

Smoking Cessation and Relapse among Smoking Cessation Scholarship Beneficiaries

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Abstract

Background/Objectives: In this study, a survey was conducted to examine the factors associated with success and failure in smoking cessation among smoking cessation scholarship beneficiaries at N university. **Methods/Statistical Analysis:** The data were collected via structural questionnaires completed by 139 university students located in Cheonan who agreed to participate in this study from September to December 2015 and was analyzed using the SPSS 18.0 program. **Findings:** There were statistically significant differences among the scholarship beneficiaries who succeeded in quitting smoking in following areas: CO2 ppm, cigarettes smoked during the period, nicotine dependency, participation in regular smoking cessation education (including attendance at smoking cessation clinics and recognition of the need for follow-up programs), motivation, factors which allowed one to remain a non-smoker, symptoms, stress, and amount of regular exercise. Logistic regression analysis related to general characteristics shows that CO2 ppm ($p < .001$), participation in regular smoking cessation education ($p = .002$), attendance at smoking cessation clinics ($p = .021$), were shown to exert a significant influence on smoking cessation success. Logistic regression analysis related to smoking factors shows that need a follow up program ($p = .035$), direct health benefits ($p = .034$), weight gain ($p < .001$), improve self-confidence ($p = .001$), willpower ($p < .001$) and in-house smoking ($p < .001$) exert a significant influence on smoking cessation. Additional factors related to health such as alcohol consumption ($p = .002$), stress-relieving exercise ($p = .028$), and health screening check ($p = .040$) exert a significant influence on smoking cessation. **Applicants/Improvement:** The present findings suggest that conducting enhanced smoking cessation education programs is a good way to guide more students to smoking cessation success in the future.

Keywords: Health Clinic, Relaps, Smoking, Smoking Cessation

1. Introduction

Smoking is the leading cause of preventable death in developed countries and is the most important risk factor for cancer worldwide, responsible for approximately 22% of all cancer deaths per year¹. Korea's adult smoking rate is still high among OECD countries; thus, the health and socio-economic burdens caused by smoking are also very high².

As a transition stage from adolescence to adulthood, one's college years are the peak period for one's physical, intellectual, and social development³. This period is also important since it forms the basis of one's lifelong health⁴. Therefore, health problems during this period may pose a significant threat to one's lifelong health.

However, college students tend to forget or neglect the importance of health. For many students who are living independently from their parents and families for the first time, it is easy to adopt unhealthy lifestyle habits like smoking due to a variety of psychosocial and mental stresses related to employment or academics^{3,4}.

In the case of Korea, where smoking is considered to be a form of social deviance during middle and high school, there is growing social acceptance of smoking among college students⁵. Accordingly, the high school student smoking rate of 21.4%⁶ increases to 40.5% among men in their 20s, and the smoking rate for women in their 20s is the highest compared to that of women in other age groups.

The Korean Government has implemented a variety of

policies to reduce the social damage caused by smoking. From March 2005, government-sponsored smoking cessation clinics have been conducted in health centers nationwide. Therapies include public health counseling (behavioral therapy) and nicotine replacement therapy (nicotine patch, nicotine gum), which provides drug therapy according to smokers' characteristics⁷. Smoking cessation reduces health risks and improves quality of life. In particular, the cumulative risk of dying of cancer or cardiovascular and lung diseases can be drastically reduced by quitting smoking, even at an advanced age⁸⁻¹⁰. Based on these considerations, this study aims to identify the factors affecting smoking cessation success among students who received a scholarship to enroll in smoking cessation clinics. The study was conducted to serve as the basis for the improvement of the smoking cessation education programs conducted at the University Health Clinic.

2. Materials and Methods

2.1 Study Subjects and Ethical Considerations

This research is a descriptive correlation study designed to examine the factors associated with success and failure in smoking cessation among smoking cessation scholarship beneficiaries at N university. The data was collected via structural questionnaires completed by 139 students studying at N university who agreed to participate in this study. All data used was collected according to the approved guidelines and screening procedures of "N University" located in Cheonan. All experiments of the present study were also approved by the Institutional Review Board [IRB No: NSU-151130-1] at "N" University.

We obtained a sample of 139 students who received smoking cessation scholarships. It is a proper sample size with a significance level (α) of 0.05, a power ($1-\beta$) of 0.95, and a medium effect size (f) of 1.5 according to the G*power 3.1.9.2 program.

2.2 Test Method

The data was collected from September 2015 to November 2015 and was analyzed using SPSS 20.0 (SPSS Inc., Chicago, IL, USA). The general characteristics were analyzed using descriptive statistics, including the means, standard deviations, frequencies, and percentages.

Patterns in the differences among study participants (according to general characteristics related to smoking cessation success) were analyzed with χ^2 -test. Logistic regression analysis was used to determine the influence on smoking cessation success.

3. Results

The general characteristics of the participants are shown in Table 1. The general characteristics of the participants were as follows. The study participants included 131 males (94.2%) and 8 females (5.8%). The mean age was 23.04 ± 1.72 years. The students' majors were as follows: 63 engineering students (45.3%); 85 design and sports students (61.2%); 54 business and management students (38.8%); and 14 health and social sciences students (10.1%). The amounts of CO₂ ppm measured were 1-6 ppm (100 students, 71.9%) and over 7 ppm (39 students, 28.1%). The periods of smoking cigarettes reported were 1-7 years (104 students, 73.8%) and over 8 years (33 students, 23.4%). Nicotine dependency was reported as mild (28.1%), moderate (30.9%), and severe (41.0%). Seventy-five students (54%) attended regular smoking cessation education programs; 108 students (77.7%) thought smoking cessation clinics were helpful; and 100 students (71.9%) recognized the need of follow-up programs. Smoking clinic completion dates were as follows: Aug. 2012 (3 students, 2.2%); Feb. 2013 (7 students, 5.0%); Aug. 2013 (27 students, 19.4%); Feb. 2014 (19 students (13.7%); Aug. 2014 (23 students, 16.5%); Feb. 2015 (23 students, 16.5%); and Aug. 2015 (37 students, 26.6%). There were 72 students who successfully quit smoking (51.8%).

When asked, "What was your motivation to attend a smoking cessation clinic?" 84 students (60.4%) answered "information provided by health clinics", and 27 students (19.4%) answered "difficulty of quitting smoking by oneself". The main improved symptom after smoking cessation was decreased cough and sputum (72 students, 51.8%). The main changes reported after smoking cessation were weight gain (63 students, 45.3%) and improved health status (34 students, 24.5%). There were 67 students who failed to quit smoking (48.2%). The main reasons for relapse of smoking were as follows: surrounding temptations (21 students, 31.3%); weakness of willpower (19 students, 28.4%); maintaining interpersonal

relationships (11 students, 16.4%); withdrawal symptoms (4 students, 6.0%); stress (11 students, 16.4%); and the desire to smoke when drinking alcohol (10 students, 14.9%). The most commonly attempted method of smoking cessation was exerting willpower (86 students, 61.9%). Additionally, in-home smoking was reported by 94 students (67.6%); 45 students did not smoke at home (32.4%). When asked, "Have you received a health check-up within the last 2 years"? 22 students answered "yes" and 113 said "no". To the question of "How much stress do you feel"? 45 students (32.4%) answered "a lot"; 75 students (54.0%) said "a little"; and 19 students (13.7%) said "none at all". When asked, "How do you relieve stress"? 61 students (43.9%) answered "by drinking alcohol". Eighty-one students (53.8%) said they engage in regular exercise. The differences in smoking cessation success among students according to their general characteristics and smoking-related factors are shown in Table 1. The research participants' attitudes on smoking cessation success showed statistically significant differences according to the following factors: CO₂ ppm ($\chi^2 = -42.238$, $p < .001$); cigarettes smoked during the period ($\chi^2 = -5.488$, $p = .027$); nicotine dependency ($\chi^2 = -97.710$, $p < .001$); helpfulness of the smoking cessation clinic ($\chi^2 = -16.820$, $p < .001$); smoking cessation education programs ($\chi^2 = 38.212$, $p < .001$); whether or not the smoking cessation clinic was considered to be helpful ($\chi^2 = 16.820$, $p < .001$); and recognition of the need for follow-up programs ($\chi^2 = -21.252$, $p < .001$). The differences in smoking cessation success among students according to smoking-related factors are shown in Table 2 and were as follows: Motivation ($\chi^2 = 13.941$, $p = .004$); the most important factor for remaining a non-smoker ($\chi^2 = 6.243$, $p = .044$); the biggest reason for continued smoking cessation ($\chi^2 = 24.989$, $p < .001$); post-cessation changes in symptoms ($\chi^2 = 28.438$, $p < .001$); the most attempted method of smoking cessation, willpower ($\chi^2 = 37.206$, $p < .001$); and in-home smoking ($\chi^2 = 54.653$, $p < .001$). The differences in smoking cessation success among students according to physical characteristics are shown in Table 3. The research participants' attitudes on smoking cessation success showed statistically significant differences according to the following factors: Stress ($\chi^2 = 23.852$, $p < .001$); stress relieving methods ($\chi^2 = 50.512$, $p < .001$); body size ($\chi^2 = 5.588$, $p = .013$); regular exercise ($\chi^2 = 17.552$, $p < .001$); and health check-up ($\chi^2 = 6.747$, $p = .029$). To determine the influence of

smoking cessation, a logistic regression model was used. For the general characteristics model, the results of the Hosmer-Lemeshow goodness-of fit test were $\chi^2 = .387$, $p = 1.000$. Among these factors (Table 4), CO₂/ppm ($p < .001$), regular education ($p = .002$), attendance at a smoking cessation clinic ($p = .021$), and recognition of the need for a follow-up program ($p = .006$) were shown to exert a significant influence on smoking cessation. The helpfulness of the smoking cessation clinic was shown to have the greatest influence on smoking cessation ($B = .212$). Among smoking-related characteristics (Table 5), recognition of the need for follow-up programs ($p = .035$), weight gain ($p < .001$), improved self-confidence ($p = .001$), willpower ($p < .001$), and in house smoking ($p < .001$) were shown to exert a significant influence on smoking cessation. Improved self-confidence was shown to have the greatest influence on smoking cessation ($B = 18.000$). The smoking-related characteristics model was found to be suitable. The results of the Hosmer-Lemeshow goodness-of fit test were $\chi^2 = 2.268$, $p = .972$. Among physical-related characteristics (Table 6), drinking as a method of relieving stress ($p = .002$), engaging in regular exercise ($p = 0.28$), and health check-up ($p = .040$) were shown to exert a significant influence on smoking cessation. Drinking was shown to have the greatest influence on smoking cessation ($B = .185$). The physical-related characteristics model was found to be suitable. The results of the Hosmer-Lemeshow goodness-of fit test were $\chi^2 = 4.765$, $p = .782$.

4. Discussion

This study is an attempt to identify the factors affecting smoking cessation among students who received a scholarship to enroll in a smoking cessation clinic. It was conducted to develop a smoking education program at the University Health Clinic. In general, the factors which showed statistically significant differences were as follows: CO₂ ppm, cigarettes smoked during the period, nicotine dependency, the helpfulness of the smoking cessation clinic, and recognition of the need for follow-up programs. These findings are similar to the findings of Lee's paper¹¹. The smoking cessation success rate of these participants was significantly high. This indicates that smoking cessation success is likely due to receiving a smoking cessation scholarship. The success rate of

smoking cessation was statistically higher in the group that received smoking cessation education. This is similar to the results of a study by¹². Their finding that a single lecture significantly improved knowledge about tobacco-related issues one year later is similar to the results of this study and is a finding of considerable interest. Additionally, the finding that the smoking cessation success rate was significantly higher in the group which recognized the need for smoking cessation education is thought to be another reason for the similarity of the research findings. Education has been identified as a potent sociodemographic predictor of smoking cessation, and the *Healthy People 2010* goals include the elimination of health disparities attributable to education. This report indicates that poorly educated smokers are less likely to

quit smoking than highly educated smokers because they tend to be more nicotine dependent and are employed in settings where there is less support for quitting¹³. Therefore it appears that conducting enhanced smoking cessation education programs is a good way to guide more students to smoking cessation success in the future.

The present findings suggest that targeting willpower may be an important strategy to incorporate into specialized intervention programs for smoking cessation. In this study, when asked "What is the most important thing to remain a non-smoker"? 51 students (36.7%) answered "willpower". Among these students, 64.7% successfully quit smoking. Angela reported that the possession of willpower by an individual was seen to be essential. The ability to mobilize that required willpower

Table 1. General characteristics

Variable	Category	n (%) mean(SD)*	Smoking cessa- tion failure n (%)	Smoking cessation success n (%)	χ^2	p
Gender	M	131 (94.2)	63 (48.1)	68 (51.9)	.011	>.999
	F	8 (5.8)	4 (50.0)	4 (50.0)	.011	>.999
Age		23.04 (1.72)				
Major	Engineering	63 (45.3)	33 (52.4)	30 (47.6)	5.242	>.999
	Design & Sports	85 (61.2)	5 (62.5)	3 (37.5)		
	Business management	54 (38.8)	20 (37.0)	34 (63.0)		
	Health & Social Sciences	14 (10.1)	9 (64.3)	5 (35.7)		
CO2 ppm	1-6 ppm	100 (71.9)	31 (31.0)	69 (69.0)	42.238	<.000
	Over 7 ppm	39 (28.1)	36 (92.3)	3 (7.7)		
Age at time of first cigarette		18.12 (2.49)				
Period of smoking cigarettes	1-7 years	104 (73.8)	45 (43.3)	59 (56.7)	5.488	.027
Period of smoking	Over 8 years	33 (23.4)	22 (66.7)	11 (33.3)	5.488	.027
Nicotine dependency	Mild	39 (28.1)	0 (0.0)	39 (100.0)	97.710 ⁺	<.000
	Moderate	43 (30.9)	15 (34.9)	28 (65.1)		
	Severe	57 (41.0)	52 (91.2)	5 (8.8)		
Smoking cessation education	Yes	75 (54.0)	18 (24.0)	57 (76.0)	38.212	<.000
	No	64 (46.0)	49 (76.6)	15 (23.4)		
helpfulness of the smoking cessation clinic	Yes	108 (77.7)	42 (38.9)	66 (61.1)	16.820	<.000
	No	31 (22.3)	25 (80.6)	6 (19.4)	16.820	<.000
Recognition of need for fol- low-up programs	Yes	100 (71.9)	36 (36.0)	54 (64.0)	21.252	<.000
	No	29 (28.1)	31 (79.5)	8 (20.5)	21.252	<.000
Smoking clinic completion time	Aug. 2012	3 (2.2)	3 (100.0)	0 (0.0)	7.167	.306
	Feb. 2013	7 (5.0)	4 (57.1)	3 (42.9)	7.167	.306
	Aug. 2013	27 (19.4)	15 (55.6)	12 (44.4)	7.167	.306
	Feb. 2014	19 (13.7)	10 (52.6)	9 (47.4)	7.167	.306
	Aug. 2014	23 (16.5)	7 (30.4)	16 (69.6)	7.167	.306
	Feb. 2015	23 (16.5)	11 (47.8)	12 (52.2)	7.167	.306
	Aug. 2015	37 (26.6)	17 (45.9)	20 (54.1)	7.167	.306
Smoking-cessation success	Yes	72 (51.8)				
	No	67 (48.2)				

+: Fisher exact test

was perceived as the key factor of success¹⁴. Also, further research reported that the effectiveness of nicotine dependence medications on smoking cessation was also related to willpower¹⁵. These results are similar to the results of the current study.

In this study, among the 63 participants (45.3%) who reported weight gain as the most noticeable symptom after quitting smoking, 22 students (34.9%) ultimately quit smoking successfully, but 41 students (65.1%) failed to quit smoking. This suggests that weight gain is significantly related to smoking cessation failure. Belinda B and Robin M reported that the majority of smokers are concerned

about post-cessation weight gain, but few studies have investigated the prospective relationship between weight-related concerns, weight-related outcomes, and smoking cessation success or a mechanism by which such concerns are related to these outcomes¹⁶. That is supported by the current study. Weight gain was found to be associated with subsequent relapse.

Smoking cessation is associated with substantial health benefits. Weight gain is cited as a primary reason for not attempting to quit smoking. Smoking was shown to impair glucose tolerance and insulin sensitivity, and cross-sectional studies have demonstrated that smokers

Table 2. Smoking characteristics of subjects

Variable	Category	n (%) mean(SD)*	Smoking ces- sion Failure n (%)	Smoking cessation success n (%)	χ^2	p
Motivation	Health problems	8 (5.8)	1 (12.5)	7 (87.5)	13.941	.004
	Surrounding recommendations	18 (12.9)	13 (72.2)	5 (27.8)		
	Difficulty of quitting smoking by oneself	27 (19.4)	18 (66.7)	9 (33.3)		
	Information of health clinic	84 (60.4)	34 (40.5)	50 (59.5)		
Improved symptoms after smoking cessation	Decreased cough and sputum	72 (51.8)	29 (40.3)	43 (59.7)	5.326+	.073
	Improvement of other health problems	36 (25.9)	23 (63.9)	13 (36.1)		
	Increased sexual desire	31 (22.3)	15 (48.4)	16 (51.6)		
The most difficult time after smoking cessation		1.41 (.74)*				
The most important thing to remain a non-smoker	Willpower	51 (36.7)	18 (35.3)	33 (64.7)	6.243+	.044
	Direct health benefits	61 (43.9)	36 (59.0)	25 (41.0)		
	Family and surrounding support	27 (19.4)	13 (48.1)	14 (51.9)		
What symptoms have you noticed?	Weight gain	63 (45.3)	41 (65.1)	22 (34.9)	28.436+	<.000
	Improved health status	34 (24.5)	15 (44.1)	19 (55.9)		
	Improved cleanliness of surroundings and body	30 (21.6)	3 (10.0)	27 (90.0)		
	Improved self-confidence	12 (8.6)	8 (66.7)	4 (33.3)		
The biggest reason for smoking relapse (only for those who failed to quit smoking)	Weakness of willpower	19 (28.4)	19 (100.0)			
	Surrounding temptations	21 (31.3)	21 (100.0)			
	Withdrawal symptoms	4 (6.0)	4 (100.0)			
	Maintaining interpersonal relationships	11 (16.4)	1 (100.0)			
	Stress	11 (16.4)	11 (100.0)			
	The desire to smoke when drinking alcohol	10 (14.9)	10 (100.0)			
When smoke relapse occurs after smoking cessation		.84 (1.26) month				
Most attempted method of cessation	Acupuncture	19 (13.7)	16 (84.2)	3 (15.8)	11.430	.001
	Consultation	47 (33.8)	28 (59.6)	19 (40.4)	3.697	.005
	Nicotine gum, candy	18 (12.9)	11 (61.1)	7 (38.9)	1.380	.240
	Taking medicine	1 (0.7)	1 (100.0)	0 (0.0)	1.082	.298
	Reducing the number of cigarettes smoked	6 (4.3)	4 (66.7)	2 (33.3)	.856	.355
	Keeping a smoking journal	2 (1.4)	0 (0.0)	2 (100.0)	1.888	.169
	Willpower	86 (61.9)	24 (27.9)	62 (72.1)	37.206	<.000
In-home smoking	No	94 (67.6)	26 (27.7)	68 (72.3)	54.653+	<.000
	Yes	45 (32.4)	41 (91.1)	4 (8.9)		

+: Fisher exact test

Table 3. Physical characteristics of subjects

Variable	Category	n (%) mean(SD)*	Smoking cessation Failure n (%)	Smoking cessation success n (%)	χ^2	p
stress	A lot	45(32.4)	35(77.8)	10(22.2)	23.852 ⁺	<.000
	A little	75(54.0)	25(33.3)	50(66.7)		
	Not at all	19(13.7)	7(36.8)	12(63.2)		
Methods of relieve stress	Drinking alcohol	61(43.9)	40(65.6)	21(34.4)	50.512	<.000
	smoking	16(11.5)	15(93.8)	1(6.3)		
	exercise	46(33.1)	4(8.7)	42(91.3)		
	Etc	15(10.8)	7(46.7)	8(53.3)		
Stress score		5.30(2.04)*				
Height		174.7(6.57)*				
weight		71.1(10.36)*				
Body size	over weight	41(29.5)	141(34.1)	27(65.9)	5.586 ⁺	.013
	normal	76(54.7)	39(51.3)	37(48.7)		
	under weight	22(15.38)	14(63.6)	8(36.4)		
Regular exercise	yes	81(53.8)	27(33.3)	54(66.7)	17.552 ⁺	<.000
Regular exercise	no	58(41.7)	40(69.0)	18(31.0)		
Health screening check	yes	22(15.8)	7(31.8)	15(68.2)	6.747	.029
Health check-up	no	113(81.3)	56(49.6)	57(50.4)		
Coffee to drink per day	Not at all	77(55.4)	38(49.4)	39(50.6)	.467 ⁺	.804
	A cup of coffee	36(25.09)	18(50.0)	18(50.0)		
	2 cups of coffee	26(18.7)	11(42.3)	15(57.7)		
Next time to attend cessation clinic	yes	84(60.4)	45(51.1)	43(48.9)	.829 ⁺	.384
	no	49(35.3)	22(43.1)	29(56.9)		

+: Fisher exact test

Table 4. Regression analysis of affecting factors on smoking cessation of general related characteristics

	B	SE	Walls	p	Exp((B)	95% CI	
						lower	upper
constant	2.292	.418	30.11	.000	9.989		
CO2/ppm	-2.866	.710	16.286	.000	.057	.014	.229
Smoking period	-.875	.588	2.218	.136	.417	.132	1.319
Regular education	-1.536	.495	9.628	.002	.215	.082	.568
attendance at smoking cessation clinics	-1.498	.650	5.320	.021	.223	.063	.789
need a follow-up program	-1.552	.567	7.501	.006	.212	.070	.643

Table 5. Logistic regression analysis related to smoking factors

		B	SE	Wald	p	Exp((B)	95% CI	
							lower	upper
constant		-2.352	4.041	.339	.561	.095		
Motivation to attend a smoking cessation clinic?	Health problem	-1.050	1.429	.540	.463	.350	.021	5.762
	Around recommendation	-.977	1.342	.530	.467	.376	.027	5.226
	Difficulty of quitting smoking by oneself	-.122	1.222	.010	.921	.885	.081	9.711
	Information of school health clinic	-1.050	1.429	.540	.463	.350	.021	5.762
need a follow-up program		-1.542	.733	4.424	.035	.214	.051	.900
The most thing to remain a non-smoker	willpower	-1.329	.798	2.923	.232	1.258	.381	17.512
	Health benefit directly	.949	.977	.943	.331	2.582	.099	5.806
	Family and around support	-.277	1.039	.071	.790	.758	.978	2.896
What symptoms have you notice	Weight gain	3.098	.788	20.044	.000	17.044	.381	17.512
	Improve health status	.071	.677	.011	.916	1.073	.290	3.966
	Clear around and body	.930	.703	1.748	.186	2.533	.043	1.006
	Improve self confidence	2.890	.863	11.208	.001	18.000	.044	2.570
Most try method for cessation	Nicorette, acupuncture	1.493	1.015	2.164	.141	4.451	.609	32.546
	Consultation	-1.319	.778	2.872	.090	.267	.058	1.229
	willpower	-2.950	.792	13.875	.000	.052	.011	.247
In house smoking(1)		2.687	.753	12.728	.000	14.689	.016	.334

Table 6. Logistic regression analysis related to physical factors

		B	SE	Wald	p	Exp((B)	95% CI	
							lower	upper
constant		18.818	19.876	.000	1.000	1.488		
Stress	A lot of			4.428	.109			
	A little	1.446	.760	3.619	.057	4.246	.957	18.836
	Not at al	2.072	1.238	2.804	.094	7.943	.702	89.812
Method of relieve stress	Drinking	-9.993	1.458	17.130	.002	.185	.000	.
	Smoking	-1.769	1.100	2.587	.108	.170	.020	1.472
	Exercise	-4.255	1.933	4.847	.028	.014	.000	.627
Regular exercise	Etc.	2.287	1.327	2.970	.085	9.844	.731	132.654
	Yes	-1.760	.799	4.850	.028	.172	.036	.824
	No			4.221	.121			
	Yes	-2.996	1.237	.000	.999	.000	.021	.913
Health Screening check	Yes	-1.974	.961	4.221	.040	.139	.021	.913
	No	-2.996	1.237	.000	.999	.000	.000	.

are insulin-resistant and hyperinsulinaemic as compared with non-smokers. Smoking cessation seems to improve insulin sensitivity in spite of weight gain. Nicotine replacement – in particular nicotine gum – appears to be effective in delaying post-cessation weight gain¹⁷. Therefore, it appears that during future university smoking cessation education programs it will be necessary to give nicotine replacement products to participants who report post-cessation weight gain.

5. Conclusions

From February 2012 to August 2015, the smoking cessation success rate of students who enrolled in the smoking cessation scholarship program conducted at the N University Health Clinic was 51.8%. In general, the factors which showed statistically significant differences were as follows: CO₂ ppm, cigarettes smoked during the period, nicotine dependency, the helpfulness of the

smoking cessation clinic, and recognition of the need for follow-up programs. In addition, the finding that the smoking cessation success rate was significantly higher in the group that recognized the need for smoking cessation education programs must be considered as a reason for the similarity of this study's results with the results of previous studies. The smoking-related factors and health-related factors which showed statistically significant differences with regard to smoking cessation success were as follows: Motivation, the most important factor that allowed one to remain a non-smoker, symptoms noticed, in-home smoking, stress, and regular exercise. Among the above factors, it is thought that smoking cessation education plays an important role in smoking cessation success. Logistic analysis shows that Co_2/ppm , regular education, attendance at a smoking cessation clinic, recognition of the need for follow up programs, direct health benefits, weight gain, self-confidence, willpower, drinking, regular exercise, and regular health check-ups had a significant influence on smoking cessation.

However, since this research only considers a small sample of students, it will be difficult to extend the results of this study to other analyses, and follow-up studies must be carried out. Therefore, proper guidelines are needed to promote smoking cessation for optimal health. Also, multi-dimensional intervention programs for smoking cessation should be developed.

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7. References

1. World Health Organization (WHO). The MPOWER: A policy package to reverse the tobacco epidemic. Geneva Switzerland: World Health Organization Press. Available from: http://www.who.int/tobacco/mpower/mpower_english.pdf
2. Ministry of Health and Welfare Health and Welfare White Paper. Seoul: Moonyoungsa Publ. Available from: www.mhlw.go.jp/english/
3. Kim HS, Oh EG, Hyung HK, Cho ES. A study of factors influencing health promotion lifestyle in college students. *Journal of Korean Academic Community Health Nurses*. 2008; 19(3):506–20.
4. Park SW. A review of cigarette smoking-related behaviors and health problems among university students. *Korean Journal of Health Education Promotion*. 2011; 28(5):35–49.
5. Shin WW, Yoo CY. The effect of drinking motives on alcohol problem - Focusing on adult population in a community. *Korean Journal of Society Welfare*. 2008; 35(1):363–87.
6. Ahn SS, Kim CS, Choi SH. Influencing of depression, anxiety, and stress-coping aspect upon smoking desire of undergraduates, according to their lifestyles. *Korean Journal of Health Service Management*. 2012; 6(1):205–18.
7. Korean Association of Smoking and Health. List of Korean youth smoking and actual condition. Available from: http://www.kash.or.kr/user_new/life_nosmoke_02_01.asp
8. Prabhat J. 21st-century hazards of smoking and benefits of cessation in the United States. *The New England Journal of Medicine*. 2013; 368:341–50.
9. Michael JT. 50-year trends in smoking-related mortality in the United States. *The New England Journal of Medicine*. 2013; 368 (4),pp. 351–364.
10. Pirie K, Peto R, Reeves GK, Green J, Beral V. Million Women Study Collaborators. The 21st century hazards of smoking and benefits of stopping: A prospective study of one million women in the UK. *The Lancet*. 2013; 381(9861):133–41.
11. Lee MS, Hong JY, Hon HJ. The factors associated with success of smoking after a 6 month cessation at smoking cessation clinic in public health center of one metropolitan city. *The Journal of Korea Convergence Society*. 2010; 1(1):31–8.
12. Grassi MC. Knowledge about health effects of cigarette smoking and quitting among Italian University Students: The importance of teaching nicotine dependence and treatment in the medical curriculum. *BioMed Research International*. 2014; 1–9.
13. David WW. What accounts for the association of education and smoking cessation? *Preventive Medicine*. 2005; 40(4):452–60.
14. Angela MT. Barriers to smoking cessation in pregnancy a qualitative study. *British Journal of Community Nursing*. 2003; 8(2):6–64.
15. Vogt F, Hall S, Marteau TM. Understanding why smokers do not want to use nicotine dependence medications to stop smoking: Qualitative and quantitative studies. *Nicotine and Tobacco Research*. 2008; 10(8):1405–13.
16. Belinda B, Robin M. The role of weight concern and self-efficacy in smoking cessation and weight gain among smokers in a clinic based cessation program. *Addictive Behavior*. 1998; 23(5):609–22.
17. Filozof C, Pinilla FMC, Fernandez-Cruz A. Smoking cessation and weight gain. *Obesity Reviews*. 2004; 5(2):95–103.