-test were used for categorical and normally distributed continuous variables. Next, the bivariate odds ratio (OR) was estimated to assess the relationship between potential predictors and alcohol craving. The adjusted OR was estimated from multivariable logistic regression to evaluate the association between socio-demographic, alcohol-related, and psychological factors and alcohol craving. A series model was developed, such as Model 1; all psychological factors were entered into the model. In Model 2, all alcohol-related factors were added to Model 1. In Model 3, all socio-demographic factors were added to Model 2. All statistical analyses were performed using SPSS, version 20.0 (IBM Corp., Armonk, NY, USA), and $P < 0.05$ was considered statistically significant.

Results

Based on the results (Table 1), most participants were male (51.1%), with an average age of 19.5 years (standard deviation [SD] = 1.3 years). Approximately 55.4% of them reported cravings for alcohol, and more than half (52.5%) had used alcohol for 3 or more years. In terms of alcohol-related factors, the most common situations and contexts that elicited alcohol craving were at a party (36.3%), in a pub or bar (32.9%), and at home (30.8%), respectively. In addition, 37.6% and 33.2% of youth indicated that drinking with peers or others (relatives or parents), respectively, triggered alcohol cravings. Moreover, a similar proportion of youth mentioned that alcohol-related sights (55.1%), sounds (53.2%), and smells (50.2%) elicited cravings. Furthermore, most of them experienced greater alcohol cravings when drinking on weekends (Friday, Saturday, or Sunday), at night, or during the afternoon. Regarding psychological factors, more than half of the respondents had high levels of PAEs, NAEs, NA, and PA, and the mean score for perceived stress was 19.1 (SD = 6.4). In addition, the comparison of all predictor variables between participants with craving and non-craving showed that perceived stress scores, alcohol-related contexts, alcohol-related behaviors, alcohol-related stimuli, day of the week, PAEs, NAEs, NA, and PA were statistically significant differences ($P < 0.05$). There was no significant difference

in gender, age, use of other substances, duration of substance use, or time of day.

In bivariate analyses (Table 2), participants who reported higher levels of PAEs, NA, and perceived stress were significantly more likely to report craving, while those who had higher levels of NAEs and PA were less likely to report craving. Furthermore, the contexts associated with increased alcohol craving were being at a party and in a pub or bar, as well as in the presence of alcohol-related stimuli such as alcohol-related sights, sounds, and smells. Additionally, adolescents reported experiencing greater cravings when drinking with peers or others and on weekends.

Based on multivariate analyses (Table 2), in Model 1, it was revealed that all psychological factors were associated with alcohol craving, similar to the bivariate model. In Model 2, alcohol-related factors were added to Model 1, and the results indicated that drinking with peers or others was equally associated with greater craving. In addition, some contexts (e.g., at a party or in a pub or bar) and stimuli (e.g., alcohol-related sights, sounds, or smells) were related to increased alcohol craving. The day of the week also influenced craving, such that drinking on weekends was associated with greater craving. In Model 3, socio-demographic factors were added to the model, and the findings represented a similar association between psychological and alcohol-related factors and alcohol craving as in Model 2. However, there was no statistically significant association between socio-demographic variables and craving.

Discussion

The findings of this present study confirmed that a greater level of alcohol craving was associated with alcohol cues and contexts. Regarding alcohol-related contexts, it was found that adolescents reported greater cravings while at a party or in a pub/bar. According to previous studies (5,6,22), being in any of the environmental contexts, especially parties, pubs, or bars, could significantly predict alcohol cravings. One possible explanation is that individual exposure to environmental contexts is likely to trigger highly automated neurocognitive processes involving cravings that lead to sustained drinking behavior (3,22). In addition, exposure to these contexts may lead to recalling substance or alcohol consumption in everyday life, which may lead to initiating cravings and provoking drinking (23). Further, it was revealed that drinking with peers or others (e.g., relatives or parents) was associated with increased alcohol cravings. Consistent with prior research, the presence of other individuals (e.g., drinking with social groups, peers, parents, or other relatives) plays an important role in eliciting an alcohol craving (5,6,24). A possible explanation is that adolescents' drinking behavior and cravings may be influenced by peer influence and peer selection processes, in which adolescents prefer to select friends who are similar to them with regard to alcohol use, and that adolescents adjust their drinking behavior to match their friends' behavior (6,24). Thus, exposure to

Table 1. Distribution of Socio-demographic, Alcohol-related, and Psychological Factors by Alcohol Craving

Variables	Alcohol Craving			P value
	Total (N=617) n (%)	Craving (n=342) n (%)	Non-craving (n=275) n (%)	
Sociodemographic Factors				
Age (y)	19.5±1.3	19.4±1.3	19.5±1.3	0.799 ^a
Gender				
Male	315 (51.1)	183 (53.5)	132 (48.0)	0.201 ^b
Female	302 (48.9)	159 (46.5)	143 (52.0)	
Duration of alcohols use (y)				
≥3	324 (52.5)	188 (55.0)	136 (49.5)	0.200 ^b
<3	293 (47.5)	154 (45.0)	139 (50.5)	
Use of other substances				
Yes	266 (43.1)	155 (45.3)	111 (40.4)	0.248 ^b
No	351 (56.9)	187 (54.7)	164 (59.6)	
Alcohol-Related Factors				
Alcohol-related contexts				
Party	224 (36.3)	137 (40.1)	87 (31.6)	0.002 ^{b*}
Pub/bar	203 (32.9)	120 (35.1)	83 (30.2)	
Home	190 (30.8)	85 (24.8)	105 (38.2)	
Alcohol-related behaviors				
Peer	232 (37.6)	142 (41.5)	90 (32.7)	0.002 ^{b*}
Others (relatives/parents)	205 (33.2)	120 (35.1)	85 (30.9)	
Alone	180 (29.2)	80 (23.4)	100 (36.4)	
Alcohol-Related Stimuli				
Alcohol-related sights				
Yes	340 (55.1)	210 (61.4)	130 (47.3)	0.001 ^{b*}
No	277 (44.9)	132 (38.6)	145 (52.7)	
Alcohol-related sounds				
Yes	328 (53.2)	202 (59.1)	126 (45.8)	0.001 ^{b*}
No	289 (46.8)	140 (40.9)	149 (54.2)	
Alcohol-related smells				
Yes	310 (50.2)	195 (57.0)	115 (41.8)	<0.001 ^{b*}
No	307 (49.8)	147 (43.0)	160 (58.2)	
Time of day				
At night	220 (35.7)	127 (37.1)	93 (33.8)	0.263 ^b
At afternoon	207 (33.5)	119 (34.8)	88 (32.0)	
Midday	190 (30.8)	96 (28.1)	94 (34.2)	
Day of the week				
Weekend	325 (52.7)	207 (60.5)	118 (42.9)	<0.001 ^{b*}
Weekday	292 (47.3)	135 (39.5)	157 (57.1)	
Psychological Factors				
Positive alcohol expectancies				
High	350 (56.7)	211 (61.7)	139 (50.5)	0.007 ^{b*}
Low	267 (43.3)	131 (38.3)	136 (49.5)	
Negative alcohol expectancies				
High	332 (53.8)	160 (46.8)	172 (62.5)	<0.001 ^{b*}
Low	285 (46.2)	182 (53.2)	103 (37.5)	
Positive affect				
High	335 (54.3)	165 (48.2)	170 (61.8)	0.001 ^{b*}
Low	282 (45.7)	177 (51.8)	105 (38.2)	
Negative affect				
High	340 (55.1)	210 (61.4)	130 (47.3)	0.001 ^{b*}
Low	277 (44.9)	132 (38.6)	145 (52.7)	
Perceived stress	19.1±6.4	22.3±5.5	14.1±4.2	0.001 ^{a*}

Note. Values are presented as numbers (%) or means±standard deviations;

^a P value for independent samples *t* test; ^b P value for Chi-square test; *Statistically significant at *P*<0.05.

Table 2. Odds Ratios and 95% CIs from Logistic Regression for Alcohol Craving

	Bivariate		Model 1		Model 2		Model 3	
	Unadjusted OR (95% CI)	P-value	Adjusted OR (95% CI)	P-value	Adjusted OR (95% CI)	P-value	Adjusted OR (95% CI)	P-value
Psychological factors								
High positive alcohol expectancies (ref.: Low)	1.57 (1.14-2.17)	0.006	2.69 (1.68-4.30)	<0.001	2.75 (1.63-4.62)	<0.001	2.70 (1.61-4.55)	<0.001
High negative alcohol expectancies (ref.: Low)	0.53 (0.38-0.73)	<0.001	0.49 (0.31-0.78)	0.003	0.46 (0.28-0.77)	0.003	0.44 (0.27-0.74)	0.002
High positive affect (ref: Low)	0.57 (0.41-0.79)	0.001	0.50 (0.32-0.78)	0.003	0.47 (0.29-0.78)	0.003	0.47 (0.28-0.77)	0.003
High negative affect (ref: Low)	1.77 (1.28-2.44)	<0.001	2.17 (1.37-3.43)	0.001	2.29 (1.37-3.83)	0.002	2.19 (1.29-3.71)	0.004
Perceived stress	1.43 (1.35-1.52)	<0.001	1.44 (1.36-1.53)	<0.001	1.51 (1.40-1.62)	<0.001	1.51 (1.41-1.62)	<0.001
Alcohol-related factors								
Alcohol-related contexts								
Party (ref.: Home)	1.94 (1.31-2.88)	0.001	-	-	2.24 (1.22-4.09)	0.009	2.25 (1.23-4.13)	0.008
Pub/bar (ref.: Home)	1.78 (1.19-2.66)	0.004	-	-	2.38 (1.27-4.43)	0.006	2.39 (1.28-4.47)	0.006
Alcohol-related behaviors								
Peer (ref.: Alone)	1.97 (1.32-2.92)	0.001	-	-	2.50 (1.33-4.68)	0.004	2.59 (1.37-4.88)	0.003
Others (ref.: Alone)	1.76 (1.17-2.64)	0.006	-	-	2.57 (1.38-4.80)	0.003	2.60 (1.38-4.86)	0.003
Alcohol-related stimuli								
Alcohol-related sights (ref.: No)	1.77 (1.29-2.45)	<0.001	-	-	2.46 (1.44-4.18)	0.001	2.57 (1.50-4.39)	0.001
Alcohol-related sounds (ref.: No)	1.70 (1.23-2.35)	0.001	-	-	1.97 (1.18-3.26)	0.009	1.99 (1.19-3.34)	0.009
Alcohol-related smells (ref.: No)	1.85 (1.34-2.54)	<0.001	-	-	2.10 (1.26-3.50)	0.004	2.16 (1.29-3.61)	0.003
Time of day								
At night (ref.: Midday)	1.33 (0.90-1.97)	0.145	-	-	1.40 (0.75-2.59)	0.284	1.42 (0.76-2.65)	0.270
At afternoon (ref.: Midday)	1.32 (0.89-1.96)	0.165	-	-	1.31 (0.70-2.44)	0.384	1.37 (0.73-2.55)	0.329
Day of the week								
Weekend (ref.: Weekday)	2.04 (1.47-2.81)	<0.001	-	-	1.97 (1.20-3.23)	0.007	1.97 (1.20-3.25)	0.007
Socio-demographic factors								
Age (years)	0.98 (0.87-1.11)	0.798	-	-	-	-	0.91 (0.74-1.11)	0.346
Male (ref: Female)	1.24 (0.91-1.71)	0.174	-	-	-	-	1.19 (0.73-1.96)	0.476
Duration of alcohols use ≥3 (ref.: <3 years)	1.25 (0.90-1.72)	0.173	-	-	-	-	1.15 (0.69-1.91)	0.582
Use of other substances (ref.: No)	1.22 (0.88-1.68)	0.217	-	-	-	-	1.39 (0.84-2.30)	0.198

Note. OR: Odds ratio; CI: Confidence interval; Ref: Reference group.

alcohol-using peers may lead them to have greater cravings and start drinking (24). In particular, deviant peers on substance use have an important influence on substance cravings, including alcohol cravings. Adolescents who spend time with deviant peers can boost their alcohol cravings through alcohol offers and sharing positive attitudes toward drinking (24,25).

Moreover, alcohol cravings have been found to be more prevalent in families than alone (7). Considering that adolescents with a family history of alcohol use involvement may observe parental drinking behavior and learn alcohol use as a usual family pattern (26), particularly in Thai society, celebratory drinking, such as when obtaining a new car or a new property or attending a birth party, is the most common reason for drinking in the family. Thus, these may trigger their cravings by offering an alcoholic beverage (27).

Additionally, our finding demonstrated that individuals'

exposure to alcohol-related stimuli (e.g., sights, sounds, or smells) were related to alcohol craving, which is consistent with the findings of previous studies, indicating that adolescent drinkers had greater cravings when faced with alcohol-related stimuli in their daily lives, and this effect was strongly associated with heavier drinking (6,27). A possible explanation is that exposure to alcohol-related stimuli (e.g., sights or smells of an alcoholic beverage, sounds of opening a beer can, and pictures of an alcoholic beverage) may contribute to the activation of the cognitive response, which may evoke an increase in alcohol craving and consumption (5,28). The Alcohol Beverage Control Act C.E. 2008 in Thailand emphasizes the prohibition of alcohol promotion, including advertisement or exposure to band logos or products in webpages, magazines, sporting events, or music events, to reduce attractiveness and access to alcohol. The exposure of most Thai youth to alcohol advertising media outside the country leads

them to crave and attempt to drink (29). According to the incentive sensitization theory, the addictive-related stimuli (e.g., visual, auditory, or olfactory stimuli) act as an incentive, grab the person's attention, and increase craving for the substance, including alcohol (30). Concerning the day of the week, it was found that it also influenced craving, such that adolescents were more likely to experience craving during the weekend (Friday, Saturday, or Sunday). According to prior studies (5-7), drinking days predicted greater intensity of craving, especially when drinking during the weekend was associated with greater craving levels. A possible reason is that individuals experience greater cravings and tend to consume a higher amount of alcohol during weekends, particularly due to its relationship to leisure time, a lack of work commitment, and parties (5,6). Additionally, some studies indicated that social or traditional events were associated with peak levels of alcohol consumption and took place on the weekend. Thus, it is possible that inherent in the culture or traditional events, alcohol consumption is allowable (27,31). Moreover, in northeastern Thailand, drinking is accepted in cultural and social events (e.g., a celebration of getting a new car or motorcycle, new property, and religion-related or spirit-related rituals), and it is the primary opportunity for adolescents to drink. Further, drinking has a specific function regarded as a mediation relationship between individuals or establishing friendship. Therefore, when addressing event-related alcohol use, individuals may be urged to consume alcohol (27).

Regarding psychological factors, it was found that adolescents with a higher level of perceived stress were more likely to experience cravings. In line with previous research (5,32), it was revealed that stressful events have been related to increased cravings for alcohol. A possible explanation is that stressful life events sometimes trigger psychological distress and negative emotions, which can elicit a strong alcohol craving (32). For example, the emergence of the coronavirus disease 19 pandemic (2020-2021) has impacted many aspects of life among the Thai population, especially stay-at-home orders, social distancing, and many schools, universities, and business closures, which can increase social isolation and loneliness (33,34). Thus, individuals who are faced with stressful conditions may desire to drink as a way to cope with their stress (5,32). Regarding positive and negative affect, it was observed that NA was associated with greater alcohol craving, whereas PA was inversely related to craving. According to prior studies (7,35), NA (e.g., anxiety, distress, or guilty sadness) can act as alcohol-related cues and trigger craving, but greater PA (e.g., feeling of joy, alertness, or relaxation) leads to decreased substance craving. One possible reason is that both PA and NA can be components of cue-induced craving and can elicit an emotional-motivational state that may lead to craving and motivate renewed drinking (35,36). For example, individuals learn to use alcohol because it can help get rid of negative emotional states. Thus, after such learning has

occurred, negative emotions trigger the desire for alcohol (36,37). Another reason is that exposure to alcohol-related cues (e.g., being in a pub or bar) significantly increases NA while decreasing PA. These changes in emotions were accompanied by an increase in stress and induced alcohol cravings (5,7). Additionally, our results confirmed that PAEs were strongly associated with increased craving; conversely, NAEs were related to decreased craving. Consistent with other studies (22,38,39), alcohol outcome expectancies were associated with alcohol desirability. A possible explanation is that exposure to alcohol-related cues (e.g., being in a pub or party or drinking with friends) evokes expectations of positive outcomes that contribute to craving and drinking. These cues may activate PAEs that produce increased relaxation, pleasure, or fun and lead to the desire to experience those feelings. This desire may trigger urges to drink (22,39). However, alcohol-related cues have negligible effects on NAEs, which seem to reduce the rewarding alcohol effect and lead to lower reward cravings (22).

The present study had some limitations. First, considering the cross-sectional design, it was hard to establish temporality and causality. Second, our subjects were hazardous drinkers, and we excluded treatment seekers, who may have different experiences with alcohol cravings than adolescents seeking treatment or other drinking groups. Thus, caution must be used when generalizing the results to other groups. Third, self-reported alcohol use and craving can be implicated in social desirability bias. Validated and standardized instruments were used to minimize self-report bias. Despite the limitations, our study provided a better understanding of alcohol cravings that are triggered by alcohol-related cues and psychological factors among non-treatment seekers. In addition, being aware of how psychological factors, especially stress, negative affect, and PAEs, elicit cravings may assist in identifying adolescent drinkers who are faced with psychological distress and are at risk of renewed drinking. Further, longitudinal studies should be applied to investigate the causality of craving and should also take alcohol use severity and cognitive-affective-behavioral factors into account to help better understand the expression of craving.

Conclusion

Alcohol-related and psychological factors play an important role in the alcohol cravings of hazardous drinkers. Such information may be useful to health professionals and relevant organizations to develop an effective intervention to reduce cravings.

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Authors' Contribution

Conceptualization: Suneerat Yangyuen.

Data curation: Suneerat Yangyuen, Atchara Chaichan.

Formal analysis: Suneerat Yangyuen, Meihua Yin.

Funding acquisition: Suneerat Yangyuen.

Investigation: Thidarat Somdee, Atchara Chaichan, Meihua Yin.

Methodology: Suneerat Yangyuen, Atchara Chaichan, Meihua Yin.

Project administration: Suneerat Yangyuen.

Resources: Thidarat Somdee, Atchara Chaichan.

Supervision: Suneerat Yangyuen.

Validation: Thidarat Somdee, Atchara Chaichan.

Visualization: Atchara Chaichan, Meihua Yin.

Writing-original draft: Suneerat Yangyuen, Atchara Chaichan, Meihua Yin.

Writing-review & editing: Suneerat Yangyuen, Thidarat Somdee, Atchara Chaichan, Meihua Yin.

Competing Interests

There is no conflict of interests.

Ethical Approval

All participants were informed about the research information. They all gave written informed consent and then completed the self-report questionnaire. This research was approved by the Review Ethics Boards of Mahasarakham University (Ethical No. PH056/2562).

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