EXPLORING ALCOHOL WITHDRAWAL SYNDROME AND PREDICTING ALCOHOL CONSUMPTION CHANGE IN PATIENTS ADMITTED TO A GENENRAL HOSPITALS IN VIETNAM

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สำรวจกลุ่มอาการถอนแอลกอฮอล์และความพร้อมในการเปลี่ยนพฤติกรรมการดื่มแอลกอฮอล์ในผู้ป่วยที่เข้ารับการรักษาในโรงพยาบาลทั่วไปแห่งหนึ่งในประเทศเวียดนาม

นาง โลนทิไม งูเย็น

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ABSTRACT (Thai)

สำรวจกลุ่มอาการถอนแอลกอฮอล์และความพร้อมในการเปลี่ยนพฤติกรรมการดื่มแอลกอฮอล์ในผู้ป่วยที่เข้ารับการรักษาในโรงพยาบาลทั่วไปแห่งหนึ่งในประเทศเวียดนาม

คำสำคัญ: กลุ่มอาการถอนแอลกอฮอล์, การเปลี่ยนพฤติกรรมการดื่มแอลกอฮอล์, ความชุกของกลุ่มอาการถอนแอลกอฮอล์, ผู้ป่วยที่เข้ารับการรักษาในโรงพยาบาล

การดื่มสุราในระดับเสี่ยง พบได้บ่อยในผู้ป่วยที่เข้ารับการรักษาตัวในโรงพยาบาล การตรวจหาผู้ป่วยที่ดื่มสุราในระดับเสี่ยงนี้ตั้งแต่ระยะแรก ๆ มีความสำคัญอย่างมากในการให้การจัดการกลุ่มอาการถอนแอลกอฮอล์ที่เหมาะสมและการให้ความรู้แก่ผู้ป่วยกลุ่มนี้ การวิจัยนี้มีวัตถุประสงค์แรกเพื่อดูปริมาณผู้ที่ดื่มสุราในระดับเสี่ยง ผู้ที่มีการดื่มสุราผิดปกติ และผู้ที่มีกลุ่มอาการถอนแอลกอฮอล์ วัตถุประสงค์ที่สองเพื่อหาตัวทำนายความตั้งใจที่จะเปลี่ยนแปลงพฤติกรรมการดื่มแอลกอฮอล์และการเปลี่ยนแปลงพฤติกรรมการดื่มแอลกอฮอล์โดยการใช้โดยใช้แบบจำลองพฤติกรรมบูรณาการ (Integrated Behavior Model) เป็นกรอบแนวคิดงานวิจัย งานวิจัยนี้เป็นการสำรวจแบบเก็บข้อมูลไปข้างหน้า ในโรงพยาบาล Kien An ซึ่งเป็นโรงพยาบาลทั่วไปในตอนเหนือของประเทศเวียดนาม ในระหว่างเดือนมีนาคมถึงมิถุนายน พ.ศ. 2561 เพื่อให้บรรลุวัตถุประสงค์แรก ทำการคัดกรองผู้ป่วย 1,340 คนที่เข้ารับการรักษาตัวในโรงพยาบาลเพื่อหาผู้ที่ดื่มแอลกอฮอล์ในระดับเสี่ยง ผู้ป่วยที่ดื่มแอลกอฮอล์ผิดปกติ และผู้ที่มีกลุ่มอาการถอนแอลกอฮอล์ ผู้ป่วย 2,168 คนที่เข้ารับการรักษาตัวในโรงพยาบาลเป็นผู้ที่ดื่มแอลกอฮอล์ในระดับเสี่ยงจำนวน 314 คน ได้ถูกเก็บข้อมูลสำหรับวัตถุประสงค์ที่สอง ผู้ป่วยที่ดื่มแอลกอฮอล์เกินระดับความปลอดภัยถูกจัดให้เป็นผู้ที่ดื่มแอลกอฮอล์ในระดับเสี่ยง ผู้ที่ดื่มแอลกอฮอล์ในระดับเสี่ยงที่มีคะแนนการทดสอบความผิดปกติของการใช้แอลกอฮอล์ (AUDIT) มากกว่า 8 จะถูกจัดให้เป็นผู้ที่ดื่มแอลกอฮอล์ผิดปกติ ในการวิเคราะห์หาผู้ที่มีกลุ่มอาการถอนแอลกอฮอล์ใช้เกณฑ์ในคู่มือสถิติและการวินิจฉัยความผิดปกติทางจิต รุ่นที่ 5 ระดับความรุนแรงจะขึ้นกับคะแนนที่ได้ ผู้ดื่มแอลกอฮอล์ในระดับเสี่ยงชาย 250 คน และ หญิง 1 คนถูกสัมภาษณ์ ในช่วงที่เข้ารับการรักษาตัวในโรงพยาบาล ด้วยแบบสอบถามที่สร้างขึ้นในการวัดทัศนคติอุปกรณ์และทัศนคติ

ประสบการณ์ต่อการเปลี่ยนแปลงพฤติกรรมการดื่มแอลกอฮอล์ บรรทัดฐานเชิงพรรณนา บรรทัดฐานคำสั่ง การรับรู้พฤติกรรมการควบคุม ความรุนแรงในการติดแอลกอฮอล์ ความตั้งใจที่จะเปลี่ยนแปลงพฤติกรรมการดื่มแอลกอฮอล์ และการบริโภคแอลกอฮอล์ในอดีต และได้มีการติดตามข้อมูลการบริโภคแอลกอฮอล์ใน 1 และ 3 เดือนหลังออกจากโรงพยาบาล ได้มีการติดตามพฤติกรรมการดื่มแอลกอฮอล์ในผู้ป่วยที่ดื่มแอลกอฮอล์ในระดับเสี่ยงจำนวน 176 คน และ115 คน หลังออกจากโรงพยาบาล 1 และ 3 เดือน ตามลำดับ

ผลการวิจัยพบว่าความชุกของผู้ป่วยที่ดื่มแอลกอฮอล์ในระดับเสี่ยง ผู้ป่วยที่มีการดื่มสุราผิดปกติ และผู้ป่วยที่มีกลุ่มอาการถอนแอลกอฮอล์ เท่ากับ 15.5%, 13.1%, และ 7.3% ตามลำดับ ผู้ป่วยที่มีการดื่มสุราผิดปกติ และผู้ป่วยที่มีกลุ่มอาการถอนแอลกอฮอล์ ทั้งหมดเป็นผู้ชายอายุมีอายุอยู่ระหว่าง 40 – 60 ปี การวิเคราะห์ถดถอยโลจิสติกหลายตัวแปรพบว่า ทัศนคติอุปกรณ์ต่อการเปลี่ยนแปลงพฤติกรรมการดื่มแอลกอฮอล์มีความสัมพันธ์กับความตั้งใจที่จะเปลี่ยนแปลงพฤติกรรมการดื่มแอลกอฮอล์ อย่างมีนัยสำคัญทั้งในกลุ่มที่มีความตั้งใจบ้างและกลุ่มที่มีความตั้งใจมากเมื่อเทียบกับกลุ่มที่ไม่มีความตั้งใจ (OR เท่ากับ 2.8 และ 4.9 ตามลำดับ) มีเพียงการรับรู้พฤติกรรมการควบคุมเท่านั้นมีความสัมพันธ์กับความตั้งใจที่จะเปลี่ยนแปลงพฤติกรรมการดื่มแอลกอฮอล์ อย่างมีนัยสำคัญในกลุ่มที่มีความตั้งใจมากเมื่อเทียบกับกลุ่มที่ไม่มีความตั้งใจ (OR เท่ากับ 2.1) ความตั้งใจที่จะเปลี่ยนแปลงพฤติกรรมการดื่มแอลกอฮอล์เป็นปัจจัยเดียวที่มีความสัมพันธ์กับการเปลี่ยนแปลงพฤติกรรมการดื่มแอลกอฮอล์อย่างมีนัยสำคัญ (OR เท่ากับ 1.3 และ 1.4 ในกลุ่มที่มีการเปลี่ยนแปลงบ้างและกลุ่มที่มีการเปลี่ยนแปลงอย่างมากตามลำดับเมื่อเทียบกับกลุ่มที่ไม่เปลี่ยนแปลงหลังจากออกจากโรงพยาบาล 1 เดือน และ OR เท่ากับ 1.2 และ 1.5 ในกลุ่มที่มีการเปลี่ยนแปลงบ้างและกลุ่มที่มีการเปลี่ยนแปลงอย่างมากตามลำดับเมื่อเทียบกับกลุ่มที่ไม่เปลี่ยนแปลงหลังจากออกจากโรงพยาบาล 3 เดือน) โดยสรุปผู้ที่มีการดื่มสุราผิดปกติ และผู้ที่มีกลุ่มอาการถอนแอลกอฮอล์พบได้ทั่วไปในผู้ป่วยที่ได้รับการรักษาตัวในโรงพยาบาล การกำหนดแนวทางที่ใช้ในการระบุและดูแลผู้ป่วยที่มีกลุ่มอาการถอนแอลกอฮอลล์เป็นเรื่องเร่งด่วน ความเชื่อที่แข็งแกร่งเกี่ยวกับผลลัพธ์ในเชิงบวกจากการเปลี่ยนแปลงการบริโภคสุรา และยิ่งผู้ป่วยมีความมั่นใจที่จะก้าวข้ามอุปสรรคหรือสิ่งแวดล้อมล่อใจมากขึ้น ก็จะมีความตั้งใจที่จะ

เปลี่ยนแปลงพฤติกรรมการดื่มแอลกอฮอล์มากยิ่งขึ้น ความตั้งใจที่จะเปลี่ยนแปลงพฤติกรรมการดื่มแอลกอฮอล์ก็จะยิ่งมีการลดการดื่มแอลกอฮอล์ การนอนรักษาตัวในโรงพยาบาลและการให้ความรู้ถึงผลกระทบของการดื่มแอลกอฮอล์ต่อสุขภาพอาจจะเป็นแรงจูงใจที่ทำให้ผู้ป่วยเปลี่ยนแปลงการบริโภคแอลกอฮอล์ของตนได้

ภาควิชา	เภสัชศาสตร์สังคมและการบริหาร	ลายมือชื่อนิสิต……..
สาขาวิชา	เภสัชศาสตร์สังคมและการบริหาร (นานาชาติ)	
ปีการศึกษา:	2562	ลายมือชื่ออาจารย์ที่ปรึกษา……

ABSTRACT (English)

##5976553533: MAJOR SOCIAL AND ADMINISTRATIVE PHARMACY

KEYWORDS: ALCOHOL WITHDRAWAL SYNDROME, CHANGING ALCOHOL CONSUMPTION, PREVALENCE OF ALCOHOL WITHDRAWAL SYNDROME, HOSPITALIZED PATIENTS

LOAN THI MAI NGUYEN: EXPLORING ALCOHOL WITHDRAWAL SYNDROME AND PREDICTING ALCOHOL CONSUMPTION CHANGE IN PATIENTS ADMITTED TO A GENENRAL HOSPITALS IN VIETNAM. ADVISOR: ASST. PROF. TANATTHA KITTISOPEE, Ph.D., 120pp.

Risky alcohol drinking is common in hospitalized patients. Early detecting risky alcohol drinkers in hospital is important to provide appropriate management of Alcohol withdrawal syndrome (AWS). This first aim of this study was to identify the extent to which patients admitted to a general hospital in Vietnam meet the criteria for risky alcohol drinker (RAD), alcohol use disorder (AUD), and alcohol withdrawal syndrome (AWS). The second aim was to identify predictors of intension to change and changing alcohol consumption using the Integrated Behavior Model as a conceptual framework. Design: A prospective survey was conducted in Kien An - a general hospital in the north of Vietnam during March-June 2018. To achieve the first objective, 1340 patients admitted to a general hospital was screened for risky alcohol drinkers, AUD and AWS. There were 314 from 2,168 patients admitted to the hospital were identified as risky alcohol drinkers for collecting data of the second objective. Patients who drank greater than the set limit for safe were classified as RADs. RADs who had the Alcohol Use Disorder Identification Test (AUDIT) score of 8 or more were identified as AUDs. Diagnostic and Statistical Manual of Mental Disorders version 5 was used as a criteria to diagnose AWS. The AWS scale was used to quantitate AWS severity level. Upon admission, there were 250 male and 1 female risky alcohol drinkers were interviewed using a designed questionnaire on their experiential and instrumental attitude toward changing alcohol consumption, descriptive and injunctive norm, perceived behavior control, alcohol dependent severity, intention to change alcohol consumption and

alcohol consumption. A total of 176 and 115 RADs were follow-up for alcohol consumption using the first 3 question of AUDIT at 1 and 3 months after hospital discharge, respectively.

The results found that prevalence of risky alcohol drinkers, AUD patients, AWS patients of hospitalized patients were 15.5%, 13.1%, and 7.3%, respectively. All the AUD and AWS patients were male. The majority of risky alcohol drinkers, AUD, AWS were found in the group of 40-60-year-old male. Multivariate multinomial logistic regression showed that instrumental attitude toward changing alcohol consumption had significant relationship with intention in both some and strong intention group comparing to no intention group (OR = 2.8 and 4.9, respectively). Only perceived behavior control had significant relationship with intention in strong intention group comparing to no intention group (OR = 2.1). Intention to act was the only influencing factor that significantly related to changing alcohol consumption (OR = 1.3 and 1.4 in some change and significant change group respectively comparing to no change group at 1 month; and OR = 1.2 and 1.5 in some change and significant change group respectively comparing to no change group at 3 months after discharging from the hospital). In conclusion, AUD and AWS were common in hospitalized patients. Setting up the protocol to identify AWS is urgent. Stronger beliefs about a positive outcome from changing alcohol consumption and more confidence over obstacles or environmental temptation correlated with higher patient intention to change. Intention to act is the strongest predictor of reduced alcohol consumption behavior. Patients were able to change their alcohol consumption after discharge from the hospital. A hospital stay and education of alcohol's impact on health may motivate patients to change their alcohol consumption

Department:	Social and Administrative Pharmacy	Student's Signature……
Field of Study:	Social and Administrative Pharmacy	
Academic Year:	2019	Advisor's Signature……

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I may have a long way to reach my goal and your all supports made me quite strong and confident to continue this journey. Looking forward to new success.

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ABBREVIATION

GABA	Gamma aminobutyric acid
AUD	Alcohol use disorder
AUDIT	The Alcohol Use Disorder Identification Test
AUDIT-C	The Alcohol Use Disorder Identification Test for Consumption
AWS	Alcohol withdrawal syndrome
CAGE	Cut down, Annoyed, Guilty, Eye-opener
DSM 5	Diagnostic and Statistical Manual of Mental Disorders version 5
GDP	The nation's gross domestic product
IBM	Integrated Behavior Model
LAST	Luebeck Alcohol Dependence and Abuse Screening Test
MALT	The Munich Alcoholism Screening Test
MAST	The Michigan Alcoholism Screening Test
NMDA	N-methyl-D-Aspartate
TWEAK	The Tolerance, Worried, Eye opener, Amnesia, (K) Cut down
USD	United State Dollars

CHAPTER 1

INTRODUCTION

The overview of the alcohol consumption and its consequences in Vietnam specifically, prevalence of alcohol positive-screening in inpatients admitted to general hospital using the validated tools from previous studies, the need to prevent alcohol withdrawal syndrome, and the factors affected to change alcohol use behavior globally were provided in chapter 1. The purpose and the significant of the study, then were in the last part of this chapter.

1.1. Rational of study

Vietnamese people drink a large amount of alcohol and alcohol consumption has dramatically increased in recent years (1). According to the report of the World Health Organization, Vietnamese aged 15 years or older consumed 6.6 litres of pure alcohol per year in 2008-2010 which is 0.4 litres higher than the average amount of alcohol that other people in the world drink. In 2008-2010, a Vietnamese man, aged 15 years and older consumed an average of 27.4 liters of alcohol per year (1). This was 3 times higher than the safe limit of alcohol consumption (2). This made Vietnam the second highest alcohol consuming country in Southeast Asia, the tenth in Asia and the 29th highest in the world (3). Vietnamese people spent 3.4 billion USD on beer purchases each year, which was equivalent to 3% of the nation's gross domestic product (GDP). Homemade alcohols were frequently consumed in Vietnam. This made the amount of alcohol consumed yearly which calculated from amount of purchasing was underestimated in Vietnam (3).

In Vietnam, 30% of social violence and 33.7% of domestic violence are caused by alcohol abuse (3). In 2012, alcohol-attributable percentage of road traffic accidents in males and females was 36.2% and 0.7 % respectively. Alcohol contributed to 8.3% of total death that ranked the fifth largest cause of death in Vietnam (3). Alcohol caused not only economic and social problems but also a big burden on the health care system. Heavy

alcohol consumption over a long period of time leads to many acute and chronic health conditions. Alcohol use is a risk factor of a wide range of disease and injuries such as high blood pressure, stroke, coronary heart disease, liver cirrhosis; and respiratory ailments such as tuberculosis, pneumonia and influenza. Additionally alcohol users experience an increase incidence of diabetes, peptic ulcer disease, epilepsy and many different cancers (4-6). In 2012, alcohol was a contributory factor for 71.1% of liver cirrhosis in males and 37.7% of this disease in female. The direct health care cost for breast, colorectal, liver, oral cavity, stomach, and cervix cancer highly relates to alcohol which accounts for 0.22% of total GDP (3). Vietnam was ranked as having the highest score for alcohol-attributable years of life lost (1). Alcohol use creates a huge burden on economic, health, and social costs which is difficult to quantify (3).

However, current policies mainly regulate the alcohol production and business. Vietnam does not have effective management for selling alcohol to consumer. Alcohol is easy to access for people in Vietnam. Vietnam is drafting the law for controlling alcohol consumption, limiting the availability, and preventing harmful alcohol use. This law is expected to contribute to restrict people obtain alcohol.

Alcohol use attributes to many diseases and injuries (4-6), thus, the patients who use alcohol at a risky level were prominent in hospital admissions. Risky alcohol drinkers range from drink over than recommended safe level to alcohol use disorder (AUD). When AUD stop drinking alcohol suddenly, they may develop Alcohol withdrawal syndrome (AWS) (7) (8). A prospective study in Australia (1995) detected that 3.6% of inpatients developed AWS, of those in withdrawal 17.6% were complicated AWS, categorized by hallucinations, seizures and delirium (9). Dolman et al. (2005) identified 2% of all new admission aged 16 and over experiencing alcohol withdrawal (10). AWS is a critical issue because AWS can increase morbidity and mortality of co-existing disease, prolongs hospital stays and death (11-14). The mortality rate of AWS is 5-10% with hospitalized patients (12, 15). Although some patients experience relatively minor alcohol withdrawal symptoms, disease processes that accompany alcohol withdrawal can cause significant

illness and death, given that AWS is one of the causes of preventable morbidity and mortality (11). The onset time of developing more severe stages of AWS including seizure, hallucination and delirium is very short (12). Due to quick progression to the later stages of delirium tremens, seizure and death, prompt detection and close monitoring and appropriate treatment is vital. The AWS complication was shown having a close relationship with the length of hospital stay. The patients without AWS complications spent 5 days in the hospital whereas the patient with AWS complications experience a 9-day length of stay. In general AWS progressed to a more complicated disease in the form of seizures, hallucination and delirium. Early detection and monitoring AWS patients could reduce 3 time of the complicated episode compare to late management (12).

In addition, if AUD patients are not identified upon admission to the hospital, symptoms of alcohol withdrawal in these patients can be misdiagnosed as other diseases, such as pneumonia and infection, cerebral vascular accident, hypoglycemia, and postoperative delirium (16). These misdiagnoses may result in unnecessary and inappropriate treatment (17), prolong hospital stay, and waste valuable resources (18).

The criteria to diagnose AWS is based on patient history and clinical symptoms, no laboratory test can detect AWS (8) so that by screening all the patients upon admission to detect early alcohol use disorder patients, health care providers could assess and monitor more closely to have rapid diagnosis, timely intervention, prevention or at least minimization of the consequences of alcohol withdrawal syndrome. AWS can be prevented up to 75% by prophylactic therapy (19).

A diagnosis of alcohol use disorder (AUD) is not based on the amount and frequency of alcohol consumption but relies on the patient's addictive behavior (20) so that alcohol drinker screening is the first step to diagnose an AUD drinker. A variety of validated screening tools such as the AUDIT (the Alcohol Use Disorders Identification Test) (21), MAST (the Michigan Alcoholism Screening Test) (22), CAGE (acronym for Cut down, Annoyed, Guilty, Eye-opener) (23), DSM (Diagnostic and Statistical Manual of Mental Disorder) (8), LAST (Luebeck Alcohol Dependence and Abuse Screening Test)

(24), MALT (the Munich Alcoholism Screening Test) (25), MINI International Neuropsychiatric (26) can be used for screening risky drinkers. Almost tools has set up cut off point to be the at-risk criteria.

Many studies worldwide on prevalence of risky alcohol drinkers in general hospitals to raise health care providers' awareness on the need of screening and early detecting risky alcohol drinkers. Research worldwide on systematic screening hospitalized patients showed the prevalence of risky alcohol drinkers among patients in hospital settings range 7.7% - 36% (17, 27-33). The rate of alcohol use disorder (AUD) diagnosed under Diagnostic and Statistical Manual of Mental Disorder Version III or IV in inpatients in general hospitals ranges from 8.4% to 32.9% (10, 17, 27-32, 34-49). The proportion rate of risky alcohol drinker varies with screening tools (17, 37), by type of patient (17, 27, 34), mostly in medical, surgical, orthopedic, psychiatric patients (34). Moore et al. (1989) found this prevalence ranged from 12.4% in obstetrics-gynecology to 24% in medicine, cardiac surgery to 30% in psychiatry and 43% in ear, nose and throat surgery (17). Research in Taiwan reported that the prevalence of having a heavy drinker in gastroenterology, orthopedics, neurosurgery and general surgery department were 47.6%, 46.7%, 36.6% and 34.3%, respectively (31). Men have heavy drinking patterns much more than women do (28, 31, 32, 38, 41, 50). Orford et al. (1992) estimated 22.5% of male and 6.5% of female were heavy drinkers (41). Hearne et al. (2002) reported 30% of the men and 8% of the women met the Diagnostic and Statistical Manual of Mental Disorder IV (DSM IV) criteria for alcohol abuse or dependence (28).

The recognition rate of a risky alcohol drinker relies on the screener (17, 31, 50). In the Wu' study, psychiatrists reported the rate of alcohol use disorder (AUD) of 25.7% whereas the nonpsychiatrist physicians identified AUD only 14.1 % of the time, the internist could detect this at rate of 23.5% and surgeon recognized 6.8% (31). Reynaud et al. (1997) found that 61% of AUD diagnosed directly by head nurse or physician, however, except the alcohol department, the detection rate is 55.4%. (50). Data from a study conducted by Moore et al (1989) revealed that psychiatrists could detect 65-66%;

medicine recognized 52-35%; neurologist identified 46-27%; gynecology identified 0-7% of alcohol dependence (17).

Unfortunately, risky alcohol drinkers were uncovered in many instances. The alcohol-related problems identified by the admitting team were normally lower than true alcohol related problems. The problem drinking issue was realized at a low rate by the admission team (45, 48) and they failed to document the findings properly (35) (46). Hearne et al (2002) found 46% of patient's chats recorded real consumption with only 18% of alcohol problems recognized by the admitting team. If the problem was not directly related to the presenting complaint, it was unlikely to be recognized (28).

Given the high prevalence of risky alcohol drinkers admitted to general hospital, physicians play important role in identifying risky alcohol drinkers and diagnosing alcohol relate problems because early detection and management the risky alcohol drinkers can reduce the alcohol consequent on mental, physical and social problems (42, 43). More over, hospital admission was more likely to facilitate risky alcohol drinkers to change their alcohol consumption (51, 52) . New patient visits, problem-oriented hospital visits for the many diseases caused or affected by risky alcohol use and a recent health scare are the moments that health care providers are able to reshape the conversation making risky alcohol drinkers recognize and share decision making with the alcohol problem (52).

The hospital is a good place to screen a large number of risky alcohol drinkers. Medical setting also is considered as the good atmosphere to educate alcoholics and a significant catalyst for shifting alcohol user's intention to abstain or reduce alcohol consumption (51, 53-55). Thus, the Vietnam Ministry of Health (MOH) encourages that risky alcohol drinkers to be screened and provided brief intervention. However, there has not been any published studies on the detection and management of risky alcohol drinkers in inpatient yet. The content of brief intervention that MOH recommend is somehow translated from motivation enhancement therapy but we do not know what factors motivate risky alcohol drinkers in Vietnamese hospital patients.

Changing alcohol consumption has to be multifaceted and psychotherapy is an important part of the intervention. Psychosocial determinants were the important factors in psychotherapy. A systematic review and meta-analysis of 40 relevant studies provided support for using Theory of planned behavior (TBP) to predict alcohol consumption. TBP appears to be a good model to predict and apply for changing alcohol consumption (56). However, currently, the Integrated Behavior Model (IBM), an expanded model from the TBP, provides more detail in predicting a particular behavior. To date, there was only one research using Integrated behavior model (IBM) to predict binge drinking among students (57). This study used IBM as the theoretical framework to predict alcohol consumption change. Alcohol consumption can cause addiction. Many studies have proven that alcohol dependence severity has a direct association with alcohol consumption (58) (59-61). Therefore, this construct was added to the IBM to predict changing alcohol drinking behavior. The present study also had another specific aim to identify predictors of intention to change and changing alcohol consumption using IBM as the conceptual framework.

1.2. Research objectives

1) To find the prevalence of risky alcohol drinker, alcohol use disorder (AUD) and alcohol withdrawal syndrome in patients admitted at a General Hospital in Vietnam.

2) To identify predictors of intention to change and changing alcohol consumption using IBM as the conceptual framework

1.3. Benefit of the study

Given the high incidence of alcohol drinker in Vietnamese, there are many unknowns in the Vietnamese population in the hospital setting. This study was conducted to identify the extent to which patients admitted to a general hospital in Vietnam meet the criteria for risky drink, AUD, and AWS. It is important to identify what extend that hospitalized patients in Vietnam drink at risk level to raise awareness for decision makers and health care professionals to develop the appropriate care for alcoholic patients. If the risky alcohol drinkers were screened and rapidly diagnosed, they would receive timely

intervention to reduce severity of or prevent AWS. Thus, patient prognosis and other short-term outcome would be improved, leading to reduce health care and other costs.

This research scrutinized the factors affecting inpatient's intention to change alcohol consumption and alcohol drinking behavior. The finding may assist to find a timesaving approach to motivate risky alcohol drinkers to change their alcohol consumption during the hospital stay which would help health care providers provide efficient intervention for changing alcohol drinking behavior.

CHAPTER II

LITERATURE REVIEW

This study aimed to find the prevalence of risky alcohol drinker, alcohol use disorder (AUD) and alcohol withdrawal syndrome (AWS) in patients admitted to a General Hospital in Vietnam and identify predictors of intention to change and changing alcohol consumption using IBM as the conceptual framework. In this chapter, the core concepts such as risky alcohol drinkers, AUD, AWS were presented. A description of the alcohol screening tools, the tools to assess the AUD, AWS severity, the Integrated Behavior Model were provided.

2.1. Alcohol consumption in Vietnam

Alcohol use in Vietnam continues to be problematic. Vietnamese aged 15 years or older consumed 6.6 litres of pure alcohol per year in 2008-2010 which was 0.4 litres higher than the average amount of alcohol that other people in the world drink. Even though the difference is not much but the alcohol use in Vietnam has rapidly increased while in worldwide it has not increased significantly. The estimated alcohol consumption per capital in Vietnam in 2020 is 11 litres, a dramatic increase of 289.5% within a 15-year time period (from 2005 to 2020). WHO reported Vietnamese men drank much more alcohol than women do. A Vietnamese man, age 15 years and older consumed an average of 27.4 liters of alcohol per year in 2010 (1). This was 3 times higher than the safe limit of alcohol consumption (2). This made Vietnam the second highest alcohol consuming country in Southeast Asia, the tenth in Asia and the 29th highest in the world (3). Both men and women are increasing use alcohol. In 2010, there were 70% of men and 6% of women aged 15 years or older reporting to use alcohol within last 30 days, the prevalence increased to 80.3% and 11.6%, respectively (4). The quite high rate of alcohol consumption was reported in youth below age 18 (5). The prevalence of AUD and alcohol dependence in 2010 was 4.6% and 2.9%, respectively (1). With a population of 90 million people (2010), Vietnam has estimated 4.23 million individuals with alcohol-related problem. A study

about alcohol use among male rural alcohol drinkers in one province of North Vietnam found that the prevalence of current alcohol drinkers was 49.6% and prevalence of risky alcohol drinkers in current alcohol drinkers was 35% (6).

Alcohol use creates a huge burden on economic, health, and social costs. Vietnamese people spent 3.4 billion USD in beer purchases each year, which was equivalent to 3% of the nation's gross domestic product (GDP). Vietnamese Ministry of Health data showed 70% of alcohol consumption was homemade alcohol. Thus, using the purchase figures made the amount of alcohol consumed yearly underestimated in Vietnam (3). The direct health care cost for breast, colorectal, liver, oral cavity, stomach, and cervix cancer highly relates to alcohol which accounts for 0.22% of total GDP (2012). The direct medical cost per patient with hallucination and/or delirium is very expensive (around 25-50/ day) (3). Alcohol abusers were not healthy enough to earn money.

Alcohol result in a large burden to the health care system. Alcohol contributed to 8.3% of total deaths. That ranked as the fifth largest cause of death in Vietnam (3). Alcohol consumption is a risk factor in many diseases, injuries, and different cancers (1). Alcohol is the third leading cause of road crashes (3). In 2012, alcohol-attributable percentage of road traffic accidents in males and females were 36.2% and 0.7 % respectively. In addition, alcohol was a contributory factor for 71.1% of liver cirrhosis in males and 37.7% of this disease in female. In 2012, Vietnam was ranked as having the highest score for alcohol-attributable years of life lost (1). Alcohol contributed to 30% of social violence and 33.7% of domestic violence (3). Alcohol abuse not only affected to the alcohol users but also cause consequences on the psychology and health of people around. These losses caused by alcohol influenced on culture and society are difficult to quantify.

2.2 Risky drink

The definition of a standard drink varies by countries. In UK, one stand drink contains 8 grams of pure alcohol. In Australia, Ireland, New Zealand, and Vietnam, one standard drink is equal to 10grams of pure alcohol. In Canada one standard drink is 13.6 gram of pure alcohol. In US, one standard drink is 14 g of pure alcohol. In most countries,

the limit of a standard drink for men is defined as no more than 2-4 drinks on single day, for women the limit is no more than 2-3 drinks per day and for both genders, no more than14 drinks/ week (62-64)

In Vietnam, the definitions of a *standard drink* was a drink that contains 10 grams of pure alcohol, the approximation is shown at the alcohol container for each beverage such as 1 can/bottle (330ml) of beer (approximately 5% alcohol), 120 ml of wine (approximately 12-15 % alcohol), or 30 ml of liquor (approximately 40% alcohol). The national guide for the standard drink limit is greater than 2 standard drinks per day or 14 standard drinks per week for men, and greater than 1 standard drink per day or 7 standard drinks per week for women (2). Risky alcohol drinker is an individual whose consumption exceeds this recommended drinking limit.

2.3. Alcohol use disorder

Alcohol use disorder is a problematic pattern use of alcohol leading to significant consequences. According to Diagnostic and Statistical manual on mental health (DSM 5), AUD patient is individual who met 2 in 11 criteria listed below during the same 12-month period

1. Alcohol is often taken in larger amounts or over a longer period than it was intended.
2. There is a persistent desire or unsuccessful efforts to cut down or control alcohol use.
3. A great deal of time is spent in activities necessary to obtain alcohol, use alcohol, or recover from its effects.
4. Craving, or a strong desire or urge to use alcohol.
5. Recurrent alcohol use resulting in a failure to fulfill major role obligations at work, school, or home.

6. Continued alcohol use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of alcohol.
7. Important social, occupational, or recreational activities are given up or reduced because of alcohol use.
8. Recurrent alcohol use in situations in which it is physically hazardous.
9. Alcohol use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by alcohol.
10. Tolerance, as defined by either of the following: a) A need for markedly increased amounts of alcohol to achieve intoxication or desired effect b) A markedly diminished effect with continued use of the same amount of alcohol.
11. Withdrawal, as manifested by either of the following: a) The characteristic withdrawal syndrome for alcohol; b) Alcohol (or a closely related substance, such as a benzodiazepine) is taken to relieve or avoid withdrawal symptoms.

The presence of at least 2 of the above 11 symptoms indicates an alcohol use disorder (AUD). If a patient has 2 or 3 symptoms he/she will be consider AUD at mild level. If a patient meet 4 to 5 symptoms, he/she will be rated as moderate AUD. If a patient experiences of 6 or more symptoms, he/she will be rated as heavy AUD.

2.3.1. Screening tools for detecting AUD patients

Screening patients is the first step in a process of determining who is positive-screening patients. The positive-screening patients are more likely to be AUD patients and the AUD patients have a greater probability of developing AWS. If the risky drinkers are treated properly, the morbidity and mortality caused by AWS may be prevented.

Several screening instruments are available to identify AUD. Some tools are rated as short, easy to administer, validated, and appropriate to use in general hospital settings such as the Alcohol use disorders identification test (AUDIT), the Cut down – Annoyed -

Guilty - Eye opener (CAGE), the Tolerance, Worried, Eye opener, Amnesia, (K) Cut down (TWEAK)

The CAGE, an acronym of the first 4 letters Cut down – Annoyed - Guilty - Eye opener, composed of 4 questions developed by Dr. John Ewing (1968) (23) as shown below:

1. Have you ever felt you should cut down on your drink?
2. Have people annoyed you by criticizing your drinking?
3. Have you ever felt bad or guilty about your drinking?
4. Have you ever had a drink first thing in the morning to steady you nerves or to get rid of a hangover (Eye opener)

Each question is scored as 0 or 1. A total score of 2 or greater is considered risky drinking and this problem needs to be addressed.

The TWEAK (Tolerance, Worried, Eye opener, Amnesia, (K) Cut down) (65) consists of five items as shown below:

1. How many drinks can you hold? (***Tolerance***)
2. Have close friends or relatives ***worried*** or complained about your drinking in the past year?
3. Do you sometimes take a drink in the morning when you get up? (***Eye-opener***)
4. Has a friend or family member ever told you about things you said or did while you were drinking that you could not remember? (***Amnesia***)
5. Do you sometimes feel the need to ***cut down*** on your drinking?

The Tolerance question scores 2 points if a responder reports that he/she "hold" more than 5 drinks. A positive response to the Worry question yields 2 points. Affirmative answers on Eye-opener, Amnesia, and Cut down question scores 1 point each question. A total score of 3 or more indicates risk drinking.

The SMAST (Short Michigan Alcoholism test) (66) consists of 13 items concerning alcohol use information during past 12 months.

1. Do you feel that you are a normal drinker? (by normal mean do you drink less than or as much as most other people drank)
2. Does your wife, husband, a parent, or other near realative ever worry or complain about your drinking?
3. Do you ever feel guilty about your drinking?
4. Do friends or relatives think you are a normal drinker?
5. Are you able to stop drinking when you want to?
6. Have you ever attended a meeting of Alcoholics Anonymous (AA)?
7. Has your drinking ever created problems between you and your wife, husband, a parent or other near relative?
8. Have you ever gotten into trouble at work because of your drinking?
9. Have you ever neglected your obligations, your family, or your work for two or more days in a row because you were drinking?
10. Have you ever gone to any one for help about your drinking?
11. Have you ever been in a hospital because of drinking?
12. Have you ever been arrested for drunken driving, driving while intoxicated, or driving under the influence of alcohol beverages?
13. Have you ever been arrested even for a few hours, because of other drunken behaviors?

The scale of all questions is dichotomous as “Yes = 1” or “No =0”. A total score of 3 indicates a borderline alcohol problem.

The AUDIT (67) (The Alcohol Use Disorder Identification test) is a 10-item validated screening tool developed by WHO to identify alcohol use disorder (AUD). AUDIT includes questions for assessing the frequency of drinking, typical quantity of alcohol use, frequency of heavy drinking; and classifying alcohol dependence and harmful alcohol use The AUDIT score ranges from 0 to 36. The patients who had a score of 8 or

more were identified as AUD. AUDIT scores of 8-15 are classified as a medium level alcohol related problem and, scores of 16 and over are classified as a high-level alcohol related problems. To identify alcohol pattern use, patients who were drinking over the standard drink limit on a typical day (question number 2 in the AUDIT) or had 6 or more standard drinks on one occasion (question number 3 in the AUDIT) were denoted as having a hazardous level of alcohol use. Hazardous alcohol use is a pattern of alcohol consumption that enhances harmful effects for the drinkers or others. Patients who had a score greater than 0 on the questions asking about impaired control over drinking, increased salience of drinking, and morning drinking (question 4-6 in AUDIT) implied the presence of alcohol dependence. Alcohol dependence means persistent desire to drink alcohol, unsuccessful control over its use, continued drinking despite harmful consequences, a higher priority given to alcohol use than to other activities and tasks, increased alcohol tolerance, and a physical withdrawal reaction when alcohol use is stopped. Those who had a score greater than 0 on the questions about guilt after drinking, blackouts, alcohol-related injuries, and others concerned about drinking (Question number 7-10 in AUDIT) indicated harmful level of alcohol use. Harmful alcohol use refers to alcohol consumption that causes consequences to physical and mental health (21).

CAGE and SMAST are used to assess lifetime problem alcohol use ("have you ever...") and relies on subjective patient report. Thus, CAGE and SMAST may not appropriate for the hospitalized patient. TWEAK was originally developed to identify alcohol problems during pregnancy. AUDIT comprises both subjective and objective criteria. AUDIT addresses what's happened in terms of alcohol use in the previous year so that AUDIT is probably more appropriate than CAGE and SMAST in the acute care setting. The Vietnam Ministry of Health has developed the AUDIT Vietnamese version for using as an alcoholic screening tool in Vietnam (68). AUDIT was validated in rural Vietnamese alcoholics. The optimal cut-off point was 7/8. In men, at this cut-off point the AUDIT had a sensitivity of 81.8% and a specificity of 76.1% for identifying at-risk drinking. For detecting alcohol dependence, the sensitivity was 93% and the specificity was 87.4% at the same cut-off point (69).

Table 1. Screening tools for risk alcohol drinker (70)

Screening tools	**Outcome**	**Length of administration (minutes)**	**Validity (*)**	
			Specificity	Sensitivity
CAGE	Screening alcohol problem or diagnoses	< 1	0.94	0.76
TWEAK	Risky drinking	< 3	0.83	0.8
AUDIT	Degree of alcohol use involvement	< 2	0.8	0.94
SMAST	General measure of lifetime alcohol related problem severity	< 6	0.93	0.78

(*) Validity in inpatient in general hospital

2.3.2. Prevalence of alcohol use disorder (AUD) in the patient admitted to the hospital

Many studies worldwide conducted to find the prevalence of AUD in general hospitals. Alcohol drinkers were screened by validated screen tools to identify the AUD patients. AUD also were diagnosed under DSM (version III or IV). Most of the studies were conducted in Europe, United State, some countries in Asia, and some countries in Africa. Many researches undertook in one general hospital. The prevalence of AUD patients who met the criteria of DSM ranges from 8.4% - 31% (27-32, 35). The prevalence of AUD patient whose score greater than cut-off point of any screening tools varies from 7.7%-36% (10, 17, 27, 28, 32, 34, 35, 37, 38, 41, 42, 44, 45, 47, 50, 71)

Table 2. Prevalence of AUD patients in the patients admitted to hospitals

Year	Country	Facilities	Prevalence of AUD diagnose by DSM	Prevalence of AUD screen by screening tools
2014	Brazil	A University hospital		25.4 - 32.9
1997	France	53 general hospitals		18
2000	France	A University hospital		9
2008	Germany	4 general hospitals	8.4	20.4
1997	India	A general hospital		23.3
2000	India	A general hospital		21
1997	India	A teaching hospital	10.3	14.6
2014	India	An emergency department general hospital		23.3
2008	Ireland	A University hospital	16	22
1994	Netherland	A University hospital		7.7
2005	Nigeria.	A general hospital		14.8
2016	Singapore	A general hospital	16.9	22.9
2010	Spain	21 hospitals		12
2006	Taiwan	A general hospital		12
1992	UK	A general hospital		male: 22.5; women: 6.5
2005	UK	A general hospital		11
1982	UK	A general hospital		15.6-23.2
2002	UK	A university hospital	31	36
2003	US	A general hospital	24	
2005	US	A general hospital	31	
1989	US	A teaching hospital		18

2.4. Alcohol withdrawal syndrome (AWS)

Alcohol withdrawal syndrome can occur when a chronic, heavy alcohol drinker either stop or reduce their alcohol consumption abruptly. According to Diagnostic and Statistical Manual of mental disorders (DSM-5) (72), one who stops or reduces alcohol consumption after a long and heavy use develops 2 or more of 8 following signs or symptoms which not attributes from other diseases within several hours to a few days is diagnosed as AWS: These signs and symptoms are:

1. Autonomic hyperactivity (e.g., sweating or pulse rate greater than 100 bpm)
2. Increase hand tremor
3. Insomnia
4. Nausea or vomiting
5. Transient visual, tactile, or auditory hallucinations or illusions
6. Psychomotor agitation
7. Anxiety
8. Generalized tonic-clonic seizures

2.4.1. Alcohol withdrawal Pathophysiology

The brain maintains neurochemical balance through inhibitory and exhibitory neurotransmitters. The main inhibitory neurotransmitter is gamma aminobutyric acid (GABA) which acts through the GABA alpha neuroreceptor. The main excitatory neurotransmitter is glutamate, which acts through the N-methyl-D-Aspartate (NMDA). Alcohol is a psychoactive substance. Alcohol facilitates the effect on gamma aminobutyric acid (GABA on $GABA_A$ receptor resulting in decreasing CNS excitability. Chronic drink alcohol results in a compensatory decrease of GABA-alpha receptor response to GABA.

Alcohol inhibits the effect of glutamate at receptor NMDA, thereby reducing the central nervous system tone. Chronic use of alcohol leads to upregulation of these excitatory receptor. Sudden cessation of alcohol in the chronic user cause diminishing GABA and enhancing NMDA, finally, resulting in a central nervous system excitation (73). Brain hyperexcitability expresses clinically as anxiety, irritability, agitation, and tremors, seizures, and delirium tremens.

2.4.2. Symptoms

Alcohol withdrawal symptoms range from mild (insomnia, tremulousness) to severe complications (seizure, delirium tremens). The symptoms depend on the amount of alcohol consumed and the time duration since last drink (74).

Minor withdrawal symptoms which are tremors, diaphoresis, nausea/vomiting, hypertension, tachycardia, hyperthermia, tachypnea (75) often occur 6-12 hours after last drink (76). Predictors for minor withdrawal symptoms are concomitant medical/surgical illness, higher blood alcohol levels, older age, time duration since the last drink, and the history of 1) detoxification; 2) dilirium tremen; 3)AWS seizures; and 4) alcohol dependence period (77). Hallucination symptoms include visual, auditory and tactile disturbances (75). These appears in 25% alcohol withdrawal patient (78) with onset time around 12-24h (76).

Alcohol withdrawal seizures may occur early without precede warning sign. It happens with 10% of alcohol withdrawal patient(79) with onset time 24-48 after last drink (76). Factors related to seizure are prolonged history of alcohol consumption (>10 years), history of AWS seizure, history of multiple episodes of withdrawals or detoxifications, and concurrent abuse of certain drugs (77).

Delirium tremens includes delirium, psychosis, hallucinations, hyperthermia, malignant hypertension, seizures and coma (80), happens with 5 % (80) of alcohol withdrawal patient. The onset time is 48-72h after the last drink (76). The predictors of delirium tremens is time since last alcohol consumption, and comorbid medical conditions (77). One of the strongest predictors of AWS is AWS genetic. Individual patient or the family who has history of AWS genetic is likely to develop AWS (81).

2.4.3. Differentiation Alcohol Withdrawal Syndrome from other situation and disease

It is imperative to differentiate symptoms related to alcohol withdrawal to other diseases because it may cause misdiagnose or delay the diagnose which will lead to significant morbidity and mortality. There are no imaging or laboratory tests to confirm AWS, so the diagnosis of AWS was conducted by ruling out other diseases with same exhibit symptoms.

Table 3. Differences between alcohol withdrawal syndrome and other situation or disease

Differentials	Differential Diagnosis
Toxicologic differential • Sympathomimetic syndrome (cocaine, amphetamines, ect.) • Antimuscarinic syndrome • Sedative-hypnotic withdrawal • Severe alcohol intoxication • Serotonin syndrome • Neuroleptic malignant syndrome	Rule out by historically, clinically, laboratory confirmation In the case of history is inconclusive, serum ethanol concentration may be considered
Medical differential	
Thyrotoxicosis	History of thyroid illness; thyromegaly, exophthalmos, lagophthalmos
Encephalitis	Fever, meningeal signs, and focal neurological deficits; MRI/CSF abnormalities
Acute psychosis	Hallucinations/delusions of long-standing duration, absence of clouding of sensorium
Hypoglycemia	Low blood glucose
Trauma (head injury)	Being found unconscious, ear or nose bleeding, pinpoint pupils, focal neurological deficits
Sepsis and septic shock	Blood Culture Urinalysis & Culture CSF analysis & Culture

2.4.4. Assessment of the Alcohol Withdrawal Syndrome severity

The severity of AWS should be monitored and assessed because it is in the process of a symptom-triggered benzodiazepine protocol. Implementing a symptom-triggered benzodiazepine protocol lead to lower medication use and shorter duration of treatment than fixed benzodiazepine dose (76). There are several rating instruments used to monitor ongoing progress and assess alcoholic's severity (82) such as 30-item Total Severity Assessment (TSA), 11-item Alcohol withdrawal syndrome (AWS scale), 15-item Clinical Institute Assessment (CIWA-Ar), Glasgow Modified Alcohol Withdrawal Scale (GMAWS), and "Anxiety Sweats Tremor" scale (AST). The contents of these instruments showed in table 4.

Table 4. The AWS rating instruments

	AST	OAWS	GMAWS	CIWA-Ar	AWS scale
Year	2016	2017	2010	1989	1997
Number of items	3	5	5	10	11
Pulse rate		x			x
DBP		x (or SBP)			x
Temperature					x
Breathing rate					x
Sweating	x	x	x	x	x
Tremor	x	x	x	x	x
Agitation		x	x	x	x
Contact					x
Orientation (time, place, person, situation)			x	x	x
Hallucination (optical, acoustic and tactile			x	x	x
Anxiety	x			x	x
Nausea/ vomiting				x	
Score range of each item	0-3	0-1	0-2	0-7(α)	0-3(β)
Maximum score	9	5	10	67	35
Score triggering drug administration	≥ 3	≥ 2	≥ 1	≥ 8	
Re-evaluate interval			0 -3: q2 ≥4: q1	<8: q4 8-15: q2 >15: q1	

(α) Item for orientaion is scored 0-4
(β) 2 items for agitation and hallucination are scored 0-4; onw item for anxiety is scored 0-2
AST is The Anxiety, Sweat, Tremor (83)
OAWS is The Objective alcohol withdrawal scale (84)
GMAWS is Glasgow Modified Alcohol withdrawal scale (85)
CIWA-Ar is The Revised clinical institute withdrawal assessment for alcohol scale (86)
AWS scale is Alcohol withdrawal scale (87)

Of the scales, the CIWA-Ar is a the most widely used alcohol withdrawal assessment scale for symptom-triggered therapy (86) which has good evidence on validity and reliability. The tool can be used repeatedly to monitor the course of the withdrawal and the result linked directly to pharmacotherapy dose in symptom-trigged regimen. CIWA-Ar includes 10 items. Three of ten components (tremor, paroxysmal sweats,

agitation) can be rated by observation, the other 7 components (anxiety, agitation, headache, disorientation, tactile disturbances, auditory disturbances and visual disturbance) required score by asking patient, thus CIWA-Ar is not suit for patient who cannot communicate well (83-85). Furthermore, the score range 0-7 is too wide and the items are not specified at any rank (87).

The AST includes 3 objective symptoms; anxiety, sweats and tremor. These symptoms are autonomic hyperactivity which normally appear first when heavy drinker stop consume alcohol abruptly. Therefore, AST is appropriate in addressing early and mild withdrawal. The Cronbach alpha is 0.68. An AST score of ≥3 predicted CIWA-Ar ≥ 8, with a sensitivity of 93% and a specificity of 63% (83).

The GMASW covers 2 domains, the first domain which explains 47% of the total variance is "physical" with items tremor, sweating and agitation. The second domain is "cognitive" which accounted for 20% of total variance, includes hallucination and orientation (85). In one study, the Cronbach alpha of GMAWS is 0.71 but in another study, the GMAWS is 0.46, the sensitivity is 100% but the specificity is 12% (83).

The OAWS scale 5 objective symptoms, this scale is not validated and benefit for cases of alcohol withdrawal which CIWA-Ar is unreliable.

The AWS scale is 11-item questionnaire developed by T. Wetterling et al. (1997) from the CIWA-A by choosing only those items with Cronbach's $\alpha > 0.8$. The trained nurses rated 256 patients by AWS scale every 2h. The good inter-rater reliability of this scale shown with κ-value ranging from 0.67-1 for all 11 items between 20 nurses and 3 senior psychiatrists. AWS scale allows an assessment of a mild AWS as well as that delirium. AWS scale scores 11 symptoms which were pulse rate, systolic blood pressure, temperature, breathing rate, sweating, tremor, agitation, contact, orientation (time, place, person, situation), hallucination (optical, acoustic, tactile), anxiety. Patients who had scores range from 3 to 6 were classified by AWS scoring

system as *mild AWS,* scores range from 7 to 12 as *moderate AWS,* and scores greater than 12 as *severe AWS*

The Prediction of Alcohol Withdrawal Severity Scale (PAWSS) can predict those at risk for complicated AWS (seizures and delirium tremens) in medical ill hospitalized patient which allowing for timely prophylactic treatment of severe stage of AWS ***(88).***

PAWSS is 10 item questionnaire, 1 point each. A score of ≥ 4 suggests high risk for moderate to severe (complicated) AWS; a prophylaxis and/or treatment may be indicated. The threshold is alcohol consumption in the 30 days preceding the encounter. PAWSS is heavily based on self-report of alcohol intake and history provided by patients. PAWSS questionnaire will measure 5 drinkers' previous symptoms and signs: episodes of alcohol withdrawal; blackout; alcohol withdrawal seizure; delirium tremens; alcohol rehabilitation. PAWSS also measures and 5 current evidences: Concomitant use of CNS-depressant agents; other illicit substances; episode of alcohol intoxication; blood alcohol level on admission; autonomic activity

2.4.5. Pharmacotherapy

Benzodiazepines: First Line Therapy

Benzodiazepines promote and enhance binding GABA at GABA, a receptor in the central nervous system. Benzodiazepines have sedation, hypnosis, decrease anxiety, muscle relaxation, anterograde amnesia, anticonvulsant activity.

No specific benzodiazepine is more helpful for treating AWS but based on their pharmacokinetics, diazepam is the most preferred because of short time onset, long time lasting duration (due to an active metabolite) and formulations includes injectable, tablet and rectal gel.

The use of an assessment tool and dosage of benzodiazepines base on the patient's score is appropriate only for uncomplicated AW. Patient with severe symptoms seizures or

delirium tremens are best serve with infusion benzodiazepines, ideally diazepam using a loading dose until control of symptom (89)

Table 5. Benzodiazepines for AWS

Drug	Properties					
	Lipid Solubility	Vd (l/kg)	Time to onset	Active Metabolite	Initial Dose (*)	Long lasting
Diazepam	++++	0.9	1-5 min IV	Yes	10-20 mg IV 10-20 mg PO	>24h
Lorazepam	+++	1.3	5-20 min IV	No	2-4 mg IV 2-4 mg PO	<10h
Midazolam	+++	0.8	2-5 min IM/IV	Yes	2-4 mg IM/IV	<10h
Chlordiazepoxide	+++	0.3	2-3 hours PO	Yes	20-100 mg PO	<10 h

(*) *For 70 kg adult*

Vd: Volume distribution

It should be noted that there is no ceiling dose for benzodiazepines in the treatment of AWS. Different patients will require difference doses, and some require very high doses (tolerance) due to their large alcohol use, history of alcohol use and number of times they have experienced AWS.

Symptom-trigged therapy with benzodiazepine is standard treatment which minimize the withdrawal symptom and avoid the progression go into to the more severe stages. This approach also cost shorter treatment, reduce over sedation and help doctor focus on specific therapy for alcohol dependence.

Fixed-schedule therapy often causes under dosing of benzodiazepine because of the phenomenon cross-tolerance

Adjunctive Therapy

Alcoholic causes metabolic disorder leading to electrolyte abnormal, dehydration require fluid infusion. These disorders should be solved quickly or they may worsen leading to severe condition such as cardiac arrhythmia. Electrolyte abnormality like alcoholic ketoacidosis, hypokalemia, hypomagnesemia may be solved by dextrose-

containing fluid. Ketoacidosis is reverse by infuse glucose-containing fluid and thiamine (89) (81)

Alcoholics exhibit vitamin deficiencies because of poor dietary habits as well as from alcohol-induced changes in the digestive tract that impair the absorption of nutrient into bloodstream. Two dietary factors of particular importance in AWS are folic acid and thiamine. Patients undergoing AWS should be administered an oral multivitamin formula for a few weeks. Supportive care does not prevent hallucinations or seizures. Hallucinations can be ego intact or ego non-intact. For ego intact hallucinations, the patient knows that it is not real and treatment with an antipsychotic is not needed.

Table 6. Dosing and monitoring of Pharmacologic Agents Used in the treatment of AWS (90)

Drug	**Dose per day** (unless otherwise state)	**Indication**	**Monitoring**	**Duration of dosing**	**Level of evidence** [a]
Multivitamin	1 tablet	Malnutrition	Diet	At least until eating a balance diet at caloric goal	B3
Thiamine	50-100 mg	Deficiency	CBC, WBC, nystagmus	Empiric x 5 days. More if evidence of deficiency	B2
Crystalloid fluid (typically D5-0.45 NS with 20mEq of KCl per liter)	50-100 ml/h	Dehydration	Weight, electrolytes, urine output, nystagmus if dextrose	Until intake and outputs stabilize and oral intake is adequate	A3
Clonidine oral	0.05 - 0.3 mg	Autonomic tone rebound	Shaking, tremor, sweating,	3 days or less	B2

Drug	**Dose per day** (unless otherwise state)	**Indication**	**Monitoring**	**Duration of dosing**	**Level of evidence** [(a)]
		and hyperactivity	blood pressure		
Clonidine transdermal	TTS-1 to TTS-3	Autonomic tone rebound and hyperactivity	Shaking, tremor, sweating, blood pressure	1 week or less. One patch only	B3
Labetalol	20mg IV every 2 hours as needed	Hypertensive urgencies and above	Blood pressure target	Individual dose as needed	B3
Antipsychotics, haloperidol	2.5 mg to 5mg every 4 hours	Agitation unresponsive to benzodiazepines, hallucinations or delusions	Subjective response plus rating scale	Individual dose as needed	B1
Antipsychotics, atypical Quetiapine Aripiprazole	25-200 mg 5-15 mg	Agitation unresponsive to benzodiazepines, hallucinations, or delusions in patient	Subjective response plus rating scale	Individual dose as needed in addition to scheduled antipsychotic	C3

Drug	**Dose per day** (unless otherwise state)	**Indication**	**Monitoring**	**Duration of dosing**	**Level of evidence** [a]
		intolerant of conventional antipsychotics			
Benzodiazepines Lorazepam Chlordiazepoxide Clonazepam Diazepam	0.5-2 mg 5-25 mg 0.5–2 mg 2.5-10 mg	Tremor, anxiety, diaphoresis, tachypnea, dysphoria, seizures	Subjective response plus rating scale	Individual dose as needed Underdosing is more common than overdosing	A2
Alcohol oral Alcohol IV		Prevent withdrawal	Subjective signs of withdrawal	Wide variation	C3

CBC, complete blood count; D5, dextrose; KCl, potassium chloride; NS, normal saline; WBC, white blood cell count

A Strength of recommendations, evidence support recommendation: A= good; B = moderate; C = poor

Quality of evidence: 1= evidence from more than 1 property randomized, controlled trial; 2= evidence from more than 1 well-designed clinical trial with randomization, from cohort or case-controlled analytic studies or multiple time series; or dramatic result from uncontrolled experiments;3= Evidence from opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert communities

Therapeutic Ethanol

Ethanol is not recommended because using alcohol need more frequent monitoring of blood alcohol level, potential cause hepatitis injury, hypoglycemia, caustic vascular injury when injection (91) (89). In addition, using ethanol cause an ethical dilemma thus ethanol is discourage (92)

Alcohol withdrawal seizures do not require treatment with anticonvulsant drug unless they progress to status epilepticus because seizure usually end before diazepam or another drug can be administrated. Phenytoin, which is not cross-tolerant to alcohol, does not treat or prevent withdrawal seizure and without an intravenous loading dose, therapeutic blood levels of phenytoin are not reached until acute withdrawal is complete. Patient experiencing seizure should be treated supportively. An increase in the dosage and tapering schedule of benzodiazepine can be necessary to prevent further seizure activity. Patient with a history of withdrawal seizures can be predicted to experience an especially severe withdrawal syndrome. In such patients, a higher initial dosage of benzodiazepine and slower tapering period of 7 to 10 days are advisable (90).

Monitoring and dosing must be guide by validated symptom scale administered by trained personnel. Inappropriate select patient for trigger-symptom were unable to communicate patient, patient does not drink large amount of alcohol before admitted to hospital, patient suffer delirium because of other reason such as hypoxia, stroke, effect of other disease than alcohol. Heavy drinker often renders reduce immune system, hence, physician must vigilant with infectious disease such as pneumonia, sepsis (91)

Symptom trigged therapy allows for lower dose of sedative-hypnotic compare to fixed dose approach (93-95). Clinically, the smaller amount of benzodiazepine patient receives the lower chance patient get side effect from this medication such as over sedation, paradoxical agitation, delirium due to intoxication, or respiratory depression. The consequences of these side effect lead to prolong treatment duration, increase morbidity from aspiration pneumonia, cost more resource (93).

For inpatient, patient experienced no significant difference of length of stay for symptom trigged approach versus fixed schedule therapy which may related to co-occurring medical problem (93, 95)

AWS Prevention

A single dose of benzodiazepine **(**example diazepam 10**-**20mg orally**)** is recommended to give upon admission for prophylaxis AWS for patient who had drank large amounts of alcohol and suddenly discontinues alcohol use; a patient has history of AWS seizures or DT; patient has repeated detoxification; who has severe medical illness **(**pneumonia, coronary heart disease, alcohol liver disease, anemia**)** regardless of AWS score and symptomatology**.** After the prophylaxis dose, trigger**-**symptom therapy guided by AWS score or another appropriate scoring system should be applied, the strategy has evident to reduce hospital days and benzodiazepine used (91) (77, 96).

Spies et al**. (**1996**)** observed 70 patients had alcohol dependence; 48 of these patients were diagnosed before surgery and received prophylaxis and then 12 patients still developed AWS **(**25**%)**; 22 patients were not diagnosed preoperatively thus they did not received prophylaxis and then 100**%** of these patients developed AWS**.** Those in prophylaxis group had shorter ICU stay **(**5±7 vs 19±16 days**)**, lower morbidity rate (19)**.** All of 51 chronic abusers did not received prophylaxis and did not develop AWS.

2.4.6. Psychological therapy for risky alcohol drinkers

Psychotherapy complements is one of the medical treatment parts for risk drinkers. The two common alcohol interventions used to reduce or quit drink are brief interventions and motivational enhancement therapy. Brief interventions involve screening for risky alcohol drinkers and providing feedback to them about their use, with the aim of reducing alcohol consumption and related consequences. Motivation enhancement therapy is based on the principles of motivational psychology. This therapy mobilizes patients' own resources to deal with their problems. Motivational enhancement therapy includes 4 sessions, at the first 2 sessions therapists focus on structure feedback based on initial assessment, future plan and motivation for change. The other 2 sessions therapists reinforce progress, reevaluate and provide objectives on the progress to change (97).

However, the previous studies show inconsistency in benefit of brief intervention in general hospitals. Some studies showed the positive outcome of brief intervention for risky alcohol drinkers. Sarkar P et al (2004) found that after treatment 35.49% cases of

alcohol dependence partially improved, 31.35% cases were abstinent. Brief intervention also showed reduce alcohol consumption (98, 99) and dead rates (100). Once research still questioned the benefit of alcohol brief intervention (101). Two studies showed no evident for efficacy of alcohol brief intervention among inpatients in general hospitals (102, 103).

2.5. Factors affected to natural change in alcohol consumption

Changing alcohol consumption has to be multifaceted and psychotherapy is an important part of the intervention. Intervention was shown to have modest impact on reducing alcohol consumption in alcoholic patients (100, 104), difference of -38g of alcohol per week (105). Intervention with different theories lead to the relatively similar result (106, 107). In most trials of alcohol intervention, both control and intervention groups reduce alcohol consumption over time. A study showed that the amount of alcohol consumption decreased within 12 months after a risky alcohol drinker discharged general hospital (51). Visiting physicians also was proved to naturally increase small readiness score (10%) and confidence score (2%) of risky alcohol drinker in changing alcohol consumption (108). These may be understood as there was natural change in alcohol consumption over time. A better understanding of behavior construct may assist to design more efficacious intervention.

We systematically review the literature to find predictors of change in alcohol consumption in risky alcohol drinkers who are not treated for alcohol dependent. Online databases searched were Pubmed, Scopus, Cochrane, google scholar. Syntax was (Alcohol*[Title]) AND (((hospital*[Title]) OR communit*[Title])) AND (((follow-up[Title]) OR recurrence) OR chan*)) AND ((((prognosis[Title]) OR prediction[Title]) OR prospectively study) OR risk factor)) without any restriction but we did not find any study. The behavior to change constructs relate to later behavior change is not well understood (108). Up to date, there was one study assess the current guidance documents and treatment manuals to identify the specific behavior change techniques associated with improved effectiveness. Promoting self-monitoring was found to be the determinant techniques related most to reducing alcohol consumption (109).

A systematic review and meta-analysis of 40 relevant studies provided support for using Theory of planned behavior (TBP) to predict alcohol consumption. TBP appears to be a good model to predict and apply for changing alcohol consumption (56). However, currently, the Integrated Behavior Model (IBM), an expanded model from the TBP, provides more detail in predicting a particular behavior. To date, there was only one research using Integrated behavior model (IBM) to predict binge drinking among students {Braun, 2012 #3620. This study used IBM as the theoretical framework to predict alcohol consumption change.

2.6. The integrated behavior model

Integrated behavioral model (IBM) is a behavioral science theory used to explaine individual behavior. Behavior in this study was defined as reduce or quit alcohol consumption (change alcohol consumption). IBM proposed that intention to act is the strongest proxy of behavior. Intention to reduce or quit alcohol drinking is perceived likelihood of drinking less than patient used to or totally quit drinking.

There determinants predict intention including attitude toward behavior (how drinker overall pleasant or unpleasant toward changing alcohol consumption), subjective norm (other drinker's perception and/or approval for behaving), personal agency (how drinker could control their behavior).

Each of three constructs (attitude, perceived norm, personal agency) include 2 sub-components. Attitude incorporate 2 subcomponents which are experiential attitude and instrumental attitude. Experiential attitude is the individual's emotional response to the idea of changing alcohol consumption. Instrumental attitude is determined by beliefs about outcomes of changing alcohol consumption.

Perceived norm includes 2 determinants which are injunctive norm and descriptive norm. Injunctive norm is normative beliefs about what others think or one should do and

motivation to comply. Descriptive norm is the perceptions about what others in one's social or personal networks are doing.

Personal agency is the combination of the perceived control and self-efficacy. Perceived control is one's perceived amount of control over changing alcohol consumption, determined by drinker's perception of the degree to which various environmental factors make it easy versus difficult to change alcohol consumption. Self-efficacy is drinker's magnitude of confidence in the ability to change alcohol consumption in the face of various obstacles or challenge.

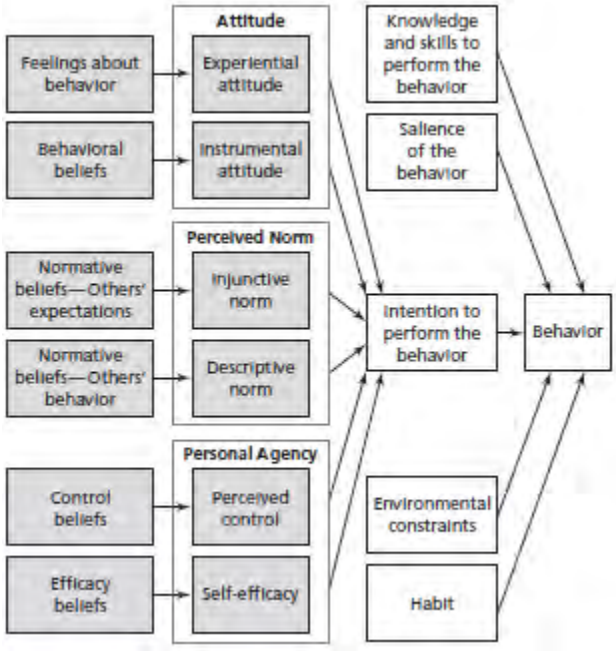

Figure 1. Integrated Behavior Model

2.7. Conceptual framework for predicting natural change in alcohol consumption

Prompting self-recording of alcohol consumption was found associated reliably with greater intervention effectiveness (109). However, self-efficacy was explained not associate with subsequent consumption cause long-term benefit because highly confident

patients may be less risk-averse in relation to drinking than less confident patients (110). Thus, self-efficacy was excluded from the IBM.

Alcohol consumption can cause addiction. Many studies have proven that alcohol dependence severity has a direct association with alcohol consumption (58) (59-61). Therefore, this construct was added to the IBM to predict changing alcohol drinking behavior. The present study had specific aims to identify predictors of intention to change and changing alcohol consumption using IBM as the conceptual framework (figure 1 & 2).

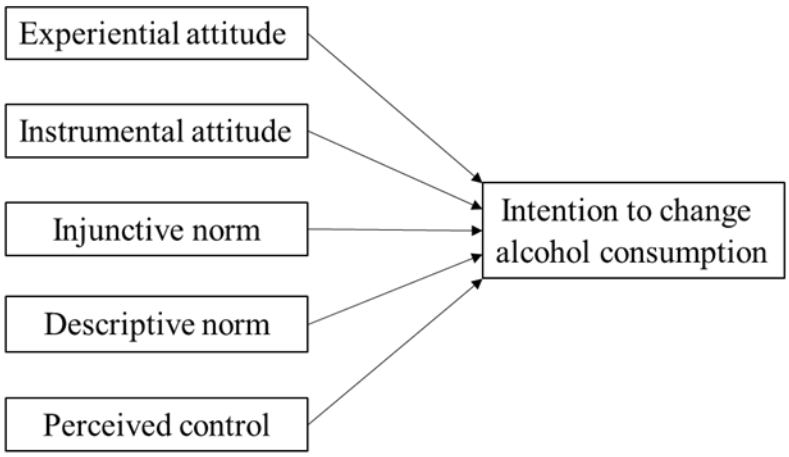

Figure 2. Research model to predict intention to change alcohol consumption

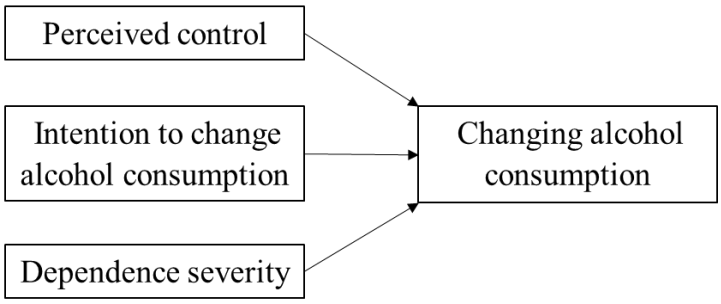

Figure 3. Research model to predict change in alcohol consumption

H1: Experiential attitude, instrumental attitude, descriptive norm, injunctive norm, perceived control will have a significant positive relationship with intension to change alcohol consumption

H2: Dependence severity, perceived control, intention to change alcohol drinking will have a significant relationship with changing alcohol consumption.

CHAPTER III

METHODOLOGY

This chapter contains the methods used to conduct this study. Methodology chapter was structured with design, participants, instrument, measures, case identification criteria, ethical approval, and data analysis.

3.1. Study Design and setting

A prospective survey using interview-questionnaires was conducted at Kien An, a general hospital in Haiphong City, Vietnam. Haiphong City is in the northern part of Vietnam with a population of 2 million. This hospital is a 550-bed general hospital providing secondary care for 700,000 people with a full range of medical and surgical services. This hospital serves 80 new inpatients daily. The hospital includes 19 clinical departments (outpatient clinic, international clinic, primary care, intensive care unit, trauma department, neuro and thoracic surgery, Urology, oncology department, Obstetrics, Gynecology, General medicine, Cardiology, Pediatric, Infectious disease, Vietnamese traditional medicine, Otolaryngology, Odonto Stomatology, Ophthalmology).

3.2. Participants

Inpatients who were 18 years old or older, stayed in the hospital over 24hours, and agreed to be interviewed were included in the study. For those who were unconscious or unable to be interviewed at that time, we provided the consent form and asked 10 AUDIT questions to their family members or caregivers in order to know whether they met the criteria for alcohol use disorder (AUD) and therefore we were able to monitor AWS timely. We asked the AUDIT questions again and verified the patient's consent when they were able to respond. Patients who had difficulty in communicating because of their serious illness, being mute or deaf were not interviewed the behavioral questions. Patients who were readmitted and had already been assessed were not enrolled into the study again.

Both caregivers and patients were interviewed by telephone at 1 and 3 months after discharge from hospital. The caregiver was called first to collect the patient's alcohol consumption then the patient was called later to obtain their alcohol use. If the information provided by the caregiver and the patient was not consistency, the patient was asked one more time to confirm their alcohol consumption.

In order to determine sample size needed, a pilot study was conducted with 325 hospitalized patients at Kien An Hospital on February 22 - 28, 2018. The result showed the prevalence of risky alcohol drinkers, AUD, AWS in the target population was 15%, 10%, 6%, respectively. From the results of the pilot study, using equation for proportion estimation objective

$$n = \frac{Z_{\alpha}^2 P(1-P)}{e^2}$$

With a margin error of 2%, a sample size of 1225, 865, 542 respectively were needed to find the prevalence of being a risky alcohol drinker, AUD, AWS in our population. We chose the largest number among this sample size. Thus, we collected data from at least 1,225 new patients to attain the first objective of this study.

The sample size for objective 2 was calculated using Cohen's suggestion (111). With five predictors of intention (Figure 2) and a population correlation of .30, 187 participants were needed to achieve 80% power. With three predictors (Figure 3) that correlated with the change alcohol consumption at .30, 144 participants are needed to maintain 80% power.

Data were collected from March- June 2018.

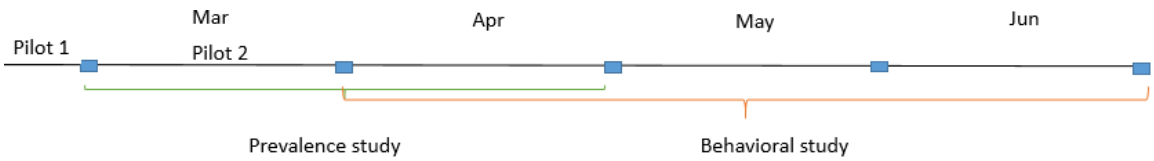

Figure 4. Study timeline

3.3. Instruments

3.3.1. The Alcohol Use Disorder Identification Test (AUDIT) (21) .

The AUDIT is a 10-item validated screening tool developed by WHO to identify AUD. The AUDIT score ranges from 0 to 36. The patients who had a score of 8 or more were identified as AUD. AUDIT has a sensitivity of 81.8% and a specificity of 76.1% for identifying AUD; in Vietnamese men at the cut-off point of 8 (69).

Table 7. The Alcohol Use Disorder Identification Test (AUDIT)

No	Question	Answer	Score
1	How often did you have a drink containing alcohol in the last 12 months?	□ Never (skip to Q9, Q10)	0
		□ Monthly or less	1
		□ 2-4 times/month	2
		□ 2-3 times/week	3
		□ ≥ 4 times/week	4
2	How many drinks containing alcohol do you have on a typical day when you are drinking?	□ 1-2 cans (bottles) of beer/120ml of wine/30ml of liquor	0
		□ 3-4 cans (bottles) of beer/120ml of wine/30ml of liquor	1
		□ 5-6 cans (bottles) of beer/120ml of wine/30ml of liquor	2
		□ 7,8,9 cans (bottles) of beer/120ml of wine/30ml of liquor	3
		□ ≥ 10 cans (bottles) of beer/120ml of wine/30ml of liquor	4

No	Question	Answer	Score
3	How often do you have six or more cans (bottles) of beer/120ml or wine/30ml of liquor on one occasion? *Skip to Questions 9 and 10 if Total Score for Questions 2 and 3 = 0*	□ Never	0
		□ Less than monthly	1
		□ Monthly	2
		□ Weekly	3
		□ Daily or almost daily	4
4	How often during last 12 months, have you found that you were not able to stop drinking once you started?	□ Never	0
		□ Less than monthly	1
		□ Monthly	2
		□ Weekly	3
		□ Daily or almost daily	4
5	How often during last 12 months have you failed to do what was normally expected from you because of drinking?	□ Never	0
		□ Less than monthly	1
		□ Monthly	2
		□ Weekly	3
		□ Daily or almost daily	4
6	How often during last 12 months have you needed a drink first drink in the morning to get yourself going after a heavy drinking session?	□ Never	0
		□ Less than monthly	1
		□ Monthly	2
		□ Weekly	3
		□ Daily or almost daily	4
7	How often during last 12 months you had a feeling of guilt or remorse after drinking?	□ Never	0
		□ Less than monthly	1
		□ Monthly	2
		□ Weekly	3
		□ Daily or almost daily	4
8	How often during last 12 months have you been unable to remember what happened the night before because you had been drinking?	□ Never	0
		□ Less than monthly	1
		□ Monthly	2
		□ Weekly	3
		□ Daily or almost daily	4
9	Have you or someone else been injured as a result of your drinking?	□ No	0
		□ Yes, but not in the last year	1
		□ Yes, during the last year	2
10	Has a relative, friend, doctor or other health worker been concerned about your drinking or suggested you cut down?	□ No	0
		□ Yes, but not in the last year	1
		□ Yes, during the last year	2
		Total score	

AUDIT scores of 8-15 are classified as a medium level alcohol related problem and, scores of 16 and over are classified as a high-level alcohol related problems. To identify alcohol pattern use, patients who were drinking over the standard drink limit on a typical day (question 2 in the AUDIT) or had 6 or more standard drinks on one occasion (question 3 in the AUDIT) were denoted as having a hazardous level of alcohol use. Hazardous alcohol use is a pattern of alcohol consumption that enhances harmful effects for the drinkers or others. Patients who had a score greater than 0 on the questions asking about impaired control over drinking, increased salience of drinking, and morning drinking (question 4-6 in AUDIT) implied the presence of alcohol dependence. Alcohol dependence means persistent desire to drink alcohol, unsuccessful control over its use, continued drinking despite harmful consequences, a higher priority given to alcohol use than to other activities and tasks, increased alcohol tolerance, and a physical withdrawal reaction when alcohol use is stopped. Those who had a score greater than 0 on the questions about guilt after drinking, blackouts, alcohol-related injuries, and others concerned about drinking (Question 7-10 in AUDIT) indicated harmful level of alcohol use. Harmful alcohol use refers to alcohol consumption that causes consequences to physical and mental health (21).

3.3.2. DSM- 5 Alcohol Withdrawal symptoms **(72)**

According to Diagnostic and Statistical Manual of mental disorders (DSM-5)**,** when patients stopped or reduced alcohol consumption after a long, heavy use and they developed at least 2 of 8 following signs or symptoms listed below within several hours to a few days they were diagnosed as AWS (8).

1. Autonomic hyperactivity (e.g., sweating or pulse rate greater than 100 bpm)
2. Increase hand tremor
3. Insomnia
4. Nausea or vomiting
5. Transient visual, tactile, or auditory hallucinations or illusions
6. Psychomotor agitation

7. Anxiety
8. Generalized tonic-clonic seizures

3.3.3. Alcohol withdrawal syndrome scale (AWS scale)

The AWS scale was used to quantitate AWS severity level (87). There were 11 symptoms in the AWS scale which were pulse rate; systolic blood pressure; temperature; breathing rate; sweating; tremor; agitation; contact; orientation with time, place, person, and situation; optical, acoustic, tactile hallucination; and anxiety. AWS scale can detect and quantitate different aspects of AWS with a good internal consistency (Cronbach's α range 0.78-0.8) and has a good inter-rater reliability (κ-value 0.64).

Table 8 AWS scale

Symptoms	**Score**				
	0	**1**	**2**	**3**	**4**
Pulse rate (per min)	<100	102-110	111-120	>120	
Diastolic blood pressure (mmHg)	<95	96-100	101-105	>105	
Temperature (°C)	<37	37-37.5	37.6-38	>38	
Breathing rate (per min)	<20	20-24	>24		
Sweating	none	Mild (wet hands)	Moderate (forehead)	Severe (profuse)	
Tremor	none	Mild (arms raised + finger spread)	Moderate (finger spread)	Severe (spontaneous)	
Agitation	none	fastening	Rolling in bed	Try to leave bed	In rage
Contact	Short talk possible	Easily distractable (i.e. noise)	Drifting contact	Dialogue impossible	
Orientation (time, place, person, situation)	Fully aware	One kind (i.e. time)	2 kind disturbed	Totally confused	

*Hallucinations (optical, acoustic and tactile)	none	suggestive	One kind (i.e. optical)	Two kinds (optical + tactile)	All kinds Scenic hallucination
Anxiety	none	Mild (if only asked)	Severe (spontaneous complaint)		

Patients with AWS score of 1-<3 = mild AWS, 3-7 = moderate AWS, greater than 7=severe (87)

3.3.4. Behavioral questionnaire

The designed questionnaire for measuring experiential and instrumental attitude toward changing alcohol consumption, injunctive norms, descriptive norm, perceived behavior control, alcohol dependent severity, intention to change alcohol consumption were developed from IBM theory and by comprehensively reviewing the published literature (21, 57, 112-114). The modification of final questionnaires was based upon 2 pilot studies (on February 22 - 28, 2018 and on March 1-31, 2018). Alcohol consumption at 1 and 3 months after discharge from the hospital were collected during the second and third interview using 3 AUDIT-C questions. The first and second pilot studies were conducted in 20 and 50 inpatients, respectively.

Intention to change alcohol consumption was defined as patient's perceived likelihood of reducing or quitting alcohol consumption in 1 month after the hospital discharge. It was measured by 4 items on patients' ability to 1) set up a limit time, 2) set up a limit amount of alcohol drinking, 3) the general ability to reduce, and 4) general ability to stop drinking after the hospital discharge. The response style for each question was an analog scale from 0 to 10 in which 0 meant "not likely" and 10 meant "likely".

Experiential attitude toward changing alcohol drinking behavior was defined as the patient's emotional response to reduce or quit drinking alcohol. There were 4 items reflecting emotions including boring, stressful, dull, feel worst physically if the patient reduces or quit drinking alcohol. Instrumental attitude was the patient's beliefs in the outcome of alcohol drinking reduction or abstinence. The outcome would yield better health, earn respect, create fewer family problems. Injunctive norm was the normative

belief about what others think patient should reduce or quit alcohol and motivation to comply. Items for injunctive norm included the advice by the significant others, influence from the beloved ones, and complaint by people around the patient. Descriptive norm was normative beliefs about what others in patient's networks are confronting with changing and not changing. Items for measuring descriptive norm included benefits from change and suffering from not change in alcohol consumption All of these constructs were measured using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Perceived control was the patient perception about the amount of control over behavior in various environmental factors. Perceived control was measured by the level of patients' confidence to change in various situations such as if alcohol was available; if they saw others drink alcohol; if they were offered a drink; and if they were depressed with their family life or work. All items were measured using a 5-point Likert scale ranging from 1 (not at all) to 5 (extremely confidence).

Alcohol dependent severity was behavioral and physiological phenomena that develop after repeated excessive alcohol consumption. Patients were asked about these phenomena including a strong desire to drink alcohol, impaired control over drinking, and continuing drinking even though it created trouble with the patient's family and friends. These were measured on the frequency scale of never, less than monthly, monthly, weekly, daily, and almost daily. See the questionnaire in*Appendix 1* The questionnaire was translated to Vietnamese and back translated to English to examine its content validity and language appropriateness (see *Appendix 2*)

3.4. Case identification criteria

On admission, patients were asked the following question in order to determine if they were a current/risky alcohol drinker: "In the past 12 months, have you sometimes drunk an alcoholic beverage?" If the answer was "No", he/she was classified as an abstainer. For those who answer "Yes", he/she was classified as current drinker and were interviewed further with 2 subsequent questions "During the last 12 months, what kind of alcohol did

you drink?" and "During the last 12 months, how much alcohol did you drink in a typical day?". If the patient used alcohol in excess of the standard drink limit, he/she was classified as a risky drinker. The definitions of a standard drink was a drink that contains 10 grams of pure alcohol, the approximation is shown at the alcohol container for each beverage such as 1 can/bottle (330ml) of beer (approximately 5% alcohol), 120 ml of wine (approximately 12-15 % alcohol), or 30 ml of liquor (approximately 40% alcohol). The national guide for the standard drink limit is greater than 2 standard drinks per day or 14 standard drinks per week for men, and greater than 1 standard drink per day or 7 standard drinks per week for women. (2).

Once an individual was classified as a risky drinker based on the quantity of alcohol used daily/weekly, assessment of the patient was conducted by using the Alcohol Use Disorder Identification Test (the AUDIT) (21). The patients who had a score of 8 or more were identified as AUD.

AUD may develop AWS within 8 hours after their last drink. The symptoms generally peak over 24-72 hours (115). To assess AWS symptoms, patients whose AUDIT score over than 8 were followed until the 5th day after their last drink. They might be followed less than 5 days if they were referred to another hospital, discharged from the hospital, or died.

The diagnose of AWS base on criteria defined by Diagnostic and Statistical Manual of mental disorders version 5 (DSM 5) was also used. When AUD patients stopped or reduce alcohol consumption and they had at least 2 of 8 symptoms within several hours to a few days after the last drink such as 1) autonomic hyperactivity, 2) increase hand tremor, 3) insomnia, 4) nausea or vomiting, 5) transient visual, tactile, or auditory hallucinations or illusions, 6) psychomotor agitation, 7) anxiety, and 8) generalized tonic-clonic seizures, they were diagnosed as AWS (8).

The alcohol withdrawal syndrome scale (the AWS scale) was used to quantitate AWS severity level (87). Patients who had scores range from 3 to 6 were classified by AWS scoring system as mild AWS, scores range from 7 to 12 as moderate AWS, and scores

greater than 12 as severe AWS. Patients who had higher scores were monitored more often than the patients who had lower scores (insert picture to follow patient). The highest score during the monitoring-period was used to identify severity level.

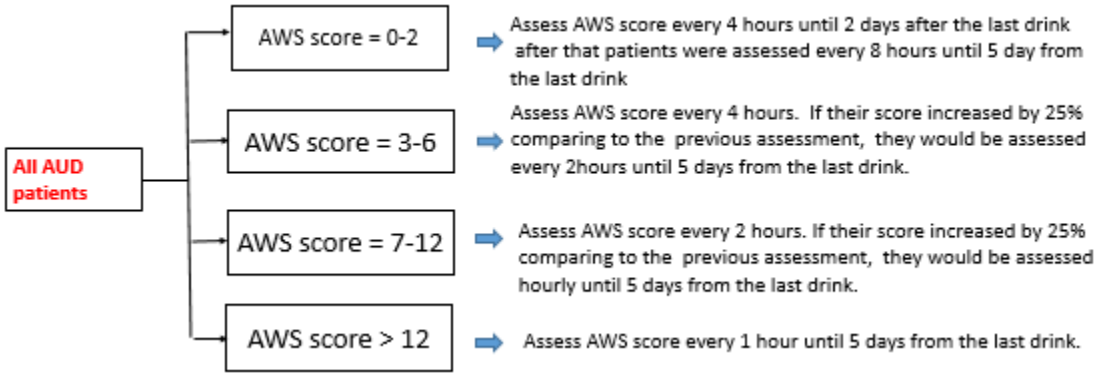

Figure 5. Diagram of monitoring AWS

Up on admission, the risky alcohol drinkers were interviewed by behavioral questionnaire. At 1 and 3 months after hospital discharge, patients' alcohol consumption were follow-up by asking the first 3 questions of the AUDIT, namely the Alcohol Use Disorder Identification Test for Consumption (The AUDIT-C)

Changing alcohol consumption was classified into 3 levels which were significant change, some change, and no change. Significant change means changing alcohol consumption to the low-risk level or abstinence. If patients had an AUDIT-C score after discharge from the hospital less than 5, they were classified as 'significant change'. If they had an AUDIT-C score after discharge higher than 5 but lower than the score upon admission, they were classified as 'some change' in alcohol use. If they had an AUDIT-C score higher than or equal the score upon admission, they were classified as 'no change'.

Table 9. Criteria for classifying change level

Change level	Definition	Classification criteria
Significant change	Change alcohol consumptions to the low-risk level	AUDIT-C score after 3 months discharging from the hospital lower than 5 .
Change somewhat	Reduce alcohol consumption but still at-risk level	AUDIT-C score after 3 months discharging from the hospital was lower than AUDIT-C score before hospitalization but still was higher than 5.
No change	Unchanged or increase alcohol consumption at 3 months after discharging from the hospital	AUDIT-C score after discharge from the hospital was the same level as or higher than AUDIT-C score before hospitalization

The distribution of total intention score was categorized into 3 levels - 'no intention' (total score of intension equal to 0); 'some intention' (total score of intention ranging from 1 to 39); and 'strong intention' (total score of intention equal to 40).

3.5. Training research assistances

A clinical expert in the alcohol field who has experience in training nurses, pharmacists, and physicians to monitor AWS was asked to train the researcher and research assistance before data collection began. All the researches followed the research's protocol. The guidebook was shown in Appendix 3

3.6. Data analysis

Statistical analysis was performed using IBM SPSS version 22.0 (IBM, Armonk, NY, United States of America). Descriptive statistics including frequencies, means, standard deviations, 95% confidence intervals were used for summarizing data. To detect significant differences among groups, t-test and ANOVA were used for continuous variables; Chi-square test, Fisher's exact test were used with categorical variables. Binary multinomial logistic regression analysis was conducted to estimate the association for each independent variable individually. Multinomial logistic regression analysis was performed by including 5 independent variables in a model of intention to change and 3 independent variables in

the model of changing alcohol consumption. Odds ratio and 95% confident interval (CI) were calculated. The Variation Inflation Factor (VIF) was analyzed for all predictors to assess multicollinearity. Model fit diagnosis was reported based on Cox-Snell R2, Cragg-Uhler R2, and McFadden R2. Associations were considered statistically significant if the P value was <0.05.

3.7. Ethical approval

The present study was approved by the Haiphong University of Medicine and Pharmacy [Haiphong City, Vietnam] review board in bio-medical research for the ethical issues. Before any interview was conducted, the study's information sheets were read and explained to the potential participant by the interviewer. Participants were explained the purpose of study, the risk, as well as the implications of participating in it. Participants were informed that this study did not affect to their usual care; their personal information would be kept confidential; they can refuse to answer any question. By fully understanding this information, potential participants were considered as competent to give voluntary consent. Potential participants were given the opportunity to ask any questions related to the study. Those agreeing to participate were to sign the consent form. The information collected by the research team about participants will be in both individually identifiable and re-identifiable. Only the principal investigator accessed to the participants' identifier database (*Appendix 4*)

CHAPTER IV

RESULTS OF THE STUDY

The first aim of this study was to identify the extent to which patients admitted to a general hospital in Vietnam meet the criteria for risky alcohol drinking, alcohol use disorder (AUD), and alcohol withdrawal syndrome (AWS). The second aim was to identify predictors of intention to change and changing alcohol consumption using the Integrated Behavior Model (IBM) as the conceptual framework. This chapter provides the above results.

4.1. Prevalence of risky alcohol drinker, AUD, and AWS

Process to identify and magnitude of patients admitted to a general hospital in Vietnam meet the criteria for risky alcohol drinking, AUD, and AWS was summarized in *Figure 6*

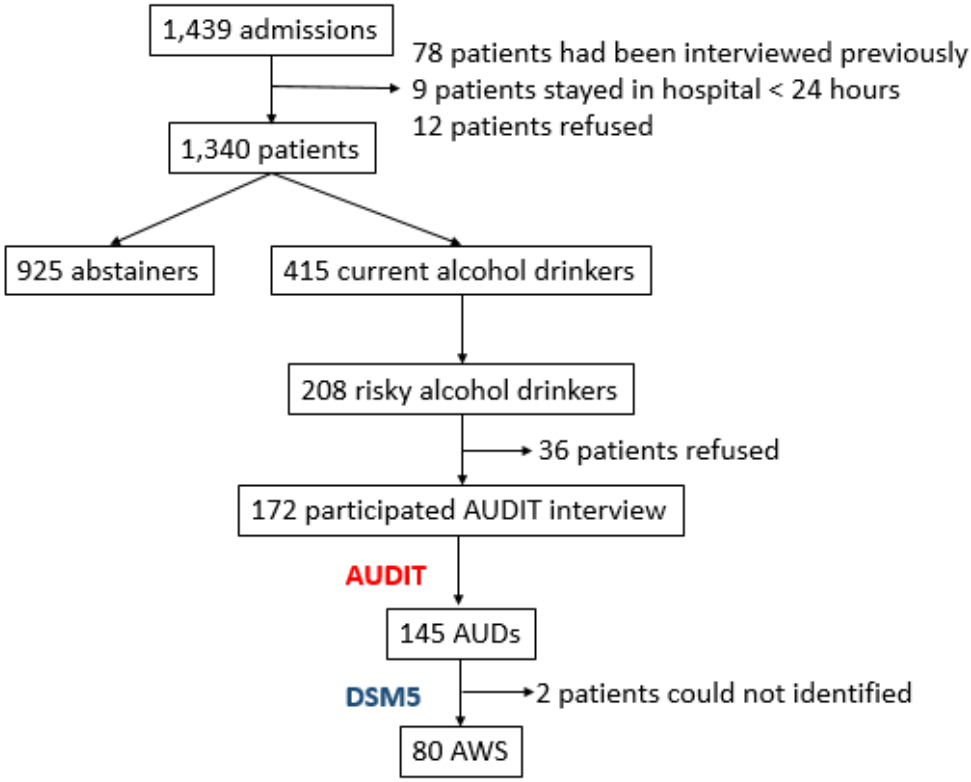

Figure 6. Process and result of prevalence study

4.1.1. Alcohol drinking

There were 1439 number of admissions to the hospital during the study period, March to April 2018. Seventy-eight patients were readmitted and were not re-enrolled after the first admission. Nine patients stayed in hospital for less than 24 hours were not included in the study. Twelve patients refused to participate in the study. Thus, a total of 1340 patients were included. More than half of these patients were male (56%). The patients' average age was 57.7 years old (S.D. = 18.4). Most of them lived in rural areas (75.4%). There were 415 patients met the criteria of current alcohol drinkers, accounting for 31% of the overall hospitalized patients. Males were more likely to be a current drinker than females (OR = 35.6; 95% CI = [21.8 – 58.6]). The current alcohol drinkers were significantly younger than abstainers were (mean difference = 7.5 years, 95% CI = [5.4 - 9.5]). The proportion of alcohol drinker was not significantly different between rural and urban area (*Table 10*)

Table 10. Association among demographic factors and alcohol consumption

Characteristics	Overall n (%)	Abstainers	Drinkers	Univariate analysis			Multivariate analysis	
	N = 1340	N = 925	N = 415	P value	OR	95% CI	OR[a]	95% CI
Sex								
Female*	589 (44.0)	571	18	0.00	1		1	
Male	751 (56.0)	354	397		35.6	21.8 - 58.1	35.4	21.6 - 58.1
Living area								
Rural *	1010 (75.4)	683	327	0.052	1		1	
Urban	330 (24.6)	242	88		1.3	1.0- 1.7	0.9	0.6 -1.2
Age (Mean ± S.D.)	57.7 ± 18.4	60.0 ± 19.4	52.6± 14.8	0.00**	7.5[b]		0.98	0.97 - 0.99

** reference category, ** t-Test, OR[a] = adjusted odds ratio (adjusted by living area, sex, and age), [b]= mean difference*

OR: calculated when dependent variables were abstainers and drinkers.

4.1.2. Risky alcohol drinkers (RADs)

Of 415 current alcohol drinkers, 208 patients met the criteria to be classified as risky alcohol drinkers. The prevalence of risky alcohol drinkers in overall hospitalized patients was 15.5%. The majority of them were men (99.5%). Only one woman was a risky drinker. Most of them lived in rural areas (76.4%). The risky alcohol drinkers average age was 51.4 years old (S.D. = 13.5). Thirty-six risky alcohol drinkers refused to be further interviewed. Therefore, 172 risky alcohol drinkers were screened for AUD using AUDIT. Risky alcohol drinkers had an average AUDIT score of 16.9 (S.D. = 9.0), about the mid-range of total AUDIT score of 36. They drank an average of 12.6 standard drinks (S.D. = 10.6) in a typical day. Most of them (98.3%) drank homemade alcohol. Homemade alcohol normally made from rice, maize or cassava (Dung et al., 2007) and contains a high alcohol content ranging from 31% to 77% (Lachenmeier et al., 2009). There were only three risky alcohol drinkers that drank beer (1.75%). Two-third of risky alcohol drinkers (68.6%) had an education level below high school. Most of them were married (87.8%) and were farmers or part time workers (77.9%).

All of risky alcohol drinkers drank alcohol at a hazardous level of alcohol use and 70.2% drank at a harmful level of alcohol use. Over half of risky alcohol drinkers (54.4%) were alcohol dependent. One-third (37.2%) of risky alcohol drinkers had an AUDIT score between 8 and 15. This group were more likely to have a medium level of alcohol related problems. Almost half (47.1%) of them had an AUDIT score over 16. They were more likely to have a high level of alcohol related problems (Babor et al., 2001) (Table 11). Over half of risky alcohol drinkers diagnosed by the admitting physician. Patients age between 40-60 years old were more likely to be risky alcohol drinkers than patients age under 40 years old (OR = 0.6; 95% CI = [0.4-0.8]) and above 60 years old (OR= 0.3; 95% CI = [0.2 – 0.4]).

Table 11. The Alcohol Use Disorder Identification Test (AUDIT) and prevalence of patient at each level of alcohol consumption

AUDIT question	Level of Alcohol consumption	Prevalence
1. How often did you have a drink containing alcohol in the last 12 months?	Hazardous level)Score of 1 or more on question 2 or 3(	100%
2. How many drinks containing alcohol do you have on a typical day when you are drinking?		
3. How often do you have six or more cans (bottles) of beer/120ml of wine/30ml of liquor on one occasion?		
4. During last 12 months, how often have you found that you were not able to stop drinking once you started?	Alcohol dependence)Score above 0 on question 4-6(	54.39%
5. During last 12 months, how often have you failed to do what was normally expected from you because of drinking?		
6. During last 12 months, how often have you needed a first drink in the morning to get yourself going after a heavy drinking session?		
7. During last 12 months, how often you had a feeling of guilt or remorse after drinking?	Harmful alcohol use)Points scored questions 7-10(	77.19%
8. During last 12 months, how often have you been unable to remember what happened the night before because you had been drinking?		
9. Have you or someone else been injured as a result of your drinking?		
10. Has a relative or friend or a doctor or another health worker been concerned about your drinking or suggested you cut down?		

4.1.3. Alcohol use disorder

Of the 172 risky alcohol drinkers, 145 patients had AUDIT score over than 8, so they were classified as AUD. The prevalence of AUD in hospitalized patients is 13.1%

$$\frac{number\ of\ AUD}{number\ of\ risky\ drinkers} x \frac{number\ of\ risky\ drinkers}{total\ patient} \times 100 = \frac{145}{172} x \frac{208}{1340} \times 100 = 13.1\%$$

Thirty-six risky alcohol drinkers refused to be interviewed by the AUDIT. These 36 risky alcohol drinkers could be all AUD or not AUD. In the case that all of them were AUD, the prevalence of AUD in hospitalized patients would be 13.5%. If none of them were AUD, the prevalence of AUD in hospitalized patients was 10.8%. The average age

of these AUD patients was 51 years old (S.D. = 11.7) and ranged from 19 to 82 years old. About two-third of them (67.6 %) were between 40 and 60 years old. Most of them were married (89%). The AUD patients drank on average of 14.4 standard drinks daily (S.D. = 10.5). Over half of them (54.5%) had liver disease diagnosed clinically.

4.1.4. Alcohol withdrawal syndrome

The 145 AUD patients were closely monitored for AWS. One patient had an intracerebral hemorrhage and another patient had a nontraumatic extradural hemorrhage. The symptoms of these two diseases were difficult to differentiate from AWS, therefore, these 2 patients were not classified as AWS. Eighty patients developed AWS, accounting for 7.3% of the overall hospitalized patients

$$\frac{number\ of\ AWS}{number\ of\ AUD} x \frac{number\ of AUD}{number\ of\ RADs} x \frac{number\ of\ RADs}{total\ patient} x\ 100 = \frac{80}{143} x \frac{145}{172} x \frac{208}{1340} x\ 100 = 7.3\%$$

RADs: Risky alcohol drinkers

Their mean age was 51.8 (S.D = 8.9). Most of them were employed as part time workers such as small business, construction worker, fishermen, or musicians (playing musical instruments at a funeral). They were considered as having low economic status. Thirty percent of the AWS patients had no source of income. The majority of them were married (88.8%). They drank on average of 17.5 standard drinks daily (S.D. = 10.4). Their alcohol consumption ranged from 2 to 50 standard drinks daily. The majority of them (82.7%) had clinically diagnosed liver diseases. There were 38.8%, 22.5%, and 28.8% of AWS patients classifying at a severe, moderate and mild AWS, respectively.

The univariate analysis found that history of AWS, presence of liver disease, GI bleed, number of daily standard drinks, AUDIT score, and age were correlated with the presence of AWS. The multivariate analysis demonstrated that patients who had experienced AWS previously or who had liver disease were more likely to develop AWS. Both univariate and multivariate analysis showed no relationship among living area, educational level and marital status with the occurrence of AWS (*Table 12*).

Table 12. Association among alcohol and disease related factors and AWS cases in risky alcohol drinking

Variables	No AWS n=90	AWS n=80	Univariate analysis			Multivariate analysis		
	n (%)	n (%)	P value	OR	95% CI	P value	OR[a]	95% CI
Had AWS previously								
No *	78 (86.7)	11 (13.8)	0.00	1		0.00	1	
Yes	12 (13.3)	69 (86.3)		40.8	16.9-98.3		11.1	3.1 – 38.8
Liver disease								
No *	76 (84.4)	15 (18.8)	0.00	1		0.00	1	
Yes	14 (15.6)	65 (81.3)		23.5	10.6-52.4		4.7	1.6 - 14.0
GI bleed								
No *	85 (94.4)	65 (81.3)	0.01	1		0.35		
Yes	5 (5.6)	15 (18.8)		3.9	1.4 – 11.4		2.2	0.4 – 10.1
Age								
Under 40	19 (21.1)	4 (5)	0.00	0.1	0.1 - 0.5	0.6	0.7	0.1 - 3.7
40-60 *	48 (53.3)	64 (80)		1			1	
Over 60	23 (25.6)	12 (15)	0.01	0.4	0.2 – 0.8	0.5	0.7	0.2 - 2.2
Amount of standard drink (Mean ± S.D.)	9.8 ± 8.1**	17.5 ± 10.4**	0.00**	7.7[b]		0.90	1	0.9 – 1.1
AUDIT score (Mean ± S.D.)	11.7 ± 6.8**	22.4 ± 7.7**	0.00**	10.7[b]		0.20	1.1	0.96 – 1.6

** reference category, ** t-Test, OR[a] = adjusted odds ratio (adjusted by had AWS previously, liver disease, GI bleed, age, amount of standard drink, and AUDIT score), [b]= mean difference*

4.2. Psychosocial predictors of change in alcohol consumption

4.2.1. Reliability of the measurement

The measurement showed satisfactory reliability. All multi-item scales had high Cronbach's coefficients (α >0.70) and each item had good factor loadings (>0.6) on its underlying construct. (

Table 13)

Table 13. Cronbach alpha and Factor loading

Constructs	Cronbach alpha	Items	Factor loading
Intention to change alcohol consumption	0.8	INT1	.92
		INT2	.92
		INT3	.85
		INT4	.76
Experiential attitude	0.9	E_att1	.85
		E_att2	.90
		E_att3	.91
		E_att4	.88
Instrumental attitude	0.8	I_att1	.87
		I_att2	.88
		I_att3	.79
		I_att5	.75
Injunctive norm	0.6	I_norm1	.60
		I_norm2	.81
		I_norm4	.84
Descriptive norm	0.9	D_norm1	.86
		D_norm3	.95
		D_norm4	.93
Perceived control	0.8	P_con1	.87
		P_con2	.87
		P_con3	.80
		P_con4	.74
Dependent severity	0.8	DP 1	0.83
		DP2	0.81
		DP3	0.81
		DP4	0.74

4.2.2. Demographics

There were 2,168 patients admitted to the hospital and 314 patients were identified as risky alcohol drinkers. There were 63 risky alcohol drinkers refused to participate the study, thus, 250 male and one female patient were interviewed the questionnaire upon hospital admission. Response rate was 80%. Patients' age was between 19-86 years old (mean = 52.0, S.D =11.7). Three fourths of them (72.9 %) lived in a rural area. Almost 90.4% of them were married. About one-fourth of them (27.9%) were farmers and 41% of them had temporary work. Two thirds of the participants (67.3%) completed primary and secondary school. Only 8.2% of them had a college degree or higher.

The majority of patients had a drink containing alcohol more than 4 times per week in the last 12 months (92.4%), 65.7% had more than 10 drinks on a typical day when they were drinking, and 57% reported a heavy episode (six or more drinks on one occasion) daily or almost daily. On average, they consumed 14 drinks on a typical day (S.D = 9.7, range 2-50 drinks), 7 times over the recommended safe limit for alcohol consumption (2). Almost half of the participants (46.2%) were alcohol dependent. The top five common diseases that patients had during the hospitalization were diseases of the digestive system (65%), injury (18.7%), diseases of the circulatory system (10.4%), respiratory system diseases (10%) and diseases of the genitourinary system (7.6%). About haft of the participants (52.2%) were admitted to the hospital with only one disease recorded.

4.2.3. Descriptive analysis of constructs

The average score of experiential attitude was 2.5 (S.D = 1.5). Patients disagreed that reducing or quitting alcohol consumption would make them bore, stress, dull, and feel worse physically. The mean score of instrumental attitude was 3.8 (S.D = 1.2). Most patients agreed that they would have health benefits, be more respectful, and have fewer family problems if they decreased their alcohol.

The data about injunctive norms showed that 84.4% of the participants received advice on reducing or quitting alcohol but only 44.2% agreed that their beloved one could influence them to reduce or quit drinking alcohol. Almost 80% of the respondents agreed that seeing what happened to other heavy drinkers such as alcohol-related accidents or diseases or death made them realize there are benefits to changing alcohol drinking behavior. Three fourths of the participants reported that they had confidence and perceived they had the ability to change alcohol consumption in various environmental situations such as the availability of alcohol, seeing others drink, being offered a drink, or coping with depression from their family life or work.

The level of the patient's intention to quit alcohol was relatively lower than their intention to reduce alcohol consumption (mean = 4.8, S.D = 4.3; and mean = 7.5 S.D = 3.1, respectively on the scale of 0-10).

Table 14. Survey statements and descriptive statistic (n=251)

Construct	Measurement items	Mean (SD)
Intention to change alcohol consumption (score range 0-10)	How likely do you intend to set up a limit on the total number of drinks you'll have before you start drinking?	7.4 (3.3)
	How likely do you intend to set up a predetermined time to stop drinking?	7.3 (3.5)
	How likely you will reduce drinking a drink containing alcohol in the next month?	7.5 (3.1)
	How likely you will stop drinking a drink containing alcohol in the next month?	4.8 (4.3)
Experiential attitude (score range 1-5)	Reducing and quitting alcohol drinking is boring	2.9 (1.7)
	Reducing and quitting alcohol drinking is stressful	2.4 (1.7)
	Reducing and quitting alcohol drinking makes me dull	2.4 (1.6)
	Reducing and quitting alcohol drinking makes me feel worst physically	2.3 (1.6)
Instrumental attitude (score range 1-5)	If I reduced or quit drinking alcohol, my disease would not be so severe.	4 (1.4)
	If I reduced or quit drinking alcohol, my current disease would not occur again.	3.9 (1.4)
	If I reduced or quit drinking alcohol, my parent/spouse/children/close relatives will respect me more.	3.8 (1.5)
	If I reduced or quit drinking alcohol, I would have fewer problems with my family	3.4 (1.7)
Injunctive norm (score range 1-5)	People whose opinion I respect advise me to reduce or quit drinking alcohol	4.3 (1.2)
	People who I love (parent/spouse/kids/lover) influence me to reduce or quit drinking alcohol	2.9 (1.6)
	Complaints by people around me make me reduce or quit drinking alcohol	3.1 (1.6)
Descriptive norm (score range 1-5)	Seeing people who experience the benefit from quitting drinking makes me intent to reduce or quit drinking alcohol	4 (1.3)
	Seeing people who have disease or have died because of alcohol make me reduce or quit drinking alcohol	4 (1.5)

Construct	Measurement items	Mean (SD)
	Seeing people who have accidents or get hurt because of alcohol make me reduce or quit drinking alcohol	4 (1.4)
Perceived control (score range 1-5)	How confident are you to reduce or quit drinking when you see others drinking alcohol?	4.1 (1.3)
	How confident are you to reduce or quit drinking alcohol if alcohol is available in your house or your workplace?	3.9 (1.4)
	How confident are you to refuse when you are being offered a drink in a social situation?	3.5 (1.6)
	How confident are you to reduce or quit drinking alcohol when you depress with family life or work	3.5 (1.6)

For the construct regarding alcohol dependent severity (

Table *15*), about half of the participants (54.6%) were able to stop drinking once they started drinking. About 35% failed to do their normal activities because of alcohol use. Almost 80% did not need a first drink in the morning to get going after a heavy drinking session. About 45% of patients continued to drink even though it was causing trouble with family and friends.

Table 15. Participants' response for each dependent severity item (n=251)

Dependent severity	Participants' response n (%)					Mean (SD) on scale of 0-4
	Never (0)	Less than monthly (1)	Monthly (2)	Weekly (3)	Daily or almost daily (4)	
Impaired control over drinking	137 (54.6)	26 (10.4)	13 (5.2)	30 (12)	45 (17.9)	1.3 (1.6)
Increased salience of drinking	164 (65.3)	31 (12.4)	15 (6)	13 (5.2)	28 (11.2)	0.8 (1.4)
Morning drink	193 (76.9)	3 (1.2)	5 (2.0)	8 (3.2)	42 (16.7)	0.8 (1.6)
Continued to drink even though it was causing trouble with family and friends	126 (50.2)	26 (10.4)	18 (7.2)	14 (5.6)	67 (26.7)	1.5 (1.7)

About two thirds of participants had some intention to change alcohol consumption and 24.7% had a strong intention to change alcohol consumption. We were able to follow 176 patients one month after discharge from the hospital. About 62% of them significantly changed drinking alcohol and 23.3% did not change their alcohol consumption. Most of the patients (81%) who had reported a strong intention to stop during the hospital interview reported they could stop drinking alcohol 1 month after discharge. Even though they had a strong intention to change, 11% of them did not change. Three months after discharge from the hospital, 74.3% of those who had a strong intention during the hospital interview to stop were still in the significant change stage. There were 115 patients remaining to follow 3 months after discharge from the hospital. About 50% of them reported they significantly changed drinking alcohol and 27.8% were in the no change stage.

Table 16. Cross tabulation between intention levels and change stages

		Intention			Total
		No intention	Some intention	Strong intention	
1 month after discharge (n=176)	No change	11	24	6	41 (23.3%)
	Some change	0	22	4	26 (14.8%)
	Significant change	3	63	43	109 (61.9%)
	Total	14 (8%)	109 (61.9%)	53 (30.1%)	**176 (100%)**
3 months after discharge (n=115)	No change	8	18	6	32 (27.8%)
	Some change	0	21	4	25 (21.7%)
	Significant change	1	28	29	58 (50.4%)
	Total	9 (7.8%)	67 (58.3%)	39 (33.9%)	**115 (100%)**

4.2.4**.** Examination of correlates of intention to change alcohol consumption

Bivariate multinomial logistic regression

Patients who had some intention and strong intention to change alcohol consumption had a significantly stronger instrumental attitude (OR = 3.1 and 5.2, respectively), injunctive norm (OR = 2.7 and 3.3, respectively), and descriptive norm (OR = 2 and 2.5, respectively) than patients who had no intention to change (

Table 17). The most significant construct associated with the intention to change was instrumental attitude. These results could be interpreted that the stronger belief about the positive outcome of change in alcohol consumption, the more likely to change in alcohol consumption. The more others think they should change, the more likely they change in alcohol consumption. Confronting with others who had suffered with the consequences of alcohol use made them had more intention to reduce or quit alcohol.

Table 17. Bivariate multinomial logistic regression analysis of intention to change alcohol consumption

Variables	Some intention (N=170) OR (95%CI)	Strong intention (N=62) OR (95%CI)
Experiential attitude	1 (0.7-1.3)	0.9 (0.6-1.2)
Instrumental attitude	3.1 (2.0 – 5.0)	5.2 (3.0 – 9.0)
Injunctive norm	2.7 (1.6-4.4)	3.3 (2.0-5.7)
Descriptive norm	2.0 (1.4 -2.7)	2.5 (1.7 – 3.8)
Perceived control	1.2 (0.9 -1.8)	2.0 (1.3 – 3.1)

**The reference category for intention to change level is "No intention" (N=19), OR = odds ratio, 95% CI = 95% confident interval.*

Multivariate multinomial logistic regression

The stronger instrumental attitude (belief the positive outcome of change in alcohol consumption) was significantly associated with increasing odds of intention to change alcohol consumption both in the 'some intention' (OR = 2.8) and 'strong intention' groups (OR = 4.9). Only higher perceived control (amount of control over change in alcohol consumption in various environment factors) was significantly associated with an increased odds ratio of intention to change in the 'strong intention' group (OR = 2.1). The results of model fit diagnosis for the intention to change model were Cox-Snell R2 = 0.26, Cragg-Uhler R2 =0.33, and McFadden R2 = 0.19 (

Table 18) .

Table 18. Multivariate multinomial logistic regression analysis of intention to change alcohol consumption

Variables	**Some intention (N=170) OR (95%CI)**	**Strong intention (N=62) OR (95%CI)**
Experiential attitude	0.9 (0.5-1.4)	0.8 (0.5-1.3)
Instrumental attitude	2.8 (1.6-4.8)	4.9 (2.6 -9.4)
Injunctive norm	1.5 (0.8-2.6)	1.4 (0.8-2.7)
Descriptive norm	1.3 (0.9 – 1.9)	1.3 (0.8-2.2)
Perceived control	1.3 (0.8-2.0)	2.1 (1.2-2.7)

**The reference category for intention to change level is "No intention" (N=19), OR = odds ratio, 95% CI = 95% confident interval*

4.2.5 Examination of correlates of changing alcohol consumption

Bivariate multinomial logistic regression

Patients who were in the significant change stage and some change stage had a significantly stronger instrumental attitude after 1-month discharge from hospital (OR = 1.4 and 1.4, respectively) and 3 months discharge from hospital (OR = 1.2 and 1.6), respectively than patients who were in no change stage. Only higher perceived control was significantly associated with increasing odds ratio of changing alcohol consumption in the significant change group only in 1 month after discharge from the hospital (OR = 1.7) (table 19).

Table 19. Bivariate multinomial logistic regression analysis of alcohol consumption change

	After 1 month (*)		**After 3 months (**)**	
Variables	Some change N=26 OR (95%CI)	Significant change N=109 OR (95%CI)	Some change N=25 OR (95%CI)	Significant change N=58 OR (95%CI)
Intention (one-unit increase)	1.4 (1.1-1.5)	1.4 (1.3-1.6)	1.2 (1.03-1.5)	1.6 (1.3-1.9)
Dependent severity (one-unit increase)	0.9 (0.6-1.2)	0.8 (0.6-1.1)	1 (0.7-1.4)	1 (0.7-1.4)
Perceived control	1.5 (1-2.2)	1.7 (1.3-2.3)	1.2 (0.8-1.9)	1.4 (1 – 2.0)

**The reference categories for change level after 1 month and 3 months was the 'No change' group (N=41 and 32, respectively); OR = odds ratio, 95% CI = 95% confident interval*

Multivariate multinomial logistic regression

Similar to bivariate multinomial logistic regression, patients who were in the significant change stage and some change stage had a significantly stronger instrumental attitude after 1 month discharge from hospital (OR = 1.3 and 1.4, respectively) and 3 months discharge from hospital (OR = 1.2 and 1.5), respectively than patients who were in no change stage. Only higher perceived control was significantly associated with increasing odds ratio of changing alcohol consumption in the significant change group only in 1 month after discharge from the hospital (OR = 1.4) (

Table 20).

The results of model fit diagnosis were Cox-Snell ^{R2} = 0.21, Cragg-Uhler ^{R2} =0.24, and McFadden R^2 = 0.13 for the model of changing 1 month after discharge from hospitals; and Cox-Snell ^{R2} = 0.24, Cragg-Uhler ^{R2} =0.28, and McFadden ^{R2} = 0.13 for the model of changing 3 months after discharge from hospitals.

Table 20. Multivariate multinomial logistic regression analysis of alcohol consumption change

	After 1 month (*)		After 3 months (**)	
Variables	Some change N=26 OR (95%CI)	Significant change N=109 OR (95%CI)	Some change N=25 OR (95%CI)	Significant change N=58 OR (95%CI)
Intention (one unit increased)	1.3 (1.1-1.5)	1.4 (1.2 -1.6)	1.2(1-1.5)	1.5(1.3-1.9)
Dependent severity (one unit increased)	0.9 (0.6-1.4)	1 (0.7-1.5)	0.8 (0.5-1.4)	1.1(0.7-1.7)
Perceived control	1.3(0.8-2.0)	1.4(1.0-1.9)	1.1(0.7-1.7)	1.1(0.7-1.7)

**The reference category for change level after 1 month and 3 months were 'No change' group (N=41 and 32, respectively), OR = odds ratio, 95% CI = 95% confident interval*

CHAPTER V

DISCUSSIONS AND CONCLUSIONS

The first objective aims at identifying the prevalence of risky alcohol drinker, AUD, AWS in hospitalized patients (not for treating alcohol dependence). This was the first study in hospitalized Vietnamese patients to examine the prevalence of AUD and AWS using the validated tools (AUDIT) to screen for AUD and apply diagnostic criteria (DSM-5) to prospective assess for AWS. The second objective examined the relationship among social cognitive factors and intention to change and changing alcohol consumption of risky alcohol drinkers. The study test two hypothesis 1) Experiential attitude, instrumental attitude, descriptive norm, injunctive norm, perceived control will have a significant positive relationship with intention to change alcohol consumption. 2) Dependence severity, perceived control, intention to change alcohol drinking will have a positive significant relationship with changing alcohol consumption

5.1. Prevalence of risky alcohol AUD, AWS

Prevalence of risky alcohol drinkers, AUD patients, AWS patients of hospitalized patients were 15.5%, 13.1%, and 7.3%, respectively. All of the AUD and AWS were male. The majority of risky alcohol drinkers, AUD, AWS were found in the group of 40-60-year-old male. Almost all patients (98.3%) drank homemade alcohol. Hospitalized patients were more likely to develop AWS if they had liver disease or past experience with AWS.

In accordance with other research, current alcohol drinkers are frequently males (13, 28, 32, 33, 36, 116). The proportion of females that was risky alcohol drinker in this study was much lower than that reported from Western countries (40, 41, 50). Asian culture may affect alcohol consumption in women (117). The highest frequency of risky alcohol drinking, AUD, AWS was found in the group of 40-60-year-old males which is similar to the report by Foy (9). Productivity capacity peaks at the middle age (118, 119), the results alarmed the Vietnamese government to conduct interventions for alcohol cessation immediately to improve national productivity.

We found the prevalence of risky alcohol drinkers in patients admitted to a general hospital was 15.5%. There was no significant difference in risky alcohol drinkers between patients living in rural versus urban areas. Prevalence of risky alcohol drinkers in our study is similar to results of other study conducted at rural community (13). Giang reported that the prevalence of current alcohol drinkers was 49.6% and prevalence of risky alcohol drinkers in current alcohol drinkers was 35%. When multiplying of these 2 numbers, it resulted in the prevalence of risky alcohol drinkers in the rural area (17.4%).

The prevalence of patients with AUD in this study was similar to other studies but the prevalence of AWS was 2-3 times higher than studies reported in other populations (9, 10). Our data showed that one out of every 3 men admitted to the hospital was a risky drinker and 47% of these risky alcohol drinkers developed AWS. With the total number of 14,585,800 annual inpatient admissions in Vietnam and 69% of the population above 18 years old, adult hospital admissions would be approximately 9 million patients. Prevalence of AWS in our study was 7.3%. Therefore, there would be approximately 657,000 AWS cases yearly in Vietnam. This high rate would result in excessive burden to the Vietnamese health care system because AWS increases the length of hospital stay, the morbidity and mortality of co-existing diseases and finally lead to high hospital resources utilization

During the data collection, we noted that there was no standard protocol for caring AUD patients in this hospital. We found that even though 16.3% AWS patients did not have any severe symptoms upon admission, they still progressed to the severe stage such as hallucinations, seizures, delirium tremens in the hospital. This might because these patients did not receive timely pharmacologic interventions for minimizing complicated withdrawal symptom. Actually, pharmacologic intervention can prevent and reduce the severity of AWS. Thus, we recommended the urgent need for setting up treatment guidelines and training alcohol specialized nurses and medical personnel to rapidly diagnose and provide timely treatment.

5.2 Psychosocial predictors of change in alcohol consumption

This study explored the extent to which risky alcohol drinkers admitted to the hospital could change their alcohol consumption up to 90 days after discharge from the hospital. Our data showed that patients reported they were able to change their alcohol consumption after discharge from the hospital. This result was accompanied with previous studies showing that hospital admission motivates risky alcohol drinkers to change their drinking behavior naturally (3, 15). Intention to act is the only influencing factor that significantly related to changing drinking behavior 1 and 3 months after discharge from the hospital. This result was in the same direction as predicted by the theory.

Perceived control was significantly associated with changing alcohol consumption at 1 month after discharge from the hospital. This result is very similar to result from Ludwig's research that perceived control could predict the treatment outcome (29). However, perceived control had no significant relationship with changing alcohol consumption at 3 months after discharge from the hospital. Patient perceptions about the amount of control over changing alcohol consumption behavior for various environmental factors were important at the beginning period of changing drinking behavior. If patients could overcome those obstacles, perceived control would not affect the maintenance of behavioral change. Our result was congruent with a study conducted to examine self-efficacy as the predictor of alcohol dependence treatment outcome (29). The definition of perceived control in the present study was quite similar to self-efficacy in their study. Langenbucher explained the self-efficacy does not cause long-term benefit because highly confident patients may be less risk-averse in relation to drinking than less confident patients (30).

Both bivariate and multivariate multinomial logistic regression showed that instrumental attitude and perceived control were influencing factors to intention to change. The stronger beliefs about a positive outcome from changing alcohol consumption and the more confident on coping their barriers for change, the higher intention to change their drinking behavior. Even though the injunctive and descriptive norm had no significant affect intention to change in multivariate multinomial logistic regression, but they had

significantly affected on intention to change in the bivariate multinomial logistic regression. Therefore, the experiences and motivation form their significant persons could help to increase more intention to change.

This knowledge guided intervention to assist risky alcohol drinkers to reduce or quit drinking alcohol in the hospitalized environment. Our study suggested health care providers can take advantage situations where risky alcohol drinkers are present in the hospital. Providing cognitive intervention to patients during the hospitalization is the right time to change alcohol consumption efficiently. The classic Knowledge-Attitude-Behavior (KAB) theory that (31), links information and attitudes with behavior postulated that people acquire information about a behavior, which leads to the development of an attitude, which, in turn, leads to behavior. Guided by KAB theory, health care providers should provide risky alcohol drinkers with information or knowledge of alcohol's impact on their diseases and long-term health. This will strengthen risky alcohol drinkers' favorable attitude toward a positive outcome and benefit associated with stopping the drinking of alcohol which, in turn can lead to a behavioral change of decreased drinking. In conclusion, instrumental attitude is the consistent and strongest factor related to intention to change alcohol consumption. Intention to act is the strongest proxy of behavior. Hospital stay and education about alcohol's impact on health may motivate patients to change their alcohol consumption.

Strengths and limitations

Although this study provided information about prevalence of risky alcohol drinkers, AUD, AWS there were some limitations. In theory, the amount of alcohol consumption is the risk factor of AWS (9). Our findings in univariate analysis showed that there was a relationship between the development of AWS and the number of standard drinks but not significance in multivariate analysis. This might because of having joint association among history of AWS, liver disease, GI bleed, age, and AUDIT score. The number of standard drinks on a typical day usually reflects the amount of alcohol consumption. Almost all patients reported drinking homemade alcohol with potentially varying alcohol concentrations (120), so the same standard drink might have different

percentages of alcohol content. Thus, the number of standard drinks on a typical day did not reflect the correct and reliable amount of alcohol content. Rates of AUD may be higher than seen in this study.

We did not continue to follow the patients who developed AWS to see the final outcome. We also did not investigate whether or not, when a patient developed AWS, if the appropriate treatment was instituted. We recommend that future research should further evaluate the appropriate treatment and follow the patient until final the outcome.

This is the first study exploring predictors of changing alcohol consumption in risky alcohol drinkers in hospitalized patients with multiple medical conditions. Most of previous studies about changing alcohol behavior were conducted in a sample of people admitted for treatment of the alcohol dependence. Our population was diverse in terms of medical problems with full range of risky drinking behaviors. The prospective collection of data made the results valid in term of causality. A limitation is that there was only one woman in the current study. This might have caused the results to not be generalizable to women. However, in the Vietnamese cultural context for this study men drink much more than the women do (14, 32). This study followed patients for 3 months. Future research is needed to follow the patients for a longer time period to see behavioral change pattern and ability to maintain the change.

Conclusion

This study found 15.5% of hospitalized patients in a general hospital setting were risky alcohol drinkers 13.1% of inpatients in a general hospital in Vietnam met the criteria of AUD with 7.3% of inpatients developing AWS. All of the AUD and AWS were male patients. Homemade alcohol was the most frequent type of alcoholic beverage. Patients in the middle age (40-60 years old) were more likely to be a risky alcohol drinker, AUD, and ASW. Hospitalized patients are more likely to develop AWS if they experienced some of the symptoms of AWS in the past or currently have liver disease.

Stronger beliefs about a positive outcome from changing alcohol consumption and more confidence over obstacles or environmental temptation correlated with higher patient intention to change. Intention to act is the strongest predictor of reduced alcohol

consumption behavior. A hospital stay and education of alcohol's impact on health may motivate patients to change their alcohol consumption.

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Appendix 1. Questionnaire

Patient's name:	Sex: ☐ 1 Male ☐ 2 Female
Year of birth	Weight (kg): Height (m):
Address	Phone number:
Department	Medical record code:
Diagnose:	Date and time of admission: Date and time interview Date of discharge:

Education	O 0	Never go to school	**Marital status**	O 1	Single
	O 1	Primary school diploma		O 2	Married
	O 2	Secondary diploma		O 3	Windowed
	O 3	High school diploma		O 4	Divorced
	O 4	College or associate degree			
	O 5	Bachelo degree or higher			

Current job:

☐ 1 Farmer
☐ 2 Worker in factories
☐ 3 Business owner
☐ 4 Organization officials
☐ 5 Retire
☐ 6 Builder, carpenter, painter
☐ 7 Free labor
☐ 8 Other (✍): .....

PART I. GENERAL QUESTIONS RELATED TO ALCOHOL

Now I am going to ask you some questions about your use of alcoholic beverages ***during last year.*** *Please think about your current situation and drinking habit and answer the following question. "alcohol beverages" mean whisky, vodka, wine, rice wine, beer, draught beer.*

1. In the past 12 months, have you sometimes drunk alcoholic beverage? □ YES □ NO
   (please score the question 1 part II)
2. In the past 12 months, what kind of alcoholic beverage do you often drink? and
3. In the past 12 months, how much alcohol do you drink in a typical day?

□ Liquor (vodka, gin, whisky, rice wine)	□ Wine	□ Beer (draught beer)
		
30ml	100ml	330 ml
---- shot	---- glasses	---- glasses/ can

   (please score question 2,3 part II)
4. How many years did you drink more than 2 drinks daily?

5. Date and time of the last drink before you come to the hospital?

   Date:…..….. Time: …….

PART II. SCREENING QUESTIONNAIRE (AUDIT)

Direction: Please check the square that indicates your appropriate answers

No	Question	Answer	Score
1	How often did you have a drink containing alcohol in the last 12 months? ***(Refer Q1 in part I)***	□ Never (skip to Q9, Q10)	0
		□ Monthly or less	1
		□ 2-4 times/month	2
		□ 2-3 times/week	3
		□ ≥ 4 times/week	4
2	How many drinks containing alcohol do you have on a typical day when you are drinking? ***(Refer Q2, 3 in part I)***	□ 1-2 cans (bottles) of beer/120ml of wine/30ml of liquor	0
		□ 3-4 cans (bottles) of beer/120ml of wine/30ml of liquor	1
		□ 5-6 cans (bottles) of beer/120ml of wine/30ml of liquor	2
		□ 7,8,9 cans (bottles) of beer/120ml of wine/30ml of liquor	3
		□ ≥ 10 cans (bottles) of beer/120ml of wine/30ml of liquor	4
3	How often do you have six or more cans (bottles) of beer/120ml or wine/30ml of liquor on one occasion? *Skip to Questions 9 and 10 if Total Score for Questions 2 and 3 = 0*	□ Never	0
		□ Less than monthly	1
		□ Monthly	2
		□ Weekly	3
		□ Daily or almost daily	4
4	How often during last 12 months, have you found that you were not able to stop drinking once you started?	□ Never	0
		□ Less than monthly	1
		□ Monthly	2
		□ Weekly	3
		□ Daily or almost daily	4
5	How often during last 12 months have you failed to do what was normally expected from you because of drinking?	□ Never	0
		□ Less than monthly	1
		□ Monthly	2
		□ Weekly	3
		□ Daily or almost daily	4
6		□ Never	0

	How often during last 12 months have you needed a drink first drink in the morning to get yourself going after a heavy drinking session?	□ Less than monthly	1
		□ Monthly	2
		□ Weekly	3
		□ Daily or almost daily	4
7	How often during last 12 months you had a feeling of guilt or remorse after drinking?	□ Never	0
		□ Less than monthly	1
		□ Monthly	2
		□ Weekly	3
		□ Daily or almost daily	4
8	How often during last 12 months have you been unable to remember what happened the night before because you had been drinking?	□ Never	0
		□ Less than monthly	1
		□ Monthly	2
		□ Weekly	3
		□ Daily or almost daily	4
9	Have you or someone else been injured as a result of your drinking?	□ No	0
		□ Yes, but not in the last year	1
		□ Yes, during the last year	2
10	Has a relative, friend, doctor or other health worker been concerned about your drinking or suggested you cut down?	□ No	0
		□ Yes, but not in the last year	1
		□ Yes, during the last year	2
		Total score	

In the past year, have you continued to drink even though it was causing trouble with your family and friends? □ YES □ NO

If answer is "yes" then ask "how often?"

□ *Less than monthly*

□ *Monthly*

□ *Weekly*

□ *Daily or almost daily*

PART III. **ALCOHOL USE BEHAVIOR CHANGE**

Experiential attitude

Definition: Patient's emotional response to reduce or quit drinking alcohol

Reducing and quitting alcohol drinking ……	Strongly disagree	Disagree	Unsure	Agree	Strongly degree
is boring	☐	☐	☐	☐	☐
is stressful	☐	☐	☐	☐	☐
makes me dull (brain block)	☐	☐	☐	☐	☐
makes me feel worst physically	☐	☐	☐	☐	☐

Instrumental attitude

Definition: patient's beliefs about outcome of reduce or quit alcohol

If I reduced or quitted drinking alcohol, …	Strongly disagree	Disagree	Unsure	Agree	Strongly degree
my disease would not be so severe.	☐	☐	☐	☐	☐
my current disease would not occur again.	☐	☐	☐	☐	☐
my parent/spouse/children/close relatives will respect me more.	☐	☐	☐	☐	☐
I would have less problems with my family	☐	☐	☐	☐	☐

Injunctive norm

Definition: normative belief about what others think patient should reduce or quit alcohol and motivation to comply

Concepts	Strongly disagree	Disagree	Unsure	Agree	Strongly degree
People whose opinion I respect advise me to reduce or quit drinking alcohol	☐	☐	☐	☐	☐
People who I love (parent/spouse/kids/lover) influence me to reduce or quit drinking alcohol	☐	☐	☐	☐	☐
Being complain by people around me make me reduce or quit drinking alcohol	☐	☐	☐	☐	☐

Descriptive norm

Definition: what others in patient's social or personal networks are doing

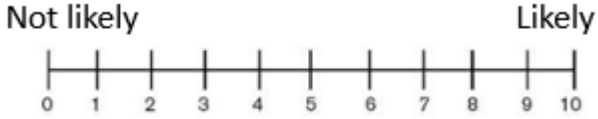
Concepts	Strongly disagree	Disagree	Unsure	Agree	Strongly degree
Seeing people who experience the benefit from quitting drinking makes me intent to reduce or quit drinking alcohol	☐	☐	☐	☐	☐
Seeing people who have disease or have died because of alcohol make me reduce or quit drinking alcohol	☐	☐	☐	☐	☐
Seeing people who have accident or getting hurt because of alcohol make me reduce or quit drinking alcohol	☐	☐	☐	☐	☐

Perceived control

Definition: Patient perceived amount of control over changing drinking behavior, determined by risky alcohol drinker's perception of the degree to which various environmental factors make patient cannot reduce or quit drinking

How confident are you to…	Confident				
	Not at all	Not very	Moderately	Very	Extremely
reduce or quit drinking when you see others drinking alcohol?	☐	☐	☐	☐	☐
reduce or quit drinking alcohol if alcohol is available in your house or your work place?	☐	☐	☐	☐	☐
refuse when you are being offer a drink in a social situation?	☐	☐	☐	☐	☐
reduce or quit drinking alcohol when you depress with family life or work					

Intention

Question	Answer
How likely do you intent to set up a limit on the on the total number of drink you'll have before you start drinking in the next month?	
How likely do you intent to set up a predetermined time to stop drinking in the next month	
How likely you will reduce drinking a drink containing alcohol in the next month	
How likely you will stop drinking a drink containing alcohol in the next month	

ALCOHOL WITHDRAWAL SCALE

Direction: score the alcohol withdrawal symptom and calculate total score each time monitoring

Date																		
Time																		
Do you have a drink today? (Yes/No)																		
Pulse rate (per min) (0) <100 (1) 102-110 (2) 111-120 (3) >120																		
Diastolic blood pressure (mmHg) (0) <95 (1) 96-100 (2) 101-105 (3) >105																		
Temperature (oC) (0) <37 (1) 37-37.5 (2) 37.6-38 (3) >38																		
Breathing rate (per min) (0) <20 (1) 20-24 (2) >24																		
Sweating (0) None (1) Mild (wet hand) (2) Moderate (forehead) (3) Severe (profuse)																		
Tremor (0) None (1) Mild (arm raised + finger spread) (2) Moderate (finger spread) (3) Severe (spontaneous)																		
Agitation (0) None (1) Fastening (2) Rolling in bed (3) Try to leave bed (4) In rage																		
Contact																		

(0) Short talk possible (1) Easily distractable (i.e. noise) (2) Drifting contact (3) Dialogue impossible																	
Orientation (time, place, person, situation) (0) Fully aware (1) One kind (i.e. time) (2) 2 kind disturbed (3) Totally confused																	
Hallucinations (optical, acoustic and tactile) (0) None (1) Suggestive (2) One kind (i.e. optical) (3) Two kinds (optical + tactile) (4) All kinds Scenic hallucination																	
Anxiety (0) None (1) Mild (if only asked) (2) Severe (spontaneous complaint)																	
Insomnia (Y/N)																	
Generalized tonic-clonic seizure																	

Completed by ……

Appendix 2. List of experts who translated back the questionnaire

1. Mrs. Luu Quynh Huong – Ph.D. candidate, School of Education, the University of New Castle, Australia
2. Dr. Do Thi Hanh Trang - Hanoi University of public health, Vietnam

Appendix 3.

GUIDE FOR RESEARCH ASSISTANTS

I would like to invite you to become part of the research study entitled "Exploring alcohol withdrawal and readiness to change alcohol drinking behavior in patients admitted to general hospital" as a research assistant. This study is being conducted by Mrs. Loan Thi Mai Nguyen as an academic requirement in her doctoral's degree in Pharmaceutical Science, Chulalongkorn University, Thailand under the guidance of Dr. Tanattha Kittisopee.

This research assistant's guide was conceptualized to delineate your roles and responsibilities present the study protocol and data collection procedures. This is divided into 3 parts namely Role and responsibilities, Data collection Procedures, and Storage. It is expected that you need to familiar with this manual and be guided throughout the study implementation to ensure the validity of results and safeguard the study from erroneous bias and spurious interpretations.

I. ROLES AND RESPONSIBILITIES

As a research assistant, your primary role is to ensure that the study data collection procedures are being strictly adhered to and the data remain valid and free from bias

Specifically, your tasks include:

1. Familiarize with this guide and the study protocol
2. Participate in the training for data collection
3. Recruit qualified study participants based on the screening guide
4. Explain to the study participants their rights and data collection procedure
5. Function as data collection on specific time periods.
6. Ensure questionnaires are answered completely, AWS score accurately, stored properly and endorsed timely to the .
7. Safeguard participants' rights to anonymity, confidentiality, and other ethical considerations
8. Directly report to the primary investigator/ research coordinator for the progress of the study and any difficulties/problem encountered.

You will also be monitored by a designated research coordinator (in this case, main researcher) to evaluate your performance during screening data collection periods based on well-specified guidelines. This mechanism ensures the validity of data and protocol fidelity.

II. Data collection procedure

2.1 Introduction: Hi, my name is …….. I am here on behalf of Loan Thi Mai Nguyen, a doctoral student at Chulalongkorn University, and I am conducting a study for her dissertation in partial fulfillment for the pharmacy doctorate from Chulalongkorn University.

The patient who have been interviewed in previous admissions will not be interviewd again.

2.2 Invitation to participant: All of the inpatients are invited to participate this study that will assess your habit in drinking alcohol. I will study your alcohol consumption, your level of alcohol use disoder, your alcohol withdraw syndrome and your readiness to change alcohol use behavior. The interview takes about 15 minutes to complete and will be carried as privately as possible and the risky alcohol drinkers will be followed up 5 days in the hospital.

2.3 Agreement to participate: If you agree to participate, I will need you to sign an informed consent form. The form states that you agree to the following: Participants will answer the questions on your demographic, your alcohol-related history, your current status of using alchol and readiness tochange alchol use behavior; The risky alcohol use will be monitored AWS until day 5; Participants have right to refuse answer questions and stop cease to participate this study any time you feel not comfortable with.

The patients who refuse to participate the present study will not be approached again.

2.4 Anticipated risks: The risks associated with this study are minimal but could include a breach in confidentiality, social discomforts, or feelings of coercion to participate. Should you need to discuss your feelings about participating in this research, you can speak with me, Mrs. Loan or Dr. Tanatha. Contact information for the these people is attached to the informed consent form.

2.5 Confidentiality of data: Could you provide us the name of any body close to you that is abole to act as collateral informant? All information abtained about you will remain confidential in a locked filling cabinet in emergency department, Kien An hospital until it is refered to Mrs. Loan. Your name will be coded for privacy. The only other individuals who will review the data will be Dr. Tanatha.

2.6 How the study will help: The information that you provide us will not effect the treatment in this hospital and your health care staff will not about this information Eventhougt this study will not provide direct benefit to you but your participation will greatly benefit future alcoholic patients and will support efforts to develop an appropriate care for them in Kien An hoapital, other general hospital and health care system as a whole.

2.7 Decision to participate or not and withdrawal of consent: Your decision whether or not to participate will not prejudice your treatment in Kien An hospital

If you are decide to participate, you are free to withdraw your consent and to discontinue participation at any time without penalty. If you have questions concerning the study, presently or in the future, I will be happy to answer/address those concerns. You can contact me by e-mail at …….. or by phone at ……

2.8 Process

2.8.1 Interview and fill paper form

Ask patient the 1st question "In the past 12 months, have you sometimes drunk an alcoholic beverage?" within 24h after their admission. If the patient's answer is "No" then this patient will be excluded. If the the patient's answer is "Yes", he/she will be asked the 2 next questions (During the last 12 months, what kind of alcohol do you drink? During the last 12 months, how much do you drink in a typical day?). If the patient drinks not exceed the standard drink (men drink >2drinks/day or 14 drinks/ week; women >1 drink/day or 7 drinks/week), the protocol will be stopped. If the patient drinks excess the standard drink, they will be continue screened by AUDIT. Based on the response in question 1 part 1, researcher notes the answer for question 1 part 2. Base on the responses in question 2,3 part 1, researcher notes the answer for question 2 in part 2. Until now, researcher know what kind of beverage that patient normally use so when asking question 3 part II, mention exactly the beverage that patient drink.

Individual whose have AUDIT score of 8 or more will be monitoring by AWS scale to assess the severity of alcohol withdrawal symptoms.

- If the AWS scale score is 0-2, patient will be assessed 4 hourly until 2 days after the last drink after that patients will be assessed every 8 hours until 5 day from the last drink.

- If the AWS score is 3-6, patient will be assessed 4 hourly. If the score increases by 25% comparing to the previous assessment, they will be assessed every 2 hours until 5 days from the last drink.

- If the AWS score below 7-12, the patient will be re-evaluated every 2h. If score increase by 25% compare to previous evaluation, then rating patient's AWS every 1h until 5 days from the last drink.

- If AWS scale score is 12 or above, the patient will be reassessed every 1h until 5 days from the last drink.

Individuals who cannot answer because of severe illness, their family member will be asked some questions to make sure their history of alcohol using, then the researcher will assess the objective symptoms of AWS and the further interview will be conducted when the patient's condition has improved.

2.8.2 Add on information to paper form on patient's demographic from patient's chat

2.8.3 Key in patient's information to google sheets

2.8.4 Check patient's information as main researcher require

III Storage

Arrange the paper forms in sequense of time series. Keep the paper forms in locked cabins in emergency department.

Appendix 4. Ethical approval

BỘ Y TẾ
TRƯỜNG ĐẠI HỌC Y DƯỢC HẢI PHÒNG

CỘNG HOÀ XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự do - Hạnh phúc

BIÊN BẢN
HỌP HỘI ĐỒNG ĐẠO ĐỨC TRONG NGHIÊN CỨU Y SINH HỌC
XÉT DUYỆT ĐỀ CƯƠNG NGHIÊN CỨU ĐỀ TÀI / DỰ ÁN KHCN

Hội đồng Đạo đức trong nghiên cứu y sinh học được thành lập theo Quyết định số: 447/QĐ-YHP ngày 08 tháng 05 năm 2017 của Hiệu trưởng trường Đại học Y Dược Hải Phòng đã tiến hành họp vào hồi 14h00 ngày 1 tháng 3 năm 2018 tại phòng Hội đồng, tầng 2, Trường Đại học Y Dược Hải Phòng.

Tên đề tài: ***Exploring alcohol withdrawal syndrome and readiness to change alcohol drinking behavior in patients admitted to a general hospital, vietnam***
(Hội chứng cai rượu và sự sẵn sàng thay đổi thói quen uống rượu bia của bệnh nhân ở một Bệnh viện Đa khoa, việt nam)

Chủ nhiệm đề tài: **PGS. TS. Tanattha Kittisopee**
ThS. Nguyễn Thị Mai Loan

Đơn vị chủ trì : **Trường Đại học Y Dược Hải Phòng**

Số thành viên hội đồng có mặt:

1. PGS.TS. Trần Quang Phục - Chủ tịch Hội đồng
2. PGS.TS. Nguyễn Ngọc Sáng - Ủy viên thường trực
2. PGS.TS. Nguyễn Văn Hùng - Ủy viên
3. PGS.TS. Phạm Văn Hán - Ủy viên
5. PGS.TS. Phạm Văn Duyệt - Ủy viên
6. PGS.TS. Phạm Văn Linh - Ủy viên
7. TS. Ngô Thị Uyên - Ủy viên
8. TS. Nguyễn Hải Ninh - Ủy viên
9. Bà Hoàng Thị Minh Hường - Ủy viên

+ *Số thành viên hội đồng vắng mặt*: 01

- TS. Ngô Thị Uyên, bận đi công tác

+ *Thư ký Hội đồng:* ThS. Phạm Tuấn Việt

- Nhóm nghiên cứu sẽ chỉnh sửa các mục tiêu nghiên cứu phù hợp với nội dung nghiên cứu.

- Xây dựng chi tiết thuyết minh phần bảo mật thông tin đối tượng nghiên cứu.

I.4. Ý kiến của Chủ tịch hội đồng:

Đề nghị ban chủ nhiệm đề tài giải trình bổ sung các nội dung sau:

- Làm rõ quyền lợi được hưởng của đối tượng nghiên cứu, bảo mật thông tin và chính sách chi phí phù hợp với đối tượng nghiên cứu.

- Đảm bảo thông tin thu được không ảnh hưởng đến chính sách của cơ sở y tế lấy số liệu

2. Kết quả đánh giá của hội đồng

Hội đồng đã tiến hành bỏ phiếu kín, kết quả như sau

Tổng số phiếu bầu:

- Tổng số phiếu phát ra: 08 phiếu
- Tổng số phiếu thu về : 08 phiếu
- Tổng số phiếu hợp lệ : 08 phiếu

Kết quả đánh giá :

Chấp thuận *(không cần sửa chữa bổ sung)*	07/08
Chấp thuận *(cần sửa chữa bổ sung)*	01/08
Không chấp thuận	0/08

Kết luận của Hội đồng: ***Đề cương đạt loại chấp thuận***

Phiên họp kết thúc vào hồi 17h30 cùng ngày.

Hải Phòng, ngày 1 tháng 3 năm 2018

CHỦ TỊCH HỘI ĐỒNG

TRƯỜNG ĐẠI HỌC Y DƯỢC HẢI PHÒNG

PGS.TS. Trần Quang Phục

THƯ KÝ

ThS. Phạm Tuấn Việt

MINISTRY OF HEALTH
HAIPHONG UNIVERSITY OF
MEDICINE AND PHARMACY

SOCIALIST REPUBLIC OF VIETNAM
Independence-Freedom-Happiness

No: 5 /HPUMPRB
Issue: Approval of HPUMPRB

CERTIFICATE OF APPROVAL

Basing on the Decision No. 477/QD-YHP on May 5th 2017 by the Rector of Haiphong Medical University on the foundation of the HPMU Review Board and secretariat for reviewing the ethical issues in Bio-medical researches;

Basing on the Decision No.2153/2013/QD - TTg on November 11th 2013 by Prime Minister on rename of Haiphong Medical University to Haiphong University of Medicine and Pharmacy;

Basing on the Agreed Minutes (enclosured) of the Haiphong University of Medicine and Pharmacy Review Board (HPUMPRB) and the ratification and assessment committee on March 1st 2018.

HAIPHONG UNIVERSITY OF MEDICINE AND PHARMACY REVIEW BOARD (HPMURB) IN BIO-MEDICAL RESEARCH

approves the ethical issues of the following research proposal:

- Research title: ***Exploring alcohol withdrawal syndrome and readiness to change alcohol drinking behavior in patients admitted to a general hospital, Vietnam***
- Principal Investigators: ***Prof. Tanattha Kittisopee***
  Ms. Nguyen Thi Mai Loan
- Research Institution: **Haiphong University of Medicine and Pharmacy**
- Site for Research: Vietnam
- Research Period: From March 2018 to March 2019

Date of approval: March 3rd 2018

IRB Chair
Haiphong University
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TRƯỜNG ĐẠI HỌC Y DƯỢC HẢI PHÒNG

Prof. Pham Van Thuc, M.D, PhD

BỘ Y TẾ
TRƯỜNG ĐH Y DƯỢC HẢI PHÒNG

CỘNG HOÀ XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự do - Hạnh phúc

Số: 5 /HĐĐĐ
V/v chấp thuận vấn đề ĐĐNCYSH

CHỨNG NHẬN CHẤP THUẬN CỦA HỘI ĐỒNG ĐẠO ĐỨC TRONG NGHIÊN CỨU Y SINH HỌC

- Căn cứ Quyết định số 447/QĐ-YHP ngày 08 tháng 05 năm 2017 của Hiệu Trưởng Trường Đại học Y Dược Hải Phòng về việc thành lập Hội đồng và Ban thư ký Hội đồng Đạo đức để xét duyệt các vấn đề đạo đức trong nghiên cứu y sinh học của các đề tài/dự án;

- Căn cứ Quyết định số 2153/2013/QĐ-TTg ngày 11 tháng 11 năm 2013 của Thủ tướng Chính phủ về việc đổi tên trường Đại học Y Hải Phòng thành Trường Đại học Y Dược Hải Phòng;

- Trên cơ sở biên bản họp của Hội đồng đạo đức NCYSH của trường Đại học Y Dược Hải Phòng ngày 1 tháng 3 năm 2018 về đề cương thực hiện nghiên cứu của đề tài (*có biên bản kèm theo*) và bản giải trình chỉnh sửa đề cương của chủ nhiệm.

Hội đồng Đạo đức trong nghiên cứu Y sinh học của trường Đại học Y Dược Hải Phòng chấp thuận về các khía cạnh khoa học và đạo đức trong nghiên cứu đối với đề tài nghiên cứu sau:

1. Tên đề tài: ***Exploring alcohol withdrawal syndrome and readiness to change alcohol drinking behavior in patients admitted to a general hospital, vietnam (Hội chứng cai rượu và sự sẵn sàng thay đổi thói quen uống rượu bia của bệnh nhân ở một Bệnh viện Đa khoa, Việt Nam)***

2. Chủ nhiệm đề tài: **PGS. TS. Tanattha Kittisopee**

ThS. Nguyễn Thị Mai Loan

3. Đơn vị chủ trì : **Trường Đại học Y Dược Hải Phòng**

4. Địa điểm triển khai: Việt Nam

5. Thời gian nghiên cứu: Tháng 3/2018 – tháng 3/2019

Ngày chấp thuận: Ngày 3 tháng 3 năm 2018

CHỦ TỊCH HỘI ĐỒNG	HIỆU TRƯỞNG
PGS.TS. Trần Quang Phục	GS.TS. Phạm Văn Thức

TRƯỜNG ĐẠI HỌC Y DƯỢC HẢI PHÒNG

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PUBLICATIONS:

English

Nguyen Thi Mai Loan, Bertino Jr., J.S., Tanattha Kittisopee. Alcohol use disorder and alcohol withdrawal syndrome in Vietnamese hospitalized patients. Alcohol. Accepted manuscript 10 Jan 2019

Nguyen Thi Mai Loan, Bertino Jr., J.S., Tanattha Kittisopee. Processes affecting reduction or abstinence from risky alcohol drinking in Vietnamese population following hospitalization: Application of Transtheoretical Model. Addicted Behavior. Submitted manuscript

Nguyen Thi Mai Loan, Nguyen Van Hung, Huyn Taek Shin. Development of Clinical Pathway Curriculum for Undergraduate Pharmacy Students at Haiphong University of Medicine and Pharmacy, the 13th Asian Conference on Clinical Pharmacy (ACCP 2013) proceeding

Vietnamese

Nguyen Quang Tap, Nguyen Thi Mai Loan, Tran Thi Ngan, Le Thi Thuy Linh, Nguyen Van Hung, Nguyen Thi Hien, Dang Thanh Dong, Nguyen Thi Hai Yen, Ha Huong Tra. Developing clinical pharmacy model in Viettiep hospital. Haiphong Department of Science and Technology, 2018

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Tran Thi Ngan, Nguyen Quang Tap, Tran Thanh Cang, Nguyen Thi Mai Loan, Nguyen Thi Lien Huong. Drug related Problem (DRPs) in the intensive care Unit of a province general Hospital in Vietnam. Journal of Pharmaceutical research and drug information, 2017

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Nguyen Van Hung, Nguyen Thi Mai Loan, Nguyen Thi Thu Phuong. Medication adherence in hypertensive, ambulatory patients. Medical practice journal, 2012, No 827 +828 p. 274-277

Ta Manh Cuong, Nguyen Thi Mai Loan. The predictors of patients who have coronary heart disease response to low-dose, long term using sympathomimetic. Vietnam Medical Journal. 5/2010, No1 p 42-49

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