

ORIGINAL ARTICLE

Predicting Factors of Quit Attempt in Thai Schizophrenic Smokers

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ABSTRACT

The purpose of this cross-sectional study was to identify the predicting factors of quit attempt among Thai inpatient schizophrenic smokers. Multistage random sampling was used in the Department of Mental Health, Ministry of Public Health of Thailand. Six tertiary psychiatric hospitals were randomly selected from all regions of Thailand, and 400 schizophrenic smokers were selected by the purposive sampling technique. Data were collected from April to September of 2015. All participants completed 12 questionnaires, with reliability ranging from 0.72 to 1.00, and Scale-Content validity index ranging from 0.86 to 1.00. The acquired data was analyzed using descriptive statistics and multiple regression analysis, with a significant level of $\alpha = 0.05$. The results revealed that nearly half of the participants had smoked 1-10 cigarettes per day (49.30%). Moreover, four of nine variables, readiness to quit ($r = .64$; $p < .01$), nicotine dependence ($r = -.28$; $p < .01$), motivation to quit ($r = .26$; $p < .01$), and intensity of smoking cessation intervention ($r = .16$; $p < .01$) – were significantly correlated with quit attempt among Thai smokers with schizophrenia. The model summary illustrates that the predictors could explain variance of quit attempt and accounted for 47.30 ($R^2 = .473$). The results suggested that mental health care providers should be aware of the significant effects of readiness to quit, nicotine dependence, motivation to quit, and intensity of smoking cessation intervention on quit attempt, and develop appropriate smoking cessation interventions to promote quit attempt in smokers with schizophrenia.

KEYWORDS: Predicting factors, Quit attempt, Schizophrenic smokers

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INTRODUCTION

Cigarette smoking in psychiatric patients, particularly among those with a diagnosis of schizophrenia, is a particularly complex behavior, with alarmingly high rates. The smoking rate among psychiatric patients is up to three times higher than in the general population, with smoking prevalence between 40% and 85%, and these patients also more dependent on nicotine ([1-6]. As reported in a Thai psychiatric hospital, the rates of smoking in schizophrenia inpatients were 71.42% in the male group and 18.18% in the female group [7]. In addition, Klongchai [8] reported files record in year 2008 that 68.02% of schizophrenia inpatients at the Somdet Choapraya Institute Psychiatric were smokers.

Schizophrenia patients had begun smoking at an early age at of about 18 years old and had been daily smokers before they were first diagnosed with a mental illness, and there were less likely to think about stopping smoking [9]. In addition, individuals with schizophrenia smoke more heavily and have higher nicotine dependence. This group has less success in quitting smoking than the general population [1, 10-14].

Quitting smoking has significant health benefits for current smokers with schizophrenia [15]. Quitting smoking is very hard for those with schizophrenia because of the greater nicotine addiction. Quit attempt is the main point related to success for quitting smoking [16, 17]. It has been suggested that quit attempt is a good indicator of quitting and smoking cessation [18]. The evidences stated defines quit attempt as quitting for at least 24 hours, and the number of times that the smokers stopped smoking for

at least 1 day or 24 hours [19, 20]. Smokers with schizophrenia who made any quit attempt that lasted longer than 24 hours were more likely to succeed in quitting smoking and maintaining long term abstinence than those who had not made any quit attempt. The possible way to success in quitting smoking in smokers with schizophrenia is to encourage them to make a quit attempt, which is the precursor of quitting [21]. Therefore, the predictors of quit attempt need to be examined.

Most evidences found that smokers with schizophrenia are more likely to face smoking-related illness at twice the rate of same-aged adults without mental illness [22, 23]. Smoking interferes with medication treatment benefits, and is associated with poor treatment response, higher level of non-compliance with drug regimens [24, 25], and higher prescribed antipsychotic medication doses than among non-smokers [26-28]. Additionally, smokers with schizophrenia also experience greater medication side effects such as tremors, rigidity, parkinsonism, and tardive dyskinesia [29, 30], and exhibit more positive symptoms such as hallucination and illusion, greater attempted suicide rates in patients with schizophrenia [31, 32], and greatly increased numbers of psychotic relapse [33]. Therefore, encouraging quit attempt in smoker with schizophrenia can decrease the mortality and morbidity from smoking-related illness and poor response to psychotropic medication.

Based on analysis of literature review, psychological symptoms such as depression, positive symptom, and negative symptom have been observed to influence on quit attempt in smokers with schizophrenia. Other variables such as being a household smoker [34], motivation to quit [35], readiness to quit [16], intensity of smoking cessation intervention [36, 37], alcohol consumption [16, 34], and nicotine dependence factors [36, 38] have also been identified as significant in predicting quit attempt in smokers with schizophrenia. In summary, the predictors that affect quit attempt remain unclear. If the cause for low quit attempt is identified, then specific interventions to increase quit attempt in smokers with schizophrenia can be developed. Therefore, this study aims to examine the factors predicting of quit attempt among Thai inpatient schizophrenic smokers.

The benefit of identification of factors significantly associated with successful smoking cessation in smokers with schizophrenia may lead to mental health nurses conducting the smoking cessation counseling derived from these related factors. The findings may lead to the ability to optimize counseling intensive to increase the probability of successful cessation in those patients who smoke heavily, and have a heavy burden of smoking-related illness.

MATERIALS AND METHODS

This study used a cross-sectional research design to identify the factors predicting quit attempt among Thai inpatient smokers with schizophrenia. This study was conducted among inpatient smokers with schizophrenia by using a multi-stage sampling method to select the psychiatric hospital, Department of Mental Health, Ministry of Public Health, from all regions. As a result, six hospitals were selected to participate in this study. Four hundred were recruited by purposive sampling based on following the inclusion criteria: (1) diagnosis with schizophrenia using DSM IV-TR criteria, (2) current smoker status (smoking at least one cigarette per day within a month before admission), (3) aged between 18 to 60 years old (both male and female), (4) admission as an inpatient, (5) allowed to participated in telephone interview after hospital discharge, (6) able to communicate in and understand the Thai language, and (7) willing to participate in this study. Participants were excluded if they met any of the following criteria; (1) re-admission within one month after discharge, and (2) out of contact by telephone within one month after discharge.

Sample size

The sample size determination was based on the parameters estimated in the hypothesized model. According to Hair and colleagues, an appropriate ratio was 10 to 20 respondents for each estimated free parameter [39]. In this study, the hypothesized model contained 34 free parameters; thus, a sample size of 340 to 680 was required. Therefore, a total sample of 340 smokers was recruited, 100% of the total sample size was added to take into account drop outs to arrive at a true population value. Thus, 400 participants were invited to participate in this study.

Procedure and measures

The data collection began after approval from the Ethics Committee, of the Chulalongkorn University Institutional Review Board, and the Ethics Committee of six psychiatric hospitals were obtained. Permission was also obtained from the directors of each setting. Data collection took place from April to September of 2015.

The twelve questionnaires were used to identify predictors related to quit attempt among participants which included; 1) *The Demographic form*, 2) *The Smoking-related information form*, 3) *The Quit attempt form*. Quit attempt defined as the number of times that schizophrenic smokers stopped smoking at least

24 hours within seven days after hospital discharged. The scoring was interpreted as number of times that schizophrenic smokers stopped smoking at least 24 hours, 4) *The Household smoker questionnaire*. Response categories as 0 (having others smoker in the household), or 1 (not having others smoker in the household), 5) *The Intensity of smoking cessation intervention questionnaire*. The single items divided level of smoking cessation intervention into four levels smoking cessation intervention that schizophrenia smokers received from healthcare professions. The scoring was dichotomized into 0-4, 6) *The Reasons for Quitting (RFQ)*. This questionnaire was developed by Curry, Wagner [40] In this study, after received permission from the author, it was translated and back-translated into Thai language by the experts, following The Brislin's model [41]. This questionnaire consists of 20 items. The RFQ had a five-point Likert scale, ranging from 0-4, 7) *The Readiness to Quit Ladder*. This ladder was developed by Biener and Abrams [42]. In this study, after received permission from the author, it was translated and back-translated following The Brislin's model (1970). It was a measure with 10 response options that assessed thoughts that smokers have about quitting. The response options ranging 1-10, 8) *The Alcohol Use Disorders Identification Test (AUDIT)*. It was a 10-item assessing alcohol problem. The participant's response to each item on a five-point Likert ranging from 0 to 4. The resulting range of score was from 0-40, 9) *The Fagerstrom Test for Nicotine Dependence (FTND)* from Heatherton, Kozlowski [43]. It was a 6-item which was measured nicotine dependence in adults. Scoring ranging from 0 to 10, 10) *The Positive symptom rating scale (PSRS)*- This questionnaire was developed by Ventura J [44] In this study, after received permission from the author, it was translated and back-translated following The Brislin's model (1970). It was a 4-item screening which was measured positive symptom. For each item, the subjects respond to each item from 1(absent) -7 (severe). Total score ranging from 4-28, 11) *The Negative symptom assessment (NSA-4)*- This questionnaire was developed by Alphs, Morlock [45] . In this study, after received permission from the author, it was translated and back-translated following The Brislin's model (1970). It was a four-item screening measure negative symptom. For each item, the subjects respond to each item from 1 (absent) -6 (severe). Total score ranging from 4-24, and 12) *The Calgary Depression Scale for Schizophrenia (CDSS)*-Thai version modified by Suttajit, Srisurapanont [46], from the original version of Addington, Addington [47]. It consisted of nine items assessment. For each item, the subjects respond to each item from 1 (absent) -3 (severe). Total score ranging from 0-27.

In this study, the content validity of each questionnaire was approved by seven experts in the area of smoking cessation in psychiatric patients with S-CVI ranging from 0.86 to 1.00 The reliability of each questionnaire was tested to establish internal consistency with reliability ranging from 0.72 to 1.00, for 30 smokers with schizophrenia with similar characteristics those of participants at Nakhon Ratchasima Rajanagarindra Psychiatric Hospital (IRB on January/2558).

Ethical consideration

This study was approved by the Institutional Review Board of Chulalongkorn University (COA NO. 018.1/2558), and the Institutional Review Board of six psychiatric hospital research settings (IRB on April/2558, IRB NO.050/2558, IRB NO.0811/1345, IRB NO.2/2558, IRB NO.004/2558, and IRB NO.3/2558. Ethical considerations were maintained throughout the study including verbal and written informed consent from the participants before the interview and after explaining the purpose of the study and assuring confidentiality and anonymity.

Statistical analysis

Data were analyzed using the Statistical Package for the Social Sciences for Windows program. Descriptive statistics were used to analyze the sample characteristics, and Pearson r correlation and stepwise multiple regression analysis were used to determine correlations between relevant variables, with a significance level at $\alpha = 0.05$.

RESULTS AND DISCUSSION

Characteristics of smokers with schizophrenia

As shown in Table 1, among 400 Thai inpatient smokers with schizophrenia, the majority were male (94.50%). Around 40% were aged between 30 and 39 years. Around 70% of them were single. Moreover, one-third of the participants (37.80%) worked as employees. Half of them had completed high school (52.20%). Approximately three quarters of them lived with their parents (67.30%). About three quarters (77.33%) of them were admitted in psychiatric hospitals between 1 to 5 times. Nearly half of them were ill for 1-5 years (44.00%).

Smoking related participant information

As shown in Table 2, the majority of the participants began smoking before the age of 20 (88.30%). Around half of them smoked less than 10 cigarettes per day (49.30%), and 36.80% had been smoking for 11-20 years. Moreover, one-third of them (35.50%) smoked combined both factory and roll your own

cigarettes. Most reported taking no smoking cessation medication (96.30%). One third of them (35.69%) were hazardous drinkers, and one third of them (30.80%) were classified as having low level nicotine dependence.

Factors predicting of quit attempt in the participants

As shown in Table 3, correlation matrix among the independent variables showed that readiness to quit had a significant positive correlation with quit attempt ($r = .64$; $p < .01$), nicotine dependence had a significant negative correlation with quit attempt ($r = -.28$; $p < .01$), motivation to quit had a significant positive correlation with quit attempt ($r = .26$; $p < .01$), and intensity of smoking cessation intervention had a significant positive correlation with quit attempt ($r = .16$; $p < .01$). In Table 4, the final model to predict quit attempt was a combination of readiness to quit, nicotine dependence, motivation to quit, and intensity of smoking cessation. This accounted for 47.30% of variance in quit attempt in smokers with schizophrenia ($R^2 = .473$, $F=4.77$, $p < .05$). The model indicating that readiness to quit, nicotine dependence, motivation to quit, and intensity of smoking cessation could predict quit attempt was statistically significant. Regarding Table 5, the standardize score formation was as follows: Quit attempt = .591 Readiness to quit - .224 Nicotine dependence + .082 Intensity of smoking cessation Intervention + .083 Motivation to quit. The predicting equation was as follows: Quit attempt = .456 + .633 Readiness to quit - .284 Nicotine dependence + .274 Intensity of smoking cessation Intervention + .481 Motivation to quit.

Table 1 Number and percentage of subjects' demographic characteristics (n=400)

Characteristics	Number	Percentage
Age (years)		
Less than 20	6	1.50
20-29	113	28.30
30-39	153	38.30
40-49	99	24.80
50-59	25	6.30
More than 59	4	1.00
Gender		
Male	378	94.50
Female	22	5.50
Marital status		
Single	282	70.50
Marriage	51	12.80
Widowed/Divorced/Separated	67	16.80
Occupation		
Unemployed	105	26.30
Government official	4	1.00
Employee	151	37.80
Business employee	3	0.80
Merchant	23	5.80
Agriculturist	99	24.80
Own business	9	2.30
Other	6	1.50
Education level		
No education/ unletter	7	1.80
Elementary education	151	37.80
High school	210	52.50
Bachelor's degree	32	8.10

(n=400)Table 2 Number and percentage of subjects' smoking related information

Characteristics	Number	Percentage
Age when smoking began (years)		
Less than 20	353	88.30
20-29	39	9.80
30-39	5	1.30
40-49	3	0.80
Duration of smoking (years)		
1-10	79	19.80
11-20	147	36.80
21-30	127	31.80
31-40	39	9.80
41-50	8	2.00

Type of cigarette		
Factory	133	33.30
Roll your own	125	31.30
Combined (Factory and Roll your own)	142	35.50
(n=255)Alcohol consumption level		
Low risk drinker	80	31.37
Hazardous drinker	91	35.69
Harmful use	30	11.76
Alcohol dependence	54	21.18
Nicotine dependence level		
Very low dependence	91	22.80
Low dependence	123	30.80
Medium dependence	54	13.80
High dependence	103	25.80
Very high dependence	29	7.30

Table 3 Correlation matrix among the independent variables (n=400)

Variables	1	2	3	4	5	6	7	8	9	10
Quit attempt	1									
Household smoker	-.030	1								
Positive symptom	-.003	-.063	1							
Negative symptom	-.081	-.001	.291**	1						
Depression	-.040	-.031	.417**	.360**	1					
Alcohol consumption	-.023	.031	-.002	-.053	.113*	1				
Nicotine dependence	-.275**	-.011	.066	-.037	.092	.070	1			
Readiness to quit	.638**	-.031	.018	-.072	-.009	.024	-.072	1		
Intensity of Intervention	.156**	.059	-.007	.052	.031	-.034	-.055	.104*	1	
Motivation to quit	.255**	-.125*	.014	-.095	-.011	-.064	-.053	.271**	.003	1

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

Table 4 Model summary

Model	R	R ²	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F	df1	df2	Sig. F Change
1	.638 ^a	.408	.406	2.28194	.408	273.872	1	398	.000
2	.678 ^b	.460	.458	2.18075	.053	38.792	1	397	.000
3	.683 ^c	.467	.463	2.17091	.006	4.608	1	396	.032
4	.688 ^d	.473	.468	2.16065	.006	4.770	1	395	.030

a.Predictors: (Constant), Readiness to quit

b.Predictors: (Constant), Readiness to quit, Nicotine dependence

c.Predictors: (Constant), Readiness to quit, Nicotine dependence, Intensity of smoking cessation intervention

d.Predictors: (Constant), Readiness to quit, Nicotine dependence, Intensity of smoking cessation intervention, Motivation to quit

Table 5 Multiple Regression analysis of independent variables on Quit attempt among inpatient schizophrenia smokers

Predictors	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	.456	.325		1.400	.162
Readiness to quit	.633	.041	.591	15.466	.000
Nicotine dependence	-.284	.047	-.224	-6.095	.000
Intensity of smoking cessation Intervention	.274	.124	.082	2.218	.027
Motivation to quit	.481	.220	.083	2.184	.030
R = .688		R ² = .473	SE = 2.16065	F = 4.770	p < .05

DISCUSSION

The findings from this study revealed that some factors determined quit attempt, *Readiness to quit had a significantly positive correlation with quit attempt* ($r = .64; p < .01$). Readiness to quit is one of the major concepts postulated by the Transtheoretical Model [48]. In this study, readiness to quit was defined as the schizophrenic smokers' thought or plan to changing behavior from smoking to stopping smoking. Five stages (along with their definitions of smoking cessation) are pre-contemplation (not seriously considering quitting in the next 6 months), contemplation (seriously considering quitting in the next 6 months or planning to quit in the next 30 days but have not made a quit attempt in the last year), preparation (planning to quit in the next 30 days and have made a quit attempt in the last year), action (quit for at least 24 hours), and maintenance (quit for more than 6 months). The smoker's stage in the change process appeared to be an important predictor of quit attempt. The participants who were in the positive stage transition were more ready to change behavior from smoking to trying to make quit attempt and stop smoking. The preparation and action stages are considered better predictors of smoking cessation outcome. This result is consistent with that of Bobo, Lando [16], who reported that nicotine dependence and stage of readiness to quit smoking predicted quit attempt at $p < .01$. Participants who were in the preparation stage of readiness to change were about 12 times more likely to make a serious quit attempt.

Nicotine dependence had a significantly negative correlation with quit attempt ($r = -.28; p < .01$). Nicotine dependence was defined as the level of severity of addiction to tobacco products caused by nicotine. In fact, level of nicotine dependence is associated with smoking cessation in that smokers with high levels of nicotine dependence are more likely to experience nicotine cravings that will stimulate them to smoke. Most previous studies reported that higher nicotine dependence was associated negatively with making a quit attempt [38, 49]. Nicotine dependence on is the largest factor determining successful quit attempts. The higher the level of nicotine dependence, the harder it is to make a quit attempt [49]. Moreover, the finding was consistent with that of Chandola, Head [50], who found that the degree of nicotine dependence was the strongest predictor smoking cessation. It was also consistent with the finding of Bailey, Bryson [51], who conducted the analyses to determine statistically significant predictors of a successful quit attempt. The results revealed that lower nicotine dependence was predictive of successful quit attempt.

Motivation to quit had a significantly positive correlation with quit attempt ($r = .26; p < .01$). Motivation to quit is an important factor affecting the successful outcome of quit attempt in the general population and in psychiatric patients. Motivation to quit was defined as the desire of smokers with schizophrenia to be interested in stopping smoking stimulated by intrinsic and extrinsic motivation. Having intrinsic concerns about the effect of smoking on health has been shown to predict making a quit attempt [52]. Higher motivation to change has been associated with quitting and greater concern about the negative consequences of smoking [53]. Several studies examined the motivation to quit in the general population and in smokers with psychiatric disorder in the past and today. The finding from Zhou, Nonnemaker [49] identified predictors of quit attempts in 2,431 smokers. The result revealed that, motivation to quit was predictive of quit attempts. Most studies indicated that if the smoker reported more reasons and appeared more highly motivated, he or she made more quit attempts [52, 54]. This is consistent with Kelly, Raley [55], who examined motivation for quitting in non-treatment seeking in smokers with schizophrenia. The results showed that people with schizophrenia who had less reason or concern for health risks associated with smoking were less likely make a quit attempt.

Intensity of smoking cessation intervention had a significantly positive correlation with quit attempt ($r = .16; p < .01$). Smoking cessation intervention was defined as brief advice or psycho-education provided by the mental health care provider to help smokers with schizophrenic stop smoking. Smoking cessation intervention is one predictor of quit attempt in smokers with schizophrenia. More intense of smoking cessation resources were related with quit attempt [56]. Most smoking cessation interventions focused on enhancing readiness to quit and motivation to quit in the general population and in psychiatric patients. Any smoking cessation intervention motivates interest in and regarding intention in quitting. Smoking cessation treatments or the programs are intended to move smokers along the continuum of readiness to quit and to increase or maintain motivation to actively engage in the change process of quitting smoking. Several studies show that smokers who receive high-intensity smoking cessation intervention are more successful in quitting smoking than those who receive low-intensity smoking cessation intervention. Smoking cessation advice and/or counseling given by nurses significantly increase the likelihood of quitting (RR = 1.28, 95% CI 1.18–1.38). Simple advice from a physician has been shown to increase abstinence rates significantly (by 30%) compared to no advice [58]. Likewise, nursing-led interventions for smoking cessation increase by 50% the chances of successfully quitting [59]. Further,

Shah, et al. (2010) conducted a study to examine the effect of clinician advice on quit attempt in hospitalized smokers. The result showed that smokers, who received advice to quit from physicians, were more likely to make a quit attempt than those who received less physician advice. Moreover, Ohakim, Mellon [61] suggest that low intensity interventions would be beneficial for most smokers. Brief smoking cessation advice is needed in hospitals.

CONCLUSION

In conclusion, four variables that could significantly predict quit attempt in smokers with schizophrenia were readiness to quit, nicotine dependence, intensity of smoking cessation intervention, and motivation to quit. Understanding by mental health care providers of the factors that affect quit attempts may be useful for development of an effective intervention that will help smokers with psychiatric and mental health disorder to quit. The strongest variable predicting quit attempt in smoker with schizophrenia is readiness to quit. The results of this study support implementation of intervention in a mental health setting. An advice delivered by a psychiatrist did make an impact on the smokers and their movement through the stage of changes. Smoking cessation programs should be addressed to reduce dependence and help smokers to progress through the stage of changes.

STUDY LIMITATIONS

Although this study yielded a finding that offers value for conducting smoking cessation intervention in psychiatric and mental health groups, it nevertheless has some limitation that need to be addressed. Firstly, intensity of smoking cessation intervention was reported by perception of the participants, there was no qualification for smoking cessation intervention, so it requires further study. Moreover, further study should confirm quit attempt by biochemical verification testing saliva, and CO, and nicotine levels. Additionally, a longitudinal study investigating smoking cessation will be conducted.

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