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SOCIO-DEMOGRAPHIC CORRELATES OF HEAVY DRINKING AFTER HOSPITAL DISCHARGE AMONG THAI ALCOHOL-DEPENDENT PATIENTS: 6-MONTH FOLLOW-UP

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ABSTRACT

Background: After receiving in-patient treatment for alcohol abuse, alcohol-dependent patients (ADP) are at risk to return to heavy drinking. Little has been known regarding the correlates of socio-demographic and heavy drinking within 6-month after inpatient treatment. **Objectives:** This study aims to examine the socio-demographic correlates of heavy drinking among Thai ADP after hospital discharge within six-months. **Methods:** A prospective cohort study of 618 ADP who received inpatient treatment at two tertiary care hospitals in Northern Thailand between July and December 2014. Heavy drinking is defined by the World Health Organization as ≥5 standard drinks for men and ≥4 standard drinks for women per occasion. Heavy drinking data was collected using a Timeline Follow Back Calendar (TLFB) every month after discharge. Other measures included the Alcohol Use Disorder Identification Test (AUDIT), Rosenberg Self-esteem Scale, Alcohol Craving Control (ACC), Severity of Alcohol Dependence Questionnaire (SADQ), and demographic questionnaires. **Results:** 618 participants present with a mean age of 43.28 (SD=10.01) years, 94.2% male, 216 (35%) reported that family members are drinkers, and 400 (70.7%) continue to exhibit heavy drinking behaviour. The logistic regression model revealed that age at onset of alcohol use was correlated with heavy drinking after hospital discharge within 6 months ($p<.01$). **Conclusions/ Importance:** Many socio-demographic factors were analysed as potential correlates of a return to heavy-drinking. The only relevant factor was the age at onset of drinking. This finding suggests that the development of adolescent alcohol prevention intervention is a priority of Thailand alcohol policy.

KEYWORDS: Alcohol dependence, heavy drinking, socio-demographic.

BACKGROUND

Heavy drinking is defined based on the World Health Organization (WHO) definition as 5 or more drinks on the same occasion for men and 4 or more drinks on the same occasion for women. One standard drink holds 10g of alcohol (Babor et al., 2001). Heavy drinking impacts physical, mental, social, and spiritual aspects of people's lives (Antai et al., 2014).

Thai men who are at very-high risk for heavy drinking (>100g/drinking day) are found in every age group. Among men aged 12-65, the proportion of heavy-drinking ranges from 23.6-45.1% (Assanangkornchai et al., 2010). In 2010, a WHO's study show the monthly prevalence of heavy episodic drinking at 3.6% of drinkers in the Thai Population from both sexes (consuming at least 60g of pure alcohol in one occasion) (WHO, 2014). Study in 2013 show that patients in tertiary hospitals in Thailand usually drank 1 liter of hard alcohol or more every day in 1 month before being admitted (Norrasing et al., 2013).

A study in Northern Thailand in 2013 addresses the criteria for admission of alcohol-dependent patients for inpatient treatment. This includes patients who cannot control their drinking in spite outpatient treatment and medication, severe alcohol withdrawal symptoms, and being unable to take care of themselves. Other criteria

include having a serious impact on their daily life function, harm to family members or people around them, and obvious health problems (Norasing et al., 2013). Statistics show that mental and behavioural disorders due to psychoactive substance use are the second highest ranked issue among Thai psychiatric patients after schizophrenia (Limsoanthikul, 2009).

Inpatient treatment for Thai people with alcohol dependence follows the international standard clinical practice guidelines that use medications and psychosocial treatment together (Assanangkornchai, Arunpongpaisarn, Srisurapanont, Saengchanchai, 2007). Because alcohol withdrawal symptoms commonly present in the first week of admission alongside physical or psychiatric comorbidity, inpatient treatment starts with detoxification and eventually moves to relapse prevention treatment (Assanangkornchai, et al., 2007). An average of length of stay in hospital is 3-weeks (Suan Prung Psychiatric Hospital, 2015; Thanyarak Chiangmai Hospital, 2015). In terms of prescribed medicine in Thailand, the only anti-alcohol relapse medication available is disulfiram which was approved by the FDA of the United States. While disulfiram is affordable, its use is limited in clinical practice because community hospitals do not provide this medication. Due to the strong side effects of drinking while on disulfiram, many patients have an inconsistent pattern with taking this medication. A few hospitals provide anti-convulsion medication like topiramate, however this is not FDA approved for alcohol-dependent medicine (Srisurapanont, 2009). A literature review by Srikosai and Thaweewattanaprecha (2011) found that psychosocial programs for alcohol-dependent patients in Thailand varies, but they follow the same objective to reduce early relapse or limit a return to heavy drinking. The most common programs are Motivational Enhancement Therapy [MET] or Motivational Interviewing [MI]), Cognitive Behavioral Therapy [CBT]), Satir Systemic Transformational Change Therapy, and Stress Management Program, respectively.

After in-patient treatment, people with alcohol dependence can relapse at any time or they will be very likely to have a period of alcohol relapse (Kelly, Gaither, & King, 2007; White & McClellan, 2008). Investigations conducted within the last decade have found alcohol relapse rates ranging from 28% to 86% (Witkiewitz, 2005). When they begin their heavy-drinking again, they are at high risk for readmission to the hospital due to suicide thought (Glasheen, 2015), an executive cognitive functioning (ECF) deficits that impact on daily life in term of impairment in planning, working memory, cognitive flexibility, psychomotor speed, and response inhibition (Houston et al., 2014). Statistics regarding patients at a 700-bed capacity psychiatric hospital in northern Thailand show that the number of male patients re-admitted ≥ 2 times within one year from 2010-2014 was average 45% (Suan Prung Psychiatric Hospital, 2014).

There have been many studies on factors associated with heavy drinking, but the evidence specific for heavy drinking within 6 months of inpatient treatment as well as the examination of socio-demographic factors is still limited. Previous studies address that pain was a significant predictor of heavy drinking relapses during treatment in the United Kingdom Alcohol Treatment Trial (Witkiewitz et al., 2015). In addition, it is not yet known if socio-demographic factors correlate to heavy-drinking after inpatient treatment. A greater understanding of the conditions in their aftercare is needed. In this study, the data on drinking patterns and early readmission of ADP after discharge was analyzed alongside many sociodemographic factors in order to understand which factors indicate a return to heavy drinking. This knowledge would provide guidance in creating appropriate early relapse prevention as well as improved rehabilitation techniques.

OBJECTIVE

To examine the socio-demographic correlates of heavy drinking among Thai ADP after hospital discharge within six-month.

Research question

Does socio-demographic data (including gender, age, age at onset of alcohol use, education, marital status, and quantity of alcohol consumption in the past month) correlate to heavy drinking among Thai ADP after hospital discharge within six-month?

METHOD

Design: A prospective cohort study using a secondary data from the project of "alcohol-dependent trajectory after 1 year hospital discharge and factors predicting each type of trajectory among alcohol-dependent patients in northern region".

Participants: 618 alcohol-dependent patients who received inpatient treatment at Suan Prung Psychiatric Hospital and Thanyarak Chiangmai Hospital in the north of Thailand between July and December 2014.

Materials and procedure: All subjects who were asked to participate in the study agreed to answer questions by six research assistants who were responsible for data collection from the first week of patients' discharge period and every month until month$_6$. In the end, data was analysed for 618 subjects with completed records. This data includes 16 participants who died during the study and 5 participants with missing.

Measurements

Sociodemographic characteristics are collected through data including gender, education level, occupation, marital status, smoking, age at onset of alcohol consumption, time of admission, and pattern of alcohol consumption before present hospital admission.

Timeline Follow-back (TLFB) – Patients fill in a TLFB calendar every week for one month, and continue follow-up with a research team once a month for 6 months. They are asked about frequency and amount of alcohol consumed per day based on the WHO definition of one standard drink. Demographic questionnaires are completed before hospital discharge. The research team then conducts TLFB interviews mainly through the phone. There are also home visits to observe if there are physical signs of alcohol or heavy-drinking in the patient. Family members are also interviewed to confirm that the data is correct.

Alcohol Use Disorder Identification Test (AUDIT) – This test collects data on the drinking behaviours and problems related to drinking. Participants have been asked to recall their experiences over the last 12 months before hospital admission. This questionnaire was developed by WHO (Saunders, Aasland, Babor, DelaFuente, & Grant, 1993). The updated version of AUDIT (Babor, Higgins-Biddle, Saunders, & Monteriro, 2001) was translated into Thai by Silapakit and Kittirattanapaiboon in 2009. TLFB and AUDIT are tested for quality by analysing the inter-rater reliability (=1.00).

Severity of Alcohol Dependence Questionnaire (SADQ) – This questionnaire was used to classify the level of alcohol dependence. It was developed by Stockwell et al. (1983) with 20 items consisting of 5 components that include physical withdrawal, affective withdrawal, craving and withdrawal-relief drinking, typical daily consumption, and reinstatement of symptoms after a period of abstinence. It has been translated to Thai and tested for psychometric properties by Srikosai et al. (2012). The scores ≥ 31 means severe alcohol dependence, 16-30 means moderate alcohol dependence, and <16 means mild alcohol dependence.

Rosenberg Self-Esteem Scale (RSES) – This scale analyses the self-esteem of patients consisting of 10 items. Wongpakaran, T., & Wongpakaran, N. investigated the structure of RSES by using confirmatory factor analysis demonstrating a good internal consistency (Cronbachus alpha 0.86), with a factorial construct consistent with earlier reports.

Alcohol Craving Questionnaire (ACQ) – This questionnaire helps the patients understand their alcohol craving control consisting of 11 items and three components. It was developed by Anton, Moak, and Latham (1995).

SADQ, RSES, and ACQ were analysed for quality through internal consistency reliability with 15 alcohol-dependent patients from Suan Prung Psychiatric Hospital and Thanyarak Chiang Mai Hospital. 9 males and 6 females. The Chronbach's alpha coefficient revealed 0.87, 0.68 and 0.73, respectively.

Data analyses: For categorical variables, a comparison of the proportions of those with and those without heavy-drinking is made using the Chi-square test. The mean differences between groups are compared using an independent t-test.

In order to understand the correlation between socio-demographic factors and relapse to heavy drinking, a stepwise binary logistic regression analysis with enter method was used to identify the independent factors significantly correlated with heavy-drinking. The regression model included all variables significantly associated with heavy-drinking in the univariate analysis ($p < .05$). The odds ratios (OR) and the corresponding 95% confidence intervals (CIs) were used to observe the associations. We determined the model goodness-of-fit by using the Hosmer and Lemeshow (H-L) test. A p-value of .05 or higher of the H-L test would indicate that the model fit well with the data. All reported p values and 95% confidence intervals are two-sided.

Ethical Issues: This study is a sub-project of a larger research project called "Trajectory of Alcohol-dependence among Thai Alcohol-dependent Patients after 1 year Hospital Discharge" approved by the Research Ethic Committee of Suan Prung Psychiatric Hospital in Thailand.

RESULTS

Participants

Table 1 shows the socio-demographic results between groups of alcohol-dependent patients (ADP) with heavy drinking and without heavy drinking within 6 months after hospital discharge (n=566). Gender, educational level, marital status, and average of quantity of alcohol consumption in 1 month between groups were not different. The majority of alcohol-dependent patients are male, completed junior high school or less, and drank an average of 1 bottle of alcohol per day.

Table 2 shows the socio-demographic results between groups of ADP with and without heavy drinking, and ADP with loss of follow-up in 6 months after hospital discharge (n=618). Data includes gender, educational level, marital status, smoking, others in family who drink, and average of quantity of alcohol consumption in the past month and shows insignificant differences between groups.

Correlates of heavy drinking

Based on the independent t-test analyses, age at onset of alcohol use ($p< .01$) and the severity of alcohol dependence level ($p< .05$) significantly difference between groups at six-months follow-up. (see Table 3).

The enter LR stepwise logistic regression analysis was conducted to predict heavy drinking at 6-month follow-up among 566 patients with alcohol dependence. The variables in table 3 were included as the predictors, and also the time of admission factor. A test of the full model

show that the age at onset of alcohol use as reliably distinguished between patients who have and patients who did not have heavy drinking at six-month follow-up (p< .01) (see Table 4).

For the Hosmer and Lemeshow test, its p-value of .761 suggested that the model fit well with the data. The prediction success overall was 73.0% (9.6% for those having no heavy drinking and 99% for those having heavy drinking). The included variables—but those that were not in the equation—were gender (p= .298), age (p= .396), time of admission (p= .114), SADQ (p= .126), self-esteem score (p= .509), and craving control level (p= 1.000).

Table 1: Socio-demographic between groups of alcohol-dependent patients with heavy drinking and without heavy drinking in 6 months after hospital discharge.

Socio-demographic	alcohol-dependent patients with heavy drinking (n=400)	alcohol-dependent patients without heavy drinking (n=166)	Difference between/ among groups Confident level at 95% (2-sided)
Gender			χ^2 = 2.899, p=.089
male	381 (95.25%)	152 (91.57%)	
female	19 (4.75%)	14 (8.43%)	
Education			χ^2 = .360, p=.417
Junior high school or less	243 (60.75%)	105 (63.25%)	
High school	90 (22.50%)	36 (21.69%)	
Bachelor degree or higher	67 (16.75%)	25 (15.06%)	
Marital Status			χ^2 = 2.949, p=.114
Single	115 (28.75%)	44 (26.51%)	
married	234 (58.50%)	108 (65.06%)	
Divorce or widow	51 (12.75%)	14 (8.43%)	
Average of quantity of alcohol consumption in the past 1 month			χ^2 = .171, p=.459
≥2 bottles of alcohol per day	61 (15.25%)	24 (14.46%)	
1 bottle of alcohol per day	199 (49.75%)	81 (48.79%)	
≤1/2 bottle of alcohol per day	140 (35.00%)	61 (36.75%)	

Table 2: Socio-demographic between groups of alcohol-dependent patients (ADP) with and without heavy drinking, and ADP with loss of follow-up in 6 months after hospital discharge.

Socio-demographic	alcohol-dependent patients with and without heavy drinking (n=566)	alcohol-dependent patients with missing or loss follow-up (n=52)	Difference between/ among groups Confident level at 95% (2-sided)
Gender			χ^2 = .000, p=.986
male	533 (94.17%)	49 (94.23%)	
female	33 (5.83%)	3 (5.77%)	
Education			χ^2 = 4.570, p=.102
Junior high school or less	348 (61.48%)	25 (48.08%)	
High school	126 (22.26%)	18 (34.61%)	
Bachelor degree or higher	92 (16.26%)	9 (17.31%)	
Marital Status			χ^2 = .560, p=.756
Single	159 (28.09%)	17 (32.69%)	
married	342 (60.42%)	30 (57.69%)	
Divorce or widow	65 (11.49%)	5 (9.62%)	
Smoking			χ^2 = 1.430, p=.232
Yes	367 (64.84%)	38 (73.08%)	
No	199 (35.16%)	14 (26.92%)	

Other in family who drink			χ^2 = 2.150, p=.143
Yes	193 (34.10%)	23 (44.23%)	
No	373 (65.90%)	29 (55.77%)	
Quantity of alcohol consumption in the past 1 month			χ^2 = 2.448, p=.294
≥2 bottles of alcohol per day	85 (15.02%)	10 (19.23%)	
1 bottle of alcohol per day	280 (49.47%)	29 (55.77%)	
≤1/2 bottle of alcohol per day	201 (35.51%)	13 (25.00%)	

Table 3: Age, age at onset of alcohol use, and clinical differences between groups of alcohol-dependent patients with heavy drinking and without heavy drinking in 6 months after hospital discharge.

Socio-demographic	Alcohol-dependent patients with heavy drinking (n=400) Mean (SD)	Alcohol-dependent patients without heavy drinking (n=166) Mean (SD)	Difference between/ among groups (2-sided)
Age (years)	42.94 (10.10)	44.54 (9.68)	Mean difference = 1.599 t= 1.765, p=.078
Age at onset of alcohol use	18.35 (4.46)	20.03 (6.22)	Mean difference = 1.680 t= 3.610, p<.001
Alcohol Use Disorder Identification Test (AUDIT total score)	28.31 (7.27)	28.05 (7.16)	Mean difference = -.257 t= -.385, p=.700
Self-esteem level(Rosenberg self-esteem score)	27.60 (3.92)	27.71 (3.41)	Mean difference = .116 t= .351, p=.725
Severity of alcohol dependence level (SADQ total score)	25.55 (12.35)	22.95 (12.30)	Mean difference = -2.601 t= -2.270, p=.024
Alcohol craving control level (alcohol craving total score)	18.68 (7.42)	17.72 (8.15)	Mean difference = -.954 t= .000, p=.078

Table 4: Enter standard logistic regression model to determine the independent correlates of heavy drinking among alcohol dependent patients.

Risk factors	*B*	SE *β*	Ward's χ2	Odds ratio (95% confidence interval)
Constant	1.963	.987	3.956 (p = .047)	7.123
Gender	.419	.403	1.081 (p = .298)	1.521(.690-3.350)
Age at on set	-.053	.019	8.035 (p = .049)	.949(.914-.984)
Age	-.009	.010	.721 (p = .396)	.991(.972-1.011)
Self-esteem	-.017	.026	.436 (p = .509)	.983(.935-1.034)
SADQ	.015	.010	2.346 (p = .126)	1.015(.996-1.034)
Alcohol craving control	.000	.015	.000 (p = 1.000)	1.000(.970-1.030)
Time of admission	.040	.025	2.502 (p = .114)	1.041(.990-1.094)

SADQ = Severity of Alcohol Dependence Questionnaire
Overall Chi-square test: Chi-square=21.93, df=7, p=.003; Nagelkerke R^2 =.057
Hosmer and lemeshow test; Chi-square test =4.972, df=8, p=.761

DISCUSSION

The present findings suggest that heavy drinking within 6-months of hospital discharge is common in patients with alcohol dependence. Heavy drinking was found in 64.72% of alcohol-dependent patients after inpatient treatment. The age at onset of alcohol use and severity of alcohol dependence are independently correlated with heavy drinking in alcohol-dependent patients.

The prevalence rate of heavy drinking among alcohol dependent patients (64.72%) in the current study of alco-

hol dependence in Thailand was higher than in other studies reviewed. A study in Switzerland found the prevalence rate to be 28.0% (Daeppen et al., 2013), another study in the UK found the prevalence rate to be 6.1% - 16.3% (Witkiewitz et al., 2015), and one study in India showed 30% of patients with ethanol related liver disease and alcohol dependence continued heavy drinking patterns (70% are abstinent at six months) (Nagaich et al., 2016). Although all studies define heavy drinking similarly, the unique characteristics of the patients assessed in each study along with the differing period of time of each study must be considered when making comparisons. However, all of the findings confirm that heavy drinking is common in patients treated for alcohol dependence.

This study finds that the age at onset of alcohol use and the severity of alcohol dependence in alcohol-dependent patients with heavy drinking are significantly different from those without heavy drinking after inpatient treatment at the 6-month follow-up. The average age of onset of alcohol use in the heavy drinking group is 18 years old, versus those in the non-heavy drinking group with an average age onset of 20. The severity of alcohol dependence questionnaire shows a higher score in heavy drinkers at an average of 25, whereas the score for non-heavy drinkers is an average of 22. This finding suggests that heavy drinking has been clearly found in alcohol-dependent patients who started drinking at the early age and who have a severe alcohol dependence.

Furthermore, this study identifies a new finding that the younger the age at which people started to drink, the greater their likelihood of heavy drinking after inpatient treatment at 6-month follow-up.

One reason pointing to the causes of early onset of drinking is congenital. An experimental study indicates that genetic factors contribute strongly to early alcohol abuse and alcohol withdrawal syndrome if the first alcohol use occurred around 15 years of age (Kibitov, Voskoboeva, & Chuprova, 2015). Additionally, a literature review of the incentive-sensitization theory of addiction by Berridge and Robinson (2016) supports two findings: genetic factors affect the susceptibility to sensitization in experimental rodents, and genes also contribute to addiction vulnerability in humans. This literature suggests that the alcohol-dependent patients in this current study may have the trait marker (gene) of risk for earlier alcohol cues or alcohol abuse. This may increase their vulnerability to heavy drinking after inpatient treatment.

A second reason may be related to the neurotransmitters affected by alcoholism and addiction. Alcohol is reported to elicit greater dopamine release in the striatum of alcoholics than in social drinkers (Yoder et al., 2016). The greater the cue-induced dopamine release, the greater the craving. (Leyton & Vezina, 2013). In terms of the overall disposition of personality, a study in 2016 found that the propensity to experience negative affect significantly increases the risk of heavy drinking, while those with positive affect do not show significant heavy-drinking tendencies (Brunborg, 2016). In addicts, mesolimbic circuits are hyper-responsive to drug cues, which may cause strong cue-triggered "wanting" to take drugs, leading to relapse (Berridge & Robinson, 2016). Among chronic alcohol-dependent patients, there may be a higher severity of withdrawal-like symptoms which are linked to greater craving among alcohol-dependent adults. This supports a connection between withdrawal-relief motives and heavy drinking (Heinz et al., 2003; Malcolm et al., 2000). Most existing knowledge presents the correlation of drinking at an early age with long term impacts on the individual, such as developing dependence at a younger age, chronic relapsing dependence, and problems during adult life (Hingson, Heeren, & Winter, 2005). Often, these people exhibit behaviours that pose risks to themselves and others (Hingson, 2004).

In a study of prescribed medication for alcohol-dependent patients from the USA, topiramate makes a difference within the first two weeks while naltrexone showed an overall effectiveness on drinking outcomes. This medication alongside psychosocial treatment shows to be more effective in preventing relapse to heavy-drinking (Chen et al., 2012). In Thailand, there is no access to anti-alcohol relapse medication. Considering 64% of patients treated for alcohol dependence return to heavy drinking within 6 months, an evaluation of current psychosocial treatment services before hospital discharge is recommended. Ensuring proper care and specific treatment for high risk groups like early-age drinkers and those with a high severity of alcohol dependence is also to be considered.

CONCLUSION

The main factor correlating to heavy-drinking after hospital discharge among Thai alcohol-dependent patients at 6-month follow-up was the age at onset of drinking. This finding suggests that an evaluation of current psychosocial treatment services before hospital discharge is recommended, ensuring proper care and specific treatment for high risk groups like early-age drinkers, as well as the development of adolescent alcohol prevention and intervention as a priority of Thailand alcohol policy.

LIMITATIONS

This current study does not include factors of psychiatric comorbidity, type of medication treatment, as well as an average of hospital stay, which may affect the return to heavy drinking.

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Declaration of interest

The authors have no conflict of interest to report.

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