

Self-efficacy in the Smoking Cessation: A Health Belief Model Perspective in A Judicial Correction Institute

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Abstract

Healthy and strong body function was essential in the job of prison management, and smoking had been proved to induce negative impacts. Based on the health belief model, the current research explored the association among health belief on smoke -cessation, self-efficacy on ceasing smoke, and possibility of ceasing smoke among the prison officials. Samples were 182 officials recruited by snowball sampling method, 72.53% were male. Test results indicated the barrier to ceasing smoke had a lowest average $2.95(\pm 1.04)$, followed by benefit of ceasing smoke (3.49 ± 0.54), perceived susceptibility (3.51 ± 0.75), perceived severity (3.59 ± 0.78), self-efficacy (3.65 ± 0.77), and possibility of ceasing smoke (3.67 ± 0.99). As to the variance analysis, history of smoking and residence were two major variables that made the constructs different, whereas age and marriage contributed the least. Noteworthy was that the education is the major contributor to the difference of smoke-ceasing possibility among respondents. Results from regression analyses indicated that perceived benefits ($\beta = .52$) and perceived barriers ($\beta = .23$) were the two major predictors of smoke-ceasing, and the other independent variables (IV) were not significant in this model ($adj. R^2 = .279$). The variance explained increased to 48.3% ($adj. R^2 = .483$) in the model with additional variable of self-efficacy. Perceived benefits and perceived barriers were replaced by the self-efficacy, and made all original IVs not significant. This indicated the mediating effects of self-efficacy between predictors and smoke-ceasing. The current research suggested the judicial correction institute shall logically staff required officials for the jobs of prison management, and recommend several smoke-ceasing measures.

Keywords: Judicial correction professional, smoke-cessation drugs, smoke addiction preventing plan, health belief model, self-efficacy.

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INTRODUCTION

Smoking causes severe health problems and eventually shorten the human's life. Health problems that caused by smokers were not only harmful to the smokers themselves by direct inhaling, but also and even worse to the people around the smokers through the effects of second-hand or third-hand had smoking. This had consumed great quantity of resources, monetary and non-monetary, of a society and the world. As a result, ceasing smoking had become a common campaign around the world. To strike the possible harms that may be brought by any forms of smoking, governments of country, civil associations, as well as the World Health Organization [1], had already made varied efforts to ceasing smoking.

Major participations made by the government bodies are generally proposed to shape the smoking

behaviors by statutory regulations by laws, doctrines, or jurisprudences, and taxations. Contribution to the smoking ceasing campaigns from the civil association may include health promotion programs, mediations, religious beliefs, physical exercises, and medicine-assisted. Medicine-assisted was one of the measures that had been proofed can effectively help those smokers who wish to detach the temptation of nicotine and to successfully ceasing smoking.

Job stress is one of the major reasons contributed to the fail of ceasing smoking. Emotional focus is one of the stress coping strategies that people may take when stresses were appraised [2].

Based on the health belief model, a typical and widely adopted health behavior theory, the current research took samples from a highly circumscribed work place in which workers exposed to an isolated and

highly stressed judicial correction institute to explore how the health belief and self-efficacy affect the smoke cessation intention of the people in a highly-stressed job environment.

Research questions to be answered by this research are:

- How demographic factors may differentiate the respondent's health belief of ceasing smoke?
- How each of the health belief factors predict the ceasing smoke behavior?
- How the results of the research may contribute to the knowledge of human resource management as well as the health promotion campaign?

LITERATURE REVIEW

Smoking and hurts

Materials smokers used for smoking are generally made of dried tobaccos leaves that contains stimulant alkaloid nicotine as well as harmala alkaloids [3]. Dried tobacco leaves are mainly used for smoking in cigarettes, cigars, pipes, shishas as well as E-cigarettes (both rechargeable and disposable), E-cigars, E-pipes and vaporizers [1].

Academics and health professionals generally proposed that tobacco use is a risk factor for many diseases, in particular directly affecting the health of heart, liver, and lungs, and as a major cause of many cancers, and was announced by the WHO as the world's single greatest preventable cause of death [1, 4]. WHO indicated that tobacco kills up to half of its users, of which more than 7 million of those deaths are the result of direct tobacco use while around additional 1.2 million are the result of non-smokers being exposed to second-hand smoke [5].

Health belief model

Health belief model (HBM) is developed to understand the predicting factors behind a person's healthy behavior [6, 7]. HBM scholars argued that the possibility of a healthy behavior can be determined by one's perception of susceptibility and severity toward a disease, along with barriers and benefits one perceived onto the actions to be taken for such health behavior. Contextual factors in the HBM may also affect such a decision at the same time [7, 8]. The current research hence proposes hypothesis as follow:

H1: Respondent's health belief varies along with demographic factors

Perceived threat of a healthy problem combines two major constructs of perceived susceptibility and perceived severity. The former refers to the possibility of suffering the captioned problem, and the latter represents how bad of the impacts once affected [9]. All of these are subjective perception. The higher a person perceived the threats, the higher the possibility of such a person to take a proper action to prevent the threats. The current research hence proposes hypothesis as follow:

H2: Respondent's perceived threats positively affect the magnitudes of smoke-cessation intention.

Whether to take an action may also be moderated by the barriers and benefits (or belief of the effectiveness) of such an action [7]. Perceived threats motivate a person for action, the barriers and benefits together affect the choice of a proper action [6]. Other contextual factors within a HBM model may include demographic factors, as well as cues to action such as the internal cues of self-health conscious, and external source of a person's information network. The current research hence proposes hypothesis as follow:

H3: Respondent's perceived benefits of ceasing smoke to the health will positively, and the perceived barriers will negatively, affect the magnitudes of smoke-cessation intention.

Self-efficacy

Self-efficacy refers to the belief that an individual has sufficient ability to accomplish something a person will perform. Self-efficacy has nothing to do with the skills possessed by the individual, but with the self-judgment of the level of competence. As a belief in one's own abilities, self-efficacy determines an individual's behavior, way of thinking, and emotional response in a particular situation [10].

According to Bandura [10], people with high self-efficacy can increase personal achievements and interests; accept task challenges as tempering, not as threats that should be avoided, and ensure that they can master it. Maintaining a high level of self-efficacy can promote personal achievement, reduce stress and avoid depression. Conversely, people with low self-efficacy will be suspicious of their ability to face difficult tasks. People with low self-efficacy are more likely to feel stress, powerlessness and depression.

The theory of self-efficacy depicts the universal principle that can be seen everywhere in daily life. It was applied in many discipline including healthcare industries to explain its effects of reinforcement of high and low self-efficacy on particular behavioral intentions or behaviors.

Self-efficacy on ceasing smoke depicts at what levels of the respondent will perceive that she or he can successfully accomplish the behavior ceasing smoke. The levels of self-efficacy can be affected by the perceived threats of health problems, as well as the perceived benefits and barriers, and in turn affect the ceasing smoking intention. In other words, the self-efficacy should act as a mediator between predictors and smoking cessation intention. The current research hence proposes hypothesis as follow:

H4: The self-efficacy will mediate the association of perceived threats of health problems, perceived benefits

and barriers, and the magnitudes of smoke-cessation intention.

MATERIAL AND METHODS

Samples

The current research collected 182 valid samples of workers from judicial correction institutes by the way of snowball sampling. Table 1 shows the composition of the sample.

Table-1: Description of samples

Variables	Group	n	%
Gender	Male	132	72.53
	Female	50	27.47
Spouse	Single	132	72.53
	Spouse	50	27.47
Education	High school	45	24.73
	Undergraduate	126	69.23
	Graduate	11	6.04
Income	<30 K	30	16.48
	31-40 K	109	59.89
	>40 K	43	23.63
Smoke history (years)	<1	15	8.24
	2-5	56	30.77
	6-10	45	24.73
	>11	66	36.26
Age	<30	45	24.73
	30-39	111	60.99
	>40	26	14.29
Shift	Yes	61	33.52
	No	121	66.48

Instruments

A structural questionnaire is developed based on the works of Schmitz and colleagues [11] and Maiman and colleagues [12] as well as other instruments that were developed for specific health problems [13, 14], and additional demographic items.

All items relate to the HBM constructs are 5-point Likert scale to measure the magnitudes of the responses to each variable. 1 for extreme disagree or unimportant and 5 for extreme agree and important.

METHODS

To answer the research question, this research applied several statistical analysis techniques to reveal the facts of the collected data. A descriptive statistic to understand the average, t-test and one-way ANOVA are used to test the difference of each variable along with demographic factors in two-category and three or more categories respectively. Finally, a Pearson's correlation analysis and multiple regression analysis to explore the relationship of independent variables of health belief and dependent variable of smoking cessation behavior.

RESULTS AND ANALYSES

Descriptive statistics

Results from the descriptive statistical analysis is shown in table 2. Contrast to perceived severity ($3.59 \pm .78$), respondents appear to pay less attention to the possibility of suffering a smoke-associated disease ($3.51 \pm .75$), such as lung cancers, impotent, cardiovascular diseases. In other words, respondents are more likely ignore the possibility, yet worried about the outcomes of diseases.

In the other hand, the gap between benefits ($3.49 \pm .74$) and barriers (2.95 ± 1.04) of health belief of ceasing smoking are large. Respondents generally appreciate the benefit of smoking cessation to the health with low covariance (0.54), and the perceived barriers to quit smoking is low. Noteworthy is the covariance of perceived barriers is high, of which means perception toward the barriers of ceasing smoke greatly different from one to another.

Table 2 also shows an average to high degree of intention to cease smoke ($3.67 \pm .99$).

Table-2

Variables	Min.	Max	Mean	s.d.	Cov.
Perceived susceptibility	2.00	5.00	3.51	.75	.56
Perceived severity	2.00	5.00	3.59	.78	.60
Benefits	1.86	5.00	3.49	.74	.54
Barriers	1.00	5.00	2.95	1.04	1.08
Self-efficacy	2.00	5.00	3.65	.77	.59
Intent of ceasing smoke	2.00	5.00	3.67	.99	.98

Variance analysis

Some t-tests and one-way ANOVA analyses are performed to understand how the health beliefs varied in each demographic factor.

Gender

The average values of each construct in gender are shown as in table 3. Constructs that significant different are perceived severity ($t = -2.65$; $p = .009 < .01$) and perceived benefits ($t = -2.79$; $p = .006 < .01$) and barriers ($t = -2.05$; $p = .042 < .05$). The other constructs are not significant different in terms of gender difference. Based on the results of the statistical data, it shows that the gender is significantly different in the model of the study.

Table-3: Difference of construct in gender

	Gender	n	mean	s. d.	t	p
Susceptibility	M	132	3.46	.74	1.50	.114
	F	50	3.66	.77		
Severity	M	132	3.50	.77	2.65**	.009
	F	50	3.83	.73		
Benefits	M	132	3.40	.74	2.79**	.006
	F	50	3.73	.68		
Barriers	M	132	3.05	.96	2.05**	.042
	F	50	2.70	1.20		
Self-efficacy	M	132	3.60	.77	-1.73	.095
	F	50	3.80	.72		
Smoking cessation	M	132	3.61	1.07	-1.50	.205
	F	50	3.82	.74		

n=182 · * $p < .05$, ** $p < .01$, *** $p < .001$

Marriage

To understand whether the marriage status affect the health belief of smoking cessation or not, the t-test results of table 4 indicated the details. The result shows that the construct of perceived smoking cessation benefit ($t = 2.08$; $p = .039 < .05$) is the only variable that significantly different with marriage status. The rest variables are not significant different.

Table -4: Difference of construct in marriage

Marriage	group	N	mean	s. d.	t	p
Susceptibility	Single	132	3.58	.72	1.82	.058
	Spouse	50	3.34	.80		
Severity	Single	132	3.64	.74	1.38	.145
	Spouse	50	3.45	.84		
Benefits	Single	132	3.56	.71	2.08*	.039
	Spouse	50	3.31	.78		
Barriers	Single	132	2.96	1.05	0.61	.095
	Spouse	50	2.95	1.03		
Self-efficacy	Single	132	3.71	.74	1.63	.090
	Spouse	50	3.50	.82		
Smoking cessation	Single	132	3.68	0.75	0.18	.814
	Spouse	50	3.64	1.45		

n=182 · *p=.05, *p=.01, ***p=.001

Education

Test result shows that education factor can only significantly differentiate the variable of perceived barrier, of which the respondents with higher education levels superior to the those with lower levels ($F=4.61$; $p=.011<0.05$), as table 5. The rest variables are not significant different in terms of educational levels. Typically, education is one of the major factors to differentiate the respondent's behavior, major reasons behind them stemmed from an assumption of people with higher education will have better chances for higher economic and social status. However, the results of the current research did not behave in the same direction.

Table-5: Difference of construct in education

Education		n	mean	SE	F	Sig.	Scheffe's	LSD
Susceptibility	1.	45	3.60	0.80	.09	.416	—	—
	2.	126	3.47	0.70				
	3.	11	3.70	1.05				
Severity	1.	45	3.73	0.73	1.37	.258	—	—
	2.	126	3.53	1.18				
	3.	11	3.74	0.78				
Benefits	1.	45	3.57	0.76	.87	.421	—	—
	2.	126	3.45	0.69				
	3.	11	3.68	1.13				
Barriers	1.	45	2.67	.94	4.61**	.011	n.s.	3>2>1
	2.	126	3.10	1.03				
	3.	11	3.42	1.20				
Self-efficacy	1.	45	3.38	0.72	5.49**	.005	3>2>1	—
	2.	126	3.71	0.75				
	3.	11	4.11	0.87				
Ceasing smoke	1.	45	3.40	0.79	2.72	.069	—	—
	2.	126	3.74	1.04				
	3.	11	4.01	0.95				

n=182; 1. High school, 2. Undergraduate, 3. Graduate; *p=.05, *p=.01, ***p=.001

Age

The statistical analysis results, as shown in table 6, is to examine how the model constructs may differ in terms of different age levels. The perceived barrier is the only variable that is significantly different in different age levels ($F=6.86$; $p=.001<.001$), and the

rest variables are not significantly different in terms of age levels. Further examinations with Scheffe's post hoc for perceived barrier, respondents who aged under 30 perceived strongest barrier than those aged over 31 years old.

Table-6: Difference of construct in age

Age		n	mean	SE	F	Sig.	Scheffe's
Susceptibility	1.	45	3.65	0.62	1.19	.307	—
	2.	111	3.49	0.75			
	3.	26	3.40	0.95			
Severity	1.	45	3.55	0.69	.23	.796	—
	2.	111	3.58	0.78			
	3.	26	3.59	0.92			
Benefits	1.	45	3.44	0.64	.14	.866	—
	2.	111	3.51	0.72			
	3.	26	3.48	0.95			
Barriers	1.	45	3.33	0.94	6.86***	.001	1>2>3
	2.	111	2.93	1.06			
	3.	26	2.41	0.391			
Self-efficacy	1.	45	3.78	0.64	2.12	.124	—
	2.	111	3.66	0.77			
	3.	26	3.39	0.91			
Ceasing smoke	1.	45	3.72	0.64	1.37	.257	—
	2.	111	3.72	1.11			
	3.	26	3.37	0.96			

n=182; 1.<30, 2.31-39, 3.>40; *p=.05, *p=.01, ***p=.001

Since some constructs varied with each demographic factor, we may conclude from the aforementioned results that the H1 is partially supported.

Regression analysis

To examine the association of independent variables and dependent variables of the research, we first conduct the Pearson correlation analysis to confirm the relationship of all variables, as shown in table 7. The

four dimensions of health belief mode, except the perceived barriers, have significant relationship with ceasing smoke behavior. The strongest association with smoke ceasing behavior is the perceived benefits ($r=.474$, $p=.000<.01$), and followed by perceived susceptibility ($r=.430$, $p=.000<.01$), the perceived barrier shows a negative relation and not significant relationship with ceasing smoke behavior.

Table-7: Pearson correlations of IVs and smoking cessation

Variables	1	2	3	4	5	6
1. Ceasing smoke	1	.430***	.346***	.474***	-.025	.695***
2. Susceptibility		1	.784***	.842***	-.426***	.561***
3. Severity			1	.842***	-.554***	.456***
4. Benefits				1	-.455***	.611***
5. Barriers					1	-.114
6. Self-efficacy						1

* $p<.05$ ** $p<.01$ *** $p<.001$

We then take the behavior of smoking cessation as a dependent variable, to be regressed with susceptibility, severity, benefits, and barriers to

examine the effects of each predictor on ceasing smoke behavior. The results are shown in table 8.

Table-8: Regression analysis

M1	Non-Std.		Std.	t	p		
	B est.	SE	Beta			Tol.	VIF
Constant	0.25	0.52		0.48	0.64		
Susceptibility	0.21	0.16	0.16	1.31	0.19	0.27	3.69
Severity	-0.11	0.17	-0.09	-0.67	0.5	0.24	4.16
Benefits	0.70	0.19	0.52	3.67	0.00	0.21	4.88
Barriers	0.22	0.07	0.23	3.01	0.00	0.69	1.44

DV: BH; $R=.528$, $R^2=.279$, Adj. $R^2=.262$, $F=17.084$, $df:4/177$; $p=.000$

The regression results indicate that all predictors can explain 26.2% (adj. $R^2=.262$) variance of ceasing smoke behavior. Perceived benefits is the strongest predictor ($\beta=.517$), followed by perceived barriers ($\beta=.230$), perceived susceptibility ($\beta=.162$), and perceived severity. H2 and H3 are supported.

The model can be expressed as an equation as follow:

$$\hat{Y}_{(\text{ceasing smoke})} = 0.25 + 0.21\chi_{1(\text{perceived susceptibility})} - 0.11\chi_{2(\text{perceived severity})} + 0.70\chi_{3(\text{perceived benefits})} + 0.22\chi_{4(\text{perceived barriers})}$$

To the last, we examine the mediation effect of self-efficacy. By adding the self-efficacy in the model, the test result shows significant changes to the previous model. In this new model, variance explained increased from 26.2% to 48.3%, and the effects of all health belief predictors are replaced by the self-efficacy as shown in table 9. This means the association of predictors and behavior is fully mediated by self-efficacy. H4 is supported.

Table-9: Self-efficacy as a mediator

M2	Non-Std.		Std.	t	p		
	B est.	SE	Beta			Tol.	VIF
Constant	-0.29			0.44		-0.66	0.51
Susceptibility	0.03	0.14	0.02	0.23	0.82	0.27	3.78
Severity	0.00	0.14	0.00	0.03	0.98	0.24	4.20
Benefits	0.17	0.17	0.13	0.02	0.31	0.18	5.57
Barriers	0.11	0.06	0.12	0.76	0.08	0.67	1.50
S-efficacy	0.80	0.09	0.62	8.74	0.00	0.58	1.73

DV: Behavior;; $R=.705$; $R^2=.497$, Adj. $R^2=.483$, $F=34.767$, $df:5/176$; $p=.000$

The model can be expressed as an equation as follow:

$$\hat{Y}_{(\text{ceasing smoke})} = -0.29 + 0.03\chi_{1(\text{perceived susceptibility})} + 0.00\chi_{2(\text{perceived severity})} + 0.17\chi_{3(\text{perceived benefits})} + 0.11\chi_{4(\text{perceived barriers})} + 0.80\chi_{5(\text{self-efficacy})}$$

CONCLUSIONS

Respondents in this research generally ignored the possibility of suffering smoke-associated diseases as well as the severity of such diseases. Ironically, respondents have generally tried some forms of efforts of self-monitored activities in ceasing smoking. In the

other hands, some respondents had even received medicine-assisted prescriptions. We may conclude that people who work in a highly stressful environment may ignore the health threats of smoking when stress raise due to job requirement (staying alert and keeping close monitor on the duty), yet they indeed have strong intention to quit smoking.

Self-efficacy, as expected acts as a very important role in enhancing the respondent's intention of ceasing smoke. Original predictors in HBM were significantly and almost fully mediated, either from significant to non-significant or lower the magnitude of effects, by the respondent's self-efficacy in ceasing smoke. This indeed provide us a useful direction in designing a smoke-ceasing program in the future. Increasing the smoker's self-efficacy is the core to the successful cessation.

Stresses, especially job stresses, are major factors that cause smoking and other abuse behaviors (drug, alcohol etc.). Abnormal behaviors such as habitual smoking, either nicotine-dependent or not, can be traced back to the stress-coping strategies. The captioned behavior may not be shaped or changed unless the rooted causes or stresses were solved or eased.

Statutory regulation to prohibit smoking in public areas, government-supported health promotion campaigns and medicine-assisted measures are some noticeable that help smoking cessation. However, all these measures are emotional focus that may work only for a temporary situation, and the cases may regain their smoking behavior before the intervention.

Other stress-coping strategies proposed by the academic is problem-solving (Lazarus & Folkman, 1984). This means the management of the judicial correction institute shall explore into the roots that cause to the extreme stresses. Causes to such stress may vary from one institute and one country to another, general complaints from the professional workers of this kind may include but not limited to continuous day and night shift, job loading in terms of hours of duty and/ or job description or requirement, work environment, lack of fringe benefit such as paid vacation and leisure facilities, and lack of job support. Extended research on this particular job stress through the research strategies of such as depth interviews and followed by a longitudinal research span may worth to conduct to gain more knowledge on how to deal with this particular problem.

This research shed some lights on how the workers behave in response to the highly stressful job environment with abnormal behavior as a stress-coping strategy. Since judicial correction facility is part of infrastructure of a nation's judicial system, and smoking is one of major health issues around the world,

the current research that was conducted in Taiwan indeed bring good reference and implications to any part of the world.

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