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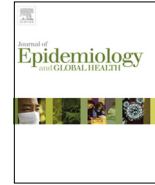
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Lebanese medical students' intention to deliver smoking cessation advice

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Abstract Objectives: Objectives of this study were to examine the constructs of the Theory of Planned Behavior and determine how they predict Lebanese medical students' behavioral intention to advise patients to quit smoking.

Study design: This was a cross-sectional study conducted among 191 medical students from six medical schools in Lebanon.

Methods: The instrument contained scales that measured attitudes toward the behavior, behavioral beliefs, subjective norms, and perceived behavioral control. Psychometric properties of the scale were examined. Item to total scale score correlations were determined and linear regression was conducted to predict the intention to advise smokers to quit.

Results: Respondents had a positive, but not very high, intention to deliver smoking cessation advice. Students reported a positive attitude toward advising patients to quit cigarette smoking and a strong belief in the physician's obligations in smoking cessation advising. The majority reported lack of time to provide smoking cessation advice, insufficient knowledge of pharmacological aids, and the lack of openness of the patient to receive the advice. The attitude scale was the only variable that yielded a significant prediction of the intended behavior.

Conclusions: The construct of attitude toward the behavior appeared to be the most predictive of the intention to deliver advice to quit smoking among Lebanese medical students. Focusing training efforts on this construct could improve the rate of delivery of brief cessation counseling.

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1. Introduction

In Lebanon, like in the rest of the world, tobacco dependence is recognized as the greatest preventable cause of disease and death [18]. The World Health Organization has repeatedly emphasized the role of health professionals, in particular physicians, in efforts to promote tobacco control in the public health agenda [17]. Physicians can have a critical role in reducing the tobacco burden, as even brief advice from health professionals can substantially increase smoking cessation rates [17,4]. Although the provision of pharmacotherapy for tobacco dependence, where available and affordable, has been shown to enhance the effectiveness of smoking cessation advice [6,7], smoking cessation advice alone is also a cost-effective intervention and is efficient [4,6,8]. The medical community in Lebanon is poorly committed to tobacco dependence treatment policies [9]. Many clinicians lack knowledge about the importance of identifying patients who are smokers, which treatments are efficacious, and how such treatments can be delivered. Additionally, they may fail to intervene because of inadequate clinic-level or institutional support for routine assessment and treatment of tobacco use [10].

Little is known regarding the competency related to, and the current practice of, tobacco dependence treatment delivery among Lebanese physicians to patients who smoke. To address this gap and respond to the recommendations to increase the competency of physicians in tobacco dependence interventions [17,4], this research focused on medical students. Medical students as future physicians, educators, and researchers that are open to innovation are in a key position to influence future tobacco cessation programs [10].

The Theory of Planned Behavior (TPB) has been developed to predict an individual's behavior and posits that the best predictor of a given behavior is the behavioral intention to perform it [1,2]. Intentions to perform the behavior are a function of the following constructs, according to the model. The first construct is attitude toward the behavior, which is influenced by beliefs about the action and one's motivation to comply with the action [1]. The second construct is subjective norms, which are influenced by normative beliefs and motivation to comply with norms [1]. The third construct is perceived behavioral control, which is influenced by self-efficacy or perceived control and perceived power [1]. Even if beliefs can be changed with success, the effect on the performance of the intended behavior would be

facilitated by the proposed causal chain of constructs listed above within the TPB. The TPB has been successfully used to predict a wide range of social behaviors, including health behaviors [13,5] and particularly a physician's delivery of preventive services [2,12,16]. The main objectives of this study were to examine the components of the TPB and determine how they predict Lebanese medical students' behavioral intention to deliver advice to quit cigarette smoking.

2. Methods

A cross-sectional study was conducted during the 2009–2010 school year among 6th year medical students enrolled at six medical schools in Lebanon. The study received exemption from the Ohio State University Office of Responsible Research and was conducted according to their approved protocol.

2.1. Study population

A listing of all colleges in Lebanon that offer degrees in medicine was obtained from the WHO 2007 updated list [19]. There are currently seven listed medical schools. A letter of invitation to participate in the study was e-mailed directly to the dean's office of each medical school. A response with permission to conduct the survey was promptly received from 6 medical schools. One medical school opened for enrollment in 2007 and was not included in the study.

All 6th-year medical students were the target population for the study in programs that have four years of medical school education following an undergraduate degree, and medical students classified as one year before their graduation year from all other programs. To be eligible, a medical student had to be in the target year for the medical school and had to understand English to be able to complete the survey. Medical students in the introductory years were not targeted because they are still learning basic sciences and medical students in their graduating year are hard to reach because they are mostly in clinical rotations and rarely in the classic classroom setting.

2.2. Instrument development

The survey instrument was developed to measure the constructs of the TPB: (1) attitude toward behavior; (2) perceived subjective norms; and (3) perceived behavioral control. To be consistent with

previous research into how the TPB predicts health-care provider behavior, attitude was measured using two scales: attitude toward the behavior and behavioral beliefs [14,11]. The outcome in this analysis was the intention to deliver advice to quit cigarette smoking in clinical rotations.

To determine which influential others are important and which barriers affect the intention to provide cigarette cessation advice, semi-structured interviews were conducted with four medical students who were recent graduates of Lebanese medical schools. The participants were asked to respond to items from previously developed questionnaires that were designed to predict intentions to use clinical guidelines in tobacco dependence counseling [14] and to examine attitudes and beliefs toward their role in assisting patients with smoking cessation [11]. Specifically, the following items were explored in the interviews: (1) attitude toward behavior, such as obligation to provide smoking cessation advice, the clinic visit as an ideal time to provide tobacco dependence advice, and all patients identified as tobacco dependent should be given tobacco dependence advice; (2) behavioral beliefs, or the evaluation of outcomes of providing brief cessation counseling, such as jeopardizing the patient-physician relationship, wasting the physician's time, and causing frustration; (3) normative beliefs, or the extent to which people were identified as influential, such as attending physicians, the hospital or medical school policy, and the patients themselves believing that brief counseling is important; and (4) perceived behavioral control, or the possession of the knowledge and resources needed by a health professional to provide brief counseling, such as behavioral skills, knowledge of pharmacological aids, and the availability of time to provide such a service. Analysis of the content of these interviews was performed to develop the measures for this study.

2.3. Survey measures

The dependent variable — intention to advise patients who smoke cigarettes to quit — was measured with the following: "How often do you intend to provide smoking cessation advice in your clinical rotations to patients who smoke cigarettes?" A response was given on a 1–10 scale, where 1 indicated "never" and 10 indicated "always".

Table 2 contains a summary of the items that were used to measure the TPB constructs. As

stated above, previously published instruments were reviewed for this study [14,11]. Attitude toward the behavior (ATB) of advising smokers to quit was measured using five statements that measured attitudes toward offering smoking cessation advice, such as beliefs about the physician's role in offering advice and the situations in which it is appropriate to give advice. Items for this variable were measured using a 5-point strongly agree/strongly disagree scale (ranging from 5 to 1 in value for every item). The scale score was determined by summing all items.

Behavioral beliefs (BB) were measured with four items related to beliefs about possible outcomes of offering cigarette smoking cessation advice to patients. The outcomes included negative consequences, such as threatening the doctor–patient relationship, wasting the physician's time, and frustration. Items for this variable were measured on a 5-point scale ranging from strongly disagree (value of 5) to strongly agree (value of 1). The scale score was determined by summing the 4 items.

Perceived subjective norms (SN) were defined according to influential personnel beliefs (normative beliefs) about offering cigarette smoking cessation advice and the medical students' motivation to comply with those people. Influential personnel were identified as attending physicians or chief residents, school policy developers such as administrators and public health advocates, and patients. Items measuring normative beliefs used a 5-point strongly agree/strongly disagree scale (ranging from 2 for strongly agree to –2 for strongly disagree). Items measuring willingness to comply used a 5-point frequently/never scale (ranging from 5 to 1). Every item related to normative beliefs was multiplied by the corresponding item for motivation. For example, the first item in this scale was about the attending physician or chief resident (influential person) wanting the medical student to give the patient smoking cessation advice. Medical students who strongly agreed (score of 2) with the belief of the attending physician and were motivated to frequently comply (score of 5) with the attending physician's beliefs would have a score of 10. A scale score was developed for social norms by summing the products of each item combination.

Perceived behavioral control (PBC) was measured by asking students about their knowledge of different aspects related to providing smoking cessation advice, resources available to them that would facilitate or hinder the provision of such an advice, and their beliefs about the effect of this knowledge or resources on providing this

service to patients. For example, if the student strongly agreed (value of 5 on a 5-point scale) with having adequate knowledge of pharmacological aids for tobacco dependence treatment, and believed that knowledge of pharmacological aids would strongly increase (value of 2 on a 5-point bipolar scale) the likelihood to provide smoking cessation advice for the patient, then the score for this item would be 10. This score is an indication of positive perceived ability to provide smoking cessation advice. The PBC scale contained 6 items. The scores for all products of each item combination were summed in one total score.

Current cigarette or smoking status was measured using the question: "During the past 30 days (1 month), on how many days did you smoke cigarettes?" A non-smoker was a person who replied "0 days" to this question.

2.4. Data collection

The survey was administered in the classroom setting in the schools after a mandatory class to ensure full attendance. Participants were informed that the survey was anonymous and that participation was voluntary.

2.5. Data analysis

The data for this study were analyzed using the statistical package Stata 10 (College Station, Texas). Response rate and descriptive statistics were calculated for the survey respondents. The mean and standard error were calculated for all scales. The internal consistency of each subscale was measured with Cronbach's coefficient alpha. The intention to deliver smoking cessation advice was treated as a continuous variable since it was reported on a scale of 1–10, with 1 being never and 10 being always. Spearman correlation was used to test the association between individual scale items and intention to deliver smoking cessation advice to patients. All correlations were considered significant at $p < 0.05$. A multiple linear regression was used to specify a predictive model of intention to provide cessation advice for patients, with the model constructs serving as the independent variables. The assumption that the overall residual distribution of the final linear mixed model is Gaussian was tested, in addition to the assumption of equal variance for the residuals, linear relation between the predictors and outcome, and diagnosis of any outliers of the random effects of the model. The variance inflation factor and tolerance were examined for the parameters to determine whether multicollinearity was present.

3. Results

The study included 191 students from 6 medical schools. The response rate was 54.3% from all medical schools. The average age of medical students who participated in the study was 23.6 ± 1.0 . Female respondents were 44.5% of the sample and 55.5% were males. The prevalence of current cigarette smoking was 26.3% among all participants. The frequency distribution of self-reported intentions to advise patients to quit cigarette smoking is presented in Table 1. Respondents in general had a positive, but not very high, intention to give smoking cessation advice. The mean for the intention scale was 6.9 on a 10-point scale. Table 2 contains the means, standard errors and Spearman correlations with intention to advise patients to quit smoking cigarettes for the 4 TPB scales (ATB, BB, SN and PBC) and individual items in each scale. In general, students reported a positive attitude toward advising patients in quitting cigarette smoking and a moderate Spearman correlation with intention to advise patients to quit smoking (0.46). Of the 5 ATB items, the most important were that the medical students felt that a physician has an obligation to advise patients to quit smoking and that patients with non-smoking related illnesses should be given smoking cessation advice. The BB scale had a theoretical range from 4 to 20, and the overall mean was 14.4, indicating the strong beliefs in the physician's obligations in smoking cessation advising. The SN scale had an overall positive mean (5.9) with a possible theoretical range of -30 to $+30$, indicating a possible social influence on decisions to provide cessation advice

Table 1 Self-reported intentions of 6th year Lebanese medical students to provide cigarette smoking cessation advice, Lebanon, 2010 ($N = 191$).

Intention rating	Intention to advise smokers to quit (1 = Never, 10 = Always) % Reported
1	6.8
2	1.2
3	5.2
4	3.1
5	13.1
6	9.9
7	9.9
8	13.1
9	6.8
10	26.2
Mean score \pm SD	6.9 ± 0.3
Median score	7
Range	1–10

Table 2 Descriptive statistics of scales, scale items, and correlation with medical students' intention to advise patients in cigarette smoking cessation.

Scale	Mean ± SE	Correlation with intention to advise	p-Value
Attitude toward behavior (ATB)			
<i>Total scale score</i>	20.5 ± 0.17	0.46	<0.005
Physician has an obligation to advise patient to quit	4.4 ± 0.04	0.34	<0.001
A doctor's visit is an ideal time to try to quit	3.9 ± 0.05	0.37	<0.001
All patients who smoke should be given cessation advice	4.3 ± 0.06	0.37	<0.001
Only patients who are ready to quit should be given cessation advice	3.8 ± 0.03	0.38	<0.001
Patients with non-smoking related illness should be given cessation advice	4.1 ± 0.04	0.35	<0.001
Behavioral beliefs (BB)			
<i>Total scale score</i>	14.4 ± 0.22	0.19	0.01
Offering cessation counseling will threaten physician–patient relationship	3.4 ± 0.11	0.10	0.03
Offering cessation counseling is a waste of time	3.8 ± 0.09	0.13	0.03
Offering cessation counseling will leave little time to do other patient care	3.5 ± 0.08	0.16	0.03
Offering cessation counseling will cause frustration	3.7 ± 0.07	0.14	0.06
Subjective norms (SN)			
<i>Total Scale Score</i>	5.9 ± 0.68	0.23	0.001
Attending physician would like patients to receive cessation counseling	2.5 ± 0.17	0.28	<0.001
Medical school policy dictates that patients receive cessation counseling	2.0 ± 0.43	0.13	0.07
Patients who smoke would like physician to offer cessation counseling	1.3 ± 0.33	0.06	0.42
Perceived behavioral control (PBC)			
<i>Total scale score</i>	24.3 ± 1.82	0.23	0.005
Knowledge of behavioral skills and techniques for cessation	4.7 ± 0.41	0.13	0.82
Knowledge for pharmacological aids for cessation	3.7 ± 0.32	0.12	0.12
Knowledge of positive effects of cessation	4.5 ± 0.27	0.19	0.01
Comfortable discussing cessation	4.3 ± 0.37	0.29	<0.001
Adequate time to discuss cessation	4.1 ± 0.28	0.28	<0.001
Patient open to receive cessation counseling	3.0 ± 0.16	0.16	0.03

in clinical rotations by the medical students. However, the Spearman correlation was weak and non-significant for some of the scale items (medical school policy requirement and patients' demands). The PBC score was positive (total mean score for the scale was 24.3 on a –60 to +60 theoretically possible range of values). Respondents tended to disagree (60% disagreed or strongly disagreed) that they have adequate knowledge of pharmacological aids to provide smoking cessation advice and tended to agree (86% agreed or strongly agreed) that they do not have adequate time to discuss the topic with a patient.

As indicated in Table 3, all four scales exhibited acceptable internal consistency as measured by Cronbach's coefficient alpha (0.61 for SN, 0.75 for ATB, 0.80 for BB, and 0.87 for PBC). However, except for ATB and PBC, the four scales were not strongly correlated with each other (Table 3).

Only the subscale score for ATB was significant in the linear regression model for predicting intention to advise patients to quit cigarette smoking

(coefficient = 0.4, $p < 0.001$). All other subscales and demographic variables were insignificant.

4. Discussion

The objective of this study was to examine the current state of intentions to advise patients to quit cigarette smoking among the 6th-year Lebanese medical students. The results of this study revealed that attitude alone was a significant predictor of intention to provide advice to quit cigarette smoking, while the other constructs were not significant determinants of intention to provide such an advice. This suggested that medical students who believed they had the knowledge to provide advice, and who perceived the behavior would be easier to perform, did not differ in intention from those who thought otherwise. An examination of the responses to these constructs revealed that the majority of medical students reported lack of time to provide smoking cessation advice, insufficient knowledge of pharmacological aids, and the

Table 3 Correlation coefficients among the TPB subscales.

Scale	Attitude toward behavior	Behavioral beliefs	Subjective norms	Perceived behavioral control
a. Attitude toward behavior	1.00			
b. Behavioral beliefs	0.20	1.00		
c. Subjective norms	0.37	-0.35	1.00	
d. Perceived behavioral control	0.67	0.038	0.45	1.00

lack of openness of the patient to receive a smoking cessation intervention.

There is evidence that medical students are receiving some kind of training in tobacco control education from their reported positive self-efficacy and ability to provide tobacco dependence counseling in their clinical rotations. The medical students reported strong agreement that it is an obligation of the physician to provide smoking cessation advice to all patients identified as smokers. Because students must be clinically competent in providing this service, it is worrisome that the reported level of knowledge in this field is low. Based on the results of this study, there is a need to expand the level of tobacco dependence education, actual training in the clinical competency to provide treatment to complicated tobacco dependency in all forms, increase intentions, and possibly future behavior in providing tobacco dependence treatment in general and cessation advice in particular. Interventions targeted to this group may focus on improving attitudes toward smoking cessation counseling, stressing the role of the physician in increasing the chances of a patient to overcome tobacco dependence, strengthening institutional requirements to provide this service to patients, and providing solutions to reported barriers, such as lack of time to provide advice or lack of knowledge of pharmacological aids.

This study revealed that the constructs of the TPB were not strong enough in this population to influence intention to provide a smoking cessation intervention in the form of advice. Despite this, the findings add to the growing body of knowledge that the construct of attitude toward the behavior in TPB may be of value in understanding and predicting medical students' behavior regarding smoking cessation counseling. The TPB has previously been used successfully to investigate the behavior of a range of health professionals [15,13,14,16,11,12]. Similar to the findings in this study, previous studies focusing on explaining the variance in health professionals' behavioral intentions have found promising results consistent with the importance of attitude as a predictor of intention [12,13,14,11]. The results of

this study support the TPB as an important addition to understanding intention, even if they were inconsistent with a number of studies of other behavioral domains that had found that perceived behavioral control significantly increased the prediction of intention [14,11,12].

5. Limitations

The TPB proposes that the best predictor of a given behavior is the behavioral intention to perform it [1]. As a result, the study was limited to the intention of providing cessation advice by medical students' in future clinical rotations rather than the actual behavior of providing the cessation advice service. These findings of intentions may not actually translate into action for this population and there may be other factors that need to be taken into consideration when predicting the performance of a behavior, such as smoking cessation counseling. However, the results of this study add to the growing evidence that the TPB is useful in predicting medical students' and other health professionals' intentions and their subsequent behavior. Other studies showed promising results in explaining variance in real behavior from intentions and other constructs of TPB [12]. This study has other limitations. First, the findings of this study rely on self-reported data and medical students may have misreported their intentions, beliefs, social norms, and level of knowledge. Secondly, the response rate of less than 60% from this cohort of medical students may limit the generalizability of the results to all medical students. Those who did not participate in the survey may have had different beliefs or intentions than students who participated. Thirdly, the Theory of Planned Behavior does not attend to variables related to personal emotions, such as feelings of threat, fear, and mood fluctuations that the medical students may have been experiencing during the examination period. Overlooking such variables has been identified as a drawback for predicting health-related behavior [3].

6. Conclusion

The findings from this study have several important implications for controlling the tobacco epidemic in Lebanon. Interventionists, educators, and medical school administrators should concentrate their efforts on improving medical education related to tobacco dependence treatment. For example, educational efforts could focus on strengthening attitudes toward the behavior of delivering brief counseling in the form of advice to quit smoking, given the relation that was found between attitudes and intentions to perform the behavior. Also, it was found that students did not feel knowledgeable about pharmacotherapy and its effectiveness. This information should be included in tobacco-related communications to physicians, residents, and students.

Declaration of interests

No competing interests to declare.

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Contributorship

All authors have contributed to this publication and hold themselves jointly and individually responsible for the content.

Conflict of interest

None declared.

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