A Causal Model of Factors Associated with Smoking-Prevention Behaviors Among Lower Secondary School Male Students[1]

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Key words: smoking-prevention behavior, lower secondary school

Abstract

The purposes of this research were first to determine factors predicting smoking-prevention behaviors, second to analyze and provide a causal model of factors associated with smoking-prevention behaviors among lower secondary school male students in Khonkaen Province. Selected study variables were based on the theory of planned behavior (TPB). The sample was 437 male non-smoker students, between the ages of 12 and 15 years, who were studying in lower secondary school level (M.1-3) in City District, Khonkaen Province. The sample was randomly selected by using multi-stage sampling.

Tools for collecting data were questionnaires consisting of two parts: intention, attitude toward smoking-prevention behaviors (direct and indirect measures), subjective norms (direct and indirect measures) and perceived behavioral controls (direct and indirect measures) in part 1, and smoking-prevention behaviors in part 2. Demographic data and variables associated with smoking-prevention behaviors were analyzed by using frequency, percentage, mean and standard deviation. Factors affecting smoking-prevention behaviors were determined by using regression analysis and a causal model of factors associated with smoking-prevention behaviors was testified and provided by using path analysis.

Results according to research hypotheses indicated that:

1. Attitude toward smoking-prevention behaviors (indirect measures), as a significant predictor, had a direct positive effect on attitude toward smoking-prevention behaviors (direct measures) and significantly explained 32.70% variance. ($p<.01$)

2. Subjective norms (indirect measures), as a significant predictor, had a direct positive effect on subjective norms (direct measures) and significantly explained 30.30% variance. ($p<.01$)

3. Perceived behavioral controls (indirect measures), as a significant predictor, had a direct positive effect on perceived behavioral controls (direct measures) and significantly explained 34.90% variance. ($p<.01$)

4. Attitude toward smoking-prevention behaviors (direct measures), subjective norms (direct measures) and perceived behavioral controls (direct measures), as significant predictors, had a direct positive effect on intention to smoking prevention and significantly explained 41.70% variance. ($p<.01$) The standardized regression coefficients of attitude, subjective norms and perceived behavioral controls were .415, .205 and .143, respectively.

5. Intention to smoking prevention and perceived behavioral controls (direct measures), as significant predictors, had a direct positive effect on smoking-prevention behaviors and significantly explained 57.10% variance. ($p<.01$) The standardized regression coefficients of intention and perceived behavioral controls were .442 and .436, respectively.

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6. As a result of testing model based on the theory of planned behavior, it was found that the model did not fit to the empirical data. (chi-square = 353.67, df = 17, p-value = .00)

7. After modifying the model, a goodness of fit causal model could explain smoking-prevention behaviors (chi-square = 7.49, df = 4, p-value = .112, RMSEA = .046, GIF =1, AGIF = .96) and consisted of attitude toward smoking-prevention behaviors (direct and indirect measures), subjective norms (direct measures), perceived behavioral controls (direct and indirect measures) and intention. These variables could significantly explain smoking-prevention behaviors. (R^2=.68, p<.05) Attitude toward smoking-prevention behaviors (direct and indirect measures) and subjective norms (direct measures) had a direct positive effect on behaviors. The standardized path coefficients of attitude (direct and indirect measures) and behaviors were .24 and .09, respectively and of subjective norms and behaviors was .17. Perceived behavioral controls (direct and indirect measures) and intention had a direct positive effect on behaviors. The standardized path coefficients of perceived behavioral controls (direct and indirect measures) and behaviors were .19 and .11, respectively and of intention and behaviors was .27. All of the above coefficients were significant except attitude (indirect measures). (p<.05)

The research findings implied that preventing youths from smoking, family, school and involved organizations (private and governmental sectors) should cooperate to promote attitude toward smoking-prevention behaviors. They should serve as a good role model by performing smoking-prevention behaviors. Additionally, they should develop youth perceived behavioral control of smoking by using influencing groups (such as peer groups).

Introduction

Tobacco smoking is a powerful and preventable risk factor for cardiovascular disease and also markedly increases the risk of lung, oropharyngeal, and esophageal cancers; chronic obstructive pulmonary disease; peptic ulcer; and osteoporosis (The National Center for Tobacco-Free Kids. 2001). During the 1990s 3 million people died each year from smoking related illnesses but by the 2020s this figure is expected to rise to 10 million people annually, 70% of whom will come from developing countries. Approximately 500 million of the worlds present population will be killed by tobacco and half of these people will be middle aged (35 to 69 years) when they die (Ash Thailand organization. 2002). Smoking prevalence in Thailand has declined particularly among the older people over the last decade. However, young men, particularly those between the age of 15 and 19 years, have shown increases in smoking prevalence over the past three years period (6.3% in 1999s and 13.5% in 2001). It is a worrying trend. Furthermore, the trend is reflected in the age of initiation of all smokers of which 60% began smoking between age of 15 and 19 years. Considering to the region, the North-East have shown highest increases in smoking prevalence. From the prevalence, it shows that smoking in Thailand typically begins in the teen years, particularly among young men (The office of National Research Council of Thailand. 2004). Young smokers may have increased respiratory distress and illness, decreased physical fitness and a heightened risk for alcohol and illicit drug use, violence, depression, and other problems. Most teen smokers continue smoking into adulthood. (The National Center for Tobacco-Free Kids. 2001).

From the literature reviews, there were many studies on the smoking patterns (how) and smoking reasons (what, why) but a few studies on the smoking prevention behaviors. Much evidence shows that cigarette use is associated with person's attitude (a

positive or negative belief about smoking), reference groups (peer or parents imitation) and self-efficacy (The National Center for Tobacco-Free Kids. 2001; Ash Thailand organization. 2002). Thus, smoking prevention behavior may be explained by behavioral beliefs (beliefs about behavior), normative beliefs (beliefs about what others think about behavior) and control beliefs (beliefs about the level of control over behavior). According to the theory of planned behavior (TPB), human behavior is guided by 3 kinds of considerations: beliefs about the likely outcomes of the behavior and the evaluations of these outcomes, beliefs about the normative expectations of others and motivation to comply with these expectations, and beliefs about the presence of factors that may facilitate or impede performance of the behavior and the perceived power of these factors (Ajzen. 2002). However, from the previous studies, the used conceptual frameworks could not explain the behavior clearly and the analyzed methods had weakness to identify the linkage causal variables. In this study, I would like to explain and predict smoking prevention behavior based on the theory of planned behavior by using path analysis.

Objectives of the study
1. To study factors associated with smoking prevention behavior among lower secondary school male students in Khonkaen Province.
2. To analyze and identify the causal model of factors associated with smoking prevention
behavior among lower secondary school male students in Khonkaen province.

Methods
Population: The population was 4,636 male non-smoker students, between the ages of 12 and 15 years, who were studying in lower secondary school level (M.1-3) in City District, Khonkaen Province.

Sample: The sample was 437 male non-smoker students, between the ages of 12 and 15 years, who were studying in lower secondary school level (M.1-3) in City District, Khonkaen Province. The sample was randomly selected by using multi-stage sampling.

Measurements: Measurements for collecting data were questionnaires consisting of two parts: intention, attitude toward smoking-prevention behaviors (direct and indirect measures), subjective norms (direct and indirect measures) and perceived behavioral controls (direct and indirect measures) in part 1, and smoking-prevention behaviors in part 2. The measurements were constructed based on the TPB conceptual and methodological considerations (Ajzen. 2002). All of the questionnaires (both direct and indirect measures) except measure of the behaviors were 7-point scale, as in the following example of perceived behavioral controls:

For me to prevent myself from smoking would be

impossible : ___ : ___ : ___ : ___ : ___ : ___ : possible

extremely quite slightly neither slightly quite extremely

The questionnaire of smoking-prevention behaviors was 5-point scale to ask participants how often during the past month they perform the behaviors. (never, slightly, quite, mostly, regular)

Quality testing of measurements: All of the questionnaires were sent to 3 experts for testing content validity. After adjustment, they were tried out by giving to 100

respondents. To secure reliable, both of direct and indirect measurements were examined for internal consistency by using Cronbach's alpha coefficient (alpha =.70-.88). Furthermore, all of the indirect measurements were examined for temporal stability by using test-retest reliability (r = .80-.82).

Data analysis: Demographic data and variables associated with smoking-prevention behaviors were analyzed by using frequency, percentage, mean and standard deviation. Factors affecting smoking-prevention behaviors were determined by using regression analysis and a causal model of factors associated with smoking-prevention behaviors was testified and provided by using path analysis.

Results

Results according to research hypotheses indicated that:

1. Attitude toward smoking-prevention behaviors (indirect measures), as a significant predictor, had a direct positive effect on attitude toward smoking-prevention behaviors (direct measures) and significantly explained 32.70% variance. (p<.01)

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4. Attitude toward smoking-prevention behaviors (direct measures), subjective norms (direct measures) and perceived behavioral controls (direct measures), as significant predictors, had a direct positive effect on intention to smoking prevention and significantly explained 41.70% variance. (p<.01) The standardized regression coefficients of attitude, subjective norms and perceived behavioral controls were .415, .205 and .143, respectively.

5. Intention to smoking prevention and perceived behavioral controls (direct measures), as significant predictors, had a direct positive effect on smoking-prevention behaviors and significantly explained 57.10% variance. (p<.01) The standardized regression coefficients of intention and perceived behavioral controls were .442 and .436, respectively.

6. As a result of testing model based on the theory of planned behavior, it was found that the model did not fit to the empirical data. (chi-square = 353.67, df = 17, p-value = .00)

7. After modifying the model (Figure 1), a goodness of fit causal model could explain smoking-prevention behaviors (chi-square = 7.49, df = 4, p-value = .112, RMSEA = .046, GIF = 1, AGIF = .96) and consisted of attitude toward smoking-prevention behaviors (direct and indirect measures), subjective norms (direct measures), perceived behavioral controls (direct and indirect measures) and intention. These variables could significantly explain smoking-prevention behaviors. (R^2=.68, p<.05) Attitude toward smoking-prevention behaviors (direct and indirect measures) and subjective norms (direct measures) had a direct positive effect on behaviors. The standardized path coefficients of attitude (direct and indirect measures) and behaviors were .24 and .09, respectively and of subjective norms and behaviors was .17. Perceived behavioral controls (direct and indirect measures) and intention had a direct positive effect on behaviors. The standardized path coefficients of perceived behavioral controls (direct and indirect measures) and behaviors were .19 and .11, respectively and of intention and behaviors

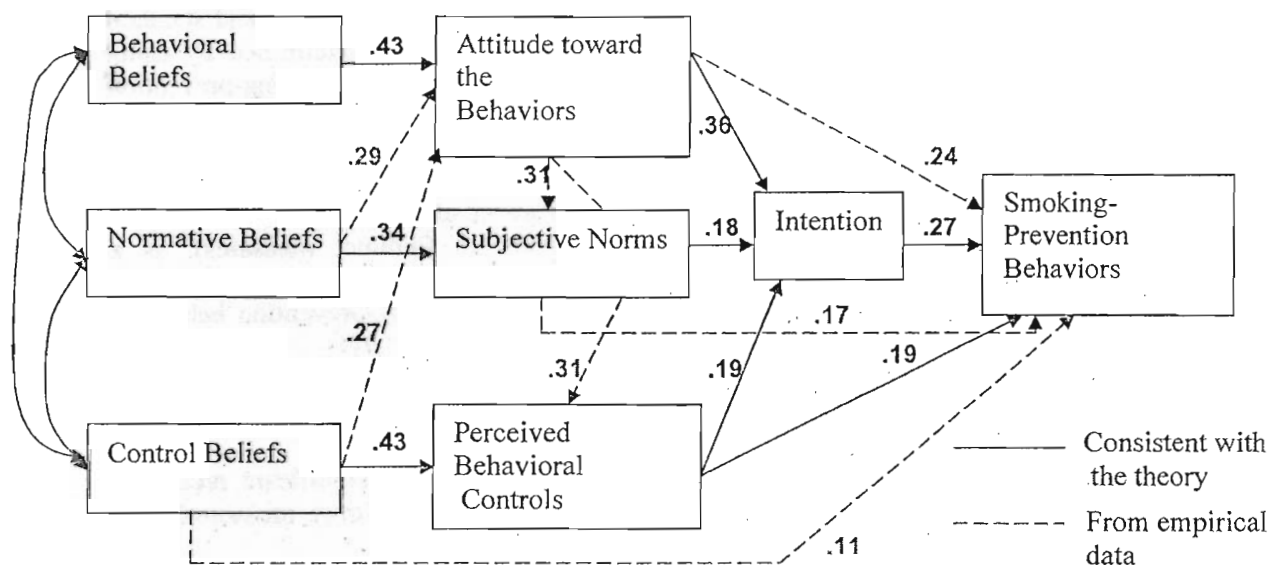was .27. All of the above coefficients were significant except attitude (indirect measures). (p<.05)

Figure 1 Modification causal model of smoking-prevention behaviors

Conclusion

The finding strongly supported all of the hypotheses. Consistent with the theory of planned behavior, (a) attitude, subjective norms and perceived behavioral controls had a direct positive effect on intention to smoking prevention, and (b) intention and perceived behavioral controls had a direct positive effect on smoking-prevention behaviors. The conclusions were that the theory had proven useful in predicting both intentions to smoking prevention and smoking-prevention behaviors, that attitudes were more powerfully predicted than subjective norms and perceived behavioral controls. Ajzen (2002) said that the relative importance of these three factors was likely to vary from one behavior to another and from one population to another. But in contrast to the theory, it found that attitude and subjective norms had a direct effect on behaviors and perceived behavioral controls had an indirect effect on behaviors as a result of testing model did not fit to the empirical data. Implications of these results should be the focus of future research. However, there were limitations to use TPB to predict behaviors. There was much ambiguity regarding how to define perceived behavioral control and this created measurement problems. Factors such as personality and other variables were not taken into consideration (Brown. 1999). Moreover, the theory's existing predictors should be behavior-specific, conforming to the principle of compatibility. That was, it should be defined in terms of the target, action, context, and time elements that described the behavioral criterion. (Ajzen. 2003)

The research findings implied that preventing youths from smoking, family, school and involved organizations (private and governmental sectors) should cooperate to promote attitude toward smoking-prevention behaviors. They should serve as a good role model by performing smoking-prevention behaviors. Additionally, they should develop

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