

## Study on Factors Contributing to the Use of Smoking Cessation Service for Male Adult Smokers

Eun-Jin Choi, Jung-Hwa Lee  
*Korea Institute for Health and Social Affairs*

### CONTENTS

I. Introduction	V. Conclusion
II. Methods	References
III. Results	Abstract
IV. Discussion	

### I. Introduction

Smoking behavior is a kind of nicotine addiction and the smoking cessation service is one of the important part of smoking policy for the nation. The World Health Organization's Framework Convention on Tobacco Control entice nations to design and implement effective programs to promote the cessation of tobacco use in educational institutions, health care facilities, workplace and sporting environments. The Agency for Health Care Policy and Research(AHCPR) in the U.S. has provided an evidence based clinical practice guideline on cessation that included a brief advice by medical providers

to quit smoking. More intensive interventions at individual or group level including counseling, treatment, and telephone counseling were also pointed as effective methods of smoking cessation(U.S. Department of Health and Human Services, 1999).

Since the national health promotion act was enacted in 1995, some portion of tobacco tax has been earmarked for the national health promotion fund. The anti-smoking policy has been a focal health promotion policy during the last 7 years in South Korea, and the government have started smoking treatment services provided by the local public health centers. In the past, the major focus of the national anti-smoking policy and programs in

Corresponding author: Eun-Jin Choi, Korea Institute for Health and Social Affairs  
 San 42-14 Bulkwang-dong, Eunpyung-gu, Seoul, Korea  
 Tel: 82-2-380-8249, E-mail: eunjin@kihasa.re.kr

local public health centers was provision of prevention campaign and self-help guidelines. It has been known that success rate in smoking cessation treatment is about 10 to 15%, and this rate can increase as a smoker attempts more in quitting. Advice in clinics can increase the cessation rate up to 13%(6 months), and the cessation rate come down to 3.8% in 12 month. Structured intensive smoking cessation programs can increase the smoking cessation rate to 30 to 50%. This kind of programs include problem solving skills/skills training, and nicotine reduction therapy(Korean Academy of Family Medicine, 1996). Smoking cessation methods includes clinical treatment and educational programs focusing on self-help, and behavioral therapy, nicotine replacement therapy, etc. There have been some studies on effectiveness of smoking cessation services in clinical settings, but there have not been any studies on the willingness or barriers of smokers in the community to use cessation treatment services in Korea(Kim, 2001; Sim et al., 2002).

South Korean males' smoking rate has been one of the highest in the world, which was about 61.8% for men and 5.4% for females in 2001(Ministry of Health and Welfare, 2001). Many health education efforts for anti-smoking have been focusing on male smokers.

The purpose of this study was to

investigate the factors contributing to male smokers' intentions of quitting smoking and willingness of using smoking cessation services in the public health centers. In addition, by analyzing the smoking service needs of the smokers, this study was to provide implications for future development of health education programs to help smokers stop smoking.

## **II. Methods**

### **1. Study Questions**

To assess the intentions of quit and the willingness to use smoking cessation services in the public health centers, the authors took the following research questions;

- 1) What are the cigarette consumption characteristics and intentions of quitting among male smokers in the country?
- 2) What kind of quit-aids, health education/information and services did the smokers have used?
- 3) What are the major predictors of using the smoking cessation services provided by the public health centers?

### **2. Collection of data**

A telephone survey was conducted to assess the needs of smokers. The survey

conducted from August 31 to September 17 in 2004. The subjects of the survey were male smoking adults aged 20 to 59 years in the country(1,400). Number of subjects in different regions in the nation was decided based on the regional population estimation by the national statistical office. When the number of subjects was decided for different regions, names of individuals were selected at random from the telephone books.

### 3. Survey Instrument

A survey instrument was developed by the authors and the items were reviewed by a couple of medical professionals. The questionnaire used for the telephone survey included items such as smoking status, intentions of quitting smoking, time of taking up a cigarette in the morning, number of cigarettes smoked each day, number of quitting attempts, stages of intentions of smoking cessation, experience of smoking cessation services and quit aids, intentions of using smoking cessation services by the public health centers. The degree of nicotine addiction can be assessed by the Fagerstrom questionnaire, but this study employed just a few items because the telephone based survey could not employ many items(KAFM, 1996). We used a behavioral model to assess the intentions of quitting among smokers. Stages of intentions of smoking cessation behaviors can be explained by the trans

theoretical model of change. Pre-contemplation, contemplation, preparation, action, and maintenance are the stages that a smoker may experience in the course of smoking cessation process(Prochaska and Diclemente, 1983).

#### 1) Dependent variables

Dependent variables included readiness to quit, and willingness of using smoking cessation services provided by the public health centers. The readiness to quit was measured by asking people if they are planning to quit smoking within next 1, 6 or more than 6 months. Authors were interested in the relationships between the readiness to quit smoking and tobacco consumption behaviors. The willingness to use the smoking cessation services was measured by asking if smokers want to use the services provided by the public health centers.

#### 2) Independent variables

Authors selected variables to find out meaningful predictors of intention of quitting smoking, and the willingness of using smoking cessation services provided by the public health centers. The independent variables included demographic variables, daily amount of tobacco consumption, time of smoking first cigarette in the morning, experience of quit attempts during the preceding 1 year, and the age of starting daily

smoking. Demographic variables included geographic regions the subjects live, age, education level, employment status, marital status, and monthly household income level. In addition, authors asked respondents if they have ever heard of quitting information or recommendation from doctors, and if they ever used quit aids or educational materials.

#### **4. Analysis of the data**

The data were gathered and coded into SPSS program(version 10.1.0). Chi-square analysis was conducted for analysis of the demographic variables and tobacco consumption. Pearson correlation and principal component analysis were conducted to find out statistically significant variables. A multiple logistic regression analysis were conducted to see the statistical significance among the variables of study interest.

### **III. Results**

#### **1. Socio-demographic characteristics and tobacco consumption**

A total of 1,403 cases were selected for analysis. Ages of the daily male smokers in the sample ranged from 20 to 59, and the mean age was 38.7. Definition of daily smoking in this study was that a daily smoker smokes at least one cigarette every day. About 77.8% of male smokers consumed 20 cigarettes or

less per day. Average daily consumption of cigarettes were analyzed by demographic variables(Table 1). Older people were significantly more likely than younger persons to smoke more than a pack of cigarettes per day. There was not significant differences in smokers' consumption of tobacco by geographical region, and monthly household income level. Types of occupation were related to the amount of daily tobacco consumption. Self-employed or other types of occupation(freelancer, part-tim workers) were more likely to smoke more than a pack of cigarettes per day. Years of education and living with a spouse were significantly related to the amount of daily cigarette consumption. Those had high school graduation or less, were more likely to consume more than a pack of cigarettes per day. A male smoker living with a spouse was more likely to smoke more than a pack of cigarettes per day.

#### **2. Smoking behaviors and intentions of quit smoking**

The mean age of starting daily smoking was lower in younger age groups, and this was statistically significant. For male smokers aged in their 20s, the mean age of starting daily smoking was around age 18, and for those in their 30s and 40s, the mean age for starting daily smoking was around age 20, and for those in their 50s the mean starting age of daily smoking was 22.3. The age of starting

Table 1. Socio-demographic variables and daily consumption of tobacco of smokers  
(Unit: number of persons, %)

	Population groups		Total
	More than a pack	A pack or less	
Gran total	312(22.2)	1091(77.8)	1403(100.0)
Regions			
Urban	267(22.2)	934(77.8)	1201(100.0)
Rural	45(22.3)	157(77.7)	202(100.0)
Age**			
20-29	40(11.6)	304(88.4)	344(100.0)
30-39	87(20.9)	330(79.1)	417(100.0)
40-49	123(31.1)	272(68.9)	395(100.0)
50-59	62(25.1)	185(74.9)	247(100.0)
Education**			
High school or less	226(25.8)	651(74.2)	877(100.0)
College or more	85(16.5)	431(83.5)	516(100.0)
Employment**			
Employed	108(18.7)	469(81.3)	577(100.0)
Student	12(11.7)	91(88.3)	103(100.0)
Self-employed	135(28.8)	334(71.2)	469(100.0)
Others	57(22.4)	197(77.6)	254(100.0)
Living with a spouse**			
Yes	242(25.9)	692(74.1)	934(100.0)
No	70(15.0)	398(85.0)	468(100.0)
Monthly Household income			
None	7(22.6)	24(77.4)	31(100.0)
1 million won or less	36(22.8)	122(77.2)	158(100.0)
~ 2million won	94(22.4)	325(77.6)	419(100.0)
~ 3million won	76(20.8)	290(79.2)	366(100.0)
3.0million won or more	90(22.8)	304(77.2)	394(100.0)

1) Other: part time employee

2) \*\* sig at .01 level

3) note : the total may be different for each variable because of elimination of case that did not respond.

daily smoking was not significantly related to the stages of change levels. The intentions of quitting smoking according to the trans-theoretical model of change were analysed with demographic variables and smoking behaviors. Older persons were more likely to think of quitting smoking in 1 month or in 6 months. Those smoking less than a pack of cigarettes per day were more likely

to have intention of quitting in one month or in 6 months. Time of smoking the first cigarette in the morning, which implies the degree of addiction to nicotine, was also associated with the intentions of quitting smoking (Table 2). Table 3 shows the result of pearson correlation analysis among smoking behaviors which was found to be significantly related.

Table 2. Intentions of quitting smoking and demographic variables

	Intentions of Quit(%)				Total(%)
	Plan to quit in 1 month	Plan to quit in 6 month	Plan to quit someday	no intention	
Age**					
20-39	48(7.5)	37(5.8)	380(59.3)	176(27.5)	641(100.0)
40-59	65(8.6)	92(12.1)	415(54.7)	187(24.6)	759(100.0)
Amount of tobacco consumption per day**					
More than a pack	24(7.7)	17(5.4)	160(51.3)	111(35.6)	312(100.0)
One pack or less	89(8.2)	112(10.3)	635(58.4)	252(23.2)	1088(100.0)
Time of smoking in the morning*					
30 min. or less	60(7.5)	70(8.8)	437(54.6)	233(29.1)	800(100.0)
More than 30 min.	53(8.8)	59(9.8)	357(59.6)	130(21.7)	599(100.0)

\*\* p<0.01      \* p<0.05

Table 3. Correlates of smoking variables

	DS	TS	AD	#QA	IQ
Daily smoking starting age	1				
Time of smoking in the morning	.141**	1			
Amount of daily consumption	-.131**	-.395**	1		
# of Quit attempts	.033	.017	-.004	1	
Intentions of quitting <sup>1)</sup>	-.069*	-.085**	.104**	-.276**	1

1) The values in the intentions of quitting range from 1 to 4, and 1 represents those who plan to quit in one month, and 4 represents those who have no intention of quitting.

2) \*\* p<0.01      \* p<0.05

About 49% of male smokers tried to quit smoking during one year preceding the survey. Smokers tried quitting smoking as they get older. About 50% of male smokers in their 20s have not tried quitting smoking, but about 55% in their 50s tried quitting smoking at least more than once. The time

of taking up a cigarette in the morning was not significantly related to having tried quitting smoking, but those who are more addicted to nicotine were more likely than others to have attempted quitting in the study sample.

### 3. Use of quit aids and Intention to use cessation treatments

About 20% of the male smokers have used quit aides such as nicotine patch, gum, quit cigarettes, and acupuncture during the preceding one year. About 2 to 5 % have used smoking cessation clinics, smoking cessation web sites, and self help books. Among the

quit aids, quit cigarettes was the mostly used method(15.9%). About 23.3% of the smokers have gotten doctor's advice to stop smoking during the past one year. Quit attempts was significantly related to use of quit aids. A factor analysis among the variables with prior quit attempts in the past 1 year showed that Nicotine gum and quit cigarettes were related

Table 4. Principal component analysis of using quit methods in regard to prior quit attempts in the past 1 year

	Component1	Component2	communalities
Cessation Clinic	-0.06	0.60	0.37
Internet web sites	-0.05	0.66	0.44
Quit aid books	0.04	0.68	0.46
Nicotine patch	0.59	-0.03	0.36
Nicotine gum	0.69	-0.04	0.48
Quit cigarettes	0.70	0.01	0.49
Acupuncture	0.60	0.13	0.38
Eigenvalues	1.69	1.27	
% of variance	24.12	18.21	
Cumulative	24.12	42.32	

Table 5. Multiple Logistic regression model for Intention of Quitting smoking

	OR	95% Confidence Interval
Intention of quitting in one month		
Amount of daily tobacco consumption(more than a pack)	0.9	0.5-1.5
Older age(40 to 59)*	0.5	0.31-1.0
Ever quit attempts in the past 1 year**	18.5	10.4-32.4
Use of Quit aids	1.0	0.5-1.8
Intention of quit in 6 months	0.5	0.3-0.8
Intention of quitting in 6 month		
Ever quit attempts in the past 1 year**	12.0	7.4-19.4
Older age(40 to 59)**	0.4	0.2-0.7
Amount of daily tobacco consumption(more than a pack)*	0.5	0.2-0.9
Use of Quit aids	0.8	.04-1.4

1) significant predictors only(p<.05)

to one component. Use of smoking cessation clinic, internet web sites, and books were related to the other component. Although the Bartlett's test of sphericity was significant at .001, the sample was not best for the factor analysis because Kaiser-Meyer-Olkin measure of sampling adequacy showed 0.624 (Table 4). To find out significant variables related to intention of quitting smoking, a multiple logistic regression analysis was conducted. Overall, older age and attempted quitting were found to be related to quit smoking in one month. Consumption of cigarettes per day was significantly related to ideation of quitting in 6 months (Table 5).

Separately, a multiple logistic regression analysis for factors related to willingness to use public health center's smoking cessation service showed a little different result. Age, time of taking cigarettes in the morning, quit attempt experience, and plan to quit were the significant predictors for willingness of using the smoking cessation services provided by

the local public health centers (Table 6). Doctor's advice was also an important variable for use of the smoking cessation services. Especially, those who wanted to quit within one month showed the largest odds ratio among the variables.

## IV. Discussion

### 1. Major characteristics of smokers

Socio-demographic variables such as age, educational level, and household income level were significantly related to smoking behavior. This result goes with the general premises that supported by many researches (Gerrit et al., 2004). About 77.8% of the subjects consumed less than a pack of cigarettes per day, which was greater than previous survey result in the National Health behavior survey in Korea (MOHW, 2001), which reported that about 49.9% of male smokers in the same age group smoked less than a pack of cigarettes per day. This may

Table 6. Multiple Logistic regression model for Willingness of using the smoking cessation services in the Public Health Centers<sup>1)</sup>

	OR	95% Confidence Interval
Older age(40 to 59)	1.5	1.07-1.87
Less time to take cigarettes in the morning( $\leq 30$ min)	1.4	1.11-1.78
Ever attempted cessation	1.4	1.07-1.75
Doctor's advice	1.7	1.28-2.15
Plan to quit in 1 month	4.2	2.53-6.81
Plan to quit in 6 month	3.2	2.32-4.36

1) significant predictors only( $p < .05$ )



imply that smokers have decreased their daily consumption of cigarettes. Readiness to quit smoking was differentiated by age groups and this result was consistent with the result reported by Kviz et al.(1994). Older smokers were more likely than younger smokers to be willing to quit smoking. Lower education level and lower income level were variables associated with smoking(Haukkala et al., 2001). In this study daily consumption of tobacco, and time of smoking the first cigarette in the morning were not significantly related to quit attempts. However, John et al.(2004) found that nicotine dependence was related to a high number of quit attempts.

## **2. Use of Quit aids and health education/information**

In this study proportion of the smokers who have used quit aids or related information was very low, and these variables were not significantly related to intention of quitting smoking. Use of quitting information can increase smoker's chance of using smoking cessation services(Gerrit et al., 2004). There were some smokers who have used the acupuncture therapy for smoking cessation, but there is no evidence that the acupuncture therapy is an effective method(Hopkins et al., 2001). Doctors advice to quit smoking is an important factor for a smoker to have quit attempts or intention of using cessation services provided by the local public health

centers. A healthcare provider's advice to quit was strongly associated with increase use of effective therapies for tobacco dependence(Cokkinides et al., 2000). Therefore, health educators have to provide teacher's education for healthcare providers.

Health education programs have to be provided differently for each different stages. Health risk appraisals, health interest studies, surveys of different stages can be employed in the pre-contemplation stage. Posters, calendar and letters can be employed in the contemplation and preparation stage can adopt self-help materials, internet programs, and counseling services. Formative practice programs and multi-media programs can be helpful in action stage. Follow-up letters and telephone reminders are effective health education methods in the maintenance stage(Han, 2003). Smoking cessation education was found to be effective in contemplation stages(Choi, 1998).

## **3. Major predictors of use of smoking cessation services provided by the public health centers**

In this study, older age, degree of addiction(less time spent without smoking after a smoker gets up in the morning), prior quit attempts, intentions to quitting smoking in 1 month or 6 months were the major predictors of using the smoking cessation services provided by the public health centers.

This finding was consistent with the research result conducted by Fiore et al.(2004). Smokers who have attempted quitting smoking in the past were more likely to have intention of quitting in the near future and wanted to use the treatment services provided by the public health centers. Similar result was found in a study on psycho-social factors and smoking cessation behaviors(Clark et al., 1998). Previous quit attempts could be an important, easily identified characteristic that can be used for targeting individuals in smoking cessation programs.

## V. Conclusion

There was some limitation in this study that the study sample may not represent the nation's smoking population. The telephone based survey was only responded by those who accepted the call and agreed to answer at home, and the sample collected may not represent the whole smoking population. The results may not give the whole picture of the needs of smokers because of the limited nature of the cross-sectional telephone based survey. We were not able to adopt all items to assess the degree of nicotine addiction based on the Fagerstrom test because we had to employ minimal items for the telephone survey. When developing health education programs targeting behavior change, major

considerations should be focused on the socio-demographic nature of the target population, degree of nicotine dependence, intentions of quitting smoking and prior experience of quitting smoking. Doctors advice is an important factor for smokers to consider quitting smoking. Health educators have to target health professionals in the area of clinical field as well as general public or civilians, too. In addition, interventions for smoking cessation have to be tailored to smoking individuals at different stages of change.

(Received: July, 25, 2005; Accepted: Sep., 10, 2005)

## References

- Choi, J.S. 1998. *The effects of smoking cessation program applying the cognitive behavior therapy*, Seoul national university graduate school, Doctoral thesis.
- Clark, M.A., Kviz F.J., Crittenden, K.S. and Warnecke, R.B. 1998. Psycho-social factors and smoking cessation behaviors among smokers who have and have not ever tried to quit, *Health Education Research*, 13(1):145-153.
- Cokkinides, V.E., Ward, E., Jemal, A. and Thun, M.J. 2005. Under-use of smoking-cessation treatment: results

- from the National Health Interview survey 2000, *Am J Prev Med*, 28(1):119-22.
- Fiore, M. et al. 2004. Integrating smoking cessation treatment into primary care: an effectiveness study, *Preventive Medicine*, 38:412-420.
- Gerrit, A.J., Rijt, V.D. and Westerik, H. 2004. Social and cognitive factors contributing to the intention to undergo a smoking cessation treatment, *Addictive Behaviors*, 29: 191-198.
- Han, Y.R. 2003. *Trans-theoretical model of behavior change to middle and high school students' smoking*, Seoul National University Graduate school, Medical Master's thesis.
- Haukkala, A., Laaksonen, M. and Uutela, A. 2001. Smokers who do not want to quit-is consonant smoking related to lifestyle and socioeconomic factors?, *Scan J Public Health*, 29(3):226-232.
- Hopkins, D.P. et al. 2001. Task Force on Community Preventive Services, Review of evidence regarding interventions to reduce tobacco smoke, *Am J Prev Med*, 20(2suppl):16-66.
- John, U., Meyer, C., Hapke, U. and Rumpf, H.J. 2004. Schumann A. Nicotine dependence, quit attempts, and quitting among smokers in a regional population sample from a country with a high prevalence of tobacco smoking, *Prev Med*, 38(3):350-8.
- Kim, C.H. 2001. Factors related to successful smoking cessation among visitors in the smoking cessation clinic, *J Korean Acad Fam Med*, 23(3):1603-1611.
- Kviz, F.J., Clark, M.A., Crittenden, K.S., Freels, S. and Warnecke, R.B. 1994. Age and readiness to quit smoking, *Preventive medicine*, 22(11):211-222.
- Korean Academy of Family Medicine. 1996. *Health Promotion of Koreans*.
- Ministry of Health and Welfare. 2002. *2001 National Health and Nutrition Survey; Health behavior*.
- Prochaska, J.O. and DiClemente, C.C. 1983. Stages and process of self-change in smoking: Towards an integrative model of change. *Journal of Consulting and Clinical Psychology*, 51:390-395.
- Sim, J.Y., Han, N.Y., Jung, Y.S., Yoo, S.M. and Park, Y.H. 2002. Factors related to successful quitting in smoking cessation clinic, *J Korean Acad Fam Med*, 23(3):325-333.
- U.S. Department of health and Human Services. 1999. *Best Practices for Comprehensive Tobacco Control Programs*.

## ABSTRACT

**Objectives:** The purpose of this study was to investigate the factors contributing to intentions of quitting smoking, and use of smoking cessation services for daily smokers, and willingness of using smoking cessation services by the public health centers.

**Method:** A total of 1,403 cases of male smokers were collected by a telephone survey. The age of smokers in the study ranged from 20 to 59. Socio-demographic variables, cigarette consumption behaviors, quit attempts and intentions of quitting smoking, and use of clinical services provided by the local public health centers were analysed using SPSS program.

**Result:** About 77.8% of the smokers consumed a pack of cigarettes or less per day. About 20% of the smokers have used quit aides such as nicotine patch, gum, quit cigarettes, and acupuncture. These variables were associated with prior quit attempts in the past 1 year. Older age, degree of addiction(less time spent without smoking after a smoker gets up in the morning), prior quit attempts, panning to quit in one month, doctor's advice to quit were the major predictors of using the smoking cessation services provided by the public health centers.

**Conclusion:** Health educators have to entice physicians to give smoking cessation advice to smokers, and have to provide many different types of educational programs to help quitting smoking.

**Key Words:** Quit-Attempts, Trans-theoretical Model, Smoking Cessation Service