

Socio-economic inequalities in the association between alcohol-use disorder and depressive disorder among Thai adults: a population-based study

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Abstract

Purpose Previous evidence indicates significant associations between alcohol-use disorders (AUD) and depressive disorders and their strong links with social conditions. This study aims to investigate the association between AUD and major depressive episode (MDE) across various socio-economic groups. **Methods** Data from the 2014 Thai National Health Examination Survey was obtained containing a random sample of 13,177 adults aged > 20 years from the whole population. The Alcohol-Use Disorders Identification Test (AUDIT) was used to classify respondents into non-problem, hazardous drinking (score 8-15) and harmful-dependent drinking (score 16-40). MDE was identified using questions based on the DSM-IV. Adjusted odds ratios (AOR) and 95% confidence intervals (CI) were calculated using logistic regression to determine the strength of associations. **Results** The prevalence of hazardous, harmful-dependent drinking and MDE was 10.3%, 1.9% and 2.5%, respectively. The association between MDE and AUD was modified by education level, wealth index and area of residence, with education having the largest effect (AOR=1.23, 95% CI: 0.55, 2.76 among those completing primary school only and AOR=15.19, 95% CI: 9.5, 24.29 among those completing secondary school or higher). **Conclusion** Socio-economic factors modify the association between alcohol-use disorder and depressive disorder among Thai people.

Introduction

Alcohol-use disorders (AUD) and depressive disorders are significant public-health problems worldwide and both are strongly linked to social conditions [1, 2]. There has been a wide range of epidemiological and clinical studies investigating the association between alcohol consumption, AUD and depressive disorders [3–6].

Socio-demographic variables such as age, gender, education, and socio-economic status (SES) have been found to be significantly related to the pattern and severity of alcohol use problems as well as risk of depression [7, 8]. Both at an individual and at a population level, the prevalence of drinking is associated with income [9, 2, 10]. Within any society, poorer people are more likely to be abstainers than richer people while across societies, a strong negative association between gross domestic product per capita based on purchasing power parity (GDP-PPP) and lifetime abstinence was evident [10].

Based on a meta-analysis, people with low SES have a higher odds of being depressed and socio-economic inequality in depression is heterogeneous and varies according to contextual factors such as region and time [7]. Another study showed that depression was more strongly related to alcohol-related problems in middle-aged and older individuals compared to younger adults [11]. All of this evidence indicates that there are certain relationships between socio-demographic factors, alcohol use problems, and depression.

Geographic location, i.e. rural or urban, has been shown to be associated with discrete culture and social environment that may impact people's behaviors and health condition [12, 13]. In Thailand, while urban residents have more access to government-sponsored public services, e.g. jobs, education and health care, rural residents have limited access to these community resources and opportunities. One of the Sustainable Development Goals is to reduce inequality within and among countries by empowering and promoting the social, economic and political inclusion of all people, irrespective of their age, sex, disability, race, ethnicity, origin, religion, economic situation or any other factors [14]. In order to identify the underlying drivers of health outcomes so that efforts can be made to reduce inequalities, researchers are increasingly examining social determinants of health [15, 8]. This study aimed to examine the prevalence of major depressive episode (MDE) and alcohol-use disorder (AUD) and the association between these two conditions at different socio-economic groups among a population-based sample aged 20 and over in Thailand.

Materials And Methods

Study design and data sources

This study used data from Thailand's fifth National Health Examination Survey (NHES-5), which was conducted in 2014. Surveys in this series have been conducted approximately every five years since 1991. The surveys are designed to represent non-institutionalized Thai populations, using a multistage stratified sampling method, the design of which has been described elsewhere [16]. Only data from adults (age 20 years and over, N = 13,177) within 540 electoral areas of 20 provinces were used in this study. Data on demographic characteristics, alcohol use patterns and disorders and symptoms of a major depressive episode were collected by face-to-face interview by well-trained field workers, who were at least bachelor degree graduates. The survey was approved by the Ethics Committee of the Institute for the Development of Human Research Protection (IHRP 1946/2556) and the Research Ethics Committee of Faculty of Medicine, Prince of Songkla University (EC 56-472-18-1). Anonymity of the data was assured to the participants after they were given detailed information of the study procedures and before they signed the informed consent form.

Measures

Alcohol-use disorder: Alcohol use disorder (AUD) was identified based on the 10-item Alcohol Use Disorders Identification Test (AUDIT), a screening instrument developed by the World Health Organization (WHO), which includes questions on the patterns of hazardous and harmful alcohol use

and dependence symptoms [17]. The respondents were classified into three levels based on the AUDIT scores: non-problem drinkers (0–7), hazardous drinkers (8–15) and harmful-dependent drinkers (16–40).

Major Depressive episode: Questions on major depressive episode (MDE) were based on the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV). The interview started with three screening questions asking if the respondent ever had depressed moods, loss of interest, and/or loss of energy or constant feelings of tiredness lasting more than a few days in the past 12 months. Those who responded in the affirmative to either one of these three questions were asked a further set of 12 questions: the first one asking if the feelings of sadness, boredom, loss of interest, and/or loss of energy occurred everyday or almost every day and the second if those symptoms occurred for a period of at least two weeks. Other questions concerned associated symptoms such as loss of appetite; psychomotor retardation; feelings of guilt or hopelessness and thoughts of death or suicidal attempt. Also included in the questionnaire were questions asking if the respondent had ever been diagnosed with a depressive disorder or been prescribed treatment for depressive disorder in the past 12 months. Presence of MDE in this study was defined as having positive answers to the first two questions and at least four associated symptoms drawn from the positive answers to the next 10 questions or a positive answer to either of two questions on being diagnosed as or prescribed treatment for depressive disorder. The questionnaire was used in the previous third and fourth surveys of the series; the diagnosis of which was found satisfactorily correlated with psychiatric interview by psychiatrists in the questionnaire development phase of the study.

Socio-economic status: A wealth index based on household assets was used to measure socio-economic status. Using a structured questionnaire, respondents were asked whether or not they or their family owned any of the following assets: a bed, air conditioner, electric water boiler, washing machine, microwave, personal computer, house telephone, car, and flushing toilet. The wealth index was calculated based on ownership of these household items, plus housing infrastructure and other characteristics, such as source of water and sanitation facilities, using principal components analysis (PCA) to assign the indicator weights [18] and then standardized to each individual. The index was classified into three terciles where the first tercile represented the lowest (poorest) SES group. Highest education attainment and employment status (yes/no) were also used as indicators of socio-economic status. Education level was categorized into primary school or lower, secondary or vocational school and university education or above.

Other variables

Other potential confounding or effect modifying variables included in the analysis were demographic factors such as age, sex, marital status and living area (urban or rural), as well as smoking status and presence of chronic diseases such as diabetes mellitus, hypertension, cholesterolemia, cardiovascular diseases, stroke, and cancer. Diagnoses of diabetes mellitus, cholesterolemia, and hypertension was based on the result of fasting blood level or blood pressure level taken at the time of data collection, or a self-report of having been diagnosed by a medical professional as having that disease, or being currently on pharmacological treatment for that disease. However, presence of cardiovascular diseases, stroke, cancers or other chronic disease was based on self-report only.

Statistical analysis

All analyses were weighted to take into account the different probabilities of a respondent being selected in the sample. Prevalence rates were expressed as a percentage. Differences in prevalence of AUD and MDE across socio-economic variables and area of residence were tested with chi-square tests. Univariate analysis was performed to examine the relationship between MDE and AUD. Multivariate logistic regression models predicting AUD were then fitted including interaction terms between MDE and each of the socio-economic variables. Wald's chi-square tests were used to evaluate the significance of these interactions. Apart from three socio-economic variables and living area, other variables included in the model were age, sex, marital status, religion, smoking status and presence of chronic illness. Adjusted odds ratios (AOR) and 95% confidence intervals (CI) were presented to assess the strength of the associations. Statistical significance was evaluated at the 0.05 level and all tests were two-sided.

Results

Participant characteristics

Altogether, 13,177 participants (51.8% female) were included in the analysis. The mean age of the participants was 46.7 years (SD: 15.7) and 70.5% were married or in a de facto relationship. Of all participants, 57.8% had no formal education or had attained only a primary school level of education, 55.6% were employed in labor type work while 34.1% were employed in private or government work, and 10.3% were unemployed; 56.5% were living in rural areas.

Based on the AUDIT, 10.3% and 1.9% were classified into hazardous and harmful-dependent drinkers, respectively while 2.5% met the criteria for MDE. Approximately 20% were current smokers. Chronic diseases were found among 41.7% of participants, with 10.2% having diabetes mellitus, 29.2% hypertension, 11.6% cholesterolemia, 3.3% cardiovascular diseases and stroke, 0.8% cancers and 15.3% other diseases.

Prevalence of MDE and AUD by socio-economic status and living area

The prevalence rates of MDE varied by all three socio-economic status indicators but not by living area. The prevalence of MDE decreased with increasing wealth, levels of education and employment status (Table 1).

Table 1
Weighted prevalence (%) of alcohol use disorders and major depression by SES, education and employment status

	Total	Wealth index				Education (years in school)				Employment status			Living area		
		Tercile 1	Tercile 2	Tercile 3	P-value	1' sc.	2' sc.	Uni.	P-value	Yes	No	P-value	Urban	Rural	P-value
Depressive symptoms	2.5	3.1	2.4	1.9	< 0.001	3.1	1.9	1.4	< 0.001	2.0	2.7	0.047	2.6	2.4	0.124
Non-problem drinker	87.8	85.8	87.8	90.0	< 0.001	89.6	84.5	87.0	< 0.001	85.6	88.5	0.117	88.4	87.3	< 0.001
Hazardous drinkers	10.3	11.3	11.0	8.7		8.9	12.7	11.6		12.2	9.9		9.5	10.9	
Harmful-dependent drinkers	1.9	2.9	1.3	1.4		1.6	2.9	1.3		1.6	1.0		2.1	1.7	
P-value from Chi-squared test, 1'sc. = primary school, 2'sc = secondary school, Uni. = university or higher															

AUD was differentially distributed in different levels of wealth index, education levels and living areas. The highest prevalence of harmful-dependent drinking was found among people in the lowest wealth tercile and those with a secondary or vocational school level of education (12-year schooling). The prevalence of harmful-dependent drinking was higher among those living in urban areas, however no significant difference in AUD prevalence was found for employment status (Table 1).

Association between MDE and AUD across levels of wealth index, education and living area

On univariate analysis there were significant associations for MDE with both hazardous drinking (OR = 0.52, 95% CI: 0.38, 0.72, $p < 0.001$) and harmful-dependent drinking (OR = 2.55, 95% CI: 1.52, 4.28, $p = 0.002$). Significant interactions between MDE and wealth index (coefficient: 0.08, 95% CI: 0.04, 0.12 $p = 0.001$), education (coefficient: 0.49, 95% CI: 0.02, 0.80 $p = 0.008$) and living area (coefficient: -0.06, 95% CI: -0.11, -0.01, $p = 0.027$) were found, indicating that these factors modified the association between MDE and AUD.

Adjusted for other variables, the associations between MDE and either hazardous or harmful-dependent drinking were strongest among those in the third tercile of wealth index (AOR = 6.89, 95% CI: 4.13, 11.48). The AOR for the association between MDE and harmful-dependent drinking was also high among those in the first tercile of wealth index (AOR = 6.14, 95% CI: 3.33, 11.34) but lower and marginally significant among those in the second tercile (AOR = 2.58, 95% CI: 1.00, 6.67). The association between MDE and harmful-dependent drinking was significant in people who had secondary school education or above (AOR = 15.19, 95% CI: 9.5, 24.29) but not among those with primary school or lower (AOR = 1.23, 95% CI: 0.55, 2.76), indicating a strong influence of educational level on the association. Finally, the association between MDE and harmful-dependent drinking was stronger among those living in urban areas (OR = 7.37, 95% CI: 4.53, 12.00) than in rural areas (OR = 4.23, 95% CI: 3.10, 5.77) (Table 2).

Table 2

Adjusted odds ratios with 95% confidence intervals showing the associations between alcohol use disorder and major depression across levels of wealth index, education and living area among Thai adult population

		Hazardous drinking	Harmful drinking/ Alcohol dependence
Wealth index	Tercile 1	0.74 (0.47, 1.15)	6.14 (3.33, 11.34)
	Tercile 2	1.53 (1.02, 2.30)	2.58 (1.00, 6.67)
	Tercile 3	2.10 (1.56, 2.80)	6.89 (4.13, 11.48)
Education	Primary school	1.06 (0.84, 1.35)	1.23 (0.55, 2.76)
	Secondary school or higher	1.73 (1.29, 2.31)	15.19 (9.5, 24.29)
Living area	Urban	1.27 (1.07, 1.50)	7.37 (4.53, 12.00)
	Rural	1.28 (0.92, 1.77)	4.23 (3.10, 5.77)
All odds ratios are adjusted for other socio-economic status variables, living area, age group, sex, marital status, religion, smoking status and presence of chronic illness.			

Discussion

Main findings, interpretations and comparisons with previous studies

In this study, data from a large national survey among adults were used to examine the association between MDE and AUD and the effects of socio-economic factors on this association. In agreement with several studies [5, 19, 20, 4, 21–23] our study found a significant association between AUD and depressive disorder. Such significant and positive relationship could be explained in terms of shared common genetic and environmental factors in the comorbidity of alcohol-use disorder and depressive disorder, as investigated in other studies [24–26]. It could also be explained in terms of causality where depressed persons may turn to alcohol as a self-medication for their symptoms and develop AUD afterwards [27]. However, confirming this explanation is beyond the scope of this study.

Also in agreement with other studies [4], the association between MDE and AUD differed across different levels of socio-economic status. Our results show that the association of MDE with harmful-dependent drinking was smallest among people in the middle socio-economic tercile but similar between the lowest and highest terciles. Inequalities in the prevalence of AUD and MDE between levels of wealth index, education, employment and urban vs. rural populations were also found, which supports studies investigating social inequalities in mental health conditions within a country [28, 7, 15, 29].

The reason that the strength of association between MDE and AUD among those in the lowest and highest socio-economic classes were higher than that in the middle class is unclear. On the one hand, it could be explained in terms of social difficulties where people of the lower class often face the most difficulties, which enhance susceptibility to negative health outcomes when exposed to risk factors [30, 8, 31]. The higher prevalence of both MDE and AUD among those in the lowest SES class could lend support to this finding. On the other hand, people in the highest SES class may have more means to reach out to alcohol or other drugs for self-medication when they get depressed. This thus explains the strong association between the two conditions. However, chance cannot be ruled out as an explanation for the observed findings due to the low statistical power as both AUD and MDE are rare in this general population study. Furthermore, the classification of wealth index derived from the PCA might not differentiate people well, thus spurious differences could also be the case [7].

For both groups of AUD, the significant and strong associations with MDE were found only among those completing secondary school education or higher but not among those with primary school education. The reason for this may be similar to the above explanation for the high socio-economic class and the finding further supports the impact of SES on the relationship between the two disorders. Education is known to causally influence health through mechanisms such as creating greater sense of control, better working conditions, increased social capital and improved health behaviors [32]. If it is true that highly educated people turn to alcohol when they are depressed to alleviate their dysphoria, it is possible that a depressive condition deforms their sense of control, leading to such poor health behaviour and education does not protect against this outcome. This finding highlights the importance of comprehensive assessment of the co-occurrence of depressive disorder and alcohol-use disorder and providing appropriate treatment and care in all individuals regardless of their education level.

No modifying effect of employment status was found on the association between AUD and MDE. The inconsistency of the findings by three SES indicators warrants further study to explicate mechanisms underlying the socio-economic inequality in the relationship between AUD and MDE. As mentioned in other studies, socio-economic inequalities in health may vary depending on the indicators used to measure SES and no single indicator can provide a full picture of SES of the population [4, 33].

Living in a rural area was found to be protective against harmful-dependent drinking in a univariate analysis and a stronger association was found between harmful-dependent drinking and MDE for people living in urban areas compared to those living in rural areas. Evidence on the relationship between urbanicity with depression and alcohol use varies in the literature [34, 30, 35]. In Thailand, people living in rural areas often have close ties and shared social activities. The poor in these rural areas also live better lives than do those in the urban areas as they have more ready access to food and green space in their surroundings. People living in urban areas can face a lot of hardships relative to urban living, for example, faster pace, higher crime rates, more crowded environment, limited green space and higher levels of pollution [36]. Such urban environments may enhance susceptibility to negative health outcomes when exposed to risk factors and increase the risk of poor mental health [37].

Depressive disorders and alcohol use disorders are common public health problems in Thailand [38] and priority conditions identified in the WHO Mental Health Gap Action Programme (mhGAP) [39]. The present findings should be considered in terms of the social context of Thailand where income inequality is in the middle range (GINI coefficient ranges between 37.50 and 39.40 since 2010) [40]. Our findings among the general Thai population suggest that mental health care and promotion would not help to improve the mental health of Thai people to its highest limit should concurrent efforts to reduce social inequalities not be implemented.

Study strengths and limitations

The main strength of this study is the large sample size and probability sampling method making it representative of the general population of the whole country. Furthermore, the possible role of confounding factors such as socio-demographic factors and the presence of chronic medical diseases was taken into account in the analyses. However, there are some limitations which deserve mention. A cross-sectional study is a useful design for obtaining the prevalence of AUD and MDE among the general population, but it cannot establish a causal relationship. The direction of causality is indeterminate; AUD and depression could be reciprocally related to each other by a feedback loop in which drinking increases the risk of depression and the depression leads to an increased consumption of alcohol and related problems [41]. In our study, AUD and MDE were self-reported and the questionnaire used for measuring both conditions in our study was a screening instrument (not a diagnostic instrument), assessing symptoms that occurred in the past 12 months, which may not fit the full criteria of major depressive or alcohol-use disorder. Therefore, our results have limited comparability with studies that used diagnostic measures. Finally, due to unavailability of data, our study did not take into account other potential confounding factors, e.g. stressful life events and personality profile, which may possibly be associated with both AUD and MDE.

Conclusions

This study shows that there is a significant association between AUD and MDE which is further moderated by certain socio-economic factors. Mental health and many mental disorders are shaped by the social, economic, and physical environments where people live [31]. Our findings emphasize the need to implement and scale up public policies and intervention programmes for depressive and alcohol-use disorders among the general population. Evidence-based interventions for depression include treatment with antidepressants and psychosocial interventions such as cognitive behaviour therapy and problem solving while those for AUD are policy and legislative interventions including regulation of availability of alcohol, enactment of appropriate drink-driving policies, and reduction of the demand for alcohol through taxation and pricing mechanisms, and interventions for hazardous drinking and treatment of alcohol use disorders with pharmacological and psychosocial interventions [39]. Our results also suggest that interventions for both conditions should be provided in proportion to the needs of people of different socio-economic groups. Future research is also needed to understand the mechanisms which underlie the different relationships that exist among people of different socio-economic status.

Declarations

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Conflict of Interest Statement

The authors declare no conflict of interest.

Author Contributions. SA: conception and design of the study; SA & JN: acquisition and analysis of data; SA & JN: drafting the manuscript; SA, JN, WA, SJ, PK & ST: involvement in data collection and review/editing of the manuscript. All authors read and approved the final manuscript.

Data availability statement

The data that support the findings of this study are available from the National Health Examination Survey Office, Health Systems Research Institute, Thailand. Restrictions apply to the availability of these data, which were used under license for this study.

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