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Alcohol Use Among Young Adults in China

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ABSTRACT

Objective: This study aimed to estimate the prevalence of alcohol consumption among current Chinese young adults through latent class analysis. Methods: A total of 203 samples from various regions in China reported their alcohol use, which was assessed using the Alcohol Use Disorder Identification Test (AUDIT). Latent class analysis and multinomial logistic regression were used to identify drinking patterns and their association with alcohol-related problems. Result: The prevalence of alcohol consumption and problematic alcohol consumption 79.3% was and 25.1%, respectively. The latent class analysis revealed that a three-class model, including one heavy consumption group, one moderate consumption group and one light consumption group, best represented the participants' alcohol use patterns. Conclusion: The findings indicate a significant prevalence of alcohol use and a strong correlation between drinking patterns and psychological factors.

Introduction

Alcohol use is the seventh-leading risk factor for premature death and accounted for 2.8 million death in 2016 (Griswold et al., 2016). Over several decades, there has been a salient and worrying rise in prevalence of alcohol consumption. For instance, a National Epidemiologic Survey on alcohol and related condition conducted among the US population presents that between 2001-2002 and 2012-2013, the yearly prevalence of alcohol use had raised from 65.4% to 72.7% in America (Grant, 2017). This ongoing phenomenon reflects a complex interplay of social, cultural, economic and personal factors that have led to significant shifts in drinking patterns and habits (Room et al., 2020). This shift is most common among young adults, especially the newly adult cohort. Due to the change in identity, they now have the autonomy to make their own choices and are not legally restricted from purchasing alcohol (Lerner, 2009). However, alcohol consumption has also brings health problems as well as economic challenges, making it the subject of ongoing debate and regulation worldwide（Moniek et al., 2015). It has been shown that drink in moderation is beneficial as it's a way for relaxation, relieving anxiety and tension (Frone, 1999). From a more objective and long-ranging point of view, nevertheless, according to World Health Organization (2023), no level of drinking behavior is good for our health, due to the long-term health risks and out of control behaviors it could potentially lead to (Bassam Moushmoush, 1991).

Alcohol consumption is widespread among young adults, with a significant proportion of these individuals engaging in drinking behavior, according to the National Survey on Drug Use and Health in the US (2021), 16.6 million young adults reported that they had consumed alcohol in the last month. A study on the prevalence and profile of alcohol use among college students indicates that among the overall 5500 participants, 51.3% consumed moderately (non-problematic), and 36% reported problematic consumption: 27.4% hazardous consumption, 4.7% harmful consumption and 3.9% dependent (Ruisoto, 2016). Across the world, drinking patterns varies from region to region depending on different customs, culture and social trends (Person et al., 2000). Generally, Western countries holds a more open attitude toward alcohol consumption, young adults often engage in binge drinking. This is often associated with a culture of heavy drinking during social events as well as lower legal drinking age, which can lead to earlier alcohol initiation among young adults (Margaretha Järvinen, 2017). In comparison, Asian countries like Japan, they have their own drinking culture, but alcohol use is usually moderate and alcoholism is less common (Milne, 2002). In

many Middle Eastern countries, alcohol consumption is strictly prohibited for religious reasons, resulting in very low rates of alcohol consumption among young adults (Liangpunsakul, 2016). China has a deep and complex relationship with alcohol, featuring long-standing traditions and etiquette around its consumption. Drinking is often a social or celebratory activity, and it has been a crucial part of Chinese culture throughout history (Allison, 2022).

There are a number of variables that contribute to alcohol consumption among Chinese adults, including increasing exposure to alcohol marketing (Noel, 2020), peer and family influence (Susan, 2005) and stress-related considerations (Keyes KM, 2011). Learning the factors contributing to alcohol use is crucial for developing effective preventive methods and interventions.

Theoretically and experientially, previous researchers have developed typological programs for classifying alcoholics, and general drinking patterns. For example, Reboussin et al. (2006) used latent class analysis to identify types of drinkers based on measures of drinking behavior and alcohol-related problems among more than 4,000 American adolescents. The analysis revealed three categories: non-problem drinkers, hazardous drinkers and regular problem drinkers. In addition, O'Connor and Colder (2005) measured quantity and frequency of consumption and alcohol-related problems based on latent profiling. They reported on five groups with a sample of 533 first-year US college students, but concluded that there were no consistent patterns of behavior. Latent class analysis is a probabilistic modelling technique compared to traditional classification methods such as binary classification models. Instead of assigning each observation to a single category as in traditional methods, latent class analysis provides the probability of belonging to each potential category. This accounts the uncertainty and variability of the data and allows for a more detailed understanding. (Stephanie T. Lanza, 2016).

The purpose of this study was to investigate the current drinking patterns among young Chinese adults using latent class analysis and to further explore the association between demographic and psychological variables and drinking patterns.

Methods

Participant and Data Collection

I used Wenjuanxing to create questionnaire and collect data. Wenjuanxing is a popular platform for online survey, which has been used for data collection in many studies (Li et al,. 2020; Wang et al., 2020), and it covers more than 2.6 million respondents, so the authenticity, representativeness and diversity of the sample can also be ensured. I recruited 207 participants aged 16-32 (M=24.3; SD=3.9). After quality control and manual checking procedures to exclude incomplete and invalid questionnaires, the total valid sample was N = 203. 59.1% of the respondents were male and 40.9% of were female.

Measures

Demographic Variables

Demographic variables included respondents' sex(male/female); age ; educational level (high school and below, bachelor and above).

Alcohol Use

I used the Alcohol Use Disorders Identification Test (AUDIT; Saunders and Aasland, 1987), a 10-item questionnaire developed as a screening tool for dangerous and harmful alcohol use. It contains three alcohol use domains: consumption (e.g. How often do you have six or more drinks on one occasion?),drinking behavior (e.g. How often during the

last year have you failed to do what was normally expected from you because of drinking?), and alcohol-related issues (e.g. How often during the last year have you been unable to remember what happened the night before because you had been drinking?). Each question is scored on a scale from 0 to 4, with a maximum score of 40. People with an audit score of 8 or more are diagnosed as dangerous or harmful drinkers, and those with a score of less than 8 are diagnosed as non-harmful and non-hazardous. we dichotomized and combined the scores for each item. The baseline category reflects responses that scored zero on the scale, "never" for questions 1, 3, 4, 5, 6, 7, and 8, "1 or 2 drinks" for question 2, and "no" for questions 9 and 10. The second category consists of all other responses to the 10 questions (Shevlin M, 2008 ; Sun et al., 2023).

Psychological Variables

Depression, anxiety, and stress were measured by Depression Anxiety Stress Scale-21(DASS-21; Lovibond, 1995), which is a validated scale that rates these 3 dimensions of mental health in adults. The rating scale followed from 0 to 3 (0: “Did not apply to me at all,” 1: “Applied to me to some degree or some of the time,” 2: “Applied to me to a considerable degree or a good part of the time,” and 3: “Applied to me very much or most of the time”).Depression, anxiety, and stress scores are measured by summarizing the scores of total 21 items and multiplied by 2. The result would be classified as: “normal, mild, moderate, severe, or extremely severe”.

Latent Class Models&Model Fit

Drinking pattern were accessed by Latent Class Analysis (LCA), statistical modelling technique for analyzing relationships in categorical data. Categorical latent (unobserved) variables can be characterized by analyzing the relationship structure between several categorically observed variables. (McCutcheon, 2002) As a validation method, latent class models can be used to test hypotheses about the researcher's prior assertions about the observed relationship structure between variables.

Information criteria, such as the Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), and Sample Size Adjusted Bayesian Information Criterion (SSABIC), played a pivotal role in evaluating model fit. Lower values of these criteria consistently signaled an enhanced model fit, signifying that the model effectively balanced the number of parameters with the information derived from those parameters. Additionally, the Lo–Mendel-Rubin likelihood ratio test (LRT) was employed to contrast a k class solution with a k−1 class solution, where k represented a specific number of latent classes. This approach examined the hypothesis that the null model (k−1) was acceptable. If the probability value (P) was found to be less than 0.05, the k model demonstrated superiority, and additional classes were introduced until the P value for the statistic exceeded 0.05. At that juncture, the preceding model was adopted (Lo et al., 2001).

Software

The *SPSS v26* (SPSS Inc., 2006) and *Mplus (Muth´en, 2005)* was used for data analysis.

Table 1. Participant characteristics

		N (%)/ M (SD)
Gender	Male	120 (59.1%)
	Female	83 (40.9%)
Age		24.3 (3.9)

Education	High school and below	92 (45.3%)
	Bachelor and above	111 (54.7%)
Drink	ever	161 (79.3%)
	never	42 (20.7%)
AUDIT	Score <8	152 (74.9%)
	Score ≥8	51 (25.1%)
Depression	Score ≤9	151 (74.4%)
	Score >9	52 (25.6%)
Anxiety	Score ≤7	147 (72.4%)
	Score >7	56 (27.6%)
Stress	Score ≤14	176 (86.7%)
	Score >14	27 (13.3%)

Note: AUDIT score> 8: dangerous or harmful drinkers; depression score >9 (Mild 10-13, Moderate14-20, Severe 21-27); anxiety score >7 (Mild 8-9, Moderate 10-14, Severe 15-19); stress score >14 (Mild 15-18, Moderate 19-25, Severe 26-33)

Results

Participant Characteristics

The sample included 120 males (59.1%) and 83 females (40.9%), with an average age of 24.3 years (SD = 3.9). Regarding education, 45.3% of participants had a high school education or less, 54.7% had a bachelor's degree or higher. Detailed sample characteristics are shown in Table 1.

Prevalence of Alcohol Use

The rates of alcohol use and problematic alcohol use were 79.3% and 25.1%, respectively.

Table 2. Fit indices for the latent class analysis of the AUDIT

Classification criteria	Number of latent class				
	2	**3**	4	5	6
AIC	1739.087	**1531.264**	1507.541	1497.283	1501.567
BIC	1808.664	**1637.287**	1650.009	1676.196	1716.925
SSABIC	1742.131	**1535.903**	1513.774	1505.111	1510.989
Vuong-LMR test[a]	p=0.0000	**p=0.0000**	p=0.4842	p=0.0937	p=0.1568
LMR-LR[b]	Value=381.577 (p=0.0000)	**Value=225.956 (p=0.0000)**	Value=44.954 (p=0.4883)	Value=31.715 (p=0.0973)	Value=18.987 (p=0.1619)
BLRT[c]	p=0.0000	**p=0.0000**	p=0.0000	p=0.0000	P=0.1765

Entropy	0.913	**0.971**	0.965	0.986	0.982

Note. [a]Vuong-Lo-Mendell-Rubin Likelihood Ratio Test; [b]Lo-Mendell-Rubin Adjusted Likelihood Ratio Test; [c]Parametric Bootstrapped Likelihood Ratio Test

Based on the results in the table above, it is evident that for the AIC criterion, the values steadily decrease from the 2-class to the 5-class models, with a slight increase observed from the 5-class to the 6-class model. However, the magnitude of decrease in AIC is smaller from the 3-class to the 4-class, and from the 4-class to the 5-class models. Regarding the BIC criterion, the values decrease from the 2-class to the 3-class model, followed by an upward trend from the 3-class to the 6-class model. Similarly, for the SSABIC criterion, there is a continuous decrease from the 2-class to the 5-class models, followed by a slight increase from the 5-class to the 6-class model. Again, the magnitude of decrease in SSABIC is smaller from the 3-class to the 4-class, and from the 4-class to the 5-class models. Therefore, the 3-class model is the optimal model according to the criteria.

Regarding the Entropy criterion, values exceed 0.9 for all models ranging from 2 to 6 classes, with the highest values observed for the 5-class and 6-class models at 0.986 and 0.982 respectively. However, the p-values corresponding to the Vuong-LMR test and LMR-LR are both greater than 0.05 for the 5-class and 6-class models. Furthermore, for the 4-class model, the p-values for the Vuong-LMR test and LMR-LR are also greater than 0.05. Considering the collective results of these criteria, the 3-class model emerges as the optimal model in terms of fit. Consequently, a detailed depiction of the response probabilities for each class across the 10 items in the 3-class model is presented in the figure below.

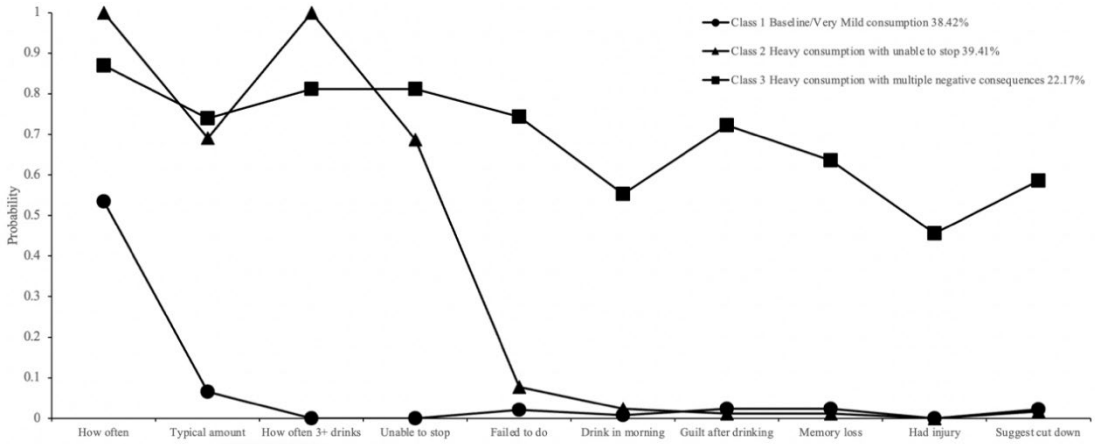

Figure 1. Latent class model based on the AUDIT-10 items

According to the results from the figure 1, the largest proportion belongs to the second class (39.41%). Within this class, individuals exhibit a very high probability of engaging in severe alcohol consumption and struggling to stop once they start, while the probability of experiencing other negative consequences is notably low. Following this, the second-largest class comprises the first class (38.42%), where individuals exhibit very low probabilities across most items, with only a moderate probability observed regarding the frequency of alcohol consumption. The final class, accounting for 22.17% of the sample, demonstrates a higher probability of alcohol consumption, alongside elevated probabilities across various negative consequences (dependence and alcohol-related issues).

ANOVA Result

There is significant difference in level of depression ($F=31.26$; $p<0.001$), anxiety ($F=37.10$; $p<0.001$), and stress ($F=35.46$; $p<0.001$) among three classes. For the level of depression, class 3 is significantly higher than class 1 (mean differences (MD)=7.46; $p<0.001$) and class 2 (MD=5.53; $p<0.001$). For level of anxiety, class 3 is significantly higher than class 1 (MD=8.07; $p<0.001$) and class 2 (MD=5.66; $p<0.001$). For level of stress, class 3 is significantly higher than class 1 (MD=7.79; $p<0.001$) and class 2 (MD=5.65; $p<0.001$).

Discussion

Young adults, especially those aged 18 to 29, show the highest prevalence of alcohol use and binge drinking, tend to drink more heavily, experience more negative consequences, and have significantly higher incidences of alcohol abuse and dependence compared to other age groups (Quigley et al.,1996). This research focused on examining the prevalence and patterns of alcohol use among Chinese young adults. Findings revealed that about 79.3% of the participants had used alcohol before, with 25.1% indicating problematic alcohol use. Through LCA, I learnt that young adults' drinking patterns fall into three categories, Category 1: baseline/very mild consumption, Category 2: heavy consumption without negative consequences, Category 3: heavy consumption with multiple negative consequences. With class 3 (heavy consumption with multiple negative consequences) demonstrate significantly higher level of depression, anxiety, and stress compared to class 1 (baseline/very mild consumption) and class 2 (heavy consumption without negative consequences), these finding also indicate the high association between demographic and psychological variables and drinking patterns.

The results categorized the sample into three subgroups based on their drinking patterns. Consistent with Merrill et al. (2022), I found the largest subgroup was the heavy consumption without negative consequences group (39.4%). Smith and Shevlin (2008) categorized individuals into six subgroups based on their alcohol consumption levels: three characterized by heavy consumption, one by moderate consumption, and two by mild consumption. Nevertheless, direct comparison with our current study is constrained due to its focus on adults within the UK context.

Heavy alcohol consumption is linked to poor mental health, including higher levels of depression, anxiety, and stress (Jacob et al., 2021). Previous research indicated a significantly higher risk of anxiety in heavy drinkers and a lower risk of depression in moderate drinkers (Smith & Shevlin, 2008). My findings align with this, showing that class 3 (heavy consumption with negative consequences) had significantly higher depression levels compared to class 1 (mild consumption) and class 2 (heavy consumption without negative consequences).

Despite previous studies (Dir et al., 2017; Jackson et al., 2013) suggesting that gender was a predictor of drinking behaviors among individuals, this study found no significant association between gender and various drinking patterns. This may be a result of recent shifts in social and cultural attitudes towards alcohol consumption. In fact, this study did not find significant differences between young adult males and females in terms of rates of past drinking or problem drinking.

The current study has several limitations. Firstly, the sample size of the study is very limited, with only 203 samples, and therefore may not accurately represent the drinking patterns of Chinese young adults. In order to gain a more comprehensive and in-depth understanding of the drinking problem, future studies should use a larger sample size to ensure the representativeness and validity of the findings. Second, all questionnaires were self-reported, which may be somewhat subjective and biased. In order to improve the accuracy and objectivity of the data, future studies may consider adopting more scientific methods of data collection, such as clinical diagnosis.

In conclusion, 79.3% of sampled Chinese young adult reported past alcohol use, with 25.1% reporting problematic alcohol use with a model including three subgroups, showing the drinking patterns among young adult in China. This study provides important insights into the multi-dimensional aspects of alcohol consumption, which is shaped by a variety of social, cultural and psychological factors. This complexity emphasizes the importance of

interventions that can be targeted to the needs of specific subgroups. The implementation of effective policies by Governments, such as restricting access to alcohol and regulation, is critical to reducing harmful drinking behavior among this population. The inclusion of psychological and behavioral interventions in educational and health-care settings is also crucial.

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