

Alcohol Use, Life Stress, and Depression among Chinese University Students

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Abstract

Aim: This study explored the depressive symptoms among Chinese university students and further examined how alcohol use and life stress experiences may contribute to depression among a sample of 526 university students in China. **Method:** The self-report questionnaire contained items concerning demographic information, alcohol use, life stress experience, and depressive symptoms. Depression was measured with the *Center for Epidemiologic Studies Depression (CES-D)*. **Main findings:** Analysis of the data showed that generally students who regularly drank alcohol reported higher scores in depression than nondrinkers' scores and students who experienced life stress (i.e., academic difficulty) had highest scores for symptoms of depression. Students who self-reported a lower than average academic performance at school on average had higher depression scores. Both more frequent drinking behavior and higher life stress (academic difficulty and poor peer relationship) were significantly associated with higher indices of depressive symptoms. **Conclusion:** Results suggest a need for more attention to the relationships of these variables before introducing well-grounded educational interventions to reduce the likelihood of severe depression. It would be useful to carefully measure each of these variables and investigate other potential factors related to depression with the possibility that alcohol use and life stress are mediating variables.

Keywords

Alcohol, Life Stress, Depression, University Students, China

1. Introduction

Estimates from Western population indicated that nearly one-fourth of youth have experienced clinically significant depressive symptoms by age 18, making such symptoms become the most prevalent psychiatric problems of young

people (Horowitz & Garber, 2006). The concept of mental illness is relatively new in China. Not until after 1990s did research in the field of mental health emerged in China and started paying attention to the depression in youth as a public health issue (Wei, Chen, & Liu, 2007). Previous studies indicated a rate of 10% - 14.81% depressive symptoms among Chinese adolescents (Ding et al., 2019; Wang et al., 2013). Research in the field of mental health is still emerging. Prevention and education about mental illness such as depression are not widespread yet. Among limited studies which have examined factors correlating to and even causing depression, results demonstrated that depressive symptoms increased with age, poor academic performance, and negative parenting behaviors (He et al., 2012; Wang et al., 2011). In addition, there is a clear gender difference in depression rates among adolescents. Females 15 - 19 years old are three times more likely than males to report having experienced depressive symptoms (Horowitz & Garber, 2006).

It is suggested that alcohol use, or abuse, is likely to play a significant role in the development of depression and other mental disorders (Sinha & Rounsaville, 2002). Previous studies demonstrated that more than half of those who experienced depressive symptoms had suffered from substance use (Moscicki, 2001; Molnar, Berkman, & Buka, 2001). Alcohol use, especially heavy use, is likely to harm the hippocampus and inhibits adolescents' adaptive coping strategy, increasing the rate of experiencing anxiety and depression (Brown, Tapert, Granholm, & Delis, 2000; Buddy, 2007; Tapert et al., 2001). Thus, measures of risky behaviors such as alcohol use could serve as a screen for high-risk adolescents with depression (Alexander et al., 1990; Kann et al., 1998). There is considerable evidence supporting the relationship between alcohol use and depression in American and European adolescents. However, few studies have explored whether this link exists among Chinese adolescents.

Drinking in China is viewed as banal. Alcohol is deeply rooted in Chinese culture and functions as a social lubricant in Chinese society. Chinese adolescents begin their alcohol experience at an early age and most toddlers had their first taste of alcohol from the elders of the family. Parents and educators take underage alcohol use for granted, and perhaps even a necessity for socialization. Alcohol drinking in China is not typically considered a "problem" substance, except when it leads to motor vehicle crashes or public misbehavior (Ding et al., 2022). Accordingly, it is difficult to view alcohol abuse as a risky behavior. This paper begins to explore this relationship among Chinese adolescents.

Exposure to life stress (e.g., academic failure, breaking up a romantic relationship, family conflict, parental control) is another influential factor that has been indicated to relate to adolescents' depressive experiences (Thapar, Collishaw, Pine, & Thapar, 2012). Similar associations between life stress and depression have been found among Chinese youths (Greenberger, Chen, Tally, & Dong, 2000). In general, students in China are directed to two types of educational systems after the completion of high school. After the national university entrance exam (gaokao), Chinese youth could choose to go to a regular univer-

sity. Students' chance of obtaining further education, to a large extent, is determined by their scores on the entrance exam. The heavy burden on academic achievements and high parental expectation tend to increase vulnerability to depression among students. Meanwhile, students could alternatively attend the vocational and technical college to obtain technical skills and then enter the job market directly after training. As a part of training, students in vocational and technical college were exposed to the real society outside the school. It is common to find students in vocational schools experiencing effects from social norms and peer influences, and thus being more likely to feel distressed and depressed due to social pressure. Thus, both academic burden and social pressure are likely to contribute to a high risk of depression among Chinese youth. However, there is an indication that the effects of specific life stress on depression may vary between university students and vocational students.

The relationships between alcohol and depression, exposure to life stress and depression have long been studied. How these three variables relate to each other in Chinese adolescents remains unclear. The present study explored the relationship among alcohol use, life stress experience, and depression among Chinese adolescents. Results from this study could provide useful information for developing health education, counseling, and prevention programs for Chinese adolescents in the future.

2. Methods

2.1. Questionnaire

The questionnaire used in this study included four sections: demographic questions, drinking behavior, questions about life stress, a depression scale. The seven demographic questions asked about grade in school, gender, age, resident area, each parent's education level, and academic performance. Six drinking behavior questions asked about drinking frequency, type of alcohol consumed, drinking occasions, drinking settings, and drinking partners. In the present study, only questions related to drinking frequency were used for data analysis.

2.2. Subjects

Data were collected in two schools. One school was a general university (264 students, mainly from grade 1 to 2) and the other a vocational and technical college (354 students, mainly in grades 1 and 2) in a city in northern part of China. All students in the surveyed classrooms were asked to complete a paper-and-pencil questionnaire. Before data collection the data collectors introduced the questionnaire to the students and read to them the three paragraphs on the front of the survey that assured students the questionnaire was anonymous and they should not place their names on the questionnaire. Students were urged to talk to the school doctor if they had questions about depression, life stress or alcohol. Data collection was entirely administrated by trained data collectors from the Center for Mental Health Education in Shaanxi Province; no

teachers or school officials were involved. All completed questionnaires were entered twice at a data entry center to minimize data processing errors. All data was aggregated for data analysis and not individual information would be identified.

2.3. Measures

Depression. Depression was measured with the *Center for Epidemiological Survey-Depression Scale (CES-D)* by Radloff (1991). The *CES-D* has demonstrated acceptable internal consistency including a total score coefficient alpha of 0.82. The Mandarin version of *CES-D* has been widely used in studies of Chinese adolescents (Liao, Zheng, Huang, & Wei, 2017; Zhang, Wu, Fang, Li, Han, & Chen, 2010). This section of the questionnaire consisted of 20 questions. Participants were asked to rate the severity of each item on a 4-point Likert scale. The items for positive feelings (item 4, item 8, item 12, and item 16) were reverse-coded. Items were summed to reach a total score of depression.

Alcohol use. Students were asked to report the number of days that they drank alcoholic beverages during the past 30 days and during the past 12 months. Students who had not used alcohol in the past year were classified as “nondrinkers;” students who had used alcohol in the past year but not in the past month were classified as “occasional drinkers;” and students who had used alcohol in the past month were classified as “regular drinkers”. This drinking classification was used in earlier studies (Ding et al., 2022; Newman, Qian, Shell, Qu, & Zhang, 2006a; Newman, Qian, Shell, Qu, & Zhang, 2006b; Newman, Shell, Qu, Xue, & Maas, 2006; Qian, Hu, Newman, & Hou, 2008; Shell, Newman, & Qu, 2009; Shell, Newman, & Fang, 2010; Xue, Newman, Shell, & Fang, 2007).

Life stress. Students were asked about their experiences of life stress. Their responses were grouped into four categories: academic difficulty, poor peer relationship, high parental expectations, and others.

2.4. Data Analysis

SPSS was used for descriptive analysis of all variables. The one-way ANOVA tests were used to test score differences for students’ depressive symptoms among three drinking status, three types of life stress, three levels of academic performance, and three age groups. The t-tests were applied to assess differences in participants’ depressive symptoms by gender, school types (vocational and technological college vs. general university). Initial correlational analyses were used to test relationships between demographic variables and participants’ depressive symptoms indices. Non-significant variables were excluded from subsequent regression analyses.

A multiple regression model was then conducted to examine the relationship among alcohol use, life stress experiences, and depressive symptoms while controlling for demographic characteristics. In our model, the outcome variable of depressive symptoms was treated as a continuous variable. Four predictor variables were applied in the regression analyses. Specifically, the drinking status was treated as a continuous variable as it was hypothesized that there was an in-

herent ordering from non-drinking to occasional drinking and then to regular drinking (coded as non-drinkers = 1, occasional drinkers = 2, and regular drinkers = 3). Similar coding strategies were applied to self-reported academic performance (less than average = 1, average = 2, higher than average = 3). The life stress experience was coded into three dummy variables presenting the three most frequently chosen life stress sources (i.e. academic difficulty, poor peer relationship, and high parental expectations) with others as the reference group.

3. Results

A total of 618 students completed questionnaires. Forty-eight questionnaires had missing values in the drinking behavior section, inconsistent responses to drinking questions, or missing demographic data; these were dropped from the sample. Another 31 questionnaires had missing values in the depression scale, and 13 questionnaires had missing values for the life stress, making the valid sample for the combined analysis 526 students (85% of the collected questionnaires). The majority of the students were ages 18 - 24. Males are 288 (54.75%).

3.1. Factors Correlated to Depression

Alcohol use. Based on this classification 34.41% (181) of the students were non-drinkers, 34.03% (179) occasional drinkers, and 31.56% (166) regular drinkers. There was a significant difference among non-drinker, occasional drinker, and regular drinker ($F(2, 323) = 5.42, p < 0.05$) in terms of their reported depressive symptom indices. The one-way ANOVA test revealed a significant difference in the scores for depressive symptoms among non-drinkers, occasional drinkers, and regular drinkers ($F(2, 520) = 3.12, p < 0.05$). Regular drinkers reported the highest scores on depressive symptom indices (19.91 ± 11.78), followed by occasional drinkers (15.21 ± 9.91) and then those non-drinkers (12.43 ± 9.51). The Bonferroni post hoc tests showed that, in comparison with the non-drinkers, regular drinkers reported significantly higher scores on depressive symptom indices ($p < 0.01$) (Table 1).

Table 1. Depressive symptoms by drinking status, life stress, and academic performance.

		Depression	
		Mean	SD
Drinking status	Non-drinker	12.43	9.51
	Occasional drinker	15.21	9.91
	Regular drinker	19.91	11.78
Life stress	Academic difficulty	19.01	6.95
	Poor peer relationship	15.07	7.88
	High parental expectation	17.38	7.91
Academic performance	>average	13.58	8.44
	average	15.79	9.03
	<average	16.80	9.78

Life stress experiences. When asking participants' experiences of the most stressful life events, around 45% of these students indicated academic difficulty (49.5% of males, 40.4% of females); 34.2% of students chose high parental expectations (28.3% of males, 39.4% of females); 10.3% reported poor peer relationship (9.1% of males, 11.5% of females). The reported life stress (academic difficulty, poor peer relationship, and high parental expectations) was significantly related to depressive symptoms indices in our sample ($F(2, 323) = 6.42, p < 0.001$). The group of students with perceived academic performance stress reported the highest depressive symptoms indices ($M = 19.01$), followed by students whose parents expected something much higher than students' ability ($M = 17.38$) and students who experienced difficulties in peer relationships ($M = 15.07$) (see **Table 1**). Results from Bonferroni post hoc tests indicated that three pairwise comparisons (academic difficulty vs. poor peer relationship, academic difficulty vs. high parental expectation, poor peer relationship vs. high parental expectation) differed significantly ($p < 0.001$).

Academic performance. There was a significant relationship between depression and academic performance ($F(2, 322) = 12.67, p < 0.001$). Students who reported academic performance lower than average had higher depression scores ($M = 16.80$), followed by students with average academic performance ($M = 15.79$). Students who reported better than average academic performance had the lowest depression score ($M = 13.58$) (see **Table 1**). Bonferroni tests indicated three significant pairwise differences for academic performance (better than average vs. average, better than average vs. worse than average, average vs. worse than average) ($p < 0.001$). However, no significant difference in depression scores was found between vocational school and general school, between female and male, among three age groups, or for mother's or father's level of education.

3.2. Multiple Regression on Depression

A multiple regression model was used to examine how drinking status (non-drinker, occasional drinker, and regular drinker) and life stress experience (academic difficulty, poor peer relationship, and high parental expectation) would predict depression among Chinese university students while controlling for demographic differences. According to the correlational analyses, academic performance was the only variable to be controlled for.

As shown in **Table 2**, both drinking behavior and life stress (academic difficulty and poor peer relationship) were significantly and positively associated with indices of depressive symptoms. Specifically, being a regular drinker increased depressive symptoms. More exposure to life stress (having academic difficulty and poor peer relationship) significantly predicted a higher level of depressive symptoms. However, the parental expectation was not significantly related to depressive symptoms in our sample after controlling for academic performance. The overall explained variances (R^2) for all predicted variables in the model were 32.8%.

Table 2. Multiple regression results for relationships among drinking behavior, life stress, and depression.

Variables	Subhead	<i>B</i>	<i>S.E.</i>	β	<i>t</i>
Constant		3.07	0.25		12.56
Drinking		0.67***	0.15	0.17	4.46
Life stress					
	Academic difficulty	0.42***	0.30	0.60	1.38
	Poor peer relationship	2.41***	0.52	0.18	4.62
	High parental expectation	0.01	0.31	0.01	0.03
Academic performance		1.15**	0.56	0.06	2.05

Note. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$. Drinking was coded as non-drinkers = 1, occasional drinkers = 2, and regular drinkers = 3. Academic performance was coded as less than average = 1, average = 2, higher than average = 3. The life stress experience was coded into three dummy variables (i.e. academic difficulty, poor peer relationship, and high parental expectations) with others as the reference.

4. Discussion

The present study examined alcohol use, life stress experiences, and depressive symptoms in a sample of Chinese university students. Analysis of the data showed that generally drinkers' depression scores were higher than nondrinkers' scores and students who experienced life stress had highest scores for symptoms of depression. Students who self-reported a lower than average academic performance at school on average had higher depression scores. Both more frequent drinking behavior and higher life stress (academic difficulty and poor peer relationship) were significantly associated with higher indices of depressive symptoms.

In the test of depression by drinking status, students who drank frequently were more likely to have severe depressive symptoms. Drinking may be a means of relieving depressive symptoms, or drinking may be a risk behavior associated with depression. Alcohol use, especially in excess, could lead to failure to apply coping strategies to resist alcohol or it could exacerbate depressive symptoms. Our result is consistent with previous study, indicating that alcohol use could induce brain depressants and increase the risk of experiencing depressive symptoms (Schuckit, 1994). Thus, alcohol use, especially excessive drinking could serve as a screen for high-risk population of depression. Our results provide evidence for school educators and students managers in applying educational interventions to reduce the likelihood of severe depression.

In response to questions asking participants' experiences of life stress in daily life, significantly more students reported perceived academic performance stress than reported stress from other events (45% students indicated academic difficulty; 34.2% chose high parents' expectations; 10.3% chose poor peer relationship). Students who reported lower than average academic performance at school

also reported higher average depressive symptom indices, whereas students who rated themselves higher than average in school performance had the lowest average depressive symptom scores. Viewed together, these results indicated that daily life stress is possibly linked to increased depression, and that specific stress related to academic performance is linked to higher level of depressive symptoms.

Interestingly, the parental expectation was not significantly related to depressive symptoms in our sample after controlling for academic performance, even though parent expectations have often been thought to be a source of academic stress and could raise the risk of depression in Western adolescent samples (Gray & Steinberg, 1999). This might be due to the fact that restrictive control and harsh regulation of children's activities are usually interpreted as parental responsiveness in Asian culture (Chao & Tseng, 2002).

Exploring the relationship of drinking, life stress, and depression was one of the purposes of this study. A higher level of reported depressive symptoms was related to higher life stress and more frequent alcohol use. These findings suggest important associations between depression and drinking and having experienced life stress. Typically in China depression and alcohol use have been studied as separate entities. Although there are certain limitations in the measures of life stress experience and drinking behavior used in this study, exploring their relationship to each other and to drinking is new. Results suggest a need for more attention to the relationships of these variables before well-grounded educational interventions to reduce the likelihood of severe depression can be introduced. Careful measurement of each of these variables and investigation of other potential variables relating to depression with possible mediating effects of alcohol use and life stress experience would be useful.

Limitations

Several limitations exist in this study. First, measuring alcohol consumption in a Chinese population remains a challenge. Drinking frequency is currently the best accepted descriptor to distinguish drinking patterns. Reporting the quantity of alcohol consumed and the alcohol-by-volume of the beverage would increase the validity of the drinking pattern description, but it is not realistic at this time. Without standard serving sizes, regular-sized drinking cups, and given the wide range of alcohol concentrations in drinks, estimating alcohol risk will depend on gross measures (Newman, Qian, & Xue, 2004). Second, the students in this study were from mostly rural areas in China. The differences between rural and urban areas in China are well established, so these results have limited generalizability. Also, the samples were drawn from one city. It was not possible to explore variations in drinking behavior, and depression among regions. In a country as large and diversified as China, study of a wider age range of young people is needed. Third, this data was self-reported and thus there may be perception issues among the participants in the levels of drinking and academic performance. In addition, a limited number of variables were considered in the present study, more variables such as health conditions and family background of participants

could also be included in future studies.

In spite of the limitations, these data give insights into life stress experience, and depression and the relationship with alcohol use in an important population. Alcohol use is different in China so there is a need to view the behaviors and any survey results describing the behavior and associated variables as presented in this paper through a Chinese lens and resist the temptation to use a western system to interpret results.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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