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Original article

Level of motivation for smoking cessation in hospitalized active smokers at Department of Internal Medicine, King Chulalongkorn Memorial Hospital

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Abstract

Background: Smoking cessation would lead to a decreased rate of re-hospitalization and a decreased risk for many diseases. Limited studies have been conducted on the level of motivation for smoking cessation, especially in the hospitalized active smokers.

Objectives: The aim of the study was to study the level of motivation for smoking cessation in hospitalized active smokers and the associated factors.

Methods: Hospitalized active smoker patients at the Department of Internal Medicine were recruited. Level of motivation of the subjects were assessed by SOCRATES-S. Descriptive statistic was applied to estimate frequency of level of motivation. Questionnaires of demographic data, data regarding current health condition, and smoking related history were assessed to determine association of these factors with the level of motivation.

Results: There were 51 subjects with mean age of 55.6 years. The overall sum score for level of motivation for subjects was mostly in the low-motivation group (86.3%). Looking separately in each three domains of the questionnaires, i.e. the recognition part, the ambivalence part, and the action part, most of the subjects were in the very low motivational group (54.9%, 31.4%, and 58.8% respectively). Presence of nicotine withdrawal symptoms and nicotine dependence were found to be factors associated with level of motivation for smoking cessation ($P = 0.037$).

Conclusion: Eighty-six percent of hospitalized active smoker subjects showed low motivation in smoking cessation. The awareness of this problem gives the space for further intervention to prevent continuation of smoking. The factors that might associate with the level of motivation are the level of nicotine dependence and existence of nicotine withdrawal symptoms.

Keywords: Cigarette, inpatient, motivation, nicotine, smoking cessation.

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Tobacco is a legal substance which is a major risk factor for many diseases. According to the 2019 records of the World Health Organization (WHO), 1.1 billion people are active smokers. Apart from health issues, cigarette smoking could affect smokers financially, socially, and affect the health of their loved ones.[1] Hence, health organizations are actively taking part in raising awareness of motivation to quit smoking. Smoking cessation intervention in hospitals plays an important role. Brief non-pharmacological intervention by the health personnel to increase the patient's level of motivation of smoking cessation has been proven to be an effective method.[2]

With regard to the level of motivation for smoking cessation, there was a large study in Europe reported that 73.5% of smokers wanted to quit smoking which 35.0% wanted to quit immediately.[3] Another study found that among actives smokers who were admitted to a district hospital, only 11.7% were reported to be highly motivated in smoking cessation.[4] Accumulating researches found factors that impact the motivation for smoking cessation included sex, socioeconomic status, marital status, level of education.[5 - 7] Other smoking-related factors which influence the level of motivation are level of nicotine dependence, environment, friends or relatives who also smoke, having withdrawal symptoms, onset of age for smoking, and the level of health concern.[8 - 10]

From literature review, there were few studies regarding the level of motivation in smoking cessation. In Thailand, there was only one study at the outpatient clinic of King Chulalongkorn Memorial Hospital that collected the data on motivation to quit smoking. The result showed that the level of motivation for smoking cessation in active smokers were low[11], however, this is a research finding only from an outpatient clinic. To fill the gap mentioned above, this study aimed to investigate the level of motivation of smoking cessation in hospitalized active smokers at the Department of Internal Medicine. The finding from this study could be useful since hospitalization would provide a lot of time for doctors to perform an effective brief intervention and motivational interviewing.[12] Moreover, the data would be beneficial for the in-progress smoking-free clinic program of the hospital.

Materials and methods

Study design and subjects

In this cross-sectional study, we recruited 51 patients who had been hospitalized at the Department of Internal Medicine, King Chulalongkorn Memorial Hospital (KCMH), between August 2020 to August 2021. We included patients by purposive sampling method, aged from 18 years who are active smokers with history of smoking within one month prior to admission and have regular smoking more than four days per week. Active smokers were identified by nurses or Internal Medicine residents using screening questions from medical records and the investigator would be notified to collect data during the admission. We excluded patients who have severe medical illness with distressing physical symptoms which may limit cooperation such as severe dyspnea, on mechanical ventilator, delirium, or severe pain. We also excluded those who have been admitted to the hospital for more than two months. The study did not include patients with COVID-19 infection. Informed consent was obtained from all subjects before completing the questionnaire. Demographic data, health-related history, smoking-related history, and level of motivation to quit smoking were assessed. Motivational interviewing was done in all subjects, i.e., those who requested for a smoking cessation program, but the ones who have major psychiatric problem would be appointed to follow-up session at psychiatric clinic. The study has been approved by the Institutional Review Board of the Faculty of Medicine, Chulalongkorn University (IRB no. 450/63).

Questionnaires

Data were obtained using questionnaire developed by the researchers. The questionnaire comprised of three parts: demographic data (age, gender, education level, occupation, marital status, employment status), data about current health condition, and smoking related history. Chronic medical underlying disease in the questionnaire was defined as having underlying disease those are vascular-risk factors such as hypertension, dyslipidemia, and diabetes mellitus, or respiratory disease such as chronic obstructive pulmonary disease (COPD) and asthma.

Severity of nicotine dependence was rated by the Fagerström Test for Nicotine Dependence (FTND). The FTND is a standard instrument for assessing the intensity of addiction to nicotine by providing an ordinal measure of nicotine dependence.[13] Thai version of FTND was proved to be highly reliable with the test-retest reliability of 0.83 and Cronbach alpha's of 0.52.[14] It contains six items that evaluate the quantity of cigarette consumption, the compulsion to use, and dependence. In scoring the FTND, yes/no items are

scored from 0 to 1 and multiple-choice items are scored from 0 to 3. The items are summed to yield a total score of 0 to 10. The higher the total FTND score, the more intense the patient's physical dependence on nicotine.

To measure the level of motivation to quit smoking, we used the Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES-S) Thai version, which has been used to assess motivational level for smoking cessation in prior outpatient study.[15] The questionnaire was translated from the Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES) that is used to assess level of motivation for quitting substances[16] with the Cronbach's alpha reliability of 0.927.[15] There are 19 items, each item has score of 1 (strongly disagree) to 5 (strongly agree). Scoring of level of motivation is accomplished by transferring to the SOCRATES-S scoring form and yield 3 categories: Recognition, Ambivalence, and Action. The questionnaire could represent the overall level of motivation for smoking cessation, the level of motivation in transtheoretical model and the level of motivation for smoking cessation in each 3 specific categories.

Statistical analysis

Statistical analysis was done using SPSS version 22.0. Categorical variables were presented as counts and percentage, and continuous variables were presented as mean and standard deviation (SD) or median and interquartile range (IQR). Association between level of motivation of smoking cessation and factors were analyzed by using Fisher's Exact Test. Unpaired *t* - test or Mann-Whitney U Test were used as appropriate for factors those are continuous data. Crude odds ratio and 95% confidence interval were shown for each factor. *P* - value less than 0.05 was considered statistically significant.

Results

Totally, there were 51 subjects with mean age of 55.6. Most subjects were male (84.3%), married (60.0%), employed (80.4%), and had low education (47.1%). All subjects used conventional cigarette. Approximately 43.1% of the subjects were hospitalized due to neurological related diseases and 58.8% had chronic medical underlying disease: 96.1% of the subjects were not obese; most of them did not have history of mood disorder (70.6%) and did not have close friends or family members who were active smoker (88.2%). Regarding the smoking-related data, most of the subjects did not know about the impact of smoking (72.5%), and they used to have history of successful smoking cessation period longer than 1 month (54.9%); 54.9% of them used to have withdrawal symptoms, and 56.9% had other comorbid substances use. FNDT showed that 54.9% had nicotine dependence (FNDT scores > 3 points) and 45.1% show no nicotine dependence (FNDT scores ≤ 3 points). Other detailed baseline demographic and clinical data are demonstrated in Table 1.

Table 1. Demographic and clinical characteristics of subjects.

Part 1: Demographic data Age (years) = 55.6 ± 12.3 (mean ± SD), (Min = 24, Max = 82)		
Variables	**N**	**Percentage**
Gender		
Male	43	84.3
Female	8	15.7
Education		
Lower than elementary school	24	47.1
Secondary school	20	39.2
Bachelor's degree or higher	7	13.7
Marital status		
Single or divorced	20	39.2
Married	31	60.8
Employment		
Employed	41	80.4
Unemployed	10	19.6

Table 1. (Con) Demographic and clinical characteristics of subjects.

Part 2: Health-related condition **Variables**	**N**	**Percentage**
Diagnosis for this admission		
Neurological disease	22	43.1
Cardiovascular disease	11	21.6
Respiratory disease	8	15.7
Others	10	19.6
Chronic medical underlying disease		
Yes	30	58.8
No	21	41.2
Obesity (BMI > 35 kg/m^2)		
Yes	2	3.9
No	49	96.1
History of mood disorder		
Yes	15	29.4
No	36	70.6
Part 3: Smoking-related history		
Pack-year = 25 (median), (Min = 4, Max = 110)		
Variables	**N**	**Percentage**
Know impact of smoking		
Yes	14	27.5
No	37	72.5
Nicotine withdrawal symptoms		
Yes	28	54.9
No	23	45.1
Family or close friends of active smokers		
Yes	6	11.8
No	45	88.2
History of successful smoking cessation period longer than 1 month		
Yes	28	54.9
No	23	45.1
Comorbid other substance use		
Yes	29	56.9
No	22	43.1
Nicotine dependence (FTND)		
Dependence	28	54.9
No dependence	23	45.1

FTND = Fagerström Test for Nicotine Dependence, BMI = body mass index

Table 2 shows level of motivation for smoking cessation of the subjects by using SOCRATES-S questionnaire. The overall sum score for level of motivation for subjects was mostly in the low-motivation group (86.3%). When looking separately in each 3 domains of the questionnaires; the recognition part, the ambivalence part, and the action part; most of the subjects were in the very low motivational group (54.9%, 31.4%, and 58.8% respectively).

According to the univariate analysis, presenting of nicotine withdrawal symptoms and nicotine dependence were found to be factors associated with level of motivation for smoking cessation ($P = 0.037$). Subjects with nicotine withdrawal symptoms and nicotine dependence were shown to have lower level of motivation for smoking cessation (Table 3).

Table 2. Level of motivation for smoking cessation.

Level of motivation	N	Percentage
Recognition Total Score = 27.0 ± 5.6 (Mean ± SD), (Min = 9, Max = 35)		
Very high	0	0.0
High	1	2.0
Moderate	9	17.6
Low	13	25.5
Very low	28	54.9
Ambivalence Total score = 13.2 ± 3.4 (Mean ± SD), (Min = 4, Max = 18)		
Very high	0	0.0
High	9	17.6
Moderate	15	29.4
Low	11	21.6
Very low	16	31.4
Action Total score = 26.6 ± 7.6 (Mean ± SD), (Min = 11, Max = 39)		
Very high	2	3.9
High	5	9.8
Moderate	7	13.7
Low	7	13.7
Very low	30	58.8
Overall level of motivation		
Low	44	86.3
Precontemplation	35	68.6
Contemplation	8	15.7
Preparation	1	2.0
High	7	13.7
Action	7	13.7

Table 3. Univariate analysis of factors associated with overall level of motivation.

Variables	Low level of motivation		High level of motivation		*P* - value	Crude OR OR (95%CI)
	N	%	N	%		
Age (years) (Mean ± SD)	55.8 ± 11.8		54.1 ± 15.8		0.747[a]	0.99 (0.93 - 1.06)
Pack-year (Median, IQR)	25.5, 33		16, 27		0.135[b]	0.97 (0.93 - 1.02)
Gender					0.579	N/A
Male	36	81.8	7	100.0		
Female	8	18.2	0	0.0		
Education					0.549	
Lower than elementary school	22	50.0	2	38.6		1
Secondary school	16	36.4	4	57.1		2.75 (0.45 - 16.90)
Bachelor's degree or higher	6	13.6	1	14.3		1.83 (0.14 - 23.82)
Marital status					1.000	
Single or divorced	17	38.6	3	42.9		1
Married	27	61.4	4	57.1		0.84 (0.17 - 4.22)
Employment					0.320	N/A
Employed	34	77.3	7	100.0		
Unemployed	10	22.7	0	0.0		
Diagnosis for this admission					0.410	N/A
Neurological disease	18	40.9	4	57.1		
Cardiovascular disease	10	22.7	1	14.3		
Respiratory disease	6	13.6	2	28.6		
Others	10	22.7	0	0.0		

Table 3. (Con) Univariate analysis of factors associated with overall level of motivation.

Variables	Low level of motivation		High level of motivation		*P* - value	Crude OR OR (95%CI)
	N	%	N	%		
Chronic medical underlying disease					0.109	
Yes	28	63.6	5	28.6		1
No	16	36.4	2	71.4		4.37 (0.76 - 25.20)
Obesity (BMI > 35 kg/m^2)					1.000	N/A
Yes	2	4.5	0	0.0		
No	42	95.5	7	100.0		
History of mood disorder					0.658	
Yes	14	68.2	1	85.7		1
No	30	31.8	6	14.3		2.80 (0.31 - 25.52)
Know impact of smoking					1.000	
Yes	12	27.3	2	28.6		1
No	32	72.7	5	71.4		0.94 (0.16 - 5.50)
Nicotine withdrawal symptoms					0.037*	
Yes	27	61.4	1	14.3		1
No	17	38.6	6	85.7		9.53 (1.05 - 86.20)*
Family or close friends of active smokers					1.000	
Yes	5	11.4	1	14.3		1
No	39	86.6	6	85.7		0.77 (0.07 - 7.78)
History of successful smoking cessation period longer than 1 month					0.436	
Yes	23	52.3	5	71.4		1
No	21	41.7	2	28.6		0.44 (0.08 - 2.50)
Comorbid other substance use					0.447	
Yes	26	59.1	3	42.9		1
No	18	40.9	4	57.1		1.93 (0.38 - 9.67)
Nicotine dependence (FTND > 3)					0.037*	
Dependence	27	61.4	1	14.3		1
No dependence	17	38.6	6	85.7		9.53 (1.05 - 86.20)*

A = Unpaired *t* - test, b = Mann-Whitney U Test, N/A = Not applicable for analysis
**P* - value < 0.05, FTND = Fagerström Test for Nicotine Dependence, BMI = body mass index

Discussion

Our study investigated the level of motivation for smoking cessation in active smokers an in-patient setting. Among 51 active smokers, 44 subjects (86.3%) were in the low-motivation group. The average age of the sample was in the late adulthood (55.6 years), which older age may relate to an increase in nicotine dependence level which effects the level of motivation for smoking cessation.[17]

The number of subjects with low motivation for smoking cessation was much higher than expected. However, the results were similar compared to the study of Srisuklorm S, *et al*. (2019) which was done in an Outpatient Check-up clinic saying 89.2% of subjects were in the low-motivation group for smoking cessation.[11] Sepúlveda-Sánchez JM, *et al*. (2018) assessed patients admitted in acute care hospital found that only 29 out of 248 patients (11.7%) were reported to be highly motivated for smoking cessation.[4] A review from West (2004) found that only a minority of smokers were motivated enough to receive medications or attend a cessation service.[18] This phenomenon might be due to those with highly nicotine dependence and withdrawal symptoms would lack confidence in their ability to quit, hence the low motivation for smoking cessation.[18] This should be a crucial data to inform that during hospital stay, any brief intervention such as motivational interviewing should merge in one of the treatment plans since most of the patients have low motivation for smoking cessation. Aside from admission with medical causes, unable to quit smoking would strongly increase risk and severity of the ongoing diseases.

Our finding are in concordance with Vangeli E, *et al*. (2011)[19] who conducted a systematic review showing that nicotine dependence is associated inversely with the level of motivation for smoking cessation significantly. Higher levels of nicotine dependence predicted the lower motivation, thus the lower success of attempts to quit. Therefore, during motivational interviewing, nicotine dependence should be assessed every time in active smokers by a reliable questionnaire such as Fagerström Test for Nicotine Dependence to evaluate the level of motivation and provide a proper intervention.

Another factor from the result of our study is that high rate of nicotine withdrawal is associated with low level of motivation for smoking cessation. Some of the subjects experienced withdrawal symptoms at the time of data collection, since smoking was prohibited in the hospital. The number of days of admission, which is related to the occurrence of withdrawal symptoms, was then put in the questionnaire for every subject. Killen JD,*et al*. (1997) found that withdrawal symptoms, can make abstaining smokers more reactive to environmental events, craving, and negative affects which all disturb the level of motivation for smoking cessation.[20] Nicotine replacement therapy such as nicotine gums or patches would therefore benefit in reducing withdrawal symptoms and increasing the level of motivation for smoking cessation.[21]

We found that 72.5% of subjects still had no clue at the time collecting data that smoking was a risk factor of many diseases and could worsen the prognosis of their current medical status which had led to the admission. The data is in concordance with the study of Cummings KM, *et al*. (2004) who surveyed 1,046 adults by telephone, found that more than two-third did not know nicotine could cause a variety of diseases including cancers and more than 53.0% absolutely did not know about the risk of nicotine.[22] Emmons KM, *et al*. (1992) found that 71.0% of hospitalized active smokers mentioned that there was no discussion about smoking cessation from a physician during a hospital stay.[23] This tells us that more psychoeducation about risk of smoking continuation must be included in the discharge planning as a prevention. More effective preventive programs such as campaigns for smoking cessation would be benefit.

Despite the result of the study, we might need a larger sample size to detect more associated factors with the level of motivation. Being in the period of COVID-19 pandemic might also be one of the confounding factors. Study of Elling JM, *et al*. (2020) showed that one-third of the smokers in this period were more motivated to quit smoking due to a belief that the coronavirus was being already a serious threat to their health.[24] Unfortunately, the results shown in our study were in the opposite direction, giving more of the reason for practitioners to give more attention in this area. Further study might include E-cigarette smoking since they have been widely used among active smokers nowadays.[25] However, all subjects in our study use conventional cigarettes.

The study in this area would be beneficial for our smoking-free clinic in the future. Setting up a team to conduct smoking cessation program or organize a relating training course for residents and nurses in the Internal Medicine Department would also be benefit for hospitalized active smokers. Cessation of smoking would lead to a decreased rate of re-hospitalization, a decreased risk for malignancy, and a lessened severity of many diseases.

Conclusion

Eighty-six percent of subjects, active smokers, were admitted in in-patient department setting; they had low motivation in smoking cessation. The awareness of this problem gives the space for further intervention to prevent continuation of smoking. The factors that might associate with the level of motivation are the level of nicotine dependence and existence of nicotine withdrawal symptoms.

Conflict of interest

The authors hereby declare no conflict of interest.

References

1. World Health Organization. Tobacco fact sheets [Internet]. 2019 [cited 2019 Oct 12]. Available from: https://www.who.int/news-room/fact-sheets/detail/tobacco.
2. Slama K, Redman S, Perkins J, Reid AL, Sanson-Fisher RW. The effectiveness of two smoking cessation programmes for use in general practice: a randomised clinical trial. BMJ 1990;300:1707-9.
3. Thyrian JR, Panagiotakos DB, Polychronopoulos E, West R, Zatonski W, John U. The relationship between smokers' motivation to quit and intensity of tobacco control at the population level: a comparison of five European countries. BMC Public Health 2008; 8:2.

4. Sepúlveda-Sánchez JM, Canca-Sánchez JC, Rivas-Ruiz F, Martín-García M, Lorente Márquez C, Timonet-Andreu EM. Assessing motivation to smoking cessation in hospitalized patients. Enferm Clin (Engl Ed) 2018;28:13-19.
5. Paavola M, Vartiainen E, Puska P. Smoking cessation between teenage years and adulthood. Health Educ Res 2001;16:49-57.
6. Broms U, Silventoinen K, Lahelma E, Koskenvuo M, Kaprio J. Smoking cessation by socioeconomic status and marital status: the contribution of smoking behavior and family background. Nicotine Tob Res 2004;6:447-55.
7. Casado L, Thrasher JF, Perez C, Santos Thuler LC, Fong GT. Factors associated with quit attempts and smoking cessation in Brazil: findings from the International Tobacco Control Brazil Survey. Public health 2019;174:127-33.
8. Foulds J, Gandhi KK, Steinberg MB, Richardson DL, Williams JM, Burke MV, et al. Factors associated with quitting smoking at a tobacco dependence treatment clinic. Am J Health Behav 2006;30:400-12.
9. Khuder SA, Dayal HH, Mutgi AB. Age at smoking onset and its effect on smoking cessation. Addict Behav 1999;24:673-7.
10. McCaul KD, Hockemeyer JR, Johnson RJ, Zetocha K, Quinlan K, Glasgow RE. Motivation to quit using cigarettes: a review. Addict Behav 2006;31:42-56.
11. Srisuklorm S, Kalayasiri R. Motivation to change smoking behavior of smokers at the check-up clinic, King Chulalongkorn Memorial Hospital. Chula Med Bull 2019;1:61-9.
12. Lindson N, Thompson TP, Ferrey A, Lambert JD, Aveyard P. Motivational interviewing for smoking cessation. Cochrane Database Syst Rev 2019;7: CD006936.
13. Heatherton TF, Kozlowski LT, Frecker RC, Fagerström KO. The fagerstrom test for nicotine dependence: a revision of the fagerstrom tolerance questionnaire. Br J Addict 1991;86:1119-27.
14. Klinsophon T, Janwantanakul P, Thaveeratitham P. Reliability of the Thai version of the fagerstrom test for nicotine dependence (FTND). J Med Assoc Thai 2017;100:1130-4.
15. Chatdon S. Prevalence qol, and level of motivation for change of patients with comorbid of substance use disorder in psychiatric outpatient department King Chulalongkorn Memorial Hospital. CPDD Conference. Bangkok: Palm Spring; 2557.
16. Miller WR, Tonigan JS. Assessing drinkers' motivation for change: The stages of change readiness, and treatment eagerness scale (SOCRATES). Psycho Addict Behav 1996;10:81-9.
17. Park S, Lee JY, Song TM, Cho SI. Age-associated changes in nicotine dependence. Public Health 2012; 126:482-9.
18. West R. Assessment of dependence and motivation to stop smoking. BMJ 2004;328:338-9.
19. Vangeli E, Stapleton J, Smit ES, Borland R, West R. Predictors of attempts to stop smoking and their success in adult general population samples: a systematic review. Addiction 2011;106:2110-21.
20. Killen JD, Fortmann SP. Craving is associated with smoking relapse: findings from three prospective studies. Exp Clin Psychopharmacol 1997;5:137-42.
21. Stead LF, Perera R, Bullen C, Mant D, Hartmann-Boyce J, Cahill K, et al. Nicotine replacement therapy for smoking cessation. Cochrane Database Syst Rev 2012; 11:Cd000146.
22. Cummings KM, Hyland A, Giovino GA, Hastrup JL, Bauer JE, Bansal MA. Are smokers adequately informed about the health risks of smoking and medicinal nicotine? Nicotine Tob Res 2004;6 Suppl 3: S333-40.
23. Emmons KM, Goldstein MG. Smokers who are hospitalized: a window of opportunity for cessation interventions. Prev Med 1992;21:262-9.
24. Elling JM, Crutzen R, Talhout R, de Vries H. Tobacco smoking and smoking cessation in times of COVID-19. Tob Prev Cessat 2020;6:39.
25. McNeill A, Brose LS, Calder R, Bauld L, Robson D. Evidence review of e-cigarettes and heated tobacco products 2018: A report commissioned by Public Health England. London: Public Health England; 2018.