Predictors of Cigarette Smoking Behavior Among Military University Students in Taiwan

Kwua-Yun Wang, Chia-Chen Yang *,
Nain-Feng Chu **, Der-Min Wu ***

RN, PhD, Deputy Director, Department of Nursing, Taipei Veterans General Hospital, & Adjunct Professor, School of Nursing, National Defense Medical Center

*RN, MS, Instructor, School of Nursing, National Defense Medical Center, & Doctoral Candidate, The Graduate Institute of Clinical Medical Sciences, Chang Gung University

**MD, PhD, Superintendent, DOH Taitung Hospital, Adjunct Professor, School of Public Health, National Defense Medical Center

***MS, Associate Professor

Significance

➢ **The smoking rate among Taiwanese adolescents remains high. In any age group, smoking behavior can be influenced by personal, social, and familial factors.**

➢ **In adolescents, many factors, including psychological, physical, emotional, interpersonal relationship, social and familial, interact to influence smoking behavior.**

➢ **At present, no data are available on smoking behavior in military students in Taiwan. Understanding the factors that influence smoking behavior is a critical element in smoking cessation programs.**

Research Purpose

➢ **The purpose of this study was to investigate the prevalence and predictors of smoking behaviors among military university students in Taiwan.**
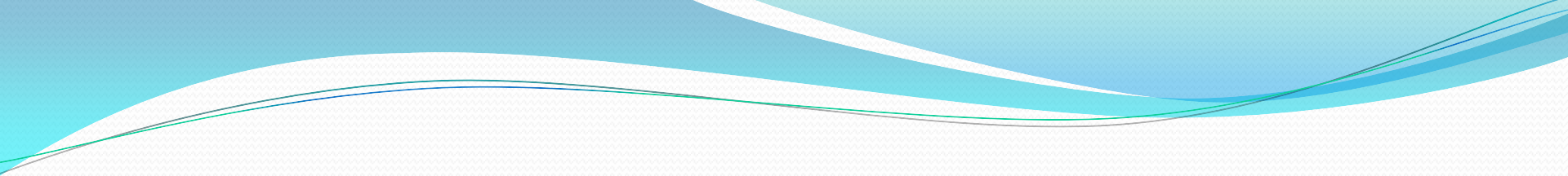
Material and Methods

Study Design

➢ **Cross-sectional, descriptive and correlation design.**

➢ **Subjects were recruited from seven military universities nationwide in 2004.**

Subjects

➢**Eligibility criteria for this study included: age 18 or higher and male.**

➢**A total of 2,477 usable questionnaires were available for the data analysis.**

➢**Participation proportions were computed in terms of the number of questionnaires collected divided by total number of students in each school.**

  ➢ **Proportion ranges for each school ranged from 82.0% to 100%.**

Definition of Terms

- **Non-smokers**: **Non-smokers defined as never-smokers or ex-smokers.**

  - **Never-smokers referred to participants who either have never smoked a cigarette or not smoked regularly and, over the course of their lifetime, have not smoked more than 100 cigarettes.**

  - **Ex-smokers referred to participants who, over their lifetime, smoked more than 100 cigarettes or previously smoked on a daily basis but have since quit cigarette smoking and, at present, do not smoke cigarettes at all.**

➢ **Smokers**: **Smokers defined as over their lifetime, have smoked over 100 cigarettes and at present smoke cigarettes on a regular basis (at least one cigarette a day) or semi-regular basis (continuing occasional smoker).**

Study tools

- **Demographics**
  - age,
  - parents' education level,
  - family environment (including parents/sibling smoking behaviors),
  - school environment (including teachers, best friends' smoking behaviors and schools' policy of smoking).

➢ **Cigarette smoking history**

    ➢ **frequency of smoking,**

    ➢ **amount of smoking, reasons for smoking,**

    ➢ **age of first smoke,**

    ➢ **progression to regular cigarette use,**

    ➢ **continuation of smoking,**

    ➢ **motivation for cessation.**

- **Cigarette smoking attitude questionnaire**
  - **Consists of 15 questions and measures attitudes toward smoking with regard to health effects, perceived impression of smoking, effects of smoking on emotional condition, and smoking prohibition policies.**
  - **Each of the questions were answered on a 5-point Likert-type scale, from 1 (strongly agree) to 5 (strongly disagree).**
  - **Content validity index (CVI) values was .96; Cronbach's alpha coefficients was .83.**

- **Self-Efficacy Refusing to Smoke questionnaire**
  - **Developed by Liao (1994) was used to measure a respondent's confidence to not smoke when faced with the following situations: stress, nervousness, boredom, depression, and being in smoke-free public spaces.**
  - **The questionnaire consists of 10 questions, with each question answered on a 5-point Likert-type scale ranging from 1 (have no confidence at all) to 5 (have full confidence).**
  - **Content validity index (CVI) value was .86; Cronbach's alpha coefficients was .98.**
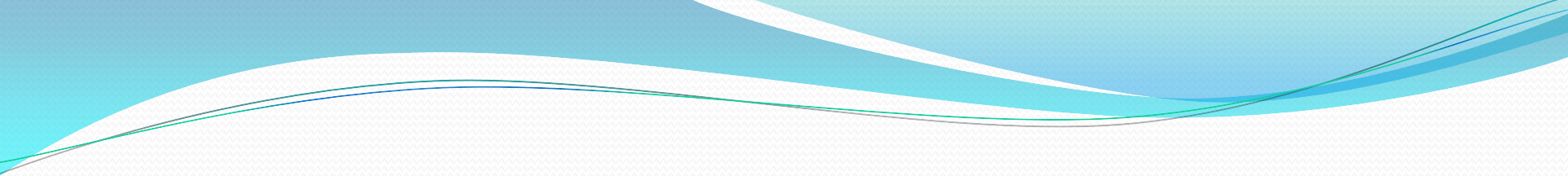
➢ **Cigarette smoking behavior**

➢ **Measured by frequency and duration of cigarette smoking from the past through the present;**

➢ **Classified respondents into two types: non-smokers and smokers.**

Data Collection and Processing

➢ **Data collection was carried out in a classroom at each school.**

➢ **Data collectors were introduced to the study purposes and instructed on how administer the questionnaire to subjects.**

➢ **Questionnaires were checked and verified for completeness when the subjects handed them in.**

➢ **A standardized decoding register was compiled and all data were computerized with the help of a card reader. Afterwards, all computerized data were compared and rectified against actual questionnaire data in order to eliminate inconsistencies.**

➢ **A frequency distribution was computed to check for any abnormal or outlying values.**

Ethical considerations

➢ **Before starting this study, researchers obtained approvals from the administrative departments of all targeted universities.**

➢ **Participants signed a written consent form, and confidentiality of responses was assured.**

Statistical Analysis

➢ **Data were analyzed using the SAS 8.1 statistical software package (SAS Institute, Inc., Cary, NC).**

➢ **Descriptive statistical analysis described the distribution of different variables of the study.**

➢ **Inferential statistical analysis, including a Student's t-test and logistic regression analysis, was used to predict factors underlying cigarette smoking behaviors.**

➢ **Statistical significance was defined as $p < .05$.**

Results

Distribution of Demographics

➢ **Of the 2,477 students, mean age was 20.9 years ($SD = 2.1$ years).**

➢ **The educational level of students' parents was primarily college and university (37.6%) for fathers and junior high school or lower (34.8%) for mothers.**

➢ **With regard to family environment, 15.7% of students' fathers and 3.2% of students' mothers reported smoking cigarettes. Approximately 13% of siblings also smoked.**

➢ **As to school environment, 62.2% students reported smoking by their teachers and/or officers, and 36.4% of their best friends smoked.**

➢ **More than half of the students indicated that their schools had a no-smoking policy in place (Table 1).**

Table 1. Subject Demographics (N=2,477)

Variables	n	%
Age (years old)		
18	138	5.6
19	423	17.1
20	593	23.9
21	576	23.3
≧22	717	28.9
Not Recorded	30	1.2
Father's Education Level		
≦Junior high	648	26.2
High school	725	29.3
College/University	931	37.6
≧Graduated	104	4.2
Not Recorded	69	2.7
Mother's Education Level		
≦Junior high	862	34.8
High school	856	34.6
College/University	653	26.4
≧Graduated	40	1.6
Not Recorded	66	2.6
Father Smoking Status		
Yes	966	15.7
No	1121	45.3
Not record	390	39.0
Mother Smoking Status		
Yes	80	3.2
No	2013	81.3
Not record	384	15.5
Sibling Smoking Status		
Yes	313	12.6
No	1779	71.8
Not record	385	15.6
Teacher Smoking Status		
Yes	1540	62.2
No	471	19.0
Not record	466	18.8
Best friend smoking status		
Yes	901	36.4
No	1155	46.6
Not recorded	421	17.0
School non-smoking policy		
Have	1372	55.4
No	881	35.6
Unknown	224	9.0

Prevalence and Cigarette Smoking History

➢ **The prevalence of cigarette smoking was 5.7%. Subjects who were non-smokers accounted for 94.3% of the total (Table 2).**

➢ **Smokers (Table 3)**

  ➢ **More than half of the students (53.9%) who smoked cigarettes consumed an average of fewer than five cigarettes per day.**

  ➢ **Around 45% smoked cigarettes every day of the week.**

  ➢ **More than one-third (34.8%) reported having smoked for 3-4 years. Around 13% of students reported that they started smoking after enrollment in school, and 33.3% progressed to become regular smokers.**

- Forty-four percent of students reported curiosity as the main reason behind their first cigarette smoking experience, followed by low mood (12.1%), and relief from stress (11.3%).
- Continuation of smoking was mainly due to relief from stress (52.5%), difficulties in smoking cessation (38.3%), and boredom (28.4%).
- In terms of cessation intent, most (83.0%) indicated a desire to quit the smoking habit.

Table 2. Prevalence of Cigarette Smoking Behavior Among Participants (N=2,477)

Variables	n	%
Non-smoker	2336	94.3
Smoker	141	5.7

Table 3. Cigarette Smoking Characteristics Among Smokers (N=141)

Variables	n	%	Variables	n	%
Average Quantity (per day)			**Form a Regular Smoking Habit**		
< 5 pcs.	76	53.9	Before enrollment in school	84	59.6
6-10 pcs.	45	31.9	After enrollment in school	47	33.3
11-15 pcs.	10	7.1	Unknown	10	7.1
16-20 pcs.	3	2.1			
> 20 pcs.	2	1.4	**Reasons for Continuing to Smoke (multiple answers allowed)**		
Not recorded	5	3.6	Have smoking around mate	16	11.4
			Relief from stress	74	52.5
			Interpersonal relationship	7	5.0
Average Days (per week)			Difficulties of smoke cessation	54	38.3
1-2 days	40	28.4			
3-4 days	25	17.7	boredom	40	28.4
5-6 days	10	7.1	Stimulating effect	35	24.8
Every day	63	44.7	Other	6	4.3
Not recorded	3	2.1			
			Would You Like to Quit Habit?		
Smoking Duration			No	20	14.2
< 1 year	10	7.1	Yes	117	83.0
1-2 year	28	19.9	Not recorded	4	2.8
3-4 year	49	34.8			
5-9 year	42	29.8			
> 10 year	10	7.1			
Not recorded	2	1.3			
First Smoking Experience					
Before in military school	118	83.7			
While in military school	18	12.8			
Not recorded	5	3.5			
Reasons for Starting to Smoke (multiple answers allowed)					
Curiosity	62	44.0			
Boredom	12	8.5			
Stimulating effect	3	2.1			
Friends' instigate	10	7.1			
Imitating family/ friends	3	2.1			
Expression of smart and cool	3	2.1			
Relief from stress	16	11.3			
Peer pressure	6	4.3			
Other	9	6.4			

Distribution of smoking attitudes and self-efficacy

➢ **Due to missing data on a number of the submitted questionnaires, the number of respondents used in data analysis was 2,025 and 2,059, respectively.**

➢ **Student's *t*-test showed significantly different attitudes toward smoking and levels of self-efficacy between smokers and non-smokers (p < .001) (Table 4).**

➢ **With regard to attitude toward smoking, non-smokers scored significantly higher than smokers (63.0 ± 8.8 vs.**

52.2 ± 6.7), which indicated that non-smokers in universities showed less acceptance of smoking behaviors.
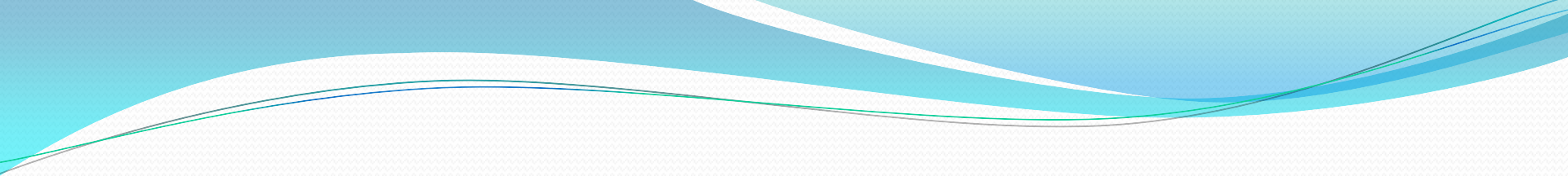
➢ **Smokers scored significantly lower than non-smokers in terms of self-efficacy (26.1 ± 6.4 vs. 46.4 ± 6.6), which indicated that smokers in universities were not confident or assertive enough to resist cigarettes.**

Table 4. Difference in Smoking Attitudes and Self-Efficacy Among Participants（N=2025 & 2059）

Variables	N	M	SD	t value	p value
Smoking Attitude					
Non-smoker	1920	63.0	8.8	15.8	< .001
Smoker	105	52.2	6.7		
Self-Efficacy					
Non-smoker	1955	46.4	6.6	30.9	< .001
Smoker	104	26.1	6.4		

Prediction Model for Cigarette Smoking Behaviors

➢ **Model 1 used univariate logistic regression to analyze smoking factors of influence. Results revealed that age, family environment, school environment, attitudes toward smoking and self-efficacy were related to cigarette smoking behaviors (Table 5).**

➢ **Model 2 used multivariate logistic regression to analyze smoking behaviors. Results showed age, peer influence and self-efficacy were the significant predictors of cigarette smoking behaviors (Table 5).**

Table 5. Predictive Models Related to Cigarette Smoking Behavior Among Participants （N=2477）

Variables	Model 1		Model 2	
	OR	95% C.I.	*OR*	95% C.I.
Age	1.35***	1.16-1.56	1.40*	1.04-1.88
Father smoking status (Yes / No)	1.90**	1.27-2.84	1.28	0.66-2.47
Mother smoking status (Yes / No)	0.65	0.28-1.54	0.41	0.10-1.70
Sibling smoking status (Yes / No)	3.32***	2.19-5.05	1.44	0.70-2.96
Teacher smoking status (Yes / No)	3.34***	1.67-6.67	1.10	0.40-3.04
Best friend smoking status (Yes / No)	9.38***	5.31-16.57	3.61**	1.53-8.54
School non-smoking policy (Yes / No)	1.50***	1.25-1.79	1.09	0.79-1.51
Smoking attitude	0.87***	0.85-0.89	1.03	0.98-1.08
Self-efficacy	0.78***	0.75-0.81	0.76***	0.72-0.80

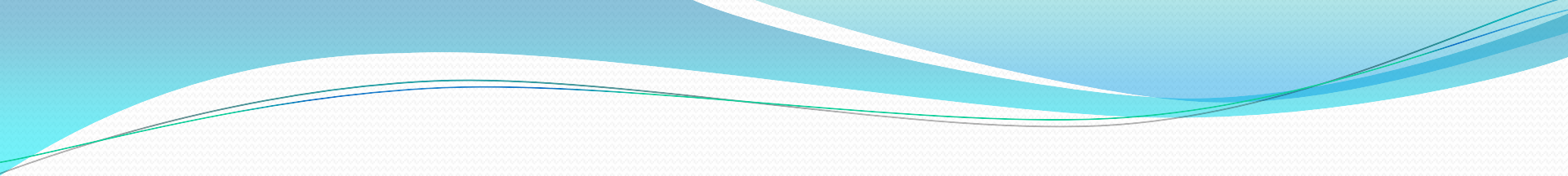*Note.* [1] Univariate analysis with the crude odd ratio.

[2] Multivariate analysis after adjusting for other variables in the model. For example, the adjusted OR of cigarette smoking for age were after further adjusting for father smoke status, mother smoke status, sibling smoke status, teacher smoke status, best friend smoke status, smoking attitude and self-efficacy; study subject as a smoker.
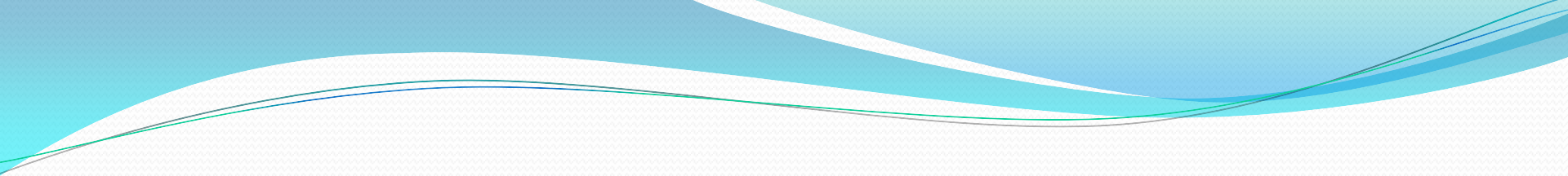
p < .05. **p< .01. ***p < .001.

Conclusion

➢ **Age, best friends smoking/peer influence, and self efficacy were significant predictors of smoking behaviors among military university students in Taiwan**.

➢ Peer influence should be taken into account when planning tobacco control strategies. It may be beneficial to promote the formation of student smoking cessation groups in order to reinforce positive group norms.

➢ Collaborative work with the Ministry of Health and other agencies are warranted at different levels. Student smokers could benefit from professional counseling and motivational interviews as well as pharmacological interventions.

➢ **It is clear that the National Defense Department wants to maintain optimal military readiness, Smoking cessation is one of the most cost-effective methods of achieving this.**

Implications for Future Research

➢ **To explore interrelationships between variables as there are many other factors that affect smoking behaviors.**

➢ **This baseline dataset can be a benchmark for National Defense tobacco control administrators planning the next steps for a longitudinal follow-up.**

Thank You for

Your Attention !!!

Questions and Comments