

WCES 2014

# An Analysis Of Variables Discriminating Between Quitter And Non-Quitter Groups Among Thai Alcohol-Dependent Smokers

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## Abstract

The purpose of this study was to identify such variables. This study used a cross-sectional research design involving 375 alcohol-dependent smokers who had received smoking cessation intervention from health care providers. The participants were selected using the convenience sampling technique, and a multistage random sampling was used to select two hospitals, and the Thailand National Quit-line for involvement in this study. All participants completed five questionnaires: 1) the Processes of Change Questionnaire (PCQ), 2) the Self-efficacy Questionnaire (SEQ), 3) the Decisional Balance Questionnaire (DBQ), 4) the Severity of Alcohol Dependence Questionnaire (SADQ), and 5) the Fragestrom Test for Nicotine Dependence (FTND). The acquired data was analyzed using percentages, means, standard deviations, and discriminant analysis. The major findings of the study were as follows: the variables that could discriminate between the „quitter“ and “non-quitter” groups among Thai alcohol-dependent smokers, at the 0.05 significance level were process of behavior change, nicotine dependency, self efficacy and decisional balance. Furthermore, alcohol-dependent smokers in the “quitter” group were found to possess lower levels of nicotine dependence, higher score of process of behavior change, higher levels of self efficacy and higher decision-making abilities than those in the non-quitter group. The findings suggested that smoking cessation intervention strategies for Thai alcohol-dependent smokers should target the process of behavior change, nicotine dependence, self efficacy and decisional balance. However, level of alcohol dependence among alcohol dependent smokers was not significantly able to discriminate between quitter and non-quitter groups. Future studies should consider for develop the effective smoking cessation intervention for this population.

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Selection and peer-review under responsibility of the Organizing Committee of WCES 2014

*Keywords:* quitter, non-quitter, smoking cessation, discriminant variable, alcohol dependence

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## 1. Introduction

Nicotine dependence is an important issue for alcohol-dependent patients. Eighty percent of people with alcohol

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dependence are also smokers, and 30% of smokers are also alcohol dependent (Romberger & Grant, 2004). When alcohol dependence occurs alongside smoking, it can present more serious health concerns than with non alcohol-dependent smokers (John, & Hanke, 2002). Moreover, alcohol and nicotine codependency can become more complex and difficult to treat than either nicotine or alcohol addiction alone (Schmidt, & Smolka, 2001; Hillemacher, et al., 2006). Both nicotine and alcohol are classified as dependence producing substances, which means that heavy users may find it difficult to quit, and may continue to use these substances despite it being seen as problematic. Le and colleagues (2006) found that repeated administrations of nicotine stimulated alcohol consumption. Often, drinking and smoking simultaneously may seem like automatic behavior (Room, 2004), which can be explained using the classical conditioning model. Drinking may enhance nicotine cravings in cigarette smokers, and, likewise, the experience accompanying alcohol abuse could also serve as a conditioned stimulus for smoking in the classical conditioning sense, thus reinforcing the smoking and drinking interaction (Burton, & Tiffany, 1997). Heavy drinking is related to heavy smoking, and the negative health consequences of these dependencies are simultaneously becoming both increasingly common and increasingly severe. Several researchers have recommended smoking cessation interventions as an effective way to avoid the severe health consequences of smoking. Smoking cessation intervention among alcohol-dependent smokers in particular is seen as a principle strategy to prevent negative outcomes from many associated diseases, alongside efforts to abstain from alcohol dependence (Bobo, Mcilvain, Lando & Leed-Kelly, 1998; Burling, Burling & Latini, 2001; Cooney, Cooney, Pilkey, Kranzle & Oncken, 2003). In comparison with non alcohol-dependent smokers, alcohol-dependent smokers have lower success rates for smoking cessation. Previous studies have shown that, while the majority of alcohol-dependent smokers express a desire to stop smoking, only a few are successful in doing so. Additionally, alcohol-dependent smokers have been found to have a higher severity of dependence (John, Meyer, Rumpf & Hapke, 2003), and a lower rate of smoking cessation than non alcohol-dependent smokers (Ellingstad, Sobell, Sobell, Cleland & Agrawal, 1999). It is possible that alcohol-dependent smokers may experience an urge to smoke in response to the discomfort associated with the urge to drink, which could explain this relationship. A better understanding about the discriminate variables for the „quitter“ and „non-quitter“ smoking groups could help to clarify these findings. In Thailand, previous data has been collected about the prevalence of smoking cessation and alcohol consumption cessation separately. However, as of yet there is no data available for the prevalence of smoking cessation among alcohol-dependent smokers. Hence, it is now critical to assess the factors involved in smoking cessation for Thai alcohol-dependent smokers. The purpose of this study is to determine which variables are able to discriminate between the „quitter“ and „non-quitter“ groups among Thai male alcohol-dependent smokers, and the findings will contribute useful knowledge for designing effective smoking cessation interventions to benefit and assist these individuals.

### *1.1 Hypotheses*

1. Significant differences will be found between the „quitter“ and „non-quitter“ groups for nicotine dependence, severity of alcohol dependence, self-efficacy, decisional balance, and process of behavior change among Thai alcohol-dependent smokers.
2. Lower levels of nicotine dependence, lower levels of severity of alcohol dependence, higher levels of self-efficacy, higher levels of smoking cessation decision-making (decisional balance), higher strategy intensity, and lower frequency of use for quitting smoking (process of behavior change) will discriminate between the „quitter“ and „non-quitter“ groups among Thai alcohol-dependent smokers.

## **2. Materials and Methods**

This study uses a cross-sectional research design to identify the variables that discriminate between the „quitter“ and „non-quitter“ groups among Thai alcohol-dependent smokers.

### 3. Participants and Procedure

The participants were all alcohol-dependent smokers who had received smoking cessation intervention from health care providers for one month. Alcohol-dependent smokers were identified as having a score of 20 or above on the Alcohol Use Disorders Identification Test (AUDIT). According to the current research setting in Thailand, the data records for co-morbid alcohol and nicotine dependence were separated. Most of the alcohol-dependent smokers involved in this study had received smoking cessation intervention from the following three main settings: 1) drug dependence treatment centers, 2) general hospitals, and 3) smoking cessation services. Multistage random sampling was used to select one drug dependence treatment center and one general hospital, and the Thailand National Quit-line was selected as the national smoking cessation service. The participants in this study were selected using a convenience sampling technique. Discriminant function analysis was selected as the statistical procedure. The sample size was estimated from the number of parameters for estimation and required at least 20 participants per variable studied (Hair, 1998). In addition, the total sample size was increased by 25% to account for potential drop-outs. Therefore, the current study had a total sample of 375 Thai alcohol-dependent smokers (drug dependence treatment centers: n=125, general hospitals: n=125, and smoking cessation services: n=125). Ethics approval for this study was sought and obtained from The Human Research Board of the Royal Thai Navy Medical Department and The Ethics Review Committee Research Board of the Princess Mother National Institute on Drug Abuse Treatment (PMNIDAT).

#### 3.1 Instruments

A self-report questionnaire was used to discriminate between the two groups, „quitter“ and „non-quitter,“ among participants. Smoking cessation was measured using the question: “have you smoked a cigarette in the last 7 days?” An answer of “no” indicated that the participant has successfully stopped smoking for seven days (Seven-day point prevalence abstinence: Quitter) and answer of “yes” indicated that the participant has not stopped smoking for seven days (Non-quitter). The Fagerstrom Test for Nicotine Dependence (FTND) consists of 6-items which measure nicotine dependence in adults using five score-levels: very high dependence (scores of 8-10), high dependence (scores of 6-7), medium dependence (score of 5), low dependence (scores of 3-4) and very low dependence (scores of 0-2). The reliability (Cronbach’s Alpha) of the instrument was 0.84 in this research study. The Severity of Alcohol Dependence Questionnaire (SADQ) (Stockwell, Murphy, Hodgson, 1983) was translated and back-translated into a Thai version by Wongsang et al. (2013). This questionnaire measures the severity of alcohol dependence using questions covering the following five aspects of dependency syndrome: 1) physical withdrawal symptoms, 2) affective withdrawal symptoms, 3) relief drinking, 4) frequency of alcohol consumption, and 5) speed of onset of withdrawal symptoms. Each question is rated on a four-point scale: Almost never – 0, Sometimes – 1, Often – 2, Nearly always – 3, with a score of 45 or higher indicating "very severe dependence," a score of 31-44 indicating "severe dependence," a score of 20-30 indicating "moderate dependence," a score of 4-19 indicating "mild dependence," and a score of 0-3 indicating "no dependence." The reliability (Cronbach’s Alpha) of the instrument was 0.93 in this research study. The Processes of Change Questionnaire, PCQ (Prochaska, Velicer, Diclemente, Fava, 1988), Decisional Balance Questionnaire, DBQ (Velicer, DiClemente, Prochaska, & Brandenburg, 1985), and Self-Efficacy Questionnaire (Velicer, Diclemente, Rossi, & Prochaska, , 1990), SEQ for smoking were translated and back-translated into Thai versions by Siriwong et al. (2012). The reliabilities (Cronbach’s Alpha) of these instruments were 0.89 for the PCQ, 0.84 for the DBQ, and 0.92 for the SEQ in this research study. The Process of Change Questionnaire (PCQ) is a 40-item questionnaire assessing ten processes, on a five-point Likert scale, of current frequency of use in the past month, including consciousness raising, dramatic relief, environmental re-evaluation, social liberation, self re-evaluation, stimulus control, helping relationships, counter conditioning, reinforcement management, and self-liberation, with scores ranging from 40 to 200 points. The Decisional Balance Questionnaire (DBQ) is a 20-item questionnaire assessing participants’ views about ten positive aspects („pros“) and ten negative aspects („cons“) of smoking. Participants rated how important each statement was to them on a 5-point Likert scale from (1) “Not Important” to (5) “Extremely Important.” A sample „pro“ of smoking read, “After not smoking for a while, a cigarette makes me feel great,” and a sample „con“ of smoking read “I’m foolish to ignore the warnings about cigarettes,” with scores ranging from 20 to 100 points. The Self-Efficacy Questionnaire (SEQ) is a 20-item questionnaire assessing self-efficacy in refraining from smoking in various situations. The scale consists of three situational factors: positive/social, negative/affective, and habit/addictive. Participants were asked

to indicate how confident they were that they could avoid smoking in each situation using a Likert scale that ranged from 0 (not at all confident) to 5 (extremely confident), with scores ranging from 20 to 100 points, and higher scores indicating greater self-efficacy.

### 3.2 Data analysis

The research data was analyzed employing SPSS (Statistical Product and Service Solutions) for Windows Version 17 for descriptive statistics and a Discriminant Analysis stepwise method technique. The independent variables were severity of alcohol dependence, nicotine dependence, processes of behavior change, self-efficacy and decisional balance.

## 4. Results

### 4.1 General characteristics of the population

The participants in this study consisted of 375 Thai alcohol-dependent smokers. The overall ages of the participants ranged from 16 to 65 years (mean=36.30 years, SD=9.61) and approximately half had completed primary education (44.9%).

### 4.2 Smoking Status

As shown in Table 1, the alcohol-dependent smokers who participated in this study began smoking at the mean age of 16.32 years, with a maximum age of 35 years, and a minimum age of 13 years. Analysis of smoking frequency was focused on the „non-quitter“ group. A large percentage of participants in this group were regular smokers who consumed at least one cigarette everyday (82.06%), while 17.94% were occasional smokers who smoked cigarettes less frequently than once a day. More than half of the non-quiters smoked up to ten cigarettes per day (60.54%), and almost half smoked their first cigarettes in the morning, less than five minutes after waking (50.28%). Most of the non-quitter participants (34.27%) were classified in the „low nicotine dependence“ level by the FTND test.

### 4.3 Discriminant analysis

Discriminant analysis was used to classify the two groups „quitter“ and „non-quitter“ among Thai alcohol-dependent smokers. One function was produced based on the 375 participants with valid data, and the overall analysis correctly classified 95.7% of the cases (99.2% of „quitter“, 94% of „non-quitter“). The function was significant, with a Wilk's test value of 0.246, and  $\chi^2 = 517.213$ ,  $p < 0.001$ . Further details for each of the variables are presented in Table 2. Table 3 displays the standardized canonical discriminant function coefficients, which show that process of behavior change, nicotine dependence, self-efficacy and decisional balance were the discriminating variables for differentiation between the „quitter“ and „non-quitter“ groups. The alcohol-dependent smokers in the „quitter“ group showed lower levels of nicotine dependence, higher levels of self-efficacy, and higher decision-making abilities than those in the „non-quitter“ group.

## 5. Discussion

The results from this study demonstrate significant differences between „quitter“ and „non-quitter“ smoking groups regarding certain specific variables. The „quitter“ group participants showed significantly lower levels of nicotine dependence, higher levels of self-efficacy, and higher decision-making abilities than those in the „non-quitter“ group. These findings are consistent with previous studies regarding levels of nicotine dependence (Novy, Hughes & Calla, 2001; Hughe, Rose, & Callas, 2000), self-efficacy (Manfredi, Cho, Crittenden & Dolecek, 2001; Fava, Velicer & Prochaska, Badr, & Moody, 2005), and decisional balance (Prochaska, et al., 1994; Lafferty, Heaney & Chen, 1999). In fact, level of nicotine dependence is associated with smoking cessation in that smokers with a high level of nicotine dependence are more likely to experience nicotine cravings that will stimulate them to smoke. Alcoholic smokers in particular were found to be more dependent on nicotine, and had more internal (affective)

barriers to smoking cessation than smokers with no history of alcohol dependence. In addition, numerous studies present alcohol-dependent smokers as scoring higher on the FTND test, and meeting a greater number of nicotine dependence criteria than smokers with no history of alcohol dependence. Furthermore, several studies have demonstrated that smokers with alcohol dependence have a higher level of nicotine dependence. This relationship could be explained by the finding that nicotine appears to have a more potent reinforcement effect in smokers who have alcohol dependence. Moreover, Leed-Kelly et al. (1996) found that the Fagerstrom Test for Nicotine Dependence score was a predictor for smoking cessation among recovering alcoholics. A high level of self-efficacy was found to be related to smoking cessation among the participants in this study. This finding agrees with Manfredi et al.'s (2007) study which found that situational self-efficacy increases self-confidence towards stopping smoking. As a result, smokers may have to learn how to refrain from smoking in specific, negatively-affecting situations so as to build a more generalized confidence, which in turn will increase their ability to quit smoking successfully. Similarly, a study by Boardman et al. (2005) shows that smokers with low situational self-efficacy and confidence in their ability to quit smoking were less likely to succeed in smoking cessation than those who had high self-efficacy. Furthermore, Martin et al. (2005) investigated the predictors of smoking cessation in patients who were previously participating in residential treatment for alcohol dependence, and their results showed self-efficacy to be among the predictors of smoking cessation in alcohol-dependent smokers ( $r=0.49$ ,  $p<0.0001$ ). Decisional balance is a measure of the importance of reasons and concerns relating to making changes in behavior. The Decisional Balance Questionnaire used in this study assessed participants' perceived utilitarian gains and losses to self, gains and losses to others, and approval and disapproval from self and important others with regards to smoking. Those individuals who continued to smoke (non-quitters) despite exposure to cessation intervention appeared to have more positive beliefs about smoking, which perhaps outweighed the benefits of smoking cessation for these individuals. The results of this study showed that the two factors, severity of alcohol dependence cannot discriminate between the „quitter“ and „non-quitter“ groups among Thai male alcohol-dependent smokers. The severity of alcohol dependence variable was not able to discriminate between the „quitter“ and „non-quitter“ groups, which did not support the hypothesis. This finding can possibly be explained by the observation that alcohol-dependent smokers who were interested in quitting smoking perhaps displayed a high level of alcohol dependence because they were ready to change their behavior, or because they were interested in stopping smoking. This is supported by Ellingstad et al. (1999), who found that alcohol abusers who were interested in quitting smoking cigarettes while in treatment for alcohol dependence responded differently to treatment when compared with those who did not desire to stop smoking, and as such this may have influenced their ability to successfully address both problems simultaneously. Moreover, a report by Batel et al. (1995) found that there was a significant relationship between severity of alcohol dependence and nicotine dependence. Consequently, alcohol and nicotine dependence may reciprocally influence and increase the severity of one another. Further research is necessary to evaluate the relationships between severity of alcohol dependence, level of nicotine dependence, intention to stop smoking, and intention to deal with dual cessation (both of drinking and smoking), in order to gain greater understanding of the factors influencing smoking cessation in the alcohol-dependent smoker population.

## 6. Conclusion

The four variables that could significantly discriminate between the „quitter“ and „non-quitter“ groups among Thai alcohol-dependent smokers were process of behavior change, nicotine dependence, self-efficacy, and decisional balance. Based on the results from this study, it is recommended that Thailand health policy makers should provide tailored support for smoking cessation among alcohol-dependent smokers, especially in alcohol consumption cessation clinics. Such support would encourage this population to achieve the cessation of both smoking and drinking with higher success rates than would be achieved through addressing drinking cessation and smoking cessation separately.

## References

- Badr HE, Moody PM., (2005). Self-Efficacy: A Predictor for smoking cessation Contemplators in Kuwaiti Adults. *International Journal of Behavioral Medicine*. 12(4): 273-277.
- Batel P, Pessione F, Maitre C, Rueff B. (1995). Relationship between alcohol and tobacco dependencies among alcoholics who smoke. *Addiction*. 1995; 90: 977-980.

- Boardman T, Catley D, Mayo M S, Ahluwalia J S. (2005) Self-efficacy and motivation to quit during participation in a smoking cessation program. *International Journal of Behavioral Medicine*. 12(4): 266-272.
- Bobo JK, McIlvain HE, Lando HA, Leed-Kelly, A. (1998) Effect of smoking cessation counseling on recovery from alcoholism: Findings from a randomized community intervention trial. *Addiction*. 93(6):877– 87.
- Burling TA, Burling AS, Latini D. A (2001). Controlled Smoking Cessation Trial for substance- dependent inpatients. *J Consult Clin Psycho*. 69(2):295–04.
- Burton SM, Tiffany ST. (1997). The effect of alcohol consumption on craving to smoke. *Addiction*. 92: 15-26
- Cooney JL, Cooney NL, Pilkey DT, Kranzler HR, Oncken CA., (2003) Effects of nicotine deprivation on urges to drink and smoke in alcoholic smokers. *Addiction*. 98(7):913–21.
- Ellingstad TP, Sobell LC, Sobell MB, Cleland PA, Agrawal S., (1999). Alcohol abusers who want to quit smoking: Implications for clinical treatment. *Drug and Alcohol Dependence*. 54: 259-64.
- Fava JL, Velicer WF, Prochaska JO., (1995). Applying the transtheoretical model to a representative sample of smokers. *Addictive Behaviors*. 20(2): 189-203.
- Hair, J.F., Anderson, R.E., Tatham, R.L., & Black, W.C. (1998). *Multivariate Data Analysis* (5th ed.). *Upper Saddle River*, New Jersey: Prentice Hall
- Hillemacher T, Bayerlein K, Wilhelm J, Frieling H, Thurauf N, Ziegenbein M, Kornhuber J, Bleich S., (2006). Nicotine dependence is associated with compulsive alcohol craving. *Addiction*. 101: 892-97.
- Hughes JR, Rose GL., Callas PW. (2000). Nicotine is more reinforcing in smokers with a past history of alcoholism than in smokers without this history. *Alcohol. Clin. Exp. Stud*. 24: 1633-1638.
- John U, Hanke M. Tobacco, (2002). smoking- and alcohol drinking-attributable cancer mortality in Germany. *Eur J Cancer Prev*. 11(1): 11–17.
- John U, Meyer C, Rumpf H, Hapke U., (2003). Probabilities of alcohol high-risk drinking, abuse or dependence estimated on grounds of tobacco smoking and nicotine dependence. *Addiction*. 98: 805-14.
- Lafferty CK, Heaney CA, Chen MS. Assessing decisional balance for smoking cessation among Southeast Asian males in the *United States Health Education Research*. 1999; 14: 139-146.
- Le AD, Li Z, Funk D, Shram M, Li TK, Shaham Y. (2006). Increased vulnerability to nicotine self-administration and relapse in alcohol-native offspring of rats selectively for high alcohol intake. *Journal of Neuroscience*. 26: 1872-79.
- Leed-Kelly A, Russell KS, Bobo JK, McIlvain H., (1996). Feasibility of smoking cessation counseling by phone with alcohol treatment center graduate. *Journal of Substance Abuse Treatment*. 13(3): 203-210.
- MacCallum RC, Lee T, Browne MW., (2010) The issue of isopower in power analysis for tests of structural equation models. *Structural Equation Modeling*. 17: 23-41.
- Manfredi C, Cho YI, Crittenden KS, Dolecek TA. (2007). A path model of smoking cessation In women smokers of low socio-economic status. *Health Education Research*. 22(5): 747-56.
- Martin RA, Rohsenow DJ, MacKinnon SV, Abrams DB, Monti PM., (2006). Correlates of motivation to quit smoking among alcohol dependent patients in residential treatment. *Drug and Alcohol dependence*. 83: 73-78.
- Novy P, Hughes JR, Callas P. A.,(2001). Comparison of recovering alcoholic and non- alcoholic smokers. *Drug and Alcohol Dependence*. 65: 17-23.
- Prochaska JJ. (2010). Failure to treat tobacco use in mental health and addiction treatment settings: A form of harm reduction? *Drug and Alcohol Dependence*. 110: 177-82.
- Prochaska JO, Velicer WF, Diclemente CC, Fava J. Measuring processes of change: Applications to the cessation of smoking. *Journal of Consulting and Clinical Psychology*. 1988; 56: 520-528.
- Romberger D, Grant K., (2004). Alcohol consumption and smoking status: the role of smoking cessation. *Biomedicine & Pharmacotherapy*. 58: 77-83.
- Room R. Smoking and drinking as complementary behaviors. *Biomedicine & Pharmacotherapy*. 2004. 58: 111-15.
- Schmidt LG, Smolka M., (2001). Relapse prevention in alcoholics by cigarette smoking? *Involvement of nicotinic-dopaminergic mechanisms*. *Alcohol*. 24: 111-15.
- Schumann A, Meyer C, Rumpf H, Hannover W, Hapke U, John U., (2005). Stage of Change Transition and Processes of Change, Decisional Balance, and Self-Efficacy in Smokers: A Transtheoretical Model Validation Using Longitudinal Data. *Psychology of Addictive Behaviors*. 19(1): 3-9.
- Stockwell T, Murphy D, Hodgson R., (1983). The severity of alcohol dependence questionnaire: Its use, reliability and validity. *British Journal of Addiction*. 78(2): 45-156.
- Velicer WF, DiClemente CC, Prochaska JO, Brandenburg N. A., (1985). decisional balance measure for assessing and predicting smoking status. *Journal of Personality and Social Psychology*. 48: 1279-1289.
- Velicer WF, Diclemente CC, Rossi JS, Prochaska JO., (1990). Relapse situations and self-efficacy: An integrative model. *Addictive Behaviors*. 15: 271-283.