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#### Full length article

Disparities in drinking patterns and risks among ethnic majority and minority groups in China: The roles of acculturation, religion, family and friends

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#### ABSTRACT

*Objective:* Studies investigating alcohol consumption related factors have rarely focused on the relationship between acculturation, religion and drinking patterns. The objective of this study is to explore the predictors of drinking patterns and their mutual relationships, especially acculturation, ethnicity and religion.

Methods: A cross-sectional household survey using a multistage systematic sampling technique was conducted in Yunnan Province of China. A revised Vancouver Index of Acculturation (VIA) and Alcohol Use Disorder Identification Test (AUDIT) Chinese version were used to measure acculturation and drinking patterns. Structural equation modeling (SEM) was used to explore the structures of how predictors affect drinking patterns.

Results: A total of 977 subjects aged 12–35 years were surveyed. A higher percentage of binge drinking was found among Lisu people. However, the proportion of drinking until intoxication was highest among Han. Gender and enculturation had both direct (standardized  $\beta$  = -0.193, -0.079) and indirect effects (standardized  $\beta$  = -0.126, 0.033) on risky drinking pattern; perceived risk of alcohol consumption (-0.065), family drinking environment (0.061), and friend drinking environment (0.352) affected risky drinking pattern directly, while education level (0.066), ethnicity (-0.038), acculturation (0.012), religious belief (-0.038), and age group (0.088) had indirect effects.

Conclusion: Risky drinking pattern was associated with gender and aboriginal culture enculturation both directly and indirectly, and related to mainstream culture acculturation and religious belief indirectly. Other demographic (such as education level) and social family factors (friend drinking environment for example) also had effects on risky drinking pattern.

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#### 1. Introduction

Harmful use of alcohol is a public nuisance around the world. From 2006 to 2010, alcohol consumption in China has increased, which could be related to the fact that China has now become the largest beer-producing country in the world (Tang et al., 2013) as

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well as aggressive marketing tactics used by the alcohol industry and an increasing income of Chinese residents.

It is important to document influencing factors for alcohol consumption to guide preventive measures. There have been several studies investigating influencing factors of alcohol consumption around the world (Bécares et al., 2011; Casswell et al., 2003; Garmienė et al., 2006; McKay, 2015; Newman et al., 2004), but few have focused on the relationship between acculturation, religion and drinking patterns in China.

Aboriginal culture enculturation has been found to be an important protective factor for alcohol consumption (Cheah and Nelson, 2004; Currie et al., 2013, 2011). Enculturation refers to the process of retaining ingredients of one's aboriginal culture (Weinreich, 2009). The quest of aboriginal culture as a possible protective factor

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et al., 2010).

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in alcohol consumption is a new exploration in China. Acculturation refers to the process that occurs when groups of individuals of different cultures come into continuous first-hand contact, which changes the original cultural patterns of either or both groups (Rothe et al., 2010). With the changes and economic development of the society, alcohol drinking among ethnic minority people in China is not limited only in sacrifice activities and celebrations but also

affected by modernization and the Han majority culture (Jianhua

There are two major theories underlying acculturation research: one-dimensional and bi-dimensional models. The one-dimensional model does not allow ethnic minorities to hold full bicultural identities, although many ethnic minorities describe themselves as such, while the bi-dimensional model is able to embrace not only individuals with bicultural identities but also people who are not attached to either culture (Kang, 2006). Ryder and colleagues developed a bi-dimensional acculturation scale, called the Vancouver Index of Acculturation (VIA; Ryder et al., 2000). A modified version of this scale was used in our study to explore the level at which aboriginal people recognized the mainstream and aboriginal cultures separately and the level to which they were in accordance with aboriginal and mainstream customs without determining what those customs would be (Currie et al., 2011). Huynh's meta-analysis and Currie and colleagues' studies showed that the reliability of VIA was robust (Currie et al., 2013; Huynh et al., 2009).

The bi-dimensional acculturation measured by VIA and its association with alcohol use and other behaviors was supported by some studies. High heritage acculturation group compared to low heritage acculturation and the majority groups were found to have less alcohol consumption and their alcohol use behaviors are more similar to the original culture background (Cheah and Nelson, 2004; Currie et al., 2013, 2011). Although acculturation was used to measure people's behaviors among the immigrants, the idea of assimilation or dissimilation of culture affects each other is the same. In our study, we modified the VIA to be suitable for the cultures of Chinese ethnic groups.

Alcohol consumption among different ethnic groups varies from country to country and from generation to generation. In general, people from low alcohol consumption background countries drink less compared to those who come from higher alcohol consumption background countries (Bécares et al., 2011; Bayley and Hurcombe, 2011; Lum et al., 2009; Van Tubergen and Poortman, 2010). Second generation immigrants are more likely to have behaviors which are more similar with native people, compared to the first generation (Amundsen, 2012).

Religious belief is a behavior regulation tool, which can strongly affect a person's behavior. Studies have shown that, compared to people who have no religious belief, having a religious belief is a protective factor for alcohol drinking (Lucchetti et al., 2014; Sinha et al., 2007; Tumwesigye et al., 2013).

Family and friend related factors have also been found to be associated with risky drinking. Studies have shown that in a family containing many drinkers or risky drinkers, family members are more prone to drink and to have a risky drinking pattern (Beal et al., 2001; Yu, 2003). People who have more drinking friends tend to drink alcohol and have risky drinking patterns (Donovan, 2004; McKay, 2015; Newman et al., 2004; Ryan et al., 2010; Simons-Morton, 2004).

Except for the above mentioned factors, female gender (Holmila and Raitasalo, 2005; Ma et al., 2006; Wilsnack et al., 2009), age (Kim et al., 2013; Wilsnack et al., 2006; Wolff et al., 2014), marital status (Bogart et al., 2005; Kearns-Bodkin and Leonard, 2005; O'Malley, 2004), education (Caldwell et al., 2008; Casswell et al., 2003; Cutler and Lleras-Muney, 2006; Huerta and Borgonovi, 2010) and people's perceptions of the risk of alcohol consumption on the body (Bühler

et al., 2015; Grevenstein et al., 2015; Henry et al., 2005) are related to the level of risky drinking.

Our study hypothesis is that aboriginal culture enculturation is associated with a reduced risk of drinking and mainstream culture acculturation is associated with an increased risk of drinking. Having religious belief and increased perceived risk of alcohol consumption are related to a reduced risk of drinking, while family and friend drinking environment increases the risk of drinking.

In the present study, we explored the relationship between risky drinking and associated factors via a structural equation model using the VIA, Alcohol Use Disorder Identification Test (AUDIT; Babor et al., 2001) and structured interview-based questionnaire. The results of this study should provide knowledge about cultural and other related factors of alcohol consumption among ethnic people in China.

#### 2. Materials and methods

#### 2.1. Participants, recruitment settings and sampling procedure

2.1.1. Participants, recruitment settings. We conducted a cross-sectional study with a multistage systematic sampling method in Lushui and Luquan counties of Yunnan Province of China during February and April, 2014. The criteria for inclusion were individuals who were Han, Lisu or Yi ethnicity, aged 12–35 years old and living in these counties for at least six months. The Ethics Review Committee of the Faculty of Medicine, Prince of Songkla University, approved the study protocol. Written informed consent was obtained from all participants before the interview.

2.1.2. Sampling procedure. Two counties were selected purposively because they had high populations of the study ethnicities, were easy to access and had good cooperation by the local government staff. Three out of nine townships in Lushui County having high proportions of Lisu people and six out of twelve townships in Luquan County having high proportions of Han and Yi ethnicities were purposively selected. By this selection method, three sets of three townships each with high proportions of Lisu, Yi and Han ethnicities were obtained. Among each township, three villages were selected using systematic sampling based on the list of villages in the selected township. Because of the mountainous geographical terrain and having no authoritative map or household archives, successive households, starting from the one closest to the village health unit within the chosen village, were sampled until the required sample size was achieved. Within the chosen family, all eligible respondents were invited to join the survey. If a respondent was absent from home, the house was revisited. If the respondent was absent from home on the second visit, a neighboring house was visited.

#### 2.2. Measures

2.2.1. Social and demographic variables. Data on demographic characteristics, social and alcohol consumption related factors were derived from a structured interview-based questionnaire. Demographic variables included age (stratified later to 12–18, 19–24 and 25–35 years, based on the average ages of attending junior and senior high school, college, and work in China), gender, education level (primary school and below, junior high school, senior high school and above), ethnicity (Han, Lisu and Yi), marital status (single, married, divorced/separated/widowed), income and occupation (student, farmer and others). Religious belief was measured by asking the question "what is your religious background?" and respondents could choose Buddhism, Christianity, Islam, Catholicism, no religious belief or other.

Family drinking environment was measured by asking about the number of drinkers in the family, parental attitude on children's drinking and accessibility of alcohol in the home. Social drinking environment included exposure to alcohol advertisements and number of friends who drank and the number who became intoxicated. Attitude toward alcohol provided by a best friend was collected by asking the question "If one of your best friends offered you an alcoholic drink, would you drink it?" with the options being "Definitely not", "Probably not", "Probably yes", and "Definitely yes". Perceived risk of alcohol consumption included three questions asking "How much do you think people risk harming themselves (physically or in other ways), if they drink alcohol once or twice a year?, if they drink alcohol several time a week? and if they get drunk once a week?" with possible responses being "No risk", "Slight risk", "Moderate risk" and "Great risk".

2.2.2. Acculturation measure. Acculturation was measured using a modified Vancouver Index of Acculturation (VIA; Ryder et al., 2000). The scale includes two subscales which estimate aboriginal culture enculturation (heritage subscale) and mainstream culture acculturation. The answer of each item was modified from a nine-point scale (strongly disagree, disagree, moderately disagree, mildly disagree, meutral, mildly agree, moderately agree, and strongly agree) to a five-point scale (strongly disagree, neutral, agree, and strongly agree). We believed that this modification would make it easier for local people to answer the questions.

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